Helping 'local favourites' join the race for healthier diets

'Traditional' vegetables are crops that are grown in their region of origin or were introduced many generations ago. They are generally sturdier and more nutritious than vegetables traded globally, but tend to be under-utilised. Our authors show how the rapidly eroding diversity of these vegetables can be countered and how they can be integrated in today's food systems.

By Marco C.S. Wopereis and C. George Kuo

About one in every three people suffer from malnutrition, be it hunger, micronutrient deficiencies, or overweight/obesity. This is caused by a combination of dietary and health factors. Increased consumption of healthy, nutrient-dense foods, such as vegetables, and reduced intake of unhealthy and processed foods will improve nutrition. Vegetables are among the most affordable sources of vitamins, minerals and plant-based proteins, which are essential for good health. However, vegetable intake world-wide is far below the recommended World Health Organization (WHO) minimum of 240 grams and the EAT-*Lancet* Commission recommendation of 300 grams per person per day, with the exception of East Asia.

Vegetable diversity in Yogjakarta market, Indonesia.

Photo: World Vegetable Center

The special case of 'traditional' vegetables

'Global vegetables' such as tomato, peppers, onion, brassicas, eggplant, carrot and beans are ubiquitously produced, commercialised and consumed. However, there are hundreds of traditional vegetables that are locally produced and socially and culturally accepted as local foods, such as leafy amaranth in East Africa, Malabar spinach in India and slippery cabbage in the Pacific Islands. These 'traditional vegetables' are either endemic crops that were domesticated and cultivated in the same place they originated from, or crops that have been introduced into a country and are now recognised as traditional vegetables. The huge diversity of traditional vegetables is more than a local peculiarity – they could potentially play a much greater role in ensuring adequate levels of nutrition in particular in low-income countries. Traditional vegetables have a much higher nutritional value than their global counterparts, such as cabbage and tomato, and offer an important source of vitamins and minerals (see Table on page 20). They also contribute to climate resilience by diversifying farming systems and create important income generation and job opportunities both on- and off-farm.

But traditional vegetables tend to be underutilised, undervalued and poorly integrated in current markets and diets. Consumers may not recognise their nutritional value and may even consider them as 'old fashioned' and 'poor man's food'. Some traditional vegetables are associated with long preparation time and not fit to be integrated into 'modern' recipes. However, there is evidence that these vegetables are making a comeback, e.g. in East Africa, with traditional vegetables like amaranth, jute mallow, spider plant and African nightshade being sold in restaurants, local markets and supermarkets.

Global trends putting a tradition at risk

The tremendous diversity of traditional vegetables is a great asset, since it provides many opportunities to adapt to local growth conditions, adding colour, taste, nutrition and health qualities to people's diets. Conserving vegetable diversity is crucial as different land races and wild relatives may have very important still-to-be discovered nutrition and health qualities and agronomic traits, such as resistance to pests and diseases or tolerance to drought. There is considerable evidence that traditional vegetables are hardier, i.e. better adapted to marginal soil and climate conditions and pest and disease pressure than their global counterparts. These traits may be very useful in future breeding programmes.

The use of traditional vegetable diversity in farming systems around the world is in decline because of diet homogenisation,

food production homogenisation and urban migration. To maintain this diversity, it is necessary to conserve and document vegetable landraces, their wild relatives and traditional knowledge of these vegetables before they are lost. This is particularly important for Africa. A recent study focusing on 126 traditional African vegetables showed that only a few (e.g. common bean) were conserved well in genebanks in Africa. About one-third of these vegetables were represented by less than ten accessions, or even no accessions at all. To secure these genetic resources for humanity, it will be necessary to organise collection missions for ex-situ conservation, upgrade seed banks in Africa to keep the seed safe, and support national conservation programmes to improve the in-situ conservation of these vegetables and their wild relatives.

A farmer in Tsenanomby, Madagascar, showing her Ethiopian mustard and amaranth plots.

Photo: World Vegetable Center

Finding 'local favourites' and boosting supply

The main bottleneck to integration of traditional vegetables into food systems is the availability of quality seed. Most traditional vegetables have not been the object of rigorous selection for local growth and market conditions or consumer preferences and dietary needs, let alone breeding work to improve productivity and marketability, with high once-over yield and uniform quality produce, whilst maintaining their nutrition and health qualities. There is a need to find 'local favourites' among the vast diversity found in a particular country or region that fit best in local agro-ecosystems and diets. This may indirectly benefit conservation efforts as policy- and decision-makers start to become aware of the value of traditional vegetables through their increased use.

The World Vegetable Center (WorldVeg) works with formal and informal seed systems to promote traditional vegetables. Seed companies are important partners because they can potentially reach large numbers of farmers. Beyond quality seed, and just like with global vegetables, attention needs to be paid to enhance productivity, marketability, and food safety and off-season production by promoting good agricultural practices, integrated pest management, and adapted and affordable protected cultivation methods. Post-harvest losses can be cut back and nutrition and health qualities maintained by improvements in transportation infrastructure, processing and cold storage, and by synchronising production and marketing.

'Grow your own' initiatives

Vegetables may be unavailable or unaffordable to consumers in low-income countries for at least part of the year. In such cases, it makes sense to promote production of vegetables for home consumption. WorldVeg has reached close to 100,000 households, working mostly with women, in Africa and Asia with home garden interventions over the last decade. Such interventions combine hands-on training in vegetable gardening with nutrition behaviour change communication. In East Africa alone, WorldVeg and partners distributed over 42,000 seed kits containing 183,000 vegetable seed samples to households in Tanzania, Kenya and Uganda. The seed kits contained traditional African vegetables, tomato, pepper and soybean. Participating households in Cambodia increased vegetable production by 43 per cent and extended the production period by four months. They also adopted a range of new production methods, including mini seed packs. Three years after a home garden intervention in Bangladesh, the former participants are producing, on average, 43 kg of vegetables per household per year, providing an important micronutrient supply of iron, zinc, folate and vitamin A. This is encouraging evidence of a long-lasting effect. Results from Africa were generally less conclusive, pointing, among others, to the need to pay greater attention to water constraints and better adaptation to local needs.

Given the large number of poor people living in and near urban centres in low-income countries, 'grow your own' initiatives focusing on nutrition-rich vegetables, such as Malabar spinach, jute mallow and spider plant in small spaces using sack gardens and vertical gardens deserve much greater attention. More research is needed to understand how these seed kits help to strengthen local seed systems, and how they can help households in evaluating a range of traditional vegetables for climate-smart agriculture and for new ways of farming such as urban agriculture.

Natural disasters disrupt food production and distribution systems. Fast-growing traditional vegetables can help restore local food supplies and provide nutrition to victims. WorldVeg seed kits with diverse and nutrient-rich vegetables are currently helping people cope with the effects of the COVID-19 pandemic in the Philippines, Taiwan and Thailand. WorldVeg and partners have also assisted victims of the tsunami in Indonesia and Sri Lanka, a typhoon in Taiwan, an earthquake in Haiti and floods in India, Thailand and Fiji.

School garden and school meal programmes

Healthy eating preferences and habits are best learned early. Starting in 2014, WorldVeg and partners conducted school garden programmes in Burkina Faso, Bhutan, Nepal, Indonesia and the Philippines. Through a hands-on experience with gardening and nutritional education, children learned how to grow and appreciate healthy foods such as fruit and vegetables. They generally became more aware and knowledgeable about vegetables and liked to consume them, but a positive effect on vegetable consumption was found only in Bhutan. School gardens are too small to produce sufficient quantities of vegetables for school

lunches. Therefore, these school garden programmes were successful in working on the 'demand side', but not on the 'supply side'.

A follow-up study in Nepal combined the school garden programme with an integrated home garden programme for parents. This time, vegetable consumption of children increased by 15 to 26 per cent (depending on the season). Nudging children towards healthier food choices clearly requires targeting caregivers as well. Another way of solving the supply issue is to stimulate greater involvement of parents and local farmers in the school meal programme and source vegetables locally. Children benefiting from this approach in Nepal had a significantly higher provision of midday school meals (+19 %) and a higher school meal quality in terms of dietary diversity (+44 %) and nutritional content (e.g. a 21 % higher consumption of vitamin A-rich fruit and vegetables). Maintaining the observed gains would require a 20 to 33 per cent increase in the current budget per school meal in addition to the cost of capacity strengthening.

Nudging people towards purchasing traditional vegetables

Many people, rural and urban consumers alike, in low-income countries will buy vegetables along the roadside, in wet markets and supermarkets, or in a restaurant. Consumers from all wealth classes need to be able to access and afford traditional vegetables and trust that they are safe to consume. Vegetables need to be appealing and easy to prepare and fit into local recipes. WorldVeg has been involved in promotional and demand creation activities for African vegetables in East Africa. This included road shows, cooking shows, nutritional sensitisation and awareness programme campaigns in hospitals, schools, markets and villages to enhance consumption and create demand and market incentives for producers.

The private sector takes care of many issues related to losses and food safety when products are sold in supermarkets. However, the majority of rural and urban consumers in low-income countries will purchase their food in informal, wet markets. This calls for reducing post-harvest losses and increasing hygiene and food safety. One of the key factors for success is to establish durable linkages between producers and markets or direct linkages between producers and consumers (e.g. through mobile phone applications) creating trust, traceability and reducing uncertainty.

What has to be done

The nutritional and health potential of traditional vegetables is tremendous, but people's diets are currently moving in the wrong direction. East Asia's example shows that it is possible to include traditional vegetables in people's diets, and can provide lessons learned for other regions. Information campaigns are needed to raise interest in traditional vegetables – these should emphasise taste, cultural value and ease of preparation, and should not only advocate nutritional, health and environmental benefits. They could include promotion campaigns with chefs and consumer champions to celebrate nutrition, taste and cultural values of these vegetables.

Farmers will need support in terms of seed supply and good agricultural practices to guarantee food safety, raise productivity and extend growing seasons. Establishment of trust and traceability relationships and short connection lines between producers and consumers will address food safety concerns, enhance production and consumption and reduce post-harvest losses. Investments in food environments, in particular in wet markets in low-income countries, are needed to improve food safety, hygiene and reduce waste.

Care must be taken to conserve the diversity of traditional vegetables world-wide whilst starting up activities to promote their production and consumption. To secure the diversity of traditional vegetables, it will be necessary to organise collection missions for ex situ conservation, upgrade seed banks to keep the seed safe and support national conservation programmes to improve the conservation of these vegetables and their wild relatives in their natural habitats.

Last but not least, promotion of traditional vegetables must fit within local, national and regional initiatives to reduce malnutrition and to get crucial buy-in from policy- and decision-makers. It will help to emphasise that besides the nutritional potential of traditional vegetables, there is also tremendous economic potential, through income generation and job creation along the value chain from seed to retail, with clear opportunities for women and youth.

Percentage of recommended nutrition intake (RNI) supplied by 100 g of selected commodities, including global (cabbage, tomato) and traditional vegetables for pregnant women*

	Protein (g)	Vitamin A (µg RE)	Iron (mg)	Folate (µg)	Zink (mg)	Calcium (mg)	Vitamin E (mg α-TE)
RNI for pregnant women (1st trimester)	60	800	30	600	11	1000	7,5
				Percentage (%) of RNI			
Rice	12	0	1	2	4	0	0
Cassava (root)	2	0	1	5	3	2	0
Millet	6	0	2	14	8	0	0
Meat (chicken)	37	0	3	1	14	2	3
Mungbean	40	2	22	104	24	13	7
Vegetable soybean	18	2	13	28	13	4	78
Cabbage	3	1	1	10	2	4	2
Tomato	2	18	1	3	2	1	7
Slippery cabbage	6	106	5	30-177	11	18	58
Moringa leaves	7	146	11	49	5	10	65
Amaranth leaves	9	160	6	31	6	32	17
Jute mallow	10	188	12	21	0	36	36
Nightshade	8	101	13	10	9	21	28
Vegetable cowpea leaves	8	198	6	27	3	54	101

*red numbers indicate high levels of nutrients; RE = Retinol Equivalent; α-TE = α-Tocopherol

Source: RNI – FAO/WHO 2004; nutrient data – USDA Nutrient Database, WorldVeg.

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References: **www.rural21.com**