



World Vegetable Center

Priorities for research and action

– what we do and why



Investing in vegetable production and consumption to improve nutrition, livelihoods and resilience

Every country in the world is affected by malnutrition, and three billion people – more than a third of humanity – suffer from poor quality diets. A quarter of all children under five are affected. And these are all avoidable problems, with the right investments and attention. Too much of the wrong food is also a tremendous public health problem, leading to obesity and all the many associated health problems, of which diabetes is just one.

The consumption of 'protective foods' including vegetables, fruits, beans, nuts and seeds, is tremendously important for improving health, as they are excellent sources of vitamins, minerals, nutrients, and dietary fiber. The World Health Organization recommended daily intake of vegetables per person for a healthy diet is three portions, or about 240 grams per day.

In most sub-Saharan African countries, actual intake is only around 70 grams – 30% of the recommended amount. Only in a few East Asian countries do people actually consume sufficient vegetables.

The production and trade of vegetables are also huge employment and income generators. Per square meter, net benefits from growing vegetables are 5-7 times what can be earned from staple crops such as rice, maize or wheat. In addition, the ability to produce large amounts on relatively small areas, makes vegetables especially attractive to youth, women and marginalized groups who so often have only limited access to land.





Vegetables are crucial for resilience to climate and economic shocks, and production for family consumption and local sale helps survive and recover from shocks. A key strategy for farmers is to diversify, and growing vegetables is one way to hedge their risks. Including traditional vegetables in the mix is especially beneficial, as they are generally well-adapted to local conditions, more resistant to pests and diseases, and often need less water. This must also be accompanied by appropriate crop management that builds soil and plant health, and reduces postharvest losses.

Importantly for mitigating climate change, more local production for local consumption – increased circularity – reduces ‘food miles’ and associated carbon emissions from transport. Fresher vegetables are also higher in nutritional content than those that have spent weeks in transit. And those grown in agroecological farming systems tend to have higher nutritional content and increased shelf life. Benefits have to be equitable too, and as such, it is critical to recognize and address power disparities and trade-offs among nutritional, livelihood and environmental food system outcomes.

Vegetables have a key role to play in all five areas identified by the 2021 UN Food Systems Summit. These are (i) nourish all people, (ii) boost nature-based solutions, (iii) advance equitable livelihoods, decent work and empowered communities, (iv) build resilience to vulnerabilities, shocks and stresses, and (v) support means of implementation. To realize the true power of vegetables, actions are needed at the food system level, to make vegetables more available, accessible, affordable and desirable through push (production and supply), pull (demand and activism) and policy (legislation and governance) mechanisms. These must also be undertaken at macro (global and national) meso (institutional, city and community) and micro (household and individual) levels.

Vegetables have huge nutritional and economic potential. But to realize this, there is a need to act now, on supply, demand and policy issues. Climate change is making supply more tenuous, and diet-related health issues are an increasing economic drain on governments and families. Work by the World Vegetable Center provides evidence-based messages to policy makers that will ensure more impacts into the future, by investing in research to address knowledge gaps.

Food system issues: What we are addressing

● PUSH factors for increased supply

Vegetable production in low-income countries is characterized by low productivity and seasonality. Postharvest losses can also be 40% or more, due to poor storage, transport and processing practices. This represents an avoidable environmental burden, and loss of nutrition and economic opportunities. Seasonality causes gluts and shortages, leading to price changes that affect farmers and consumers alike. But appropriate technologies do exist that can improve year-round production and processing of vegetables. Food safety along the supply chain is also a major concern. Overuse of pesticides is common, causing health risks for farmers,

consumers and the environment. Microbial contamination is another and often greater threat, and that often increases from fields to markets. Vegetables produced in urban areas can also be contaminated with heavy metals where soils or water are polluted. Fruit and vegetable biodiversity, including wild relatives, is threatened because of rapid urbanization and homogenization of production systems and diets. This loss means a narrowing of new crop options and reduced variation for breeding nutritious and resilient varieties for current and future generations in the face of climate change.

● PULL factors for increased demand

The world population is predicted to reach 9.6 billion people by 2050, 70% of whom will be living in cities. Rapid urbanization means more mouths to feed in areas away from traditional production heartlands, and this needs not just calories, but a diversity of food to counter all forms of malnutrition. However, as incomes rise, consumption of meat, dairy and ultra-processed foods is rising much faster than that of vegetables. Surveys show that vegetables are considered a less acceptable or desirable food choice due to food safety or contamination concerns, taste preferences, or culture.

Traditional crops are seen by many as 'famine foods' or 'grandma foods', and not in keeping with false perceptions of modernity. Work is needed in the 'food environment', where issues of access and availability, price and affordability, and marketing and preferences meet. Increasingly, in the food environment for billions of people, a healthy diet is not a priority. Intensive marketing of unhealthy food adds to this, and consumption of fresh fruit and vegetables tend to be pushed aside.

● POLICY factors for improved governance

Vegetables receive less attention in terms of seed and agriculture and health policies compared to staple crops. A legacy of the Green Revolution is a world with US\$700 billion of agricultural subsidies per year, mostly on staple grains, whereas subtle policy changes could see a shaping of supply and demand towards healthier and more sustainable diets. This is mirrored in the stark funding disparity, with only 2-3% of international research spending dedicated to vegetables and fruit,

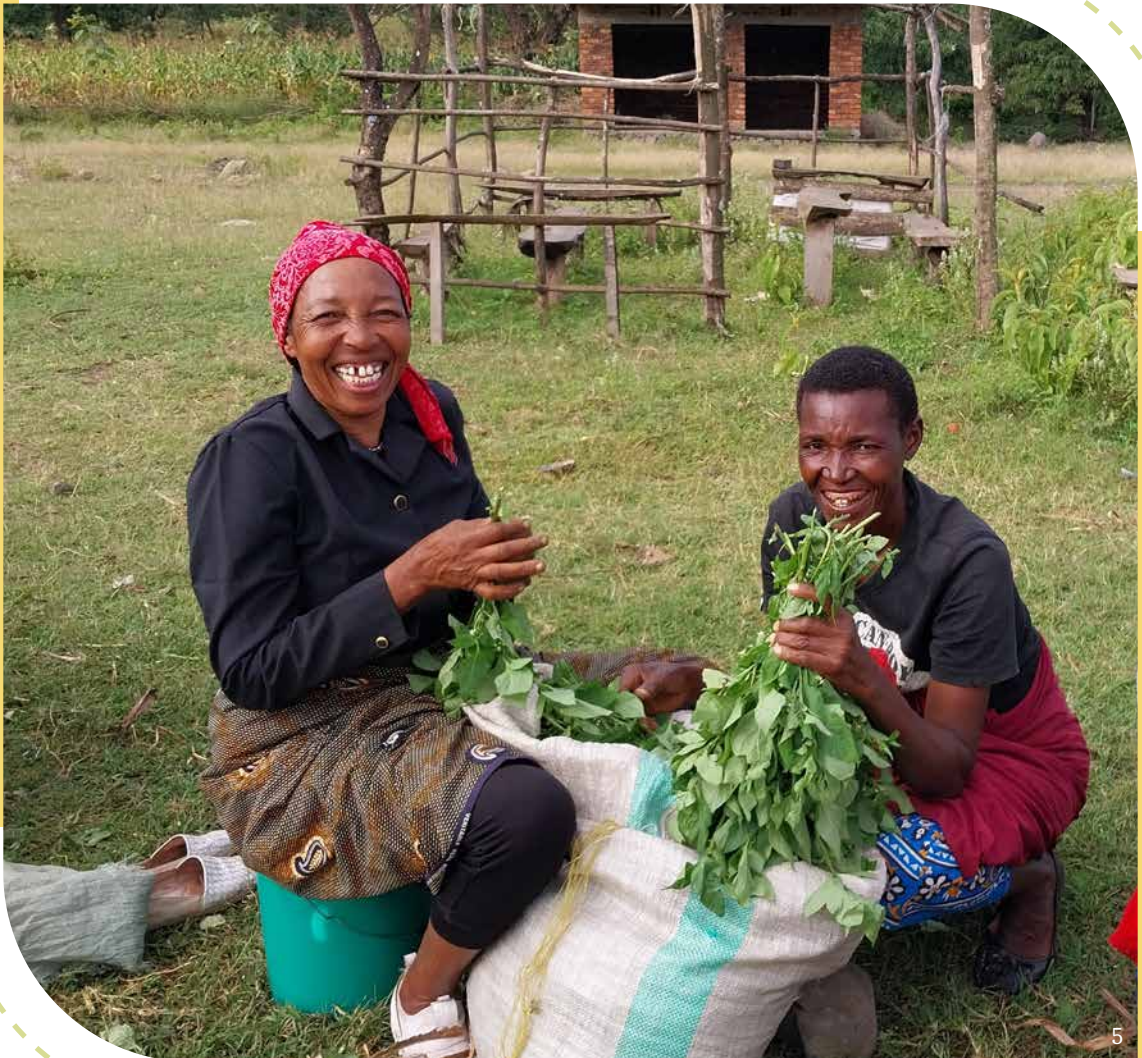
in contrast to most government guidelines that suggest half of our plates should be filled with these foods. Unlike staples with international markets, locally produced vegetables for local markets do not have powerful lobby groups, and receive inadequate public policy advocacy. Available technologies also make vegetable production an attractive enterprise especially for youth and women-led start-ups in peri-urban areas, to nourish growing cities. Opportunities are endless.



Food system solutions: What we are doing

There is a need for action and innovation in real-life food systems settings, in close interaction with all stakeholders and decision makers. Research must build upon and strengthen local innovation capacity, establish a global community of practice facilitating knowledge sharing on what works well, where, for who and why; and connect to existing networks focusing on safe, locally produced, and affordable nutritious food, enabling further scaling of results.

To boost vegetable consumption and production, there is a need to simultaneously address all of these ‘push, pull and policy’ issues. Given the complexity and diversity of situations, there is no single recipe for change. But we propose a ‘menu’ of options for policy makers and donors to consider. Each dish has the potential to drastically improve nutrition, livelihoods and resilience, and contribute at the same time to local needs, and the global good.



A menu of priority actions

The investment menu

Mobilize vastly more investment for vegetable research and development

- Significantly increase vegetable research and development, and especially in Africa.
- Create an enabling environment for private sector investments in the vegetable sector.
- Invest in a broad range of vegetables, not just in the economically most important species.
- Collect better data on vegetable production and consumption, to support decision making.
- Build synergies with ongoing and future programs on other nutritious foods.
- Establish 'vegetable innovation alliances' to strengthen local capacities and facilitate knowledge sharing.
- Invest in horticultural education at universities and technical colleges.



The nutrition focused menu

Actively stimulate the increased intake of vegetables

- Prioritize dietary diversity as a key strategy to solving all forms of malnutrition.
- Increase investments in the vegetable sector that focus on enhancing the nutrition of local consumers.
- Ensure that vegetables are part of every school meal and any other institutional meal program.
- Incentivize food sellers to include enough vegetables in the meals they provide.
- Enhance consumer awareness of the importance of eating vegetables.
- Encourage vegetable gardening among rural and urban households to increase access to vegetables.
- Promote food labeling and traceability systems to gain consumer trust in the safety of vegetables.



*All side dishes under each menu have across-the-table benefits.
So 'a la carte' is strongly recommended, to best suit local tastes and needs.*

The livelihood focused menu

Create business opportunities by diversifying food systems with vegetables

- Create stable and stronger business relationships between vegetable producers, traders and customers based on collaboration and information sharing rather than competition.
- Increase market segmentation of vegetable value chains based on quality aspects, to reduce competition on price and volume alone.
- Strengthen vegetable businesses to create more employment opportunities for women and youth.
- Design, pilot, evaluate and scale innovative processing technologies and solutions to reduce postharvest losses along value chains.



The resilience focused menu

Rescue rapidly declining vegetable biodiversity and restore soil health

- Ensure that local vegetable varieties and wild relatives are rescued, conserved, and used for breeding, research, and cultivation.
- Accelerate breeding methods and learning across crops, and especially in traditional vegetables with better climate resilience, nutritional qualities and shelf life.
- Strengthen the private and informal seed sectors to stimulate local production of quality seed of locally demanded vegetables, through public-private collaboration and international breeding consortia.
- Develop and implement legislation and regulations specifically for vegetable seed production.
- Diversify farming systems with vegetables and invest in soil health to boost sustainable production.






The **World Vegetable Center** is an international non-profit institute for vegetable research and development. It mobilizes resources from the public and private sectors to realize the potential of vegetables for healthier lives and more resilient livelihoods.



WorldVeg's globally important genebank, improved varieties, production and postharvest methods help farmers to increase their vegetable harvests, raise incomes in poor rural and urban households, create jobs, and provide healthier, more nutritious diets for families and communities. With headquarters in Taiwan, field operations are led from regional centers in Benin, India, Mali, Tanzania and Thailand, and through offices in other countries.



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