

Improving community livelihoods by recovering and developing their traditional crops

When crops that could contribute to better food, health and income are abandoned by communities, marginalized by mainstream agriculture, ignored by research and absent from consumers' diets, the entire world loses.

Quality of life is associated with having enough good food to eat and a diversity of food choices. Market pressures and consumer demands for fast food have reduced food choices so drastically that many people are feeding on just a few staples! Traditional crops that could provide nutritious foods are increasingly being ignored: farmers do not see them as profitable any longer, consumers exclude them from their (increasingly simplified) diets, agricultural research omits them from their agendas and local communities lose the food culture which is part of their identity. These traditional crops, often defined as the 'orphans' of R&D, are what we call today neglected and underutilized species (NUS).

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What are NUS and how did they gain this status?

Neglected and underutilized species are a cornucopia of useful crops—hundreds of food crops of different kinds, such as minor millets in South Asia (e.g. finger millet, foxtail millet, little millet), Andean grains in Latin America (e.g.

amaranth, cañihua, lupin), leafy vegetables in Africa (e.g. Jew's Mallow, bitter leaf, black nightshade, spider plant) or the amazing diverse tropical fruit trees (e.g. breadfruit, durian, bush mango). They are not commercialized on a national scale, despite their potential to contribute to food security, health and nutrition, income generation and environmental services. They are often collected from the wild or cultivated in traditional production systems with little or no external inputs, which makes them adapted to difficult agro-ecological niches and marginal lands. NUS can have attractive characteristics, such as better flavour or shorter cooking times, and may be rich in nutrients and value for their medicinal properties.

However, NUS have predominantly informal seed systems and their cultivation and use practices are poorly documented. They can be slow growing and their preparation for food can require long processing times. In many cases research into how they breed is inadequate and this results in a lack of improved varieties.

Relatively simple and inexpensive changes in NUS cultivation, processing, commercialization and use can reverse the perception of NUS as 'food of the poor'. This brief illustrates how this change is possible, by showing examples of farmer communities in three regions of the world who improved their livelihoods through NUS.

RESCUING AND PROMOTING NUS

Grains in the high Andes of Peru and Bolivia

Quinoa (*Chenopodium quinoa*), cañihua (*Chenopodium pallidicaule*) and amaranth (or kiwicha, *Amaranthus caudatus*) are nutritious, hardy, resilient Andean grains, long used for food by farming communities in Bolivia, Peru and Ecuador. They adapt well to drought, floods and frosts, common in the climate conditions of the high Andes and likely to increase in frequency and severity under climate change. They play an important role in the nutritional security of people in the Andes where they have a comparative advantage over other major staple crops in terms of resilience of traditional cultivations and food systems. These grains, however, are not competitive in the markets, good quality planting material is scarce, their growth cycles are long and processing their grain is a laborious task. With support from the International Fund for Agricultural Development (IFAD), and working with Andean farmers, Andean grains' genetic diversity and traditional knowledge were recovered, conserved and made available to users. Their production, processing and marketing were improved, the nutritional content of many varieties was determined, and new processed products developed. Farmers are starting to conserve their Andean grain diversity on farm, under an innovative approach that rewards farmers for their conservation efforts¹.

¹ http://www.bioversityinternational.org/research/sustainable_agriculture/pacs.html



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Leafy vegetables in Africa

About 900 species of African leafy vegetables (ALV) are reported to be grown traditionally in sub-Saharan Africa by small-holder farmers, gathered from the wild, or cultivated in home gardens. ALV used to be a key part of African people's diets and culture, particularly in low income families, but were considered less prestigious than more marketable, introduced vegetables such as lettuce and cabbage. They were of no interest to national agricultural research programmes because of their wild, semi-wild or weedy nature, putting their diversity under threat.

ALV were rescued and promoted by collecting, characterizing, promoting and valuing their diversity; analyzing their nutritional composition to determine their dietary potential; documenting the indigenous knowledge on their cultivation and use; identifying promising varieties and constraints to seed availability and supply; and assessing their acceptance by consumers. These actions increased the demand, volume and number of ALV species grown by local farmers and available in local supermarkets. An impact assessment study carried out on a Bioversity-led ALV project in Kenya has shown that over 60% of project participants in one site reported that their net monthly income from vegetables increased considerably due to the work on ALV, and sales at supermarkets in Nairobi for these products rocketed by an astonishing 1100% in just 2 years!

Minor millets in Asia

RESEARCH AND POLICY ACTIONS CAN CHANGE THE STATUS OF NUS SPECIES

Minor millets are small-seeded crops grown for food and fodder. With a protein content close to that of wheat, they are rich in B vitamins (especially niacin, B6 and folacin), calcium, iron, potassium, magnesium and zinc. Even though they have been cultivated for centuries, minor millets account for less than one percent of the food grains produced in the world. They are mostly grown in marginal areas, because they require little water, and under conditions where major cereals would fail to give sustainable yields. Research has paid little attention to improving the crop and the way it is cultivated and used. Furthermore, processing millet is a laborious, time-consuming task.

To change the status of minor millets in India, their planting techniques were improved and traditional knowledge recovered for selection of higher quality varieties. As a result, Indian small millet growers increased their yields by 70% and their income by 30%. Women farmers have benefitted from training to select and pack quality grain into innovative snack foods, which they are now marketing to urban markets and schools.

Current food systems need to be reshaped because they are unsustainable. NUS can play an important role to that end, renewing and enriching food systems and making them more sustainable. For this to happen, research, collective action and policy interventions are needed. Interventions should cover the agronomy, processing, marketing, nutrition and public perception of NUS. Actions should involve farmers, researchers, market chain actors and decision makers, and should aim to achieve poverty alleviation, food security and resilience to climate change.

Priority research actions include:

- mapping the distribution of NUS, characterizing genetic and morphological diversity to identify important traits and assessing genetic erosion
- studying the nutritional and health contribution of NUS in resilient food systems and sustainable diets
- developing cultivation practices and post harvest technologies that make these species economically competitive
- developing new products for existing and/or new markets
- documenting scientific and indigenous knowledge on NUS cultivation and use to increase their value
- characterizing the seed supply and exchange systems of NUS to improve availability and farmers' access to quality seeds
- strengthening capacities of scientists, value chain actors and community-based institutions in promoting NUS to improve people's livelihoods.

Priority interventions for policy include:

- maintaining NUS diversity by supporting small-scale farming and creating incentives to diversify agricultural production systems, which will contribute to more nutritious and resilient food systems
- making NUS germplasm available for research and use in farming systems, through access and benefit sharing schemes
- supporting NUS custodians and promoting inclusion of NUS in community seed fairs, seed banks, seed production and certification schemes
- establishing measures to protect NUS resources from biopiracy
- integrating NUS in policies dealing with climate change adaptation and environmental and public health to encourage their cultivation and improvement



- safeguarding the diversity within revitalized production systems based on NUS
- promoting NUS for strengthening self-reliance of countries, reducing dependency on exports.

Greater awareness as a driver of change

Education is a powerful tool for change. Awareness campaigns can create or revive interest in minor crops and the opportunities they offer. UN international years can be drivers for high profile initiatives on crops, as was seen in Peru in 2008, the International Year of the Potato, which raised Peruvians' interest in the diversity of their native and underutilized potatoes, and catalyzed their rescue and promotion. Similar results are expected in Andean countries with the International Year of Quinoa in 2013. Bioversity, FAO and country partners are already planning initiatives to raise the profile of quinoa and other NUS associated with Andean farming systems.

Developing school curricula on the nutritional benefits of NUS and their relevance can help maintain the cultural and culinary traditions of local communities around the world. Growing and showcasing these crops in school gardens can strengthen the connection between young generations and local species. Higher education programmes oriented towards sustainable rural development, food security and agroecology can also incorporate conservation and use of NUS.

For further reading and information

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Note: videos and more information on Bioversity projects on NUS are available at http://www.bioversityinternational.org/research/sustainable_agriculture/neglected_underutilized_species.html

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