OFFICIAL ABSTRACT and CERTIFICATION

Urban Expansion and Carbon Emissions

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It is predicted by the UN that by 2050, 68% of the world ' s population will live in urban areas- a 2.5 billion person increase. With such, it is important to consider the implications on the climate. CO emissions are a popular indicator of an area ' s effect on climate change.

The purpose of this experiment was to test the correlation between CO emissions within large and growing cities with built-up area and built-up area rate of increase. It was hypothesized that large cities would have larger emissions per hectare of the built-up area and that both groups would see an increase in emissions as the built-up area increased.

Data was collected from The Atlas of Urban Expansion as well as publicly available databases. Cities were separated into large and growing cities, and 15 per category were chosen. The Built-up area was gathered from The Atlas of Urban Expansion. CO emissions were determined by multiplying the city ' s population by the country emissions per capita. Results were then graphed and analyzed.

Though no significant results were found, as seen by the R^2 values, a direct relationship between emission rates from 1990-2015 and emissions with the built-up area in growing cities was found. In larger cities, each of these metrics saw a parabolic relationship with each other.

The hypothesis was neither accepted nor rejected, as the results of this study were not shown to be significant. Further testing is needed for this hypothesis.

This project was important, as it helped to test the relationship between urban growth and carbon emissions. These two areas- urban expansion and global warming- carry an important, yet the unquantified relationship with one another. Research in this area is important to create recommendations for policy changes that will allow the planet to slow the pace of climate change.

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