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Quick Facts Sheet

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Community Gardens Environmental Justice

- In many American cities, white populations have vacated inner-city areas that have been environmentally damaged and now community gardens serve as one way to restore these areas (Ferries, Norman, and Sempick 2001).
- There is a strong spatial correlation between tree canopy and median household income as urban trees are seen as a commodity, in turn, planting trees can increase property value (Taguchi et al., 2020).
- Property values for houses located within 1000 feet of a community garden increased by 9.4% in 5 years and direct use values of public parks in Philadelphia were valued at approximately $100,000 per acre. Additionally, the groundwater recharge valuation is on average $86.42 per acre foot of recharge stemming from green infrastructure usage (Wise et al., 2010).
- A two standard deviation in increase of the number of parks would result in a 0.14 unit decrease of collective efficacy rating. This effect in Chicago would translate to 21 fewer premature deaths, 17 fewer cardiovascular deaths, 31 fewer homicides, 3 fewer malignant neoplasms, and a 14% reduction in the probability of asthma/breathing problems. This would also lead to 0.08 fewer violent crimes, 0.16 fewer victimizations epr neighborhood, and 0.16 fewer homicides per neighborhood (Cohen et al., 2008).

Mangroves

- Between 1977 and 2002, mangrove cover increased by 12% due to an abandonment of agriculture and increases in conservation policy protection (Sebastián et al., 2009).
- The world’s mangrove forests have decreased in area by 35% since the 1980s (Valiela et al., 2001, in Martinuzzi et al., 2009).

- Mangrove forests must match the sea level rise rate predicted to be 3-5 mm/yr in most modeled scenarios (Mckee et al., 2007).

Pollinators

- Both native and non-native flowers have been found to be important for pollinator foraging (Baldock et al., 2019).
- Modifying land use to incorporate more green space increases pollinator abundance (Baldock et al., 2019).
- Urban gardens could serve as a refuge for pollinators when forage or nest sites are scarce, or management practices are inhospitable (Langellotto et al., 2018).
- 30–50% of the garden bee community in urban gardens might provide neighboring pollination-dependent farms and food gardens with pollination services (Langellotto et al., 2018).
- Projects that engage students with habitat for pollinator insects in urban environments can enhance scientific literacy by giving students first-hand experience in the scientific process (Saunders et al., 2018).
- Habitat had a significant effect on the number of pollinator insects caught. The highest number of insects were caught in open grassy areas, and the fewest insects were caught in paved areas (Saunders et al., 2018).
- Although the color of a pan trap has previously been found to influence the number and types of insects attracted to the trap, this study results yielded that there was no difference in the number of individuals caught in each trap color (Saunders et al., 2018).
- The bee fauna of Puerto Rico was found to have lower biodiversity in relation to the remaining Antillean islands (Genaro & Franz, 2008).
- Educational modules aiming to increase individual willingness to protect honeybees in intervention groups (living animals vs. eLearning) produced a greater willingness to protect bees as pollinators. This effect remained for six to nine weeks after participation (Schönfelder & Bogner, 2018).
- Declines in bee diversity over the last century have been recorded in highly industrialized regions of the world, particularly northwestern Europe and eastern North America (Potts et al., 2016).
- Pollinators are also shifting ranges to more temperate latitudes or higher altitudes, following climate change, but often seem unable to track temperature shifts completely (Potts et al., 2016).
- The production of crops that depend directly on pollinators constitutes a global food volume of 5–8% but global agriculture is now twice as dependent on pollinators compared to five decades ago (Potts et al., 2016).
- A loss of pollinators may have negative impacts on the reproduction of wild plants, as more than 90% of tropical flowering plant species and about 78% of temperate-zone species rely, at least in part, on animal pollination (Potts et al., 2016).

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Puerto Rico Land Use

- By 1948, most of the island of Puerto Rico was deforested for agricultural use, and only 6% of the original forest remained (Birdsey and Weaver, 1987, in Martinuzzi et al., 2009).

“Puerto Rico” Statistics

- There is a lot of emigration from PR. The population has dropped by 14.3% (3,726,157 to 3,193,694) from 2010 to 2019 (Census, 2020)
- Nearly 100,000 of 226,800 Puerto Rican students eligible for the study were surveyed from 1 February to 29 June 2018, in the island’s seven education districts. Overall, about 6,900 students, 7.2%, reported “clinically significant” symptoms of PTSD. (Holpuch, Amanda, and Hazar Kilani. "Hurricane Maria’s lasting impact on Puerto Rico’s children revealed in report." *The Guardian* 26 (2019): 2019.)
- 47.5% of children’s family’s homes were damaged, while 83.9% of children saw damaged homes
- 24% of youth helped rescue people
- 25.5% of youth were forced to evacuate
- 32% of youth experienced shortages of food and water
- 16.7% of youth still did not have electricity five to nine months after the storm(*The Guardian* 26 (2019))
- Currently, 43.1% of the population lives under poverty conditions and in 2017 57.8% of children lived in poverty (Previdi et al., 2020)

Urban Forests

- Trees in the United States were estimated to remove 17.4 million tons of air pollution in 2010, accounting for $6.8 billion in human health value (Nowak et al., 2014).
- In terms of hydrological impacts, the greatest influence on the ecological value of urban areas depends on green space area, especially trees (Nilsson et al., 2011). More connected areas have a greater impact on flood management than fragmented areas (Miller, 2020).
- Urban trees provide stormwater benefits by intercepting rainfall and taking up water soaking into the soil around their roots which can stabilize soil and reduce erosion (Taguchi et al., 2020).
- The researchers concluded that urban flooding can be reduced with considerable increases in urban green space but most communities are limited in their ability to expand green space (Liu et al., 2014).
- Residents’ attitudes toward trees and their related services and disservices have been found to differ according to the location of the tree relative to the resident’s property or whether they are located on private or public property (Olivero-Lora et al., 2020).
- Variation in residents’ positive attitudes toward trees explained the current variation in yard tree abundance, along with residents’ age, housing tenure, yard size, and watershed location (Olivero-Lora et al., 2020).

- Urban tree canopies function as spatio-temporally dynamic storage reservoirs can vary as micro-meteorological conditions change (Nytch et al., 2019).

Urban Heat Island Effect

- Greenspaces (gardens & forests) help to mitigate the effects of the Urban Heat Island effect (Méndez-Lázaro 2018; Gunawardena 2017; Livesley, McPherson, Calfapietra, 2016; Marando et al., 2019)
- A large area of forested trees will be more effective at reducing the heat island effect than many spread out trees (Livesley, McPherson, Calfapietra, 2016). Forests have a greater impact on reducing temperature than street trees do (Marando et al., 2019).

School Gardens

- Some of the most commonly recommended vegetables to grow in Puerto Rico gardens are cantaloupe, cucumber, eggplant, onion, and tomato (Muñiz-Torres 1992, in Ruiz et al., 2018).
- The number of schools with gardens in San Juan was much lower than the number of schools with people interested in establishing a garden (Ruiz et al., 2018).
- The percentage of schools in the Rio Piedras watershed that discontinued gardening was high (55%) when compared with schools in Los Angeles (14%) and nationwide (10%) (Ruiz et al., 2018).
- The main reasons for ending gardening programs in 20 elementary schools in Puerto Rico were: lack of funding, turnover of staff, and the burden on teachers (Ruiz et al., 2018).
- A limiting factor unique to Puerto Rico compared to other U.S. school jurisdictions is the green iguana. With few predators and competitors, this invasive reptile has become a severe agricultural pest as its population has expanded considerably on the island (Ruiz et al., 2018).
- School-based garden interventions improved or maintained both fruit and vegetable consumption or mediators thereof and academic performance (Barrett et al., 2015).
- Garden-based learning does not negatively impact academic performance or fruit and vegetable consumption and may favorably impact both (Barrett et al., 2015).
- Garden programs improved fruit and vegetable intake in 71% of studies measuring that outcome (Barrett et al., 2015).
- Trees may also play an important role in creating supportive environments for children to study and learn (Kweon et al., 2017).
- Schools with more trees had a higher percentage of proficient or advanced scores in Mathematics and Reading standardized tests even after controlling for school size, student-teacher ratio, and free lunch enrollment (Kweon et al., 2017).

Adverse Childhood Experiences, Community Resiliency

- Discussion of living conditions and health disparities in Puerto Rico (Previdi et al., 2020).

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- Researchers have defined ACEs as including physical or emotional abuse or neglect, sexual abuse, domestic violence, substance abuse or mental illness in the home, parental separation or divorce, having an incarcerated household member, and not being raised by both biological parents (Soleimanpour, et al. 2017).
- Children living in homes with lower household incomes or in less safe and supportive neighborhoods, as well as those who qualified as having special health care needs, were more likely to experience ACEs (Soleimanpour, et al. 2017).
- With 3 or more ACEs, nearly half (48%) of youth experience low engagement in school, 44% cannot stay calm and controlled, and 41% demonstrate high externalizing behaviors (Soleimanpour, et al. 2017).
- Understanding, identifying, and nurturing protective home, school, and community elements may help diminish the overall impact of youth's exposure to ACEs (Soleimanpour, et al. 2017).
- Poverty and household stressors, like unemployment, housing instability, and food insecurity combine to create an environment in which a child's home, school, and community are sources of stress (Ellis, et al. 2017).
- When families live in communities in which food insecurity, domestic violence, challenges to parenting, unemployment, inadequate educational systems, crime, and social justice issues are common, the result is an environment in which ACEs abound, needed social supports are scarce, and toxic stress results (Ellis, et al. 2017).
- The Building Community Resilience (BCR) model posits that establishing shared understanding of the connection between toxic stress, ACEs, and community resilience is necessary within a health system as well as across a partner network (Ellis, et al. 2017).