



## THE REPORT

# ON TINY ISLAND FARMS, BIODIVERSITY IS A WAY OF LIFE

The agricultural industry has much to learn from the small farms of Jamaica, which live in harmony with nature and embrace biodiversity

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In the remote John Crow Mountains of northeastern Jamaica, it's difficult to tell where the lush forests end and cultivated land begins. By growing food in harmony with the wild flora, small-scale farmers in the region are helping to preserve crop varieties and other plant species that are unique to the Caribbean island.

A recent study of this mountainous region in the US journal *Economic Botany* (part funded by the National Geographic Society Committee for Research and Exploration) found that its farmers grow an average of 87 useful plant varieties per plot. Very often, it noted, crops as diverse as yam, plantain, banana, mango, beans, pepper, coconut, breadfruit and medicinal plants grow amid wild trees and shrubs that help to hold nutrient-rich soil in place on the steep slopes.

"In rural Jamaica, small farms blend in with the forests," says study co-author Ina Vandebroek, Caribbean program director at the New York Botanical Garden. "In that variety lays the protection of biodiversity. The farmers know that to keep the soil healthy and food production up, they need the wild trees and native shrubs."

By growing a variety of plants, the farmers in northeastern Jamaica boost food security by maintaining agricultural biological diversity (agrobiodiversity). But protecting that diversity is becoming increasingly difficult, however, since most of the world's cultivated land is dedicated to growing the handful of staples we eat. According to the United Nation's Food and Agriculture Organization, as much as three-quarters of the world's food comes from just a dozen plant species.



Agrobiodiversity can ensure there are plentiful food-source options in case one crop fails. The Great Famine in Ireland (1845-52) — caused by successive episodes of potato blight devastating the island's main food source — is the classic example of something going wrong.

“If we depend on only a handful of crops and something happens, like a disease wiping them out, then we're putting our food security at risk,” Vandebroek says. “Why limit what's available for our diets when having more variety can help us survive as human beings?”

Vandebroek and her research partner, Logan Sander, of Yale University, found that farmers in rural north-eastern Jamaica tend to raise a wide variety of food crops, including timber trees they can quickly harvest if a cash flow crisis arises; in home gardens, their focus is on medicinal plants that can be harvested when health issues arise.

Considering its relatively small size, the Caribbean is extremely biodiverse; furthermore, cultural traditions vary widely from island to island, which has led to the development of many unique crop varieties and diets.

**“Even though Jamaican farmers only use machetes to work their lands, it's amazing the different crops they've independently developed without the help of institutions,” Vandebroek says. “It's a testament to their creativity and skill.”**

By exchanging seeds — a process Jamaican farmers call ‘catching breeds’ — varieties with desirable characteristics can be developed over generations. If farmers like the taste of a scotch bonnet pepper or if there's an ackee plant that doesn't get too mushy after it's been cooked, for example, they'll keep the seeds to grow in the future.

Government support is much needed in Jamaica, since many roads are so poor that getting produce to market can be difficult. Vandebroek hopes her work will not just help build support for farmers here but boost awareness of how agroforestry can help to safeguard biodiversity.

Protecting crop varieties — through agroforestry techniques like those used by Jamaican farmers — goes hand in hand with efforts to safeguard woodlands, not least because forests are home to around 80% of Earth's terrestrial biodiversity, and yet modern agriculture has led to massive deforestation and species loss.

Getting government funding to build community seed banks could also help preservation efforts in Jamaica, Vandebroek claims. Doing so is particularly important in a country where one hurricane could wipe out all crops and seeds suited to local growing conditions, just like the earthquake of April 2015 did in parts of Nepal.

Vandebroek, an ethnobotanist and neuropsychopharmacologist, is also studying how people use plants, and their effects on the body. Last year, she co-wrote a book on the medicinal uses of plants in northeastern Jamaica.

“It's my sincere hope that this book will stimulate Jamaican youth to follow in the footsteps of their farming relatives, and learn from them as much as I did,” Vandebroek writes in her book. “The true riches of Jamaica are in the land.” ●