Women in a diversity field of millets in eastern Madhya Pradesh. Credit: Bioversity International/G. Meldrum

Underutilized crops to enhance resilience and nutrition in Guatemala, India and Mali

The programme "Linking agrobiodiversity value chains, climate adaptation and nutrition: Empowering the poor to manage risk" is supported by IFAD and the EU and linked to CCAFS and A4NH.

Diversity in crops, trees and livestock contributes to food and nutrition security and livelihood resilience by allowing farmers to respond to changing climatic, economic and social conditions. To support this process, communities must have access to crops adapted to emerging conditions and capacity to use agricultural biodiversity effectively to generate income and nutritionally complete family diets.

Many traditional crop species are good sources of macro- and micro-nutrients and are tolerant to stressful growing conditions such as drought and poor soils. These crops can help improve nutrition, food security, and livelihood resilience in the face of climate change. However, many are underutilized as farm and food systems are increasingly dominated by a handful of commodity crops and knowledge on the use of local plants is being forgotten. Some traditional crops are still important in local food systems but they have not benefitted from the intensive research that has raised the productivity and marketability of rice, wheat and maize. Due to a lack of research attention, local crops typically face constraints to their use in addition to low yields, such as poor seed availability, laborious processing and lack of consumer demand. These constraints can be overcome with research attention and support for their cultivation, consumption, and value chain development to realize the potentials of these crops to enhance food and nutrition security, raise incomes of the rural poor and empower marginalized peoples.

The programme "Linking agrobiodiversity value chains, climate adaptation and nutrition: Empowering the poor to manage risk" is supported by the International Fund for Agricultural Development (IFAD) and the European Commission (EC) from 2015-2018. The programme aims to strengthen the capacities of farmers to manage risks associated with climate change, poor nutrition status and economic disempowerment through agrobiodiversity-based solutions. Local food systems in Mali, Guatemala, and India are being revitalized with the research and promotion of traditional crop species and their use in sustainable and resilient livelihood practices. The programme has a special focus on smallholder farmers and indigenous peoples, who are the custodians of global agricultural biodiversity.

Holistic Value Chain Approach

A holistic approach addressing multiple bottlenecks in supply and demand of target crops is being applied in the programme to enhance productivity and promote cultivation and use of nutritious and climate-hardy underutilized species. Multiple stakeholders are being engaged in the research to ensure that the value chain interventions are pro-poor and gender-sensitive and to advocate for supportive policies. The genetic diversity of target crops is being evaluated through participatory approaches and safeguarded to support the realization of robust value chains. Farmers' access to information on diversity, markets, and weather is being enhanced and their capacity developed for

The programme is coordinated by Bioversity International and led in Guatemala by the Universidad del Valle de Guatemala (UVG), in India by Action for Social Advancement (ASA) and in Mali by L'Institut d'Economie Rurale (IER).

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From 2015-2018 the IFAD contribution will amount to 3 million USD and the EU contribution 1.5 million Euro.

better nutrition and risk management to complement the value chain interventions.

Tepary bean and Mayan spinach

The programme is focused on the dry corridor in Guatemala, where farming communities face grave issues with food insecurity and malnutrition that are being exacerbated by climate change. Mayan spinach (*Cnidoscolus aconitifolius)*, known locally as *chaya*, is being promoted to improve availability and consumption of vegetables year round. The leaves of this shrub have high protein, carbohydrates, fats, fibre, vitamin A, vitamin C and calcium. Highly drought-tolerant tepary bean (*Phaseolus acutifolius*) is also being promoted to enhance the resilience of production. Farmers are assessing the performance and culinary acceptability of tepary bean as compared to the dominant bean crop in the region (*Phaseolus vulgaris*) using a participatory "crowd-sourcing" approach.

Kodo and Little Millets

In India the programme is focused on Mandla and Dindori districts of Madhya Pradesh where indigenous Gond and Baiga communities face increasingly unpredictable rains and high levels of poverty and malnutrition compared to other regions of India. Kodo (*Paspalum scrobiculatum*) and little millet (*Panicum sumatrense*) are the traditional staple cereals in these communities but they have low productivity and commercial potential. The initiative is working to improve the seed quality and productivity of these crops through participatory trials and reversing diversity erosion. The capacities of four farmer producer companies are being strengthened for millet commercialization and their value chain linkage enhanced to help farmers achieve higher prices for their millet production.

Bambara Groundnut and Fonio

In Mali, the programme is targeting communities in Ségou and Sikasso regions where increasingly arid conditions and a shortening growing season are major threats in a context of existing chronic food insecurity and malnutrition. Native crops like Bambara groundnut (*Vigna subterranean*) and fonio (*Digitaria* sp.) are adapted to the harsh conditions of the region and can help secure food production under climate change but they have low yields, are highly laborious to process and have poor market development. The progamme is working to overcome these constraints to improve their contribution to Malian livelihoods.

Credit: Bioversity International/G. Meldrum

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