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Promoting fruit and vegetable value chains to improve supply and consumption

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This policy brief series, funded by the **Government of Chile**, is an outcome of the **FAO/WHO International Workshop on Fruits and Vegetables 2020** and is designed to orient government policymakers to adopt the most effective and efficient policies that promote sustainable fruit and vegetable production, supply, consumption, and availability for human and planetary health. This brief is based primarily on Santacoloma *et al*., 2021.

Contents

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Key messages

Policies with a focus on fruits and vegetables (F&Vs) need special consideration because of the high perishability and susceptibility of F&Vs to waste and loss, high labour demand, yield variations, and high consumer prices.[1]

Fruit and vegetable crops have the potential to generate more income for small farmers compared to traditional staple crops; specifically, starchy roots/tubers and grains.

Factors that limit the availability and affordability of F&Vs include low production and productivity, the loss of agrobiodiversity, inadequate technology, logistics and infrastructure, weak organizational, business and technical skills, and inefficient market linkages across the supply chain.

Many value chains for F&Vs need improvements, investments and shortening as well as gender-responsive approaches, including gender-sensitive investments, to achieve better producer prices, lower risk and higher quality, especially for small farmers.[2]

A very large proportion of retail prices are from transportation, storage and intermediate actors, which could be reduced by policies designed to lower retail prices while ensuring fair producer prices.

Markets often favour foods with longer shelf lives, easy transportability, and uniformity in size, colour, taste and appearance. More perishable but nutrient-rich and biodiverse F&V varieties may have difficulties competing in the marketplace in this context. Perishability can be a particular hindrance to F&V competitiveness with highly processed foods.

[1] For the purpose of the International Year of Fruits and Vegetables, F&Vs are defined as "edible parts of plants (e.g. seed-bearing structures, flowers, buds, leaves, stems, shoots and roots), either cultivated or harvested wild, in their raw state or in a minimally processed form." The definition excludes starchy roots and tubers, dry grain legumes, cereals, medicinal plants, stimulants (e.g. tea, coffee, and cacao) and ultra-processed foods (FAO, 2021a).

[2] "A 'value chain' in agriculture identifies the set of actors and activities that bring a basic agricultural product from production in the field to final consumption, where at each stage value is added to the product. A value chain can be a vertical linking or a network between various independent business organizations and can involve processing, packaging, storage, transport and distribution" (FAO, ILO, and IFAD, 2010, p. 2).

Scope of the problem

Fruits and vegetables (F&Vs) contribute to human and planetary health. In the context of global ambitions to meet the targets of the United Nations Decade of Action on Nutrition 2016–2025 and 2030 Agenda for Sustainable Development, there is an urgent need to advance research and investment on the potential of F&Vs to improve livelihoods, nutrition, food security and diet quality. A trend analysis of global F&V production between 1968 and 2017 suggests that despite an increase in global production, their availability has been and will remain insufficient under current conditions to meet the consumption recommendation of at least 400 grams/day established by the Food and Agriculture Organization of the United Nations (FAO) and the World Health Organization (WHO) (Santacoloma *et al.*, 2021). Increased global F&V consumption will require greater supply, mainly at national level, given that less than 9 percent of global fruit production and 5 percent of vegetable production are traded internationally.

Fortunately, F&Vs are increasingly important in many low- and middle-income countries (LMICs) due to their economic and nutritional

benefits. The F&V sector also carries potential benefits for employment and empowerment, particularly among women and youth, whose participation is key for effective development (Santacoloma *et al.*, 2021).

Nevertheless, more policy actions and investments are required at all stages of the value chain to make them more sustainable, healthy, efficient, resilient and inclusive, as well as biodiverse in terms of neglected and underutilized species (NUS), especially in low- and middle-income economies. Public policies that favour F&V production, value chains and consumption have not been implemented globally, in part due to industry lobbying and a lack of firm political commitment and funding. This has resulted in a global food environment in which highly processed foods are cheaper and more widely available and desired than more nutritious foods, including F&Vs. The International Year of Fruits and Vegetables (IYFV) is a call to action for policymakers and stakeholders involved in food systems to strengthen inclusive and sustainable F&V value chains in order to improve availability, access, affordability, and utilization of F&Vs (Santacoloma *et al.*, 2021).[3]

[3] FAO defines a sustainable food value chain as "the full range of farms and firms and their successive coordinated value-adding activities that produce particular raw agricultural materials and transform them into particular food products that are sold to final consumers and disposed of after use, in a manner that is profitable throughout, has broad-based benefits for society and does not permanently deplete natural resources" (FAO, 2014, p. 6).

Evidence of the impact of policy actions to strengthen fruit and vegetable value chains

Agricultural production and agricultural diversification

A five-year agroecology programme in Malawi that harnessed local resources and participatory approaches, including farmer-to-farmer knowledge sharing and recipe exchanges, significantly improved agricultural diversification and household dietary diversity (Kansanga *et al.*, 2020).

Another successful example is the Indian Government's inclusion of previously underutilized millets into its nutrition security programmes, which resulted in better nutrition, agrobiodiversity conservation and improved local livelihoods, with the support of the International Fund for Agricultural Development (IFAD) and the European Commission (Padulosi *et al.*, 2015).

Capacity building within fruit and vegetable value chains

In Jordan, since 2007, capacity building within the F&V sector has focused on water management, particularly through multisectoral collaborations between the government, farmers' groups and engineers to manage and maintain drip irrigation systems for F&V crops (Fernandez-Stark, Bamber and Gereffi, 2011).

In Honduras, Fundación para el Desarrollo Empresarial Rural (FUNDER) supports community-owned F&V supply firms in acquiring business administration skills to make this value chain more inclusive of small farmers (Fernandez-Stark, Bamber and Gereffi, 2011).

Reduction of food losses and waste and infrastructure improvements

Ten Latin American countries, as well as the Caribbean Community (CARICOM), have policies on food losses and waste (FLW) that incorporate some of these approaches or are working on laws that establish measures to reduce FLW through targeted actions; these include awareness building and training of value chain actors (farmers, processors, distributors, consumers) on adequate food handling, and stipulating that supermarkets must donate all food that has lost commercial value, but is still in good condition and suitable for human consumption, while prohibiting its destruction (FAO, 2017).

Shorter and more efficient fruit and vegetable value chains

A 2020 literature review of public procurement programmes linked to family farming in Latin America and the Caribbean showed that these initiatives increased small farmer access to markets (market inclusion) and consumer access to F&Vs, leading to improved diets, food security and livelihoods (Cervantes-Zapana *et al.*, 2020).

The Mexican Network of Organic Markets (Red Mexicana de Tianguis y Mercados Orgánicos), comprising 26 farmers' markets from 15 states, is one example of a short food value chain that supports the organic movement. Consumers can buy directly from farmers who apply sound environmental and social practices to preserve local resources, knowledge and traditions. In addition, these markets offer cultural and social activities that promote the exchange of experiences on food, health, the environment and mobility (Santacoloma *et al.*, 2021).

Multi-stakeholder and public-private partnerships

At a national scale, Chile's **Elige Vivir Sano** system, whose secretariat is part of the **Ministry of Social Development and Family**, uses an intersectoral and food systems approach to implement policies and coordinate among ministries and stakeholders to promote healthy diets, including access to F&Vs (Ministerio de Desarrollo Social y Familia, 2020).

Another good example is Grow Asia, which works to improve the productivity, profitability and environmental sustainability of small F&V farmers in six countries in South East Asia, through in-country teams and 46 working groups support by FAO, IFAD, the World Bank and others (Grow Asia, 2020).

Policy recommendations to strengthen fruit and vegetable value chains

Promote sustainable agricultural production, agricultural diversification and biodiversity conservation to increase fruit and vegetable availability and benefits for human and planetary health

Many intensive agricultural practices are not environmentally sustainable as they decrease biodiversity, soil quality and water resources over time (Santacoloma *et al.*, 2021), even though they are, in many circumstances, the better short-term economic option. Conversely, the sustainable intensification of crop production enables small F&V farmers to achieve the highest possible productivity per unit of production input within an ecosystem's capacity.

A recent study shows that farms smaller than 50 hectares produce between 51 percent and 77 percent of the total volume of the major food groups for human consumption (**cereals, fruits, pulses, roots and tubers, and vegetables**) at global level (Herrero *et al.*, 2017).

Appropriate cultivation practices can help mitigate the negative environmental impacts

of F&V production (e.g. planting cover crops, using no- or reduced-till systems, and integrating livestock with crops). Disseminating knowledge on correct pesticide use and integrated pest management can help avoid overusing pesticides that harm both the environment and people. In addition, growing F&Vs in greenhouses may protect crops from climate and pest pressures, while improving water use efficiency and productivity per hectare (Santacoloma *et al.*, 2021).

Together with the abovementioned **agricultural practices**, agricultural diversification and biodiversity conservation can also contribute to more sustainable F&V production, ensuring adequate plant nutrition based on healthy soils and managing water resources efficiently (FAO, 2011). Diversification and conservation, with a special emphasis on NUS, are also key for more nutritious diets, economic development and, ultimately, human health and climate change resilience.

Reduce food losses and waste and improve infrastructure

Fruits and vegetables are highly perishable, and FAO has estimated that **21 percent of total** F&Vs was lost from the post-harvest stage to distribution in 2016 (FAO, 2019). Fruit and vegetable losses not only diminish their availability, but also increase their prices and environmental footprint. Policies, regulations, infrastructure investments, research, technology and knowledge transfer are needed to decrease FLW. **These could include setting national FLW goals; funding agricultural extension programmes on FLW; fostering market linkages, short supply chains and market development; promoting sales and processing of "ugly" F&Vs; educating consumers on food storage and utilization; and creating national expiration date labelling standards and national food recovery programmes,** e.g. secondary markets or donation schemes for non-conforming F&Vs (Neff, Kanter and Vandevijvere, 2015). For action to be based on sound evidence, countries will need to collect data on food loss in order to replace regional estimates with more accurate and detailed knowledge. Accurate data will allow for correct assessments country-wise, commodity-wise and along the value chain for effective decision-making.

To reduce FLW of F&Vs, infrastructure needs to be upgraded regularly, including greater investments in electricity as a basic need, cold chains, collection centres near production areas, improved roads, sorting and grading, packaging, processing, storage, equipment, training, market facilities and sanitation facilities (Santacoloma *et al.*, 2021). Given the limited investment sources in LMICs, responsible foreign direct investment may significantly contribute to upgrades in export and domestic value chains. Support to facilitate positive spillovers from export value chains to local ones, in terms of access to infrastructure, innovation, capacity building, and improved skills, can help upgrade local value chains. For example, the World Trade Organization (WTO) provides funding to LMICs through its Aid for Trade mechanism to strengthen supply-side capacities and trade-related infrastructure for F&V production and supply (e.g. linking F&V farmers to technical assistance, or infrastructure improvements to facilitate the transportation of F&Vs to markets).

Strengthen capacity building within fruit and vegetable value chains

Capacity development is needed for individuals and institutions along the F&V value chain, as well as to create an enabling environment within the F&V sector. Priorities include technical, managerial and soft skills development on food safety and quality standards and for all jobs in the value chain (e.g. production, packing, storage, agro-processing), including through partnerships between educational institutions and private companies (Fernandez-Stark, Bamber and Gereffi, 2011). FAO has large programmes on Farmer Field Schools (FFS) for technical skill transfer, which are increasingly coupled with Farmer Business Schools (FBS) to enable value chain actors to run an enterprise and improve marketing, efficiency, profitability and income (FAO, 2015; FAO, 2021b). Greater capacity building is also needed to forge public-private partnerships on research and development that address nutrition sensitivity, research on food preferences and needs-based approaches for the commercialization of F&Vs (FAO, 2021c).

Promote shorter and more efficient fruit and vegetable value chains to make fruits and vegetables more affordable for consumers

Shorter value chains, for example, e-commerce, public procurement and direct sales, can make F&Vs more affordable. One example is e-commerce platforms and low-cost delivery infrastructure used in China, which afford greater opportunities to small farmers and community-supported agriculture (CSA) to sell seasonal, organic F&Vs directly to consumers.

During the 2020 **COVID-19 pandemic**, short value chains rapidly developed when traditional marketing channels were interrupted: many municipalities promoted urban and peri-urban agriculture to improve the availability of food for their citizens and to safeguard farmers' livelihoods (Santacoloma *et al.*, 2021). Public food procurement can improve value chain efficiencies by increasing small farmers' access to markets and consumers' access to F&Vs. Often related to social protection programmes, these food

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assistance programmes or meals provided by public institutions (e.g. schools, food banks, hospitals) can purchase fresh F&Vs directly from farmers and farmer organizations. However, small farmers often need support to produce at the required scale and market standards, for example, to build cooperatives; meet food safety standards; access finance, technical assistance and post-harvest technologies; and to bridge the digital divide in rural areas.

Strengthen multi-stakeholder and public-private partnerships

Strong multi-stakeholder commitment and partnerships among government ministries and institutes, farmers, distributors, consumers, academia, civil society, international organizations and the private sector are critical to strengthen F&V value chains because they make policy development and implementation more feasible and equitable (FAO, 2021d). Of particular importance are partnerships that generate extension and training mechanisms (e.g. knowledge training on specialized F&Vs, affordable training on food safety standards for small farmers); infrastructure development (e.g. partnerships between public infrastructure, such as roads, and private F&V processing facilities); joint public-private certification of safety and quality standards; and value-chain coordination (e.g. contracts with small F&V farmers that enable them to adhere to public regulations that have been jointly developed with the private sector). In Kenya, for example, public-private partnerships enabled small farmer leaders to be trained in good agricultural practices and export market requirements for green bean exports and to form a company that owns cold storage facilities for small-scale vegetable growers. The 2018 report *Multi-stakeholder partnerships to finance and improve food security and nutrition in the framework of the 2030 Agenda* provides guidance on how to build and improve such multi-stakeholder partnerships, as well as a listing of existing partnerships (HLPE, 2018).

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Conclusions

The changes needed in F&V production, value chains and consumption can only be achieved with the commitment of all stakeholders; adequate funding; the formulation and implementation of evidence-based policies, laws, regulations and programmes; and proper measuring, monitoring and evaluation. Value chains that improve F&V supply and consumption can be promoted through the following policy actions:

Establishing a dedicated public institution or institutional mechanism mandated to promote intersectoral and cross-value chain actions related to diverse and healthy diets, sustainable production and value chains rich in F&Vs, as well as public-private partnerships;

Supporting better funding, capacity building, and upgrades of F&V value chain infrastructure;

Promoting shorter value chains that make F&Vs more affordable;

Implementing more inclusive public food procurement programmes; and

Reducing food loss and waste to generate environmental and human health benefits.

Through these measures, F&V value chains can be improved to increase F&V production, availability and affordability, thus leading to increased consumption and reduced nutrient deficiencies in local diets.

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