



BIODIVERSITY
FOR FOOD AND
NUTRITION

Harvesting the Benefits of Local Foods: from Healthy Diets to Sustainable Growth

The integration of **locally-sourced, native food biodiversity** into diets and school-feeding programmes has vast potential as a healthy, cost-effective, long-term solution to **boost local economies, improve education** and **reduce malnutrition**. Currently, diet-related diseases cost Brazil \$US 2.1 billion per year¹. Promoting biodiversity in diets, besides **economic health savings**, could bridge the gap between **agriculture** and **health**, while increasing the appreciation and sustainable use of native food species, and helping to **reduce biodiversity loss**.

Key Messages

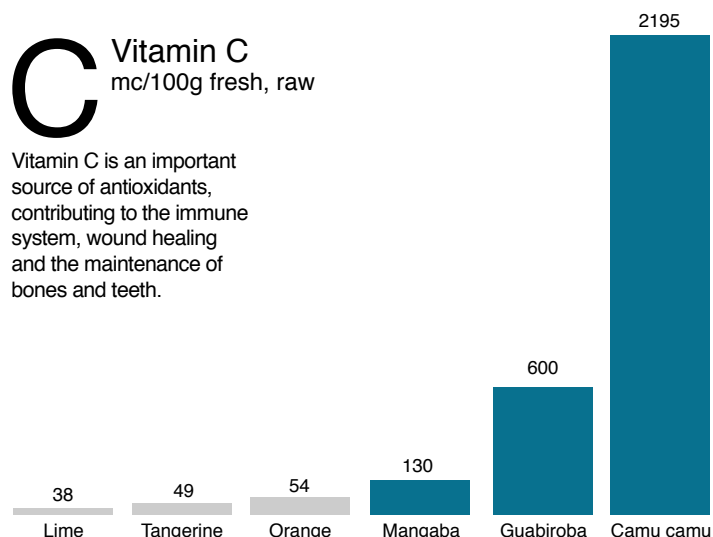
- 1 Native food biodiversity contributes to **healthy diets** and provides a wide range of nutritious options that meet diverse cultural and taste preferences.
- 2 Increasing knowledge of the **nutritional value** of native food biodiversity is essential to enhance the use and appreciation of these species for quality diets.
- 3 **Value chain** development and **capacity building** of chain actors are needed to increase production of native food biodiversity and successfully link family farms to markets.
- 4 Native food biodiversity can be easily integrated into current farming systems to improve **environmental sustainability** and **farmer resilience** against global shocks.
- 5 The appreciation and use of native food species helps maintain **cultural heritage, culinary traditions** and **national identity**.

Actions for Policymakers

- 1 Support the **conservation** of native food biodiversity and **promote the diversification** of agricultural and food systems at both local and national levels.
- 2 Encourage and fund **research** aimed at increasing knowledge and information on native food biodiversity and other non-conventional species and varieties.
- 3 Support enterprises that work with **family farmers** and **public institutions** to source native food and invest in value chain development for new biodiverse products.
- 4 Develop sectoral **policies** that recognize the importance of native food biodiversity and integrate nutrition objectives and concerns in their investment planning process.
- 5 Create **awareness campaigns** on the benefits of native food biodiversity and cultural significance.

C Vitamin C mc/100g fresh, raw

Vitamin C is an important source of antioxidants, contributing to the immune system, wound healing and the maintenance of bones and teeth.



Sources: TACO - Brazilian Food Composition Table; SIBBr (2018)



Credit: BFN Brazil

Camu camu (*Myrciaria dubia*), with an exceptionally high level of vitamin C, is used in soft drinks, ice cream, jellies, jams and liqueurs.

Diversity in Nature but Not in Diets

Brazil hosts between **15-20% of the world's biological diversity**, with the greatest number of endemic species on a global scale². Despite being a major player in global agricultural production, Brazil experiences alarming rates of malnutrition. While less than 2.5% of the population remains undernourished, 54% of the adult population is overweight. Micronutrient deficiencies are prevalent, with 27.2% of women of reproductive age suffering from anaemia and 13% of preschool-age children diagnosed with Vitamin A deficiency^{3,4}. The country carries the so-called “**triple burden of malnutrition**”, in which hunger, overweight and micronutrient deficiency coexist in the same population and often in the same individual across the lifecycle⁵. An important underlying cause of malnutrition is **diet**, often consisting of ultra-processed foods low in variety and nutrients⁶.

The focus of commercial agriculture on a limited number of exotic crops (e.g. sugarcane, soybean, coffee and maize) combined with changes in consumer preferences, dietary patterns and lifestyles, has reduced food system diversity, meaning that there is less variety in the food that consumers can find in markets to purchase and eat⁷. Today, only **1 out of 4 Brazilians consumes the recommended 400g per day of fruits and vegetables** (Figure 1)⁸. Yet Brazil contains vast amounts of **food biodiversity**⁹, mostly managed by **family farmers** and **traditional communities** who own less than 25% of Brazil's agricultural land^{10,11}. Some of this native diversity is of local and regional relevance – e.g. cassava, pineapple, peanuts, cacao, cashew, cupuaçu, passion fruit, Brazil nut and açaí - but most is neglected and its potential nutritional and economic value remains unexplored¹². To ensure **long-term food security**, it is vital that greater technical, political and financial support, as well as incentives for farmers to conserve plant genetic diversity are put in place. With proper support and use, nutrient-rich indigenous crops can provide ready access to the diversity of nutrients needed for **healthy growth and living**¹³, thus combatting national health and nutrition challenges.

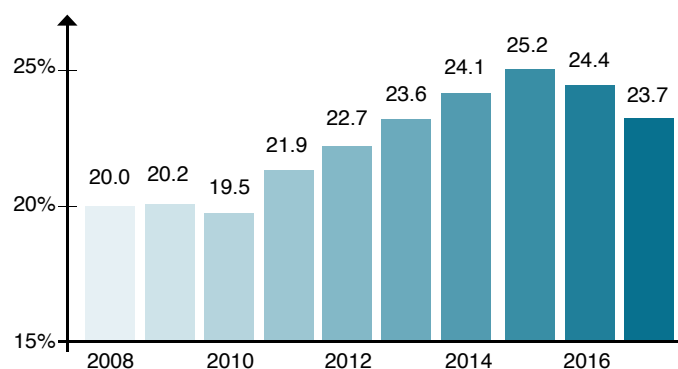
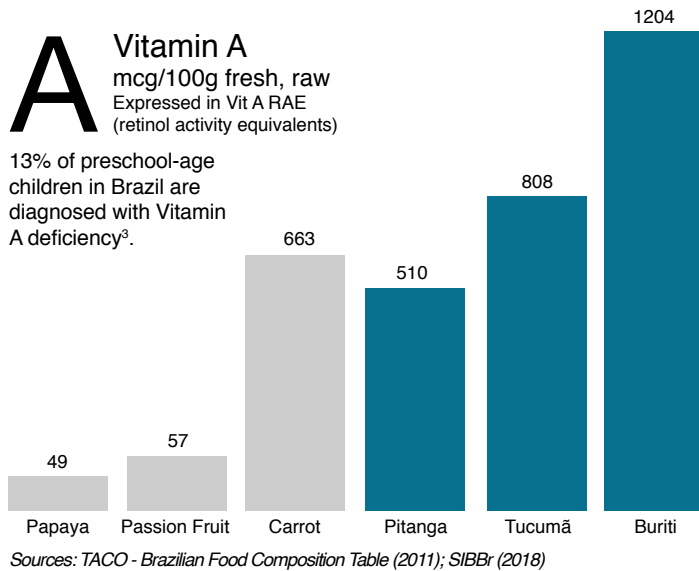


Figure 1: Percentage of adults who consume fruits and vegetables as recommended by the World Health Organization (400g per day)⁸

The Potential of Food Biodiversity in Brazil

Research has shown that diet quality is highly correlated with the number of species grown on farms, especially among poorer producers and consumers¹³. In partnership with federal universities and research institutes, BFN Brazil compiled and generated food composition data for **70 native species**, showing that compared to more commonly consumed fruits, native species such as camu-camu (*Myrciaria dubia*), guabiroma (*Campomanesia xanthocarpa*) mangaba (*Hancornia speciosa*) and cagaita (*Eugenia dysenterica*) contain higher quantities of vitamin C, while buriti (*Mauritia flexuosa*), tucumã (*Astrocaryum aculeatum*) and pitanga (*Eugenia uniflora*) are rich in vitamin A (see the graphs above). Besides contributing to **healthier diets**, native biodiversity can stimulate **local economies**, especially when linked to institutional markets^{14,15}. Promotion of these species empowers family farmers, indigenous, and quilombola communities by both strengthening local livelihoods and engaging these marginalised groups to support sustainable food systems. Furthermore, in addition to being **better adapted to local environments** including soils and climate¹⁶, native species depend less on farming inputs and are available year-round, particularly in the months of greater food shortage¹⁷.

*The GEF Mainstreaming Biodiversity for Conservation and Sustainable Use for Improved Human Nutrition and Wellbeing Initiative (BFN) is led by Brazil, Kenya, Sri Lanka and Turkey and coordinated by Bioversity International, with implementation support from UN Environment and the Food and Agriculture Organization of the UN. Additional support for the project is provided by the CGIAR Research Program on Agriculture for Nutrition and Health. The project contributes to the Convention on Biological Diversity's Cross-cutting Initiative on Biodiversity for Food and Nutrition.

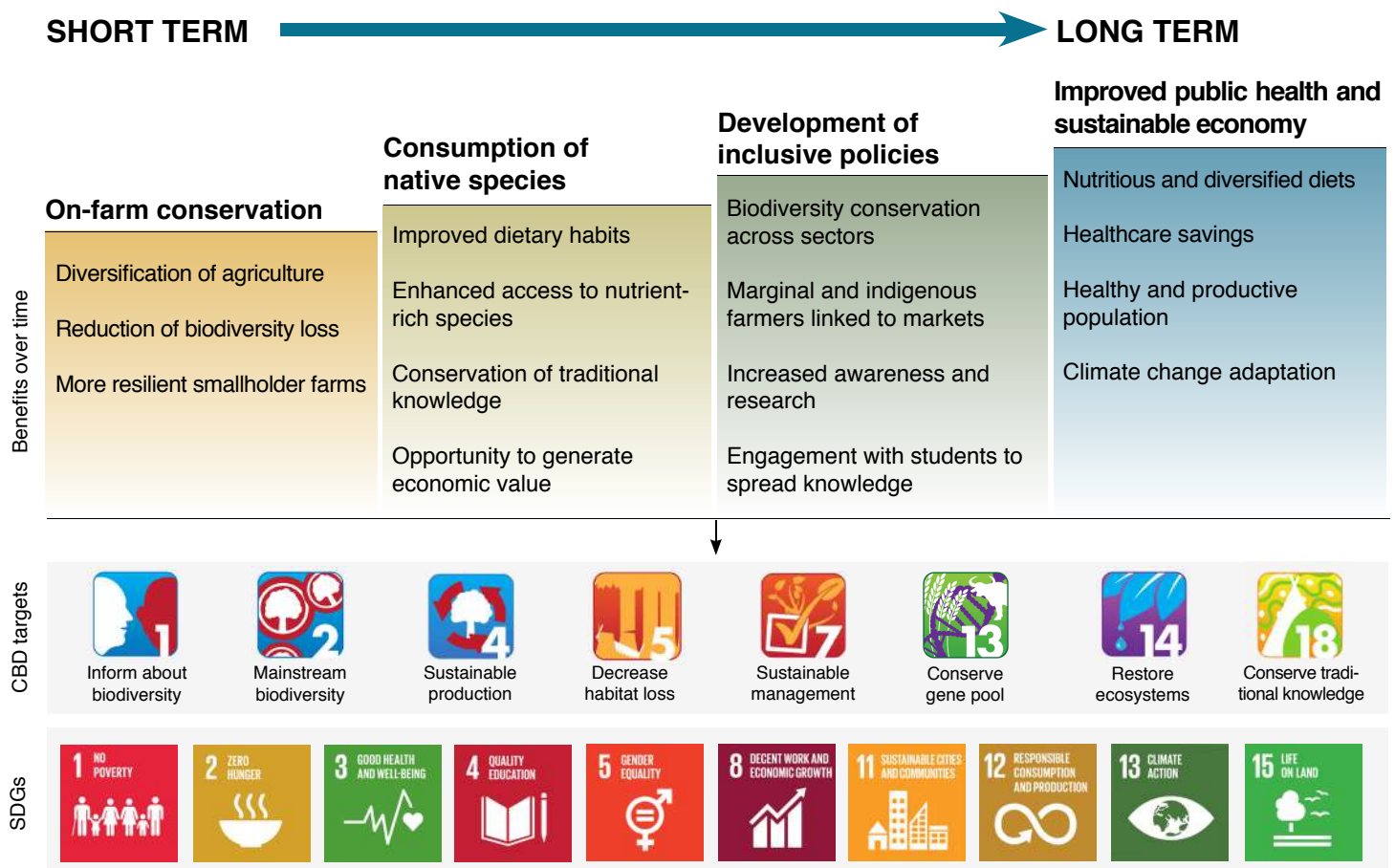


The pulp from buriti fruit (*Mauritia flexuosa*), consumed raw or turned into flour after drying, is used in cakes and jams.

Reliable Data for Informed Policymaking

Conserving native biodiversity, stimulating local economies and improving nutrition and health are deeply embedded in **Brazil's National Biodiversity Strategy and Action Plan** and its commitment towards achieving the **Aichi Biodiversity Targets** and **Sustainable Development Goals of the UN (SDGs)**^{18,19}. These targets are also in line with the policy frameworks established under the Zero Hunger Strategy²⁰ related to food and nutrition security and income generation, including the Food Acquisition Program (PAA)²¹, the National School Feeding Program (PNAE)²² and the National Food and Nutrition Policy (PNAN)²³. Providing reliable nutritional data of native biodiversity species has helped inform these policies

and enabled a broader use of native biodiversity⁷. Under the BFN framework, the Ministries of Environment and Social Development signed **Ordinances 163 and 284** on "Brazilian Sociobiodiversity Native Food Species of Nutritional Value" that **identify 100 neglected and underutilized species** for further utilization, and recognize the key role of sociobiodiversity for food and nutrition security²⁴. This encourages the cultivation of indigenous species by smallholder farmers, and links them with schools and development organizations through a direct procurement model. Furthermore, information generated by the project has been made available on the **online platform** Information System on Brazilian Biodiversity (SiBBr)¹⁵.



Highlight: Sustainable Gastronomy

Sustainable gastronomy promotes linkages between local biodiversity, local producers, and nutritious food systems through geographical indicators focused on quality attributes of regional foods²⁵. BFN highlighted culinary traits with the publication of the **Brazilian Regional Food book**, followed by **cooking workshops** across Brazil promoting the sustainable use of native crops in local cuisine. High profile chefs and well-known restaurants showcased **traditional recipes** with extra culinary appeal²⁶. In addition, BFN worked with Rio Alimentação Sustentável (Rio Sustainable Food Initiative) to promote sustainable and diverse diets from local sources during the **2016 Olympics**²⁷.



Credit: BFN/S.Landersz

Brazilian chef cooking with indigenous crops during the International BFN Symposium, Brasilia 2017.

Improving Diets by Raising Awareness

Reliable data is also important to “encourage consumers to make positive choices for healthful diets”²⁸. Elements of biodiversity for food and nutrition are now included in the **Food-based Dietary Guidelines** for the Brazilian Population as well as in the Brazilian Regional Foods books highlighting the benefits and uses of native foods and calling for **greater sustainability of food and agricultural systems**^{29,30}. **Recipe books** were developed in addition to an **online course** on mainstreaming biodiversity for food and nutrition aimed at policy makers, researchers and professionals. **Street fairs, cultural and gastronomic events** that showcase native foods, non-conventional vegetables, as well as different species and varieties of widely consumed crops, increase the recognition of biodiversity’s value for food and nutrition among farmers and consumers. Engaging and establishing partnerships with universities and research institutes is hoped to generate future research

investments, teaching and extension on native biodiversity³¹, with students likely to **carry on this knowledge** in their future professional lives, as well as to their homes and relatives.



Credit: BFN Brazil

A celebrity chef and an indigenous representative meet at a regional food workshop, 2016.

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