EcoAir: Biochar Low-cost Portable Purifier for Indoor Pollution

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Air pollution is a major problem in metropolitan areas around the world. Even though it affects the health of all, its impact is more severe in the underserved communities in developing countries, mostly due to the burning of public garbage dumps, unregulated vehicle emissions, electricity producing diesel generators, and traditional open wood fire cooking. Additionally, dust from local quarries and stone cutting industries amplify the issue of a low air quality. Toxic air chemicals and dust particles enter residential homes as the majority of the marginalized population do not live in air-sealed houses. The major objective of this project was to propose an inexpensive solution to increase indoor air quality. A prototype of an air purifier, EcoAir, was constructed from locally available materials. The tests were performed in a closed chamber and samples were analyzed for removal of particulate matter and gaseous contaminants. Air was also evaluated for microbial contamination. The results showed removal of 75% of smoke particulates. It was also found that the sample without purifier provided on average 77 CFU, while the purified air resulted in 22 CFU and thus also having positive impact on removal of potential biological contaminants. In the future with more time, resources and further testing the hope is to turn the EcoAir prototype into a product that can be used in low socioeconomic areas with high air contamination to provide healthier options for breathing.

Awards Won:
U.S. Agency for International Development: Third Award Climate and Environmental Protection