Only one country in the world produces all the food it needs. Here's why

While hundreds of millions around the world face food insecurity, a tiny South American nation has managed to become the only country that can entirely feed itself. How did Guyana manage it?

By Joe Phelan

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Picture this. A country smaller than Idaho by area, where most people live crowded along a narrow coastal strip, with vast swathes of impenetrable rainforest covering 85 per cent of its territory. By all conventional wisdom, this shouldn't be the place where people come closest to solving one of civilisation's oldest challenges – feeding themselves entirely from their own resources.

And yet Guyana, a South American nation with a population of around

830,000, has quietly achieved what no other country on Earth has managed: complete food self-sufficiency across all essential food groups.

The revelation comes from groundbreaking research published in the journal *Nature Food*, which analysed 186 countries to determine how well each could theoretically feed its population from domestic production alone.

Guyana lies on the northeast shoulder of South America, about 2,000 miles southeast of the United States, just below the Caribbean. Credit: Getty

The study's results were stark: Guyana alone achieved self-sufficiency across all seven essential food groups – fruit; vegetables; dairy; fish; meat; legumes, nuts and seeds; and starchy staples.

Walk through any market in Georgetown, the nation's capital, and the picture is clear: stalls stacked with local rice, root vegetables like cassava, fresh fish, fruit and other produce, much of it sourced from within Guyana's borders.

Guyana hasn't closed itself off from the world; it still trades like any modern nation. What sets it apart is that the country uniquely possesses the capacity to meet all its citizens' nutritional needs from its own soil and waters.

Recipe for success

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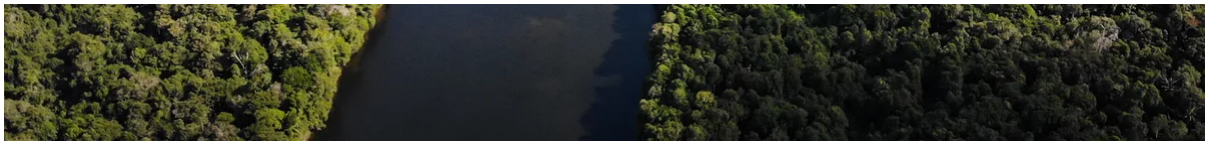
To understand just how extraordinary this achievement is, consider Guyana's geographic constraints. The country sits wedged between Venezuela, Brazil, and Suriname, with most of its population concentrated along a coastal plain that makes up less than five per cent of the total land area.

The interior is dominated by the ancient Guiana Shield – a geological formation of pristine rainforest that, while ecologically priceless, offers little scope for large-scale agriculture.

And what makes this accomplishment even more remarkable is Guyana's approach to conservation. It has achieved food self-sufficiency not by destroying its natural heritage but by maximising its limited agricultural land. Whereas deforestation ravages much of South America as countries clear land for farming and cattle ranching, Guyana has preserved more than 85 per cent of its original forest.

"The climate in the coastal region of Guyana makes it highly suitable for crop production," explains Nicola Cannon, professor of agriculture at the Royal Agricultural University in Gloucestershire, UK.

The numbers bear this out: the country sits between one to nine degrees north of the equator, blessed with year-round warmth, plentiful rainfall, high humidity, and, crucially, fertile clay soils deposited by the Amazon River system over millennia.



Guyana's largest river, the Essequibo, flows through vast forested landscapes - Photo credit: Getty

But climate alone doesn't explain the success. These tropical conditions exist across much of South America, yet neighbouring countries struggle with food security. The difference lies in how Guyana has harnessed its limited farmland.

Growing more with less

While much of the world's farmland is dominated by monoculture – single crops grown in vast, uniform fields – Guyanese farmers take a markedly different approach to cultivation. They intercrop – growing two or more crops together in the same field, with each occupying its own niche and drawing on resources at different times.

It's a practice that most industrial agriculture abandoned centuries ago, but in Guyana it remains central to farming success. Coconut farmers plant pineapples or tomatoes between young trees as they mature. Corn and soya beans use the same soil: the beans 'fix' nitrogen naturally, while the corn draws on nutrients at a different point in the season.

When done right, the benefits can be substantial. Intercropping requires careful planning – pairing crops that naturally complement each other rather than compete – but when farmers get the balance correct, it can improve soil structure, enhance fertility, and help control pests without major chemical intervention. It also spreads risk across the growing season: if one crop struggles due to weather, pests, or market fluctuations, another can still thrive.

An example of intercropping, where multiple crops are grown together in a single field. - Photo credit: Getty

From staple crops like rice and cassava to a wide variety of fruits and vegetables, this agricultural diversity isn't just feeding people – it's actively nourishing the country's soil. What Guyana has quietly maintained is what modern agriculture is now beginning to rediscover: biodiversity isn't merely sustainable, it's essential.

"Intercropping offers opportunities to improve productivity," notes Cannon. The technique can improve yields by 1.2 to 1.5 times versus solo planting, "demonstrating a clear advantage".

This isn't just about squeezing more produce from the same space. The diversity creates something of a natural insurance policy against the sort of crop failures that can devastate monocultural systems.

As Dr Michael Rapinski, an ethnoecology researcher at the Muséum National d'Histoire Naturelle in Paris, puts it: "There's the old saying that goes: 'Don't put all your eggs in one basket.' The diversification of staple crops is akin to having a diversified stock portfolio."

The banana industry learned this lesson the hard way. The 'Gros Michel' variety dominated global markets until the 1950s, when Fusarium wilt – nicknamed the 'Panama disease' – wiped out commercial production almost overnight. Today's ubiquitous Cavendish banana faces similar threats and acts as a stark reminder of monoculture's vulnerabilities.

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Cultivating fertility

Even more remarkable than Guyana's crop diversity is the way it has ramped up food production without stripping away nutrients faster than they can be restored.

"Soil organic matter levels have been declining globally over the last 60 years," warns Cannon. Poorer soil structure leads to worse water retention, reduced nutrient-holding capacity and less resilience to extreme weather.

Guyana seems to have avoided this trap through sophisticated practices now known as 'regenerative agriculture'. Livestock is integrated into cropping systems, while erosion is kept at bay by ensuring living roots remain in the ground year-round. These methods actively rebuild soil health as well as prevent degradation.

"Living roots not only physically hold the soil together, they also secrete [carbohydrates] which encourage microorganisms," explains Cannon. "This helps keep soils alive and aids residue decomposition."

The result is a virtuous cycle where healthy soils support diverse crops, which in turn feed the soil biology that maintains fertility. It's a system that could, theoretically, sustain itself indefinitely.

One of the largest markets in the Caribbean, Guyana's Stabroek Market buzzes with traders selling everything from fruit to street food - Photo credit: Getty

The downside?

While Guyana's food feat is remarkable, experts emphasise that this kind of self-sufficiency, or autarky, is not necessarily a desirable goal for every nation. This debate centres not on Guyana's approach, but on whether other countries could – and indeed should – pursue similar policies.

"The history of autarky is not good," warns Tim Lang, emeritus professor of food policy at City St George's, University of London. "It usually means draconian repression of internal populations and liberty." Lang advocates instead for growing what suits local conditions while maintaining healthy trade relationships for foods that cannot be produced efficiently at home.

Lang's caution is underscored by the sheer rarity of national self-sufficiency. According to the *Nature Food* study, while agricultural powerhouses like China and Vietnam can meet six of the seven essential food groups, only one in seven countries can manage five or more, and more than a third can meet just two or fewer. Currently, the US meets four, while the UK only two.

Hens Runhaar, professor of sustainable food system governance at Utrecht University in the Netherlands, echoes Lang's concern, arguing that self-sufficiency is not a silver bullet.

"I doubt whether food production will be more sustainable, per se, if all countries become self-sufficient," he says, noting that not all countries have enough fertile land. For true sustainability, he argues, other major changes are essential, such as a drastic reduction in food waste and the necessary shift from animal to plant-based proteins.

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Lessons, not blueprints

So, what can other nations learn from Guyana's achievement?

First, work with nature not against it. Guyana succeeds because its farmers have chosen crops and practices suited to local conditions rather than trying to impose unsuitable agricultural models. "Supporting and developing indigenous and native crops and varieties that are naturally adapted to local soil and climate conditions," should be a priority, argues Rapinski.

Second, diversity can outweigh efficiency. Industrial agriculture focuses on maximising single-crop yields, whereas Guyana's mixed systems may produce less per crop but offer greater overall resilience.

Third, invest in the fundamentals. Guyana's success didn't happen overnight – it required sustained investment in irrigation, drainage, processing facilities, infrastructure and farmer education. As Jessica Fanzo, professor of climate at Columbia Climate School, notes, "the extent of farmland is less important than how it is managed."

A vegetable stand in Guyana featuring bora, a long, slender green bean and a staple of Guyanese cuisine - Photo credit: Getty

Perhaps most importantly, Guyana demonstrates that small countries with limited resources aren't doomed to perpetual food insecurity. Through strategic thinking and smart practices, even nations facing significant constraints can achieve surprising outcomes.

The future of food security

As global challenges mount – from climate change to geopolitical tensions that disrupt trade – Guyana's model is only liable to become more relevant. The COVID-19 pandemic caused dramatic shifts in grain prices, showing how quickly global supply chains can fracture, leaving nations scrambling to feed their populations.

But Guyana's experience suggests that high-tech solutions work best when combined with age-old principles of diversity, soil stewardship and working within natural limits. As Lang concludes: "Building a sustainable internal food economy ought to be central to all countries' food policies."

Guyana proves that this is not just an admirable goal – but one that can be realised to the full.

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