Farmer field day evaluating millet performance. Credit: Action for Social Advancement/B.

Promoting chaya and tepary bean for better nutrition and climate resilience in Guatemala

Guatemala is a global hotspot for biodiversity. In addition to a rich wild flora and fauna, the country is also a center of origin and diversity for many globally-important crops such as maize, bean, papaya, pumpkins, avocado, cocoa, cassava, sweet potatoes, and peppers, along with numerous lesser-known crops The high agricultural biodiversity in Guatemala partly results from and reflects the high cultural diversity that exists in this country, where a large portion of the population is indigenous and many different ethnic groups coexist. Rich knowledge on the use of local biodiversity is maintained by indigenous peoples for leveraging its values for meeting subsistence needs of food, shelter and medicine.

Neglected and underutilized indigenous plants

Many of the native plants used by rural communities in Guatemala have not received much attention from research and development efforts to enhance their roles in the livelihoods of Guatemalan peoples even if some have much high nutrition values and greater tolerance to stressful growing conditions than many important introduced crops. The programme "Linking agrobiodiversity value chains, climate adaptation and nutrition: Empowering the poor to manage risk" funded by IFAD and the European Commission from 2015 to 2018 aims to strengthen the capacities of farmers to manage risks associated with climate change, poor nutrition status, and economic disempowerment through leveraging their local agrobiodiversity. The programme is focused on chaya (*Cnidoscolus aconitifolius*) and tepary bean (*Phaseolus acutifolius*) in Guatemala, which were identified through multi-stakeholder consultations as native species with strong potential to support better nutrition and resilience.

Chaya

Chaya or Mayan spinach (*Cnidoscolus aconitifolius*) is a domesticated shrub that has been cultivated since pre-Hispanic times in Mesoamerica. The leaves are highly nutritious, containing significantly higher amounts of crude protein, fibre, calcium, potassium, iron, ascorbic acid and β-carotene than spinach. It is a perennial woody species that grows up to six meters tall. It is often planted in gardens and fields

Millet harvest. Credit Action for Social Advancement/S. Priyam

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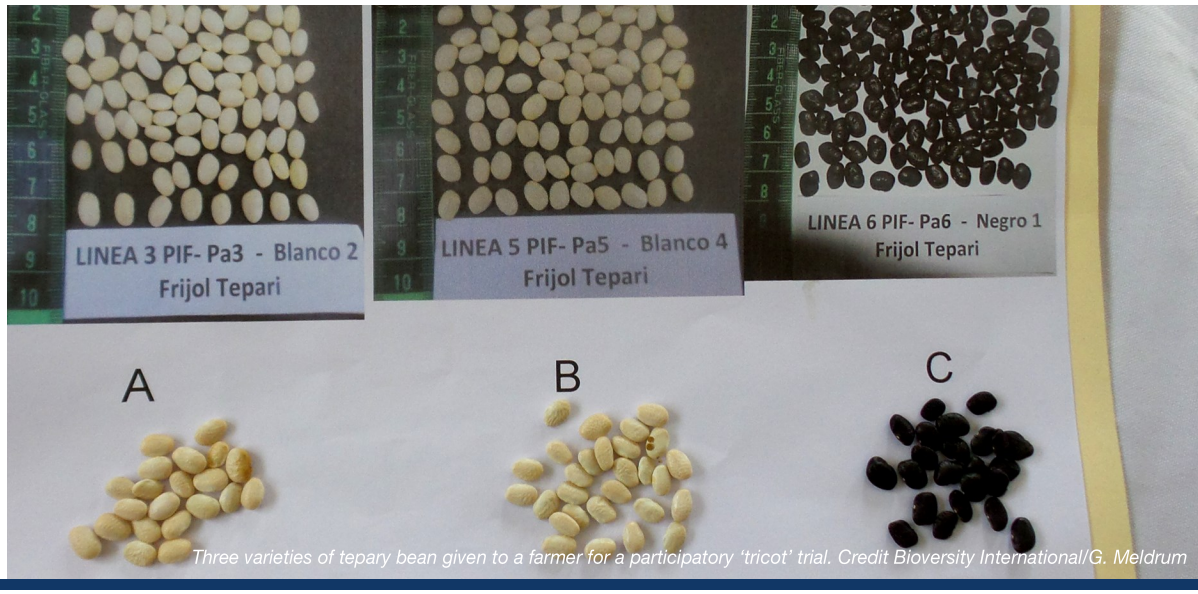
as a hedge. The nutritious and tasty leaves can enhance diet quality for rural and urban Guatemalans, especially in the lean season, as the plant produces a harvest year round, The promotion and use of this species can provide an income source for marginal producers while strengthening indigenous food culture. Despite the many potentials of chaya, there has been little research of this crop and limited work to promote its use in Guatemala. A holistic approach addressing multiple bottlenecks in supply and demand is being applied in the project, engaging consultation and participation of multiple stakeholders to ensure interventions are pro -poor and gender-sensitive

Map of Project villages. Credit Bioversity International/ G. Gullotta

The initiative is targeting communities in Chiquimula district with activities to promote the cultivation and use of chaya and tepary bean. This district is part of the dry corridor of Guatemala where the population faces a high burden of malnutrition, poverty and climate risk.

Tepary bean

Tepary bean (*Phaseolus acutifolius*) was domesticated in the dry regions of Central Mexico and the southwestern USA. It is a relative of common bean (*Phaseolus vulgaris*), which is the fundamental staple in Guatemalan diets alongside maize. Tepary bean is well-adapted to arid conditions with high drought, heat, and cold tolerance, as well as early maturation. It is fairly high yielding and outperforms common bean in hot environments. For this reason, it can support diversification of Guatemalan farm systems for climate change adaptation. Tepary beans are comparable or superior in nutritional content compared to other major pulses in Guatemala. Its taste, which is distinct from common bean, is appreciated by populations in its native range and beyond. This crop has been grown in small levels in Guatemala but has essentially fallen out of cultivation. The performance of this crop and its acceptability to farmers and consumers in Guatemala are being explored in the project. Tepary is being introduced to farmers through participatory crop evaluation trials following a novel crowd sourcing approach. Consumer acceptability trials in urban and rural populations are also being conducted.



Three varieties of tepary bean given to a farmer for a participatory 'tricot' trial. Credit Bioversity International/G. Meldrum

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