Contributing to a Crisis: How Deforestation is a Driver of Climate Change

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Research Question: Does deforestation have an impact on climate change?

Abstract: Deforestation and climate change are two of the biggest environmental impacts facing the planet today, therefore, it is important to know the interaction between them. Using a meta-analysis we looked at the effect that deforestation has on the climate as well as climate change. Ten papers were selected for statistical analysis from 185 initial results representing twenty-five countries with large rainforests. In order to produce relevant and applicable results, the papers were restricted to the last five years. We found that deforestation has both regional and global impacts on the climate. This result has significant implications because it shows that slowing deforestation is not only critical for the local environment but also for the entire global climate.

Purpose

- To determine the extent of the effects of forest loss on regional climates
- To explore the polarity of these changes on climatic conditions

Methods

- Web of science review using following search terms, “Climate and Deforestation,” “forest loss and climate,” “deforestation and climate change,” “Forest* manage* and climate,” and restricted to the past five years
- 218 initial results; 185 after duplicates removed
- 170 Articles excluded after title and abstract review; 15 articles remained
- 2 articles excluded after full text screening
- 3 articles excluded after data extraction
- 10 articles selected for data analysis

Scan for Contact Information and References

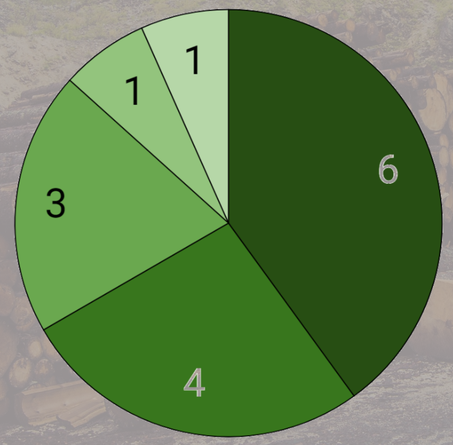

Figure 1: Pie chart showing the effects of deforestation on the climate and how many studies found each effect.

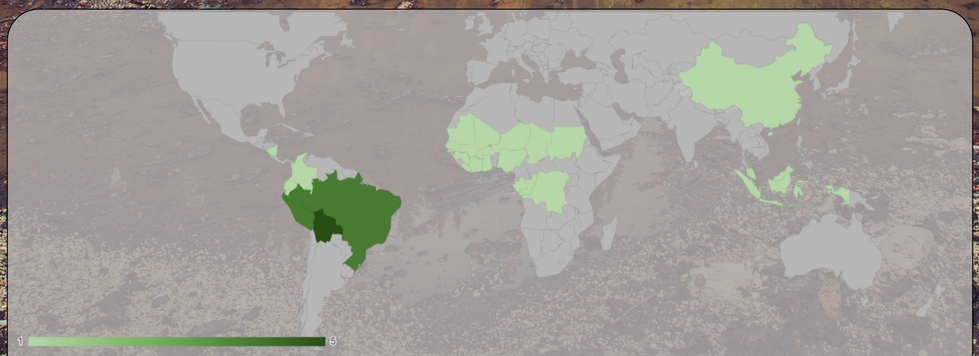

Figure 2. Map of 25 countries from 10 studies (2013-2018) included in meta-analysis (N=185, n=10)

Results

- 2 studies reported non-significant results
- 8 studies reported significant results
- 3 studies had strong negative correlations
- 3 studies had weak positive correlations
- 4 studies had strong positive correlations

Implications

- Increases in forest loss directly affects regional climate by altering surface temperatures
- Forest loss results in warmer and drier climates in most studies analyzed
- Some studies reported increases in precipitations
- Reductions in deforestation practices are necessary to minimize future climate change
- Further research on the global implications is needed