

## **Breadfruit Food Security in the Face of Global Crises**

by Jon Letman via stan - Truth-out *Thursday, Apr 9 2015, 7:56am*

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Hawaii - Political instability, poverty, war, disease and climate change are testing humanity like never before, but in a world beset by rapidly compounding crises, one thing remains constant: People need to eat nutritious food.



Even as Western industrialized and rapidly developing nations face an epidemic of health problems related to obesity and associated "lifestyle illnesses," the Food and Agriculture Organization (FAO) of the United Nations reports that approximately one in eight people in developing nations is chronically undernourished. According to a 2014 FAO Hunger Map, that number has fallen by some 100 million in the last decade, but still remains around 805 million worldwide. Progress in fighting malnutrition in Latin American and Southeast Asia is offset by widespread chronic hunger in sub-Saharan Africa (nearly one in four) and Southern Asia (over half a billion).

Despite advances in transportation, technology and increased crop yields, hunger remains at the top of the world's problems, stubbornly entrenched between conflict and environmental destruction, fueled by soaring populations, climate change and a globalized market that pumps billions into industrialized economies, but leaves behind hungry millions in the developing world.

Against this dark backdrop, however, there is reason not only for hope, but substantive results that illustrate viable means of improving food security. In the battle against global hunger, one of the brightest stories has its roots in the islands of the Pacific.

Breadfruit, a pan-Pacific staple crop first cultivated in New Guinea more than 3,000 years ago, has long provided sustenance to the people of Micronesia, Melanesia and Polynesia. Today, this fast-growing, high-yielding fruit tree (imagine bowling ball-sized green fruits that can be prepared like a potato) is increasingly being propagated vegetatively by cuttings (essentially making botanical clones) and sent to tropical regions where the tree has had limited or no historical use. Introducing breadfruit to new geographic regions has been almost exclusively at the request of people in places where food scarcity, deforestation and other environmental problems are endemic, says Dr. Diane Ragone, director of the Breadfruit Institute in Hawaii. Because the fruit is seedless, she adds, it poses no threat of becoming invasive.

Valued as a hardy, easy-to-plant, beautiful leafy tree, breadfruit's prolific fruit-bearing quality is augmented by other benefits such as useful wood, leaves and flowers, and its use as an anchor crop in agroforestry and reforestation projects.

One variety in particular, a Samoan cultivar called Ma'afala (ma-ah-fala), has been deemed superior in taste, nutrition and growth habit after years of comparing different varieties. In Jamaica, for example, when researchers introduced Ma'afala, people were skeptical of the new variety, but found it lighter and more flavorful than the Tahitian variety introduced centuries earlier.

In a 2014 study, researchers in Hawaii and British Columbia found that Ma'afala has higher quality protein than potatoes, wheat, rice, soybean, corn and peas. The fruit is high in carbohydrate energy, low in fat and a good source of fiber, calcium and minerals. And while breadfruit remains relatively unknown outside of the tropics, chefs familiar with its preparation praise it for its taste, versatility and nutritional value.

Breadfruit can be grown in a broad band that runs north and south of the equator through Latin America and the Caribbean, across Africa, Asia, northernmost Australia and the Pacific Islands.

Since 2009, more than 54,000 breadfruit trees have been distributed to 31 countries and territories around the world from Haiti and Honduras to Nigeria, Kenya, Myanmar, Pakistan and throughout Oceania. Scientists at the Breadfruit Institute in Hawaii and the University of British Columbia are partnering with Global Breadfruit, an offshoot of the horticulture firm Cultivaris, and small nonprofits and nongovernmental organizations around the world to propagate, distribute and grow more breadfruit.

#### No Time for Farming

In West Africa, where decades of civil war have been followed by a deadly Ebola epidemic, breadfruit offers improved food security when forced quarantines disrupt mobility, trade and farming activities. In 2014, Charles Mattia, director for entrepreneurship at Cuttington University in northern Liberia, oversaw the import of some 1,500 breadfruit saplings through the Washington, DC-based First Avenue International, which partners with farmers and researchers throughout Africa. Those young trees were distributed to small farms to be grown in trials.

Mattia says the tree is perfectly suited for Liberia's climate, adding that its canopy shades the ground, the fallen leaves enrich the soil and the long-lived tree is a good substitute for more labor-intensive crops like cassava, eddoes and yams.

In Liberia, breadfruit is prepared by boiling and slicing or mashing it into a large dumpling-like dish called dumboy. According to Mattia, the nutrition provided by a single breadfruit tree can be the difference between starvation and survival. He believes Liberia can be an example to other tropical countries where breadfruit is not yet grown.

Speaking from California, Global Breadfruit's Josh Schneider said, "One tree can change the life of a family for generations; 10 trees can change the fortune of a village. It can do everything a potato can but in a more sustainable way," adding that because some varieties have high provitamin A carotenoids, afflictions like infant blindness could be greatly reduced if a diet heavy in breadfruit were adopted.

In 2014, Schneider hand-delivered 150 breadfruit saplings to Liberia's capital, Monrovia, for distribution to women's cooperatives and farmers across Liberia. Global Breadfruit later shipped an additional 1,000 young trees to Liberia and in 2015 Schneider expects to send breadfruit to Cameroon, Ghana and Ethiopia.

As with tens of millions of other commercially grown plants around the world, breadfruit saplings

are shipped in trays, boxed for transport. Like any plant, breadfruit cannot be exposed to extreme temperatures or go without water for too long. This presents challenges when hand-carrying saplings or shipping them internationally. Ideally, once there is a demand for the trees, they can be grown locally near their planting destination.

### Breadfruit and Chronic Hunger

In Zambia, a small nonprofit organization called Planting a Future For Zambia is growing 150 Ma'afala saplings donated by the Breadfruit Institute. The group's founder, Lloyd Lukama Kasela, spearheaded efforts to distribute the trees to families, schools, churches, farms and an orphanage in the south of the country.

Importing trees from Global Breadfruit's nursery in Germany involved navigating the complexities of Zambian phytosanitary and plant quarantine protocols and overcoming a lack of awareness by government officials.

"No one in Zambia had ever heard about breadfruit," Kasela said, explaining that officials had to be convinced it even existed before they would grant an import permit.

Kasela believes breadfruit may hold the key to ending chronic hunger among poor rural families who face seasonal shortages of Zambia's staple crop maize. The problem is worsened by erratic rain patterns and the rising cost of fertilizer and seed. When farmers deplete their maize stocks, they're forced to collect "wild fruits" in order to survive, but the introduction of breadfruit could change that.

In Zambia, where the HIV/AIDS infection rate is over 12.5 percent among adults (15-49 years old), breadfruit offers an affordable, reliable source of nutrition.

"The high HIV/AIDS infection rate drove me to breadfruit," said Kasela, referring to the fact that the tree provides an abundance of high-nutrition food to AIDS patients who are vulnerable to opportunistic infections.

In the southern district of Kazungula, two dozen vulnerable families have received breadfruit and been taught how to care for them. To date, the tree's survival rate has been about 66 percent.

In Zambia and other places where breadfruit is a new crop, the intention is not to replace staple foods, but rather to offer an additional food that grows on a long-lived tree that has other social and environmental benefits. At the same time, breadfruit offers a reliable food source that can be adopted by new cultures. Global Breadfruit's Schneider explains: "Agriculture by nature depends on tradition and experience. Even though breadfruit is a very old crop in its native habitats, it's still very new to many."

And while Schneider says skepticism toward new products makes it difficult to enter large farm programs he adds, "When you show people a tree that can help feed them, as well as being an alternative ingredient in traditional foods, it's easier. Small farmers know that a diversity of crops provides insurance that large monocultures do not."

As a starchy crop, breadfruit is good for soups, stews and salads, but can also be baked as breads, cakes, muffins, pancakes, flatbreads or even nachos.

### Eating Grass to Survive

On the other side of the world, in subzero Ontario, Canada, Najeeb Syed is chairman of the international committee of the Rotary Club of St. Catharine's South. He's also the founder and driving force behind the Breadfruit Tree Trust for Pakistan.

In 2009, his club was approached by the Trees That Feed Foundation asking for support for a breadfruit program in Jamaica. Because the program's primary goal was to feed people, he supported it. Initially, his club donated 100 breadfruit trees to schools in Jamaica, and later raised funds to send 3,000 trees to be planted in schools and orphanages in the Caribbean nation.

Impressed with the success of the program, a friend suggested Syed launch a similar effort in Pakistan, an idea he initially dismissed, thinking the tree was ill-suited for Pakistan's colder, drier climate. However, after discussing the idea with a Pakistani friend working in horticulture, Syed agreed to raise funds for a small flat of trees to be grown as a trial in the south of Pakistan.

In 2014, Syed's club shipped 530 trees from Global Breadfruit in Germany to Pakistan. Because of Pakistan's semi-arid climate, the trees were started in plastic bags and small pots for 11 months (compared with three months in Jamaica).

From Canada, Syed formed a partnership with a Rotary club in Karachi whose members, along with Pakistani agronomists and horticulturists, volunteered their time to help plant the young trees at 14 farms in the coastal regions of Sind and Baluchistan provinces.

Syed praised his Pakistani partner's efforts: "No money is involved. Nobody charged me a penny for this. Everything is being done out of good faith. I am supplying them with the soil, the bags, the pots, everything, but they are not charging anything for labor."

The trees are still too young to produce fruit, but Syed is optimistic they will thrive and plans to send 800 more trees. In February 2015, Syed returned to Pakistan where he introduced food products made from breadfruit flour. Breadfruit, which is gluten-free, Syed says, is ideal for making roti (flat bread), a staple in South Asia.

"Pakistan has a menace of malnutrition," Syed said. "There are children eating grass to survive ... dying of hunger." In a country reliant on wheat, rice, corn and potato, Syed believes that if breadfruit trees can be established, it can make a meaningful dent in the nation's hunger problem and serve as a model for other semi-arid regions. "There are so many countries which are not tropical, but have lots of hunger so hopefully this will work for them too," he said.

## Old Is New Again

New varieties of breadfruit are also being introduced in places where breadfruit has a long history. In Haiti, one of the least developed countries in the Western Hemisphere, where political instability, hunger, disease and the long-term effects of a devastating 2010 earthquake linger, breadfruit has a been eaten for centuries. After falling out of favor among Haitians in recent decades, breadfruit is enjoying a revival.

In Port-au-Prince, American Eric Helgemo operates a three-acre plot of land where he grows breadfruit on behalf of the Trees That Feed Foundation. In January 2015, an order of more than 1,000 breadfruit trees arrived in Haiti and will be distributed to schools, orphanages, small farms and deforested communities. Helgemo has imported about 8,500 trees since 2012 and expects to import 2,500 more in 2015. He says that Trees That Feed is working to develop a market for breadfruit flour, which can be used for baked goods like muffins and bread. Nutritious, abundant

food, growing on long-lived leafy green trees is, Helgemo says, an important part of what Haiti needs to combat endemic hunger and deforestation.

"We believe breadfruit is a key species to incorporate in any reforestation efforts in Haiti. Today, we seek to start a movement to bring back some of Haiti's former jewels which were its trees ... Trees are renewable resources - they are key to restoring Haiti to its former glory," Helgemo said.

In the Republic of the Marshall Islands (RMI), a Micronesian country where US nuclear weapons testing and militarization disrupted traditional lifestyles and forced urbanization, the tiny island nation now faces the immediate threat of climate change-driven sea level rise. As in other parts of the Pacific, breadfruit is a traditional staple, but by introducing new varieties, small growers can increase the likelihood of year-round production and greater local food security.

Preliminary data about which varieties are most salt-tolerant may provide crucial understanding of the best types of breadfruit to grow on low-lying atolls where sea level rise makes frequent flooding and giant "king tides" an urgent problem.

Rebecca Lorennij, secretary for the RMI's Ministry of Resources and Development, says her office, with assistance from the government of Taiwan, imported 288 breadfruit trees for distribution in the capital Majuro and to remote outer islands where locally grown food is essential.

"We brought in three or four other varieties from outside ... The reason we bring [them in] is so we can have breadfruit all year round," Lorennij said.

#### Use It or Lose It

This global network of researchers, growers and distributors leads back to the Breadfruit Institute. Ragone, the institute's director, has dedicated the last 30 years to collecting, studying and advancing breadfruit.

When she first began field collecting in Samoa in the 1980s, she found breadfruit was a highly diverse but underutilized crop outside its traditional range.

Ragone wanted to better understand breadfruit, not simply as an academic exercise, but to identify and share traditional and high-nutrient varieties that were at risk of being lost. After launching the Breadfruit Institute in 2003, Ragone began partnering with researchers and experts in horticultural distribution with the goal of sharing and reintroducing traditional varieties to their place of origin.

Besides the increased knowledge of nutritional composition, growth habit and suitability for specific environments, Ragone's work has led to the recognition of breadfruit as a source of economic development and job creation that can add value to an otherwise quickly perishable crop.

Now that she and other researchers have identified Ma'afala as among the best tasting, most nutritious varieties (out of some 200) and have created a network that can grow, distribute and educate people, Ragone is confident breadfruit will continue to have an increasingly important and impactful role in fighting hunger and helping more people become self-sufficient.

This network, she says, came about from the collection of breadfruit she assembled in Hawaii. "We recognized that we had a responsibility with the collection not just in conserving traditional varieties, but to utilize this incredible crop diversity."

As a food and a tree, Ragone says breadfruit is unmatched. "There's so much less labor involved from planting, caring and management and it has all the benefits that trees provide while producing a starchy staple carbohydrate food that is nutritious and delicious."

But breadfruit has its challenges too. The fruits are large and, when in season, remarkably prolific. This means a lot of fruit at one time and nothing in the off-season. Also, breadfruit ripens quickly and must be prepared, preserved or dried and made into flour within days.

In the past, lack of available planting material was also a problem, but thanks to micropropagation techniques researched at the University of British Columbia, this has been largely overcome.

Ragone recognizes that breadfruit alone will not "solve world hunger."

"No one crop alone can do that," she said. But as multiple crises around the globe confound and challenge humans to simply survive, breadfruit offers one alternative to dependency on imports, food shortages or starvation. While no crop - or combination of crops - can ever eliminate hunger until there is a social commitment to that goal reflected in economic structures everywhere, in the meantime, both in the traditional "breadfruit belt" of the Pacific and places where it was never eaten before, people are embracing this extraordinary tree.

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Jungle Drum Prose/Poetry. <http://jungledrum.lingama.net/news/story-1547.html>