Evaluation of Green Infrastructure to Mitigate Increased Stormwater Volumes in Disadvantaged Communities

The last decade has experienced increased frequency and intensity of flooding caused by climate change, urbanization, and undersized stormwater management systems escalating the impacts of flooding. Disadvantaged communities, marked by a high prevalence of minorities and residents facing economic hardships, bear a disproportionate burden of the environmental and health impacts of flooding. One way to manage excessive stormwater is through implementing green infrastructure, which uses soil and vegetation or engineered capture technologies to manage runoff where natural drainage systems have been impacted by urbanization. Additionally, green infrastructure functions as localized stormwater treatment in contrast to traditional grey infrastructure. This research seeks to identify and understand flooding events and socioeconomic dimensions in vulnerable communities and evaluate existing green infrastructure. The ultimate goal is to provide recommendations for strategically implementing green infrastructure to alleviate stormwater impacts on disadvantaged populations. The study combines spatial analysis, socio-economic profiling using EPA's EJScreen, and data analysis to evaluate green infrastructure to capture and manage stormwater. The analysis considered disadvantaged communities experiencing increased stormwater over the past ten years. The results will inform the implementation of green infrastructure to address stormwater challenges in these communities. Additionally, the results will aid in sustainable development and nature-based solutions to enhance community resilience and promote environmental justice from the effects of increased rainfall and associated stormwater. Recommendations from the study will guide future green infrastructure initiatives to foster more resilient and inclusive communities in the face of increasing stormwater challenges.

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