

The background of the entire page is an aerial photograph of a city, likely Santo Domingo, Dominican Republic. The image shows a dense urban area with numerous multi-story apartment buildings and commercial structures. There are also green spaces with trees and some lower-rise buildings interspersed among the taller ones. The sky is clear and blue.

Building Environmental Resilience With Green Infrastructure Planning In The Dominican Republic

The Challenge



The Dominican Republic faces ongoing climate-related challenges, including flooding, mudslides, and increasing temperatures resulting in salinization, rising sea-levels, and coastal erosion. The Dominican Republic is located in the Atlantic hurricane belt, making it vulnerable to increasingly more frequent and devastating hurricanes and storms, further placing its economy, infrastructure, and people at risk.

These challenges disproportionately affect Dominicans living in under-served, densely populated areas. This includes the coastal communities of the nation's larger cities such as Santo Domingo. High salinity levels require more desalination plants to provide fresh water, placing additional economic constraints on the people of the Dominican Republic. Additionally, sea-level rise affects coastal infrastructure and can negatively impact the tourism industry, an essential contributor to the Dominican economy.

How PEER Researchers are Tackling the Issue

USAID's Partnerships for Enhanced Engagement in Research (PEER) program-funded lead researcher Dr. Solhanlle Bonilla-Duarte from the Instituto Tecnológico de Santo Domingo (INTEC) and her team have been working alongside Gerald Bauer and Dr. Wayne Arendt from the U.S. Forest Service and Dr. Elvia Meléndez-Ackerman from the University of Puerto Rico to help the Dominican Republic adapt to climate change. Using an urban forestry approach, the researchers are engaging local communities and collaborating with academic institutions, non-governmental organizations, and policy-makers to build resilience within urban environments and equip urban communities with tools to alleviate the effects of climate change.

To drive this project, researchers are using i-Tree, an online suite of user-friendly interactive tools developed by the U.S. Forest Service. i-Tree models have been used in over 130 countries worldwide to help mitigate the impacts of climate change using natural and man-made infrastructure planning. i-Tree helps researchers create tree population inventories in specific geographical areas to calculate their ecological and monetary value.

The benefits of using i-Tree lie in its sustainability, simplicity, and accessibility. i-Tree and its associated tools promote engagement and training of citizen science volunteers. Using global scientific research and datasets as a framework, Dr. Bonilla-Duarte and her partners strive to motivate government officials, policymakers and urban planners to: (1) propose, implement and enforce strategic laws; (2) make more informed decisions on climate change adaptation; (3) develop policies that incorporate an ecological perspective for infrastructure planning; (4) increase the quality of life, wellbeing and health of local communities.

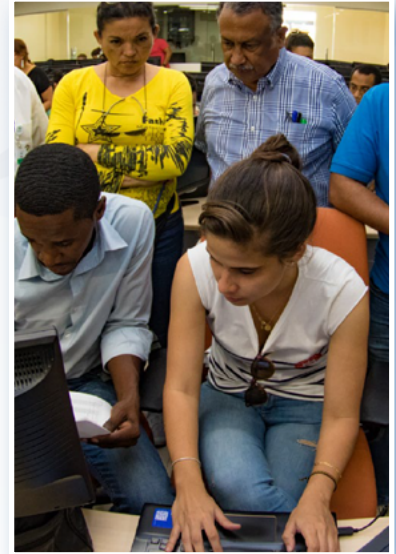
Trees provide a myriad of benefits and ecosystem services. Dr. Meléndez-Ackerman from University of Puerto Rico emphasizes their importance in urban planning: "Trees provide shade, and that shade means that you may be able to reduce your energy consumption during the summer. Trees allow for the removal of air pollutants in urban areas, resulting in cleaner air. Trees reduce the amount of stormwater that reaches the soil, thereby decreasing flooding and reducing the burden on the stormwater infrastructure on the cities." In addition, wildlife researcher Dr. Arendt has incorporated wildlife studies into the i-Tree research protocol by overlapping urban bird survey points with i-Tree survey plots.



Project Impact

The project has not only achieved impact in the Dominican Republic, but also in other Latin American countries. According to researcher Gerald Bauer, “This project is a good example in which someone from the Dominican Republic was trained, and subsequently, was able to train others in El Salvador and Guatemala, taking the i-Tree ...methodology to other Latin American countries. I think activities like this expand the impact of not only PEER in general but also the success we have accomplished in the Dominican Republic”.

The team’s work has played an essential role in engaging citizen science volunteers across Santo Domingo. In particular, the project engaged with 12 “Junta de Vecinos” (neighborhood associations or councils) that incorporated this project as part of their volunteer services and helped gather information and conduct i-Tree analyses in their communities. The local government has previously worked with these councils for recycling and waste management services and views this as a way to ensure sustainable community involvement. Ana Pou from the Office of Environmental Management and Risk at the Dominican Ministry of Education added that “while this project is innovative, the tools are simple and easy-to-use and have helped build awareness and consciousness within the society.”



On an academic level, there has been increasing interest among researchers and students in continuing this work and helping generate publications highlighting the importance of green infrastructure planning in urban environments. According to lead researcher Dr. Bonilla-Duarte: “We have seen a rise in prospective students showcasing interest in projects related to this field. The implemented model used in both Puerto Rico and the Dominican Republic focuses on training researchers and students, hoping that they will incorporate this into their expertise and take it beyond their communities, which has been the case with several students”.

According to lead researcher Dr. Bonilla-Duarte, this project was able to help establish strategic alliances with the Ministry of the Environment, the Santo Domingo Mayor’s Office, the Environment Net of Universities (RAUDO), the Ministry of Education, the Ministry of Health, and higher education institutions. There have also been discussions with the Santo Domingo Municipality and their environmental advisory teams, who are considering incorporating i-Tree into future urban planning. Utilizing this network of institutions, the research team plans to use the national forestry inventory to help influence forestry policies. These policies would help increase tropical forest coverage and would support the Dominican Republic’s pledge to reduce emissions by 25 percent as part of the Paris Climate Agreement.

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Project website: https://sites.nationalacademies.org/PGA/PEER/PEERscience/PGA_174192

Contact:

Solhanlle Bonilla Duarte

Instituto Tecnológico de Santo Domingo,
Dominican Republic
E-mail: solhanlle.bonilla@intec.edu.do

Gerald Bauer

U.S. Forest Service, International Institute of
Tropical Forestry, Puerto Rico
E-mail: gerald.bauer@usda.gov

Photos courtesy of Gerald Bauer



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