INSTITUTE FOR DEVELOPMENT IMPACT

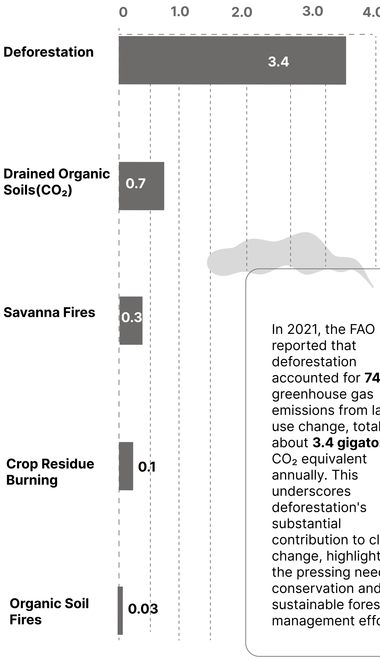
CONTRIBUTION OF AGRICULTURE TO GREEN HOUSE GAS EMISSIONS.

SPECIAL FOCUS ON IMPACT OF DEFORESTATION ON CLIMATE - STRATEGIES FOR REDUCING GREENHOUSE GAS EMISSIONS

Agriculture plays a dual role in our climate-balanced world—both vital for sustenance and a significant emitter of greenhouse gases. Deforestation driven by agricultural expansion releases vast amounts of carbon dioxide, worsening the climate crisis. Shifting to sustainable practices and protecting forests can mitigate emissions, preserve biodiversity, and secure our future.

MAJOR CAUSES OF GREENHOUSE GAS EMISSIONS SPECIFIC TO DEFORESTATION

Contribution of Deforestation to Greenhouse Gas Emissions in Gigatons

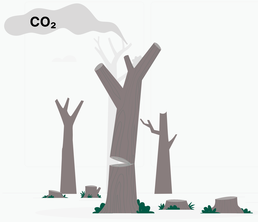


In 2021, the FAO reported that deforestation accounted for **74%** of greenhouse gas emissions from land use change, totaling about **3.4 gigatons** of CO_2 equivalent annually. This underscores deforestation's substantial contribution to climate change, highlighting the pressing need for conservation and sustainable forest management efforts.

DATA SOURCE FAO EMISSION DATASET

The primary driver of greenhouse gas emissions from deforestation stems from activities such as crop production and pasture establishment. Directly, emissions occur through tree felling, while indirectly, they arise from anaerobic fermentation in waterlogged soils resulting from deforestation. These processes collectively contribute significantly to the release of greenhouse gases into the atmosphere, exacerbating global climate change impacts.

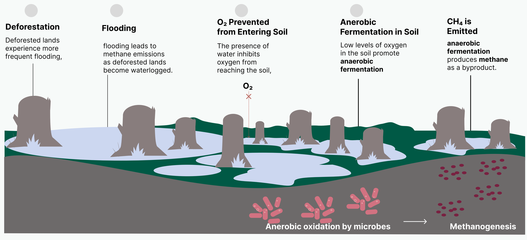
Direct Emissions Through Tree Felling



Trees sequester carbon dioxide through photosynthesis.

When trees are cut down, stored carbon is released as carbon dioxide, worsening the greenhouse effect and climate change impacts.

Indirect Emissions Through Anaerobic Fermentation

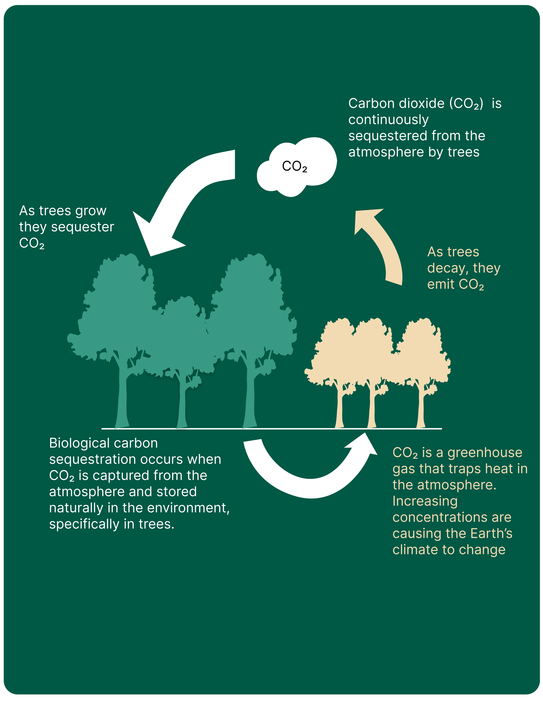


EOS

OPPORTUNITIES FOR GREENHOUSE GAS EMISSIONS REDUCTION GLOBALLY

Role of Trees in the Reduction of Greenhouse Gas Emissions

Forests play a significant role in shaping the greenhouse gas composition of the atmosphere. They possess a unique ability to absorb greenhouse gas emissions, particularly carbon dioxide (CO_2)generated by human activities, agricultural fires, animal respiration, and manure management and utilization, while also producing oxygen in return.



Specific Mitigation Efforts for Reducing Greenhouse Gas Emissions

Reforestation and Afforestation

3.8 gigaton

reduction in GHG emissions by 2050.

By implementing reforestation and afforestation strategies, we can **cut global GHG emissions by 3.8 gigatons by 2050**. Reforestation restores depleted areas, while afforestation creates new forests, enhancing carbon sequestration and supporting climate initiatives.

Deforestation Avoidance

2.4 gigaton

reduction in GHG emissions by 2050.

By implementing strategies to avoid deforestation, we have the opportunity to **reduce global GHG emissions by 2.4 gigatons by 2050**. Preventing forest clearing preserves essential carbon sinks, which is crucial for global climate mitigation.

Forest Management

0.8 gigaton

reduction in GHG emissions by 2050.

With effective forest management strategies, we have an opportunity to **cut global GHG emissions by 0.8 gigatons by 2050.** Practices such as selective logging and fire management help maintain forest health and biodiversity while promoting carbon sequestration.

DATA SOURCES FAO PATHWAY TO LOWER EMISSION MCKINSEY.COM

© 2024 Institute for Development Impact