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Neglect me not: plants of the past are foods for the future

Introduction

As we grapple with the global challenges of poor diets (under-nutrition, over-nutrition, and micronutrient deficiencies) and their relationship to ecologically destructive agricultural practices (Willet et al. 2019), awareness is simultaneously growing regarding the widespread loss of biodiversity and its ramifications for nutrition and food security (IPBES 2019). Research has shown that agrobiodiversity can play an important role in battling diet-related illnesses and malnutrition (Nugent 2011; Remans and Smukler 2013; Allen et al. 2014; Powell et al. 2015, Bioversity 2017). Unfortunately much of this biodiversity is currently neglected and underutilized, despite its traditional place in local diets and ecosystem functioning (Padulosi et al. 2013; Meldrum et al. 2018). In addition to local efforts—especially by indigenous and family farmers, to conserve and sustainably manage wild and cultivated biodiverse species, much of their survival depends on wider incorporation of these resources into sustainable cultivation and consumption practices.

To successfully promote neglected and underutilized species, we need better knowledge of their nutritional properties, and must develop policy support for their marketing and commercialization. Ultimately, raising awareness of their untapped potential for sustainable food and nutrition security can contribute to further achievements of many Sustainable Development Goals (Fanzo 2019) and Aichi Biodiversity Targets of the Convention on Biological Diversity (Hunter et al. 2019).

Focusing on the cross-cutting link of diets with human and planetary health, the *Biodiversity for Food and Nutrition Project* (BFN) project started in 2012* to explore neglected and underutilized species in Brazil, Kenya, Sri Lanka and Turkey. The project aimed to develop an adaptable approach to prioritization, research, and promotion of biodiversity for food security and nutrition policies and practices.

Methods

The BFN approach was implemented in four target countries - Brazil, Kenya, Sri Lanka and Turkey - each characterized by high biodiversity, unique traditional use of native species, yet high malnutrition status. The partner-led, multi-sectoral, interdisciplinary approach followed three overarching linked actions:

1. Providing evidence: compiling local knowledge on food species, prioritizing those with high nutrition and economic potential, conducting food composition analysis, and sharing knowledge with national partners from the agriculture, environment, health, education, social development, and market sectors.
2. Influencing policy and markets: advocating for the inclusion of indigenous species in policies, strategies and action plans, creating new policies to incentivize food biodiversity, and identifying markets including public food procurement and school feeding.
3. Raising awareness: sharing information through cultural and gastronomic events, educational initiatives, training workshops, and outreach activities across the supply-demand spectrum.

For example, evidence was shared on the supply side with BFN Kenya's localized approach in Busia County, which connected a community-based farmer support group with schools, policymakers, and farmers to encourage local production and create an enabling policy/market environment for underutilized crops. Meanwhile, on the demand side, evidence generated by the project was communicated to consumers in order to influence dietary habits and appreciation of food culture. BFN Brazil partnered with political institutions, universities, indigenous communities and celebrity chefs to further incorporate native crops into policies, national food-based dietary guidelines, markets, school curricula, gardens and meals.

Results

Altogether BFN has documented the food composition data on over 190 prioritized species, with country-level achievements including:

BFN Brazil's work led to a "Socio-biodiversity" policy ordinance listing 101 regional species as nutritious foods eligible for procurement programs. Because this list serves as a guide for implementing the Food Acquisition Program, National School Feeding Program, and the Minimum Price Guarantee Policy of Biodiversity Products, this greatly expands institutional capacity for local produce, and ensures fair prices and markets for family farmers (UNSCN 2017a).

BFN Kenya is helping conserve and promote nutrient-rich African leafy greens by linking farmers to local schools for their provision in school meals (UNSCN 2017b). Busia County has developed a Biodiversity Conservation Policy – the first of its kind across Kenya's 47 counties – that recognizes the importance of traditional foods for nutrition and food security.

In Sri Lanka, under the brand name "Hela bojun - True Sri Lankan taste", 17 market outlets for the sale of traditional foods are empowering rural women to earn a living while sourcing local foods.

In Turkey, the annual Alaçatı Herb Festival attracts thousands of visitors to celebrate wild edible plants through seminars on nutrition and diets, exhibitions, nature walks, selling of local products, activities for children, cooking workshops, contests, and visits to the Wild Edible Plants Collection Garden. Turkish students have also been introduced to wild edibles within a "green" vocational training program.

Each country has produced a Policy Brief with key messages and actions to better mainstream biodiversity for improved nutrition, with entry points including Dietary Guidelines, National Biodiversity Strategy and Action Plans.

Global outputs include www.b4fn.org, a repository of open-access information including nutrition information on over 190 species and varieties, recipes, and articles. The project has produced a free E-Learning course with case studies, entry points, and barriers for mainstreaming biodiversity.

Conclusion

The BFN Project has developed a methodology focused on evidence, policy and awareness, however, the examples from different countries demonstrate that context determines the most effective approach to mainstreaming agrobiodiversity for nutrition. In particular, the success of activities depends on partnerships that build off pre-existing demands and opportunities. Operating in four significantly

different countries has shown to be a strength, with the exchange of lessons learned across countries forming a critical component of the project.

As the first phase of BFN concludes (2012-18), the project is sharing methods and results, for example, with its inclusion in the FAO's State of the World Report on Biodiversity for Food and Agriculture, presented at the 17th session of the Commission on Genetic Resources for Food and Agriculture (February 2019), as well as anticipating how to adapt to further regions in the future. With support from the Australian Centre for International Agricultural Research, BFN is initiating rigorous testing of the direct procurement model in additional schools and countries where it is possible to build off pre-established regional partnerships. This will be key in establishing a strong quantitative evidence basis demonstrating the feasibility of up-scaling the growth, sale, and consumption of underutilized species. Additional evidence can also support further policy successes and contribute to increased awareness and capacity for nutritious, culturally-relevant biodiversity.

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