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Food Systems and Diets:

A Handbook of Essential Policies

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Global Panel
on **Agriculture**
and **Food Systems**
for **Nutrition**

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Global Panel on Agriculture and Food Systems for Nutrition

There is growing demand for high-quality evidence to support the implementation of cost-effective policy solutions to improve people's health and wellbeing.

This handbook offers a summary of the evidence and concrete policy recommendations for countries seeking to provide healthy diets to secure better health and nutrition, and social and economic prosperity for all.

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Global Panel on Agriculture and Food Systems for Nutrition

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Foreword

Poor quality diets are now the leading cause of ill health and death in low – and middle-income countries.

Sir John Beddington (left)
Co-chair 2013–2020; Chair 2020–present

H.E. John Kufuor (right)
Co-chair 2013–2020

Malnutrition in all its forms, underpinned by poor quality diets, currently affects every country in the world. It comes in many guises: stunting, wasting, deficiencies of essential vitamins and minerals, as well as overweight and obesity.

Future changes in climate, increased competition for natural resources, and population growth, particularly in urban areas, will put further pressure on our food systems and our ability to produce the foods needed for high-quality diets.

Unless policymakers act decisively to accelerate efforts which improve diets and food systems, all countries will pay a heavy price in terms of mortality, physical health, mental wellbeing, economic losses, degradation of the environment, and the continuing problem of malnutrition.

The Global Panel on Agriculture and Food Systems for Nutrition provides recommendations on how food systems can be repositioned to deliver safer, affordable and accessible healthy diets for all.

Since its inception in 2013, the Panel has produced evidence-based briefs covering all aspects of the food system, which have been brought together in this handbook.

We hope that policymakers and those connected with civil society organisations and the private sector will find this handbook helpful in preparing strategies that will transform food systems in ways that promote greater diversity, availability and affordability of healthy diets, as they strive to secure health, social and economic prosperity.

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Global Panel on Agriculture and Food Systems for Nutrition

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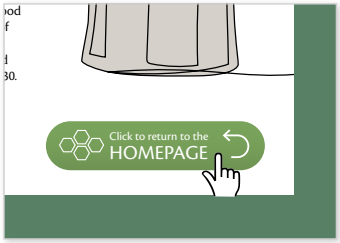
Go to the homepage and click on the different elements of the diagram to explore a topic.

2

This will direct you to key information on specific aspects of the food system to help you improve nutrition and diets in your region.

3

Use the navigation tabs to move between Evidence, Key Facts, Policy Recommendations and Policy Examples within the topic. You can also download the full report.



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When you have finished exploring the topic, use the button in the bottom right-hand corner to return to the homepage and select a new topic.

All the information provided in this handbook is underpinned by evidence, which is cited separately within each of the briefs.

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Global Panel on Agriculture and Food Systems for Nutrition

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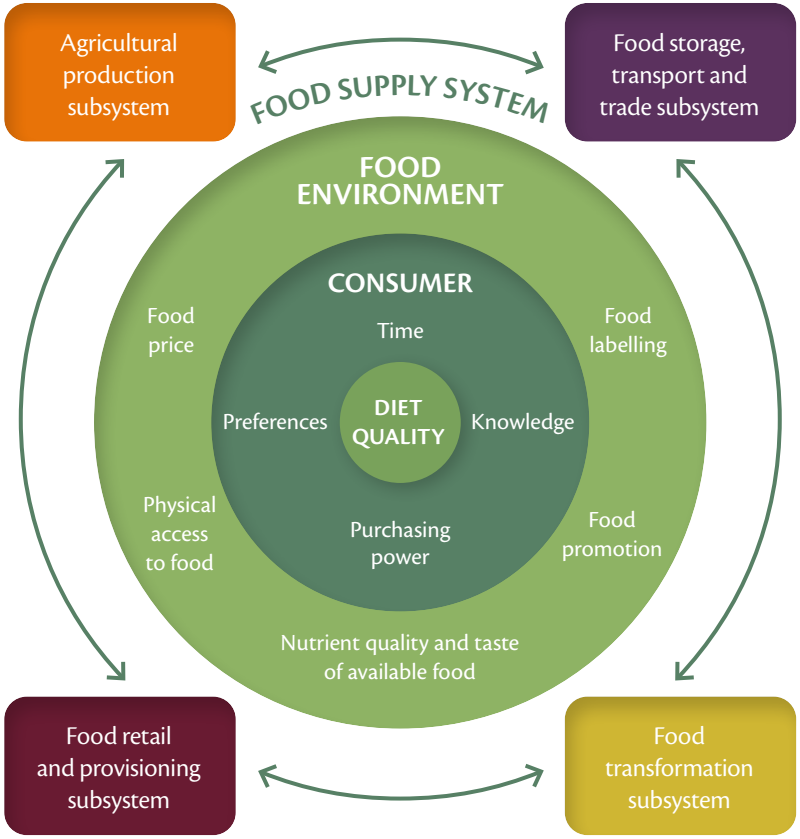
Food systems and diets

Food systems comprise the growing, harvesting, packing, processing, transforming, transporting, marketing, consuming and disposing of food.



Food systems include the inputs needed and outputs generated at each step. A food system operates within, and is influenced by, social, political, economic and natural environments.

Consumers are central to food systems. The quality of an individual's diet is influenced by consumer purchasing power, knowledge, preferences (including values, beliefs, social norms) and time.

In turn, food systems influence the diet quality of consumers by shaping the 'food environment' that provides the food options from which people make purchasing decisions.

Underpinning these food environments are food supply systems. Often referred to as the 'food supply chain' or 'food value chain' they are made up of four interlinked and interacting subsystems covering everything from agricultural production to retail.

From a policy perspective, the Global Panel argues that the distinction between promoting 'healthy diets', rather than promoting nutrition per se is important, as healthy diets underpin the solution to malnutrition in all its forms.

A healthy or high-quality diet is one that includes a diversity of foods that are safe and provide levels of energy appropriate to age, sex, disease status and physical activity, as well as essential micronutrients.

More about food systems: DOWNLOAD FORESIGHT 1.0

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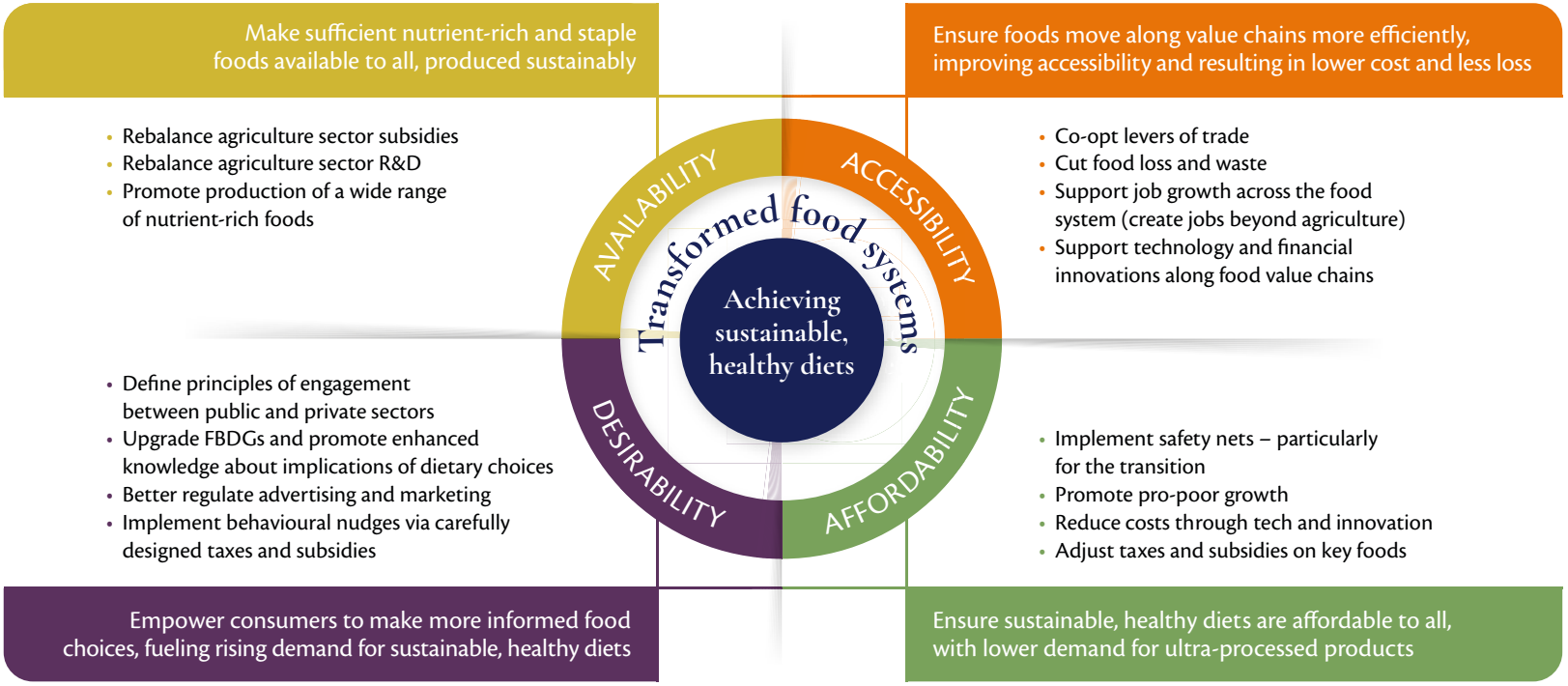
Global Panel on Agriculture and Food Systems for Nutrition

Contents

Key interventions of the food system

The transformation of food systems requires a series of transition steps which can be distilled into four distinct policy objectives: producing the right mix of foods in sufficient quantities to deliver sustainable, healthy diets; ensuring those foods are readily accessible and also affordable to everyone; and ensuring that they are desirable to all consumers.



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Global Panel on Agriculture and Food Systems for Nutrition

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Delivering healthy diets

Click on your policy area

Consider the use of biofortified crops

Evidence

Among the diverse policy opportunities in agriculture and food systems to improve diet quality and nutrition, biofortification offers a potential win-win. It can improve the nutrient quality of crops while also delivering high yields and good agronomic performance.

They are also relatively easy to incorporate into national programmes for improving food production and nutrition security and complement good agronomic practices, such as soil management.

When combined with interventions that promote dietary diversification, commercial fortification through food processing and targeted supplementation to specific population groups, biofortified crops can contribute to resolving nutrient deficiencies at a significant scale.

Biofortification should always be regarded as one component of a suite of complementary strategies to reduce micronutrient deficiencies. They should not be seen as an alternative to other nutrition-enhancing agricultural and food-related interventions, such as increasing the production, availability or affordability of nutrient-dense foods like vegetables, fruit, milk, fish and meat, or intervening in food systems to preserve nutrient levels, fortify foods or encourage consumer demand and consumption.

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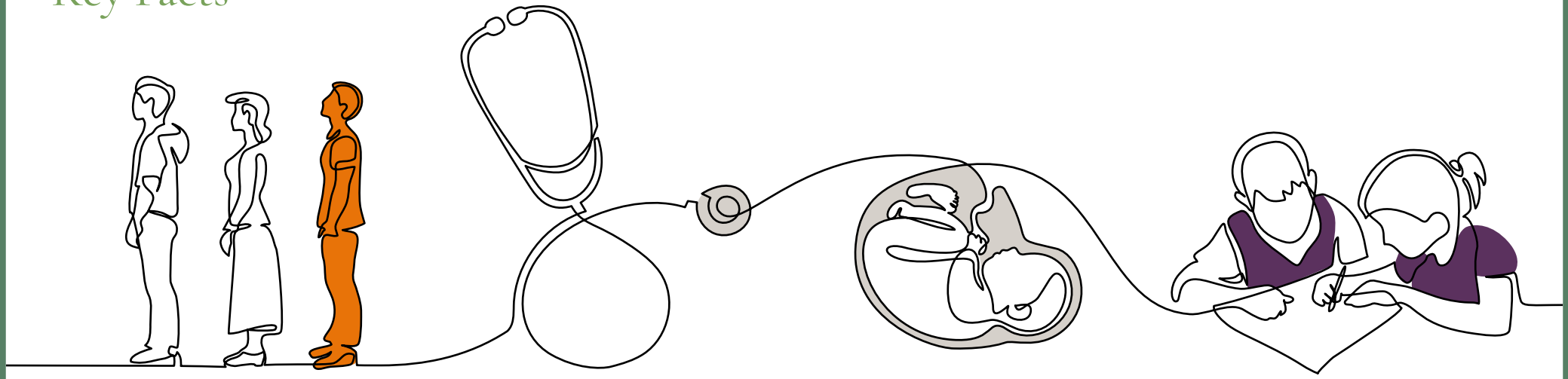
Consider the use of biofortified crops

Key Facts



Roughly one third of the world's population suffers deficiencies of vitamins (particularly A and C) and minerals (such as zinc, iodine and iron).

Micronutrient deficiencies are also associated with the growing problems of overweight and obesity, and with non-communicable diseases.

Mandatory fortification of wheat flour with folic acid has helped reduce widespread birth defects in many countries, while salt iodisation has proven to be effective globally in addressing the world's most prevalent cause of brain damage.

Iron biofortified millet has been shown to improve the iron status of school-aged children.

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Consider the use of biofortified crops

Policy Recommendations

Evaluate whether biofortified crops can make a valuable contribution to tackling micronutrient deficiencies, alongside other interventions.

Invest in national agricultural research on crop varieties with high micronutrient content through conventional breeding and novel genetic approaches.

Facilitate the registration, certification and production of biofortified seeds or cuttings to allow for private and public sector distribution.

Invest in effective delivery strategies to increase knowledge and access to biofortified crops for smallholder producers.

Target nutritionally-vulnerable populations through active social marketing, gender-sensitive extension guidance and institutional feeding programmes (e.g. schools).

Support data gathering and reporting to evaluate the cost-effectiveness of biofortification strategies against other interventions aimed at improving agriculture, health and nutrition.

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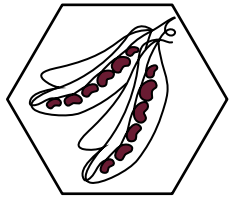
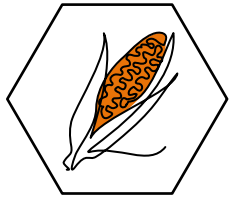
Consider the use of biofortified crops

Policy Examples

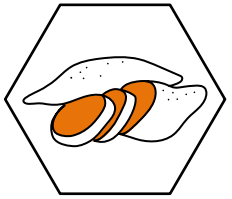


High-iron bean varieties
In Rwanda, Uganda and the Democratic Republic of Congo beans with higher iron content than traditional varieties have improved iron status in women.

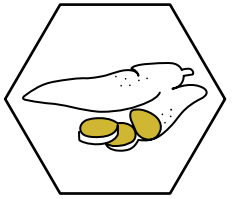


Orange maize
Varieties of maize with high betacarotene levels grown in Zambia since 2012 maintain similar yields to traditional varieties and have a positive nutritional impact.

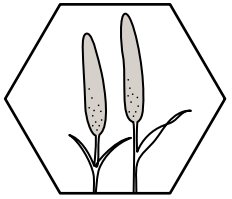
Rice
Rice biofortified with zinc has a 30% higher zinc content than local varieties, matures faster, and is less likely to lose zinc during the polishing process.



Orange flesh sweet potato
Since 2009, eight African countries have grown orange flesh sweet potato which have good consumer acceptability and improve the vitamin A status of consumers.



Yellow cassava
Yellow cassava with high betacarotene levels was released in 2013 in Nigeria, where 100 million Nigerians eat cassava daily. Consuming yellow cassava has been shown to improve vitamin A status in children.



Biofortified pearl millet
Biofortified pearl millet, with higher iron content, has provided a significant amount of iron to Indian girls.

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Global Panel on Agriculture and Food Systems for Nutrition

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Create climate-smart food systems

Evidence

While evidence of effective climate change actions is growing, there is ample evidence of how diets and food systems are adversely affected by weather-related shocks and other dimensions of climate change. There is also growing evidence that higher levels of carbon dioxide in the atmosphere may reduce the nutrient content and quality of various staple crops. Nutrient-rich foods are particularly susceptible to droughts, pests, diseases, and temperature fluctuations.

The shift in agricultural productivity to high-value commodities is resulting in increased incomes, which in turn can lead to diversified food choices, but may also be increasing greenhouse gas emissions.

Solutions lie in the diversification of agricultural and non-farm production systems, the mitigation of climate-related stresses on crop and livestock quality, greater resource use efficiency (including greater efficiency in post-harvest storage, processing and transportation), and the protection of nutrient quality in the face of supply and price shocks.

Nutrition-sensitive food systems have the potential to be climate-smart. Climate-smart actions which support nutrition entail a focus on diverse, high-quality and healthy diets.

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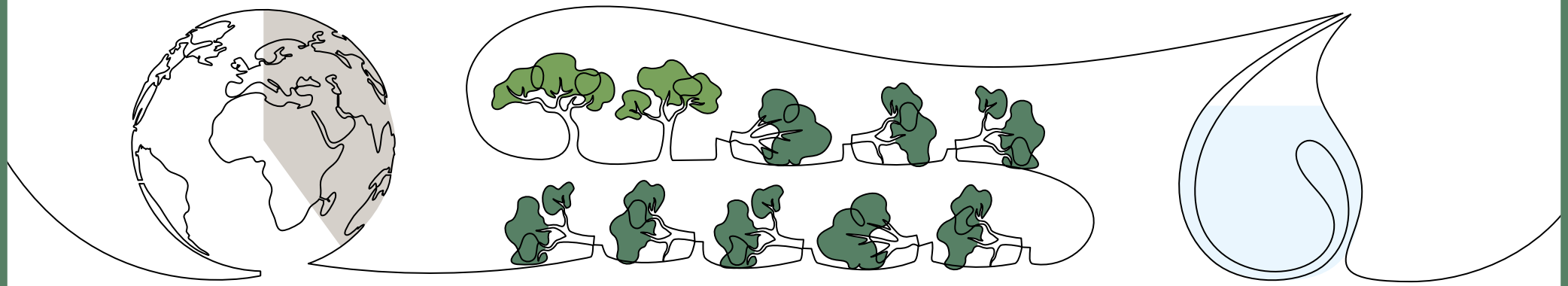
Create climate-smart food systems

Key Facts

By 2100, it is anticipated that up to 40% of the world's land surface will have to adapt to novel or partially altered climates.

Climate change is expected to lead to a 2% fall in crop and livestock output per decade through to 2050.



Food systems are responsible for up to 29% of total greenhouse gas emissions.

Agriculture is responsible for an estimated 80% of global deforestation.

Agriculture accounts for 70% of the world's fresh water use.

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Create climate-smart food systems

Policy Recommendations

Define diet quality goals within the adaptation targets for global climate action.

Diversify agricultural investments based on ecological suitability and comparative advantage.

Support greater food system efficiency, so that agricultural outputs per unit of water, energy, land and other inputs are optimised.

Integrate measures to improve climate change resilience and nutritional value by adapting crop and livestock to the anticipated impacts of climate change in the form of pests, diseases, weather-related shocks, and price volatility.

Protect the diet quality of the poor in the face of supply shocks and growing food demand.

Promote the generation and use of rigorous evidence on investments along food value chains, that are resilient to climate change while also delivering positive dietary outcomes.

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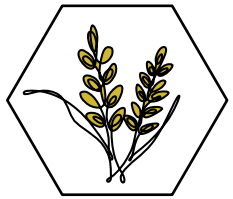
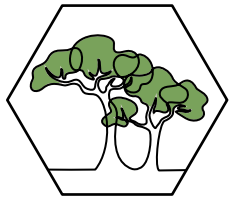
Create climate-smart food systems

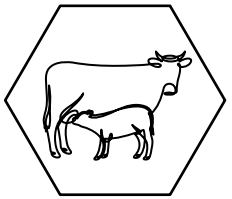
Policy Examples



Developing tolerant strains
Researchers have been actively developing and promoting the use of drought tolerant strains of staple crops such as wheat and maize, salt tolerant and faster maturing variants of rice, heat tolerant strains of livestock, and pest-resistant legumes.



Humbo Assisted Natural Regeneration Project
The Humbo Assisted Natural Regeneration Project in Ethiopia is an Assisted Natural Regeneration Project focusing on restoring almost 3,000 hectares of biodiverse forest. According to the World Bank, this has resulted in income generation for smallholders who now sell agroforestry products, such as honey and wild fruits.



East African Dairy Development Programme
The use of improved feed supported and implemented by the East African Dairy Development programme of Heifer International has improved milk quality and supply (among 179,000 smallholder producers in Uganda, Rwanda and Kenya), whilst reducing greenhouse gas emissions.

Adaptation for Smallholder Agriculture Programme
The Adaptation for Smallholder Agriculture Programme in Bolivia has used indigenous knowledge related to climate change adaptation to support the introduction of varieties that can be grown at higher altitudes if necessary.

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Global Panel on Agriculture and Food Systems for Nutrition

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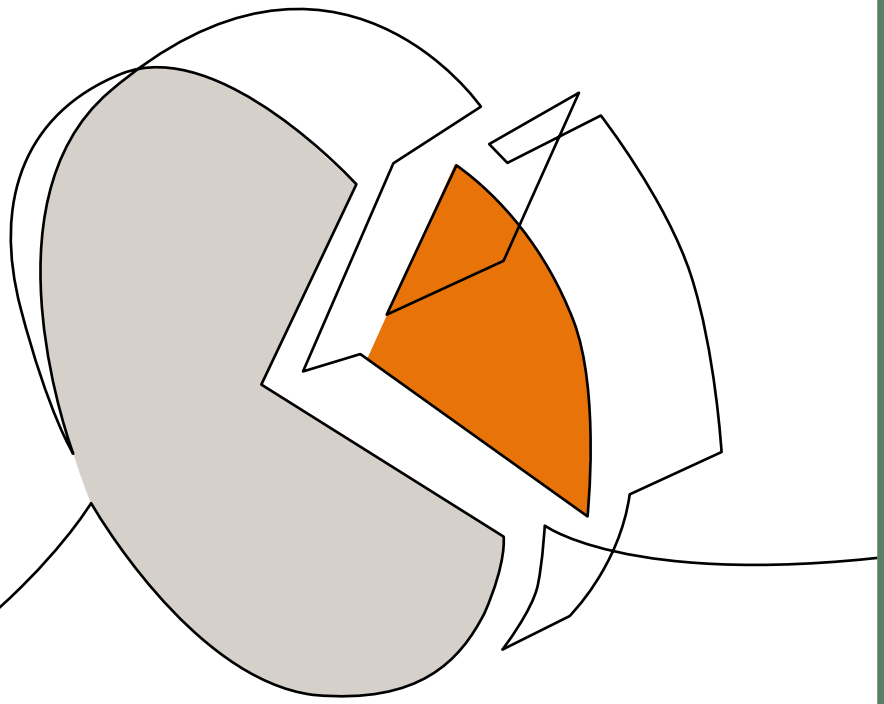
Improve data and metrics

Evidence

Existing tools for measuring the outcomes of agricultural and other food policy interventions relevant to nutrition capture only some elements of food systems, such as agricultural output, total food supply, and food prices. These provide a partial assessment of actual food and nutrition needs of vulnerable populations, dietary quality, or the drivers of food choices. Consequently, decision makers only have fragmented evidence on which policies and interventions work best to enhance food value chains for nutrition.

Since good evidence lies at the core of effective policy action, it is difficult for governments to intervene effectively when needs are poorly understood and impacts inadequately measured.

New metrics are therefore needed to measure diet quality and sufficiency, as well as food system efficiency and sustainability, and the processes that link various points across food system domains.



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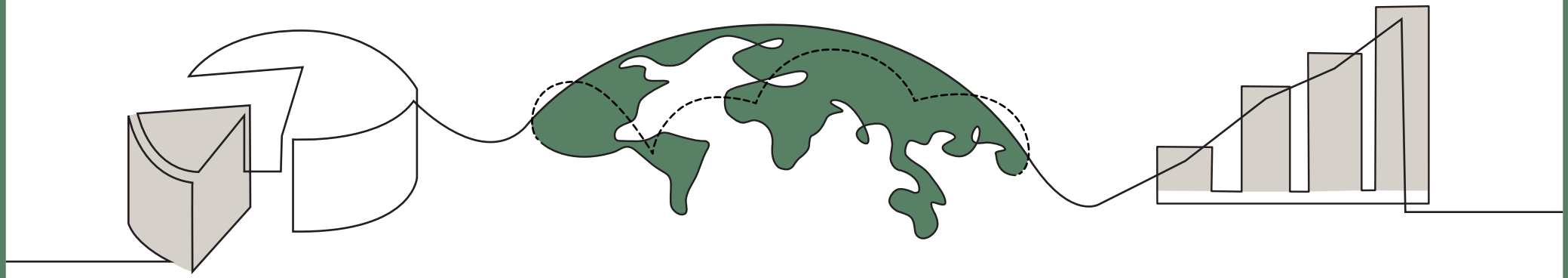
Improve data and metrics

Key Facts

Few countries are currently using empirical data to measure the nutritional impact of national agricultural and food policies, and other interventions with sufficient detail.

While imports and exports of agricultural commodities and many food products are tracked and reported at national level, patterns of consumer demand, and how these are affected by prices and convenience, are poorly monitored.

There is little data ona on how the private sector is influencing diets and diet quality through food processing, fortification, marketing and pricing.



A modelling exercise to assess global food demand by 2050 acknowledged that the use of a metric of food energy supply per capita "captures only one dimension of human diet" and "does not fully address shifts in diet preferences with income growth." (Keating et al 2015)

Long-standing assumptions about dietary patterns in rural Africa are being challenged. In East and Southern Africa, rural middle-class households now purchase between 60–83% of their food. About three-quarters of this total comes in the form of processed foods which are primarily local in origin.

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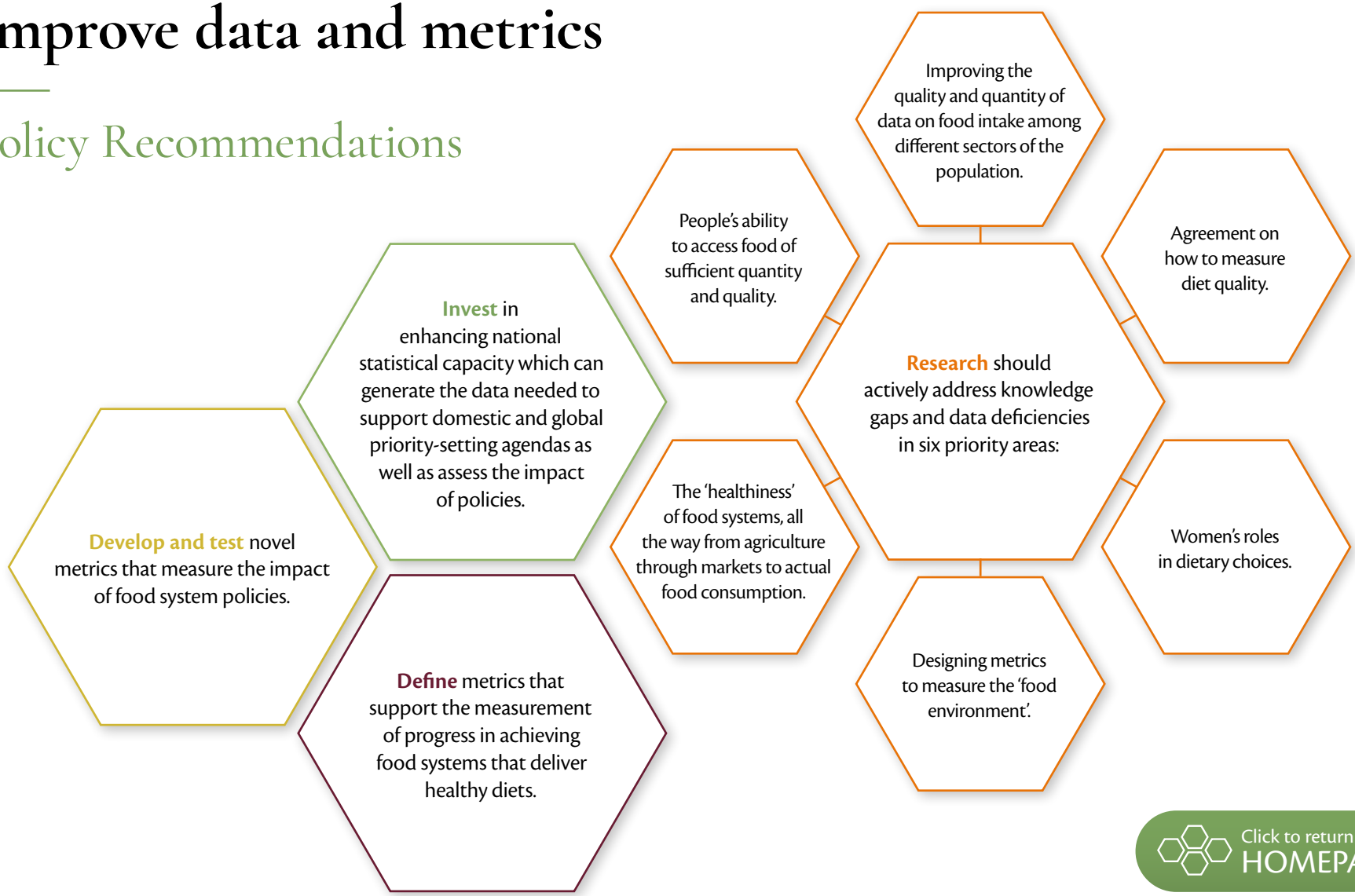
Improve data and metrics

Policy Recommendations



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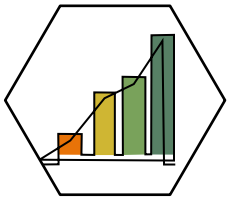
Improve data and metrics

Policy Examples

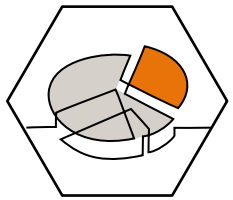
Household-level metrics

The Center for Integrated Modelling of Sustainable Agriculture and Nutrition Security (CIMSANS), a collaboration with researchers, academia, and industry partners, is developing a set of household-level metrics to capture seven linked facets of the food system: dietary adequacy, environmental sustainability, affordability and accessibility, cultural appropriateness, resilience, food safety, and waste/loss minimisation.



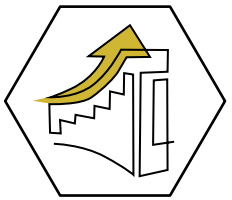
Food Insecurity Experience Scale

The Food and Agriculture Organization of the United Nations (FAO) recently launched a Food Insecurity Experience Scale (FIES), to be used annually to monitor the prevalence of food insecurity in over 140 countries. The FIES is an adaptation of a metric first used in the 1990s to measure household perceptions of, and responses to, hunger and food insecurity.



Sustainable Diets and Food Systems Initiative

Bioversity's initiative on indicators of Sustainable Diets and Food Systems aims to generate metrics to support decision making related to food system policies. Several indicators have been suggested covering a range of dimensions, including the environmental impact of the foods produced, dietary diversity, income and health.



Food Environment Policy Index

The Food Environment Policy Index is an initiative that seeks to rank policies relating to the food environment. Designed to assess the healthiness of food environments, it captures the extent of government implementation against international best practice.

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Global Panel on Agriculture and Food Systems for Nutrition

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Provide healthier school meals

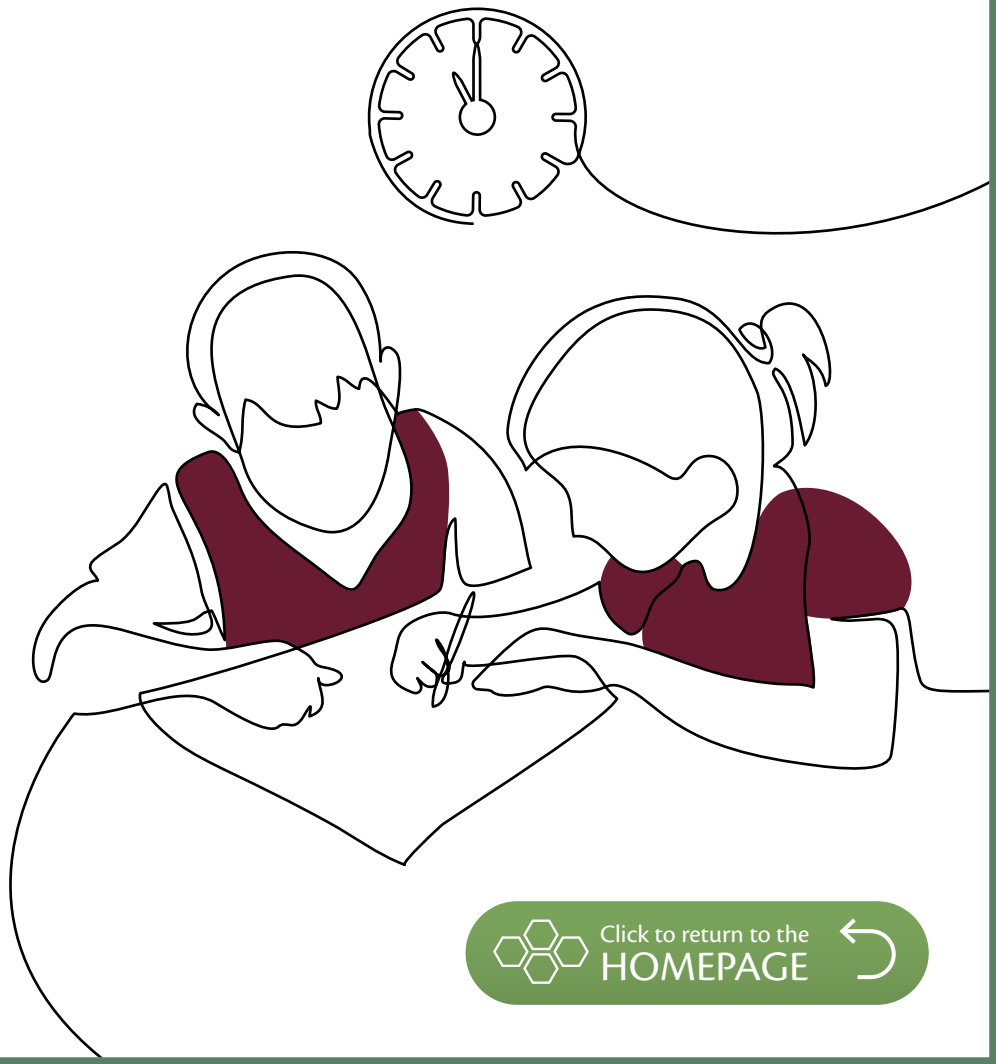
Evidence

Evidence from around the world on locally-sourced school meals reveals a multiple-win opportunity for policymakers with important benefits for school achievement, employment and national economic growth.

Providing nutritionally balanced school meals with complementary nutrition education and health measures can deliver improved school performance, nutrition literacy as well as lay the foundations for productive employment and higher incomes in later life. The procurement of food for schools from local farming communities supports farming households and livelihoods, and promotes sustainable local markets for diverse, nutritious foods.

Combined interventions can also unleash a chain of beneficial impacts that break the cycle of poverty: better child nutrition supports better education, which supports improved dietary and health choices by mothers, which in turn leads to better birth outcomes and enhanced educational success for the next generation.

The feedback loop between education and nutrition has long been recognised, but the use of schools as a primary vehicle for policy action on nutrition has not always been widely accepted. While the United Nations' Millennium Development Goals Hunger Task Force argued that governments should provide "balanced school meals with locally produced foods", the evidence of cost-effectiveness continues to accumulate.



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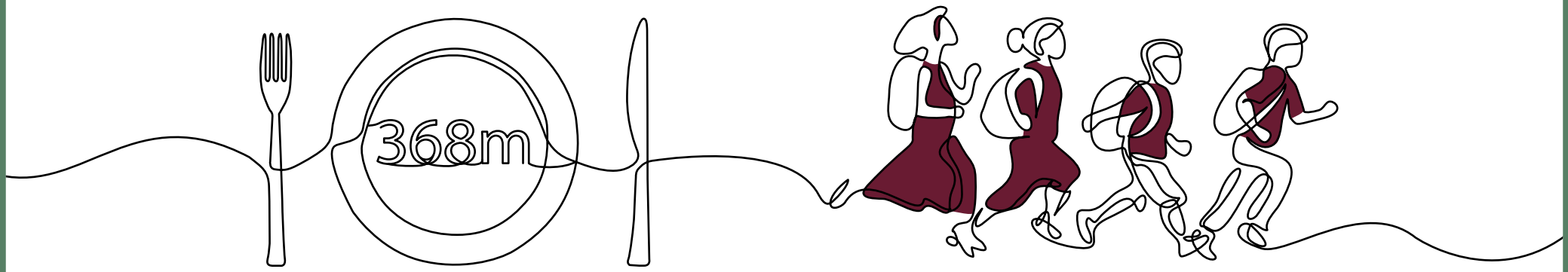
Provide healthier school meals

Key Facts

Most countries in the world are already providing school meals of various kinds: in 2013 at least 368 million children were fed daily in schools, which represented an annual investment of roughly US$75 billion with most funding coming from government budgets (2013).

Participation in school-based meals in low – and middle-income countries is linked to improved dietary habits and a reduced likelihood of deficiencies of important vitamins and minerals.

School feeding programmes can help offset food insecurity at home. During a severe drought in India, children who were participating in the Midday Meals scheme had lower stunting prevalence compared to children who did not participate in the scheme.



School meals integrated with complementary initiatives can have positive impacts on micronutrient status, dietary adequacy, and even obesity prevention.

Studies across 32 African countries showed absolute enrolment by girls increased by 28% during the year after school meals were made available.

A simulation analysis from Kenya suggests that the annual income of farmers would see a net increase of around US$50 per year if schools were to purchase maize from them.

In Malawi, over 95% of school feeding programmes procure locally produced fortified flour.

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Provide healthier school meals

Policy Recommendations

Ensure a supportive nutrition policy within schools, e.g. banning unhealthy food sales.

Data is needed to target areas where malnutrition is most acute and school feeding can be implemented.

Define a national policy goal to revise and update the nutritional standards for school meals, which should be consistent with national dietary guidelines.

Promote cost-effective operations that link local procurement with healthy meal provision in schools.

Establish effective indicators to measure the implementation and nutritional impact of healthy school meals.

Establish a policy regimen that would promote local and regional procurement of foods for meals in schools.

Make food and nutrition education part of school staff training.

Link the provision of healthy school meals with clear nutrition promotion and education objectives and activities to promote healthy eating habits while avoiding the double burden of malnutrition.

Review supply of locally-available processed foods that could be incorporated within procurement systems for meals in schools.

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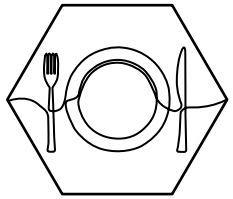
Provide healthier school meals

Policy Examples

The United States

The Agricultural Act passed in 2014 included provisions to improve meals in schools by increasing the use of local and regionally produced foods, coupled with hands-on learning activities such as school gardening, farm visits, culinary classes, and the integration of nutrition-related education into classroom curricula.



India

Almost 100 million children across 265,000 schools currently have free access to a balanced and nutritious midday meal. An Indian Supreme Court Order of 2001 required the government to provide meals in all primary schools "with a minimum content of 300 calories and 8–12 grams of protein", and many of the schools are procuring local produce.

Ghana

The government started supporting food procurement for schools from local farmers in 2005. That initiative now involves 4,000 schools serving over 1.6 million children.

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Global Panel on Agriculture and Food Systems for Nutrition

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Manage food price volatility

Evidence

In most contexts, food prices are determined by market factors. They fluctuate by season and year, responding to supply-demand interactions. Prices for staple foods, such as rice, maize and wheat, are also influenced by government intervention.

Variability in food prices is a feature of most food systems; variability reflects producer and market responsiveness to consumer demand and underlying conditions of supply.

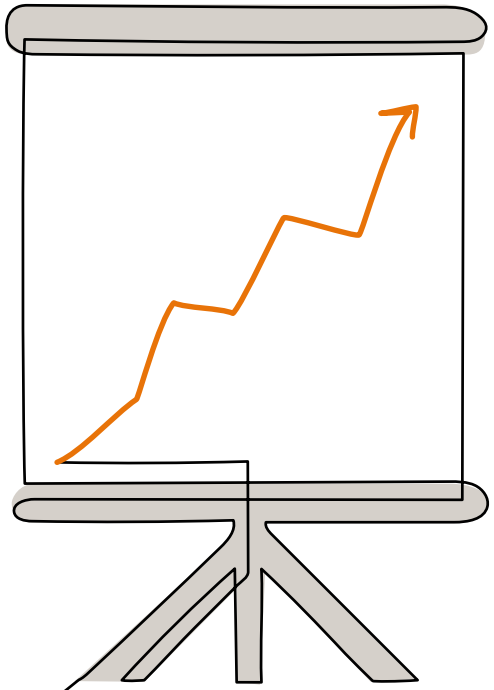
Volatility is measured by the extent to which prices rise or fall outside of expected ranges, and how fast they do so. Analysts predict that such food price volatility is "likely to persist and continue to challenge the ability of consumers, producers and governments to cope with the consequences."

Rapid changes in food prices make it hard for farmers to take decisions about investments in production because of uncertainty about future prices. They also make it difficult for traders to determine appropriate stock levels and set prices, and for consumers to make choices about which foods to buy, and when. For smallholders, rising food prices can act as an incentive to increase production and generate more income, but higher prices are also a threat because many poor producers are net food buyers meaning they spend more on food than they make by selling it.

Nutrient-rich foods are typically more costly relative to staple grains and are the first to be cut from budgets when prices rise. As a result, rapid and unexpected increases in food prices tend to have a greater effect on nutrient consumption in poorer households.

Short-term policy responses to price volatility have included the creation of publicly-held food reserves which can be released when prices soar, establishment of price controls on staple grains, and expansion of social safety nets that aim to help provide healthy diets.

Longer-term measures have been aimed at increasing agricultural production, improving market efficiency, expanding regional trade, and improving labour productivity and wages.



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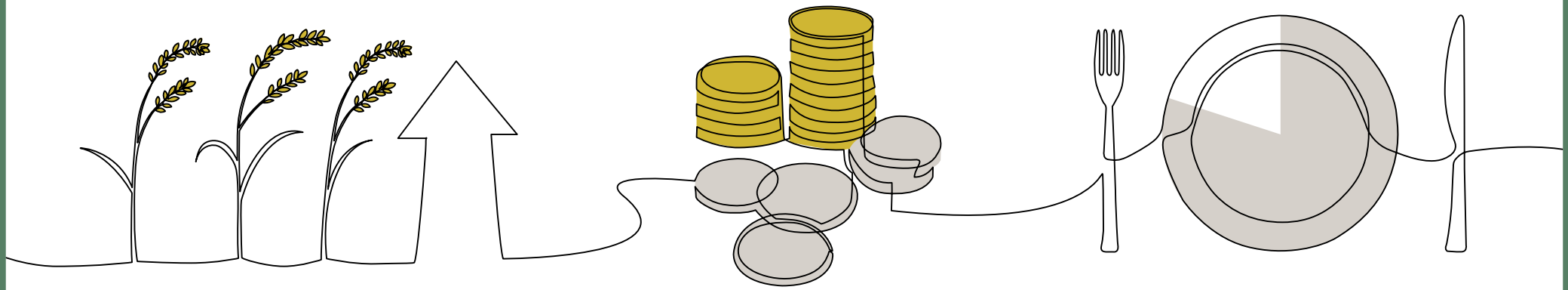
Manage food price volatility

Key Facts

In 2008, an additional 40 million people were pushed into hunger by the global rise in cereal prices.

Households in low-income countries spend as much as 75% of their total income on food.

More than 80% of people in the world today live in net food-importing countries.



The food price crises throughout Indonesia in the second half of the 1990s resulted in reduced nutrient consumption, with green leafy vegetable intakes falling by 30%.

This means that unpredictable or volatile food prices can impact them much more severely than households which spend relatively less on food. During the 2007–8 price crisis in Latin America, households' energy intake fell by an average of 8% across seven countries. Ecuador and Panama recorded falls in total energy intake of around 15%.

A nutritious diet can be unaffordable during 'normal' periods. In 2007, before food prices spiked, the per capita cost of a nutritious diet ranged from US$0.71 per day in Tanzania to US$1.27 in Ethiopia, where many citizens were living on less than US$1 per day.

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Manage food price volatility

Policy Recommendations

Invest in market monitoring and market-based insurance systems, e.g. harvest protection insurance.

Invest in agricultural productivity, so local production of a diversified set of nutritious foods can buffer consumers against unforeseen changes in global commodity markets.

Facilitate efficient markets, with enhanced tracking of food supply, transparent market data, better infrastructure (roads and bridges, physical markets, storage facilities), and effective regulatory systems.

Build food transformation capacity to enhance nutritional quality of foods, e.g. working with industry on nutrient-fortified foods, made available through social protection mechanisms during times of crisis.

Establish cost-effective consumer protection for diet quality that targets households vulnerable to nutritional compromise. This may require action on consumer prices for nutrient-dense foods, e.g. through vouchers or food transfers.

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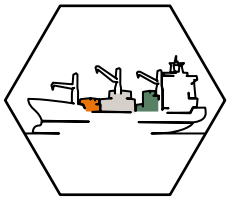
Manage food price volatility

Policy Examples

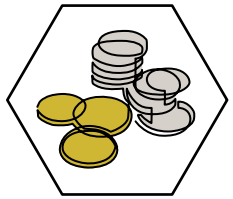
Boosting local agricultural production

Many countries have used agricultural input subsidies, e.g. fertilisers subsidies and expanded access to credit to boost national production. Senegal and Burkina Faso have promoted diversification of agriculture to shift diets towards more locally produced foods that are less affected by global markets.



Avoid trade-distorting embargoes

Many countries have introduced bans and restrictions on food exports in response to a price shock, although this can be counter-productive. For example, India banned grain exports just as Bangladesh, experiencing flood-related harvest losses, searched for imports.



Shaping agricultural markets and trade

Investments in market infrastructure are also essential, and should include rural roads, public sector storage, information systems, etc. Sri Lanka, Malawi and Malaysia have established fixed and maximum prices for certain staples.

Improve consumers' purchasing power

Many countries have used cash transfers in response to the food price peaks, including China, Haiti, Mozambique and Costa Rica. Madagascar doubled the number of children receiving free meals through schools in 2007.

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Global Panel on Agriculture and Food Systems for Nutrition

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Implement food safety regulations

Evidence

Millions of people unknowingly eat food that is unsafe, containing harmful microorganisms, toxins and chemicals. These foods can cause illness and death through food poisoning, and have longer-term impacts, for example causing cancer or impairing child growth.

Food safety has traditionally been seen as a public health or medical matter, but is increasingly recognised as an important issue for agriculture and food systems. Food safety affects trade, rural incomes and purchasing power, worker productivity, and consumer confidence.

Some food safety hazards originate during production and storage, for example arsenic-contaminated groundwater leading to high levels of arsenic in rice, inappropriate pesticide and herbicide use leaving chemical residues on crops, or harmful mycotoxins from moulds on maize, groundnuts and sorghum.

Other hazards can be introduced during transportation, processing or retail. For example, through poor sanitary facilities of food handlers, insects or rodents spreading pathogens, or through contaminated water being used in washing foods such as fruits and vegetables.

Low-income consumers who lack knowledge, expertise and equipment, or rely on informal food markets, are particularly vulnerable.

Food safety policy, regulation and surveillance are therefore fundamental challenges for governments which seek to enhance the dietary quality and nutrition of their citizens.

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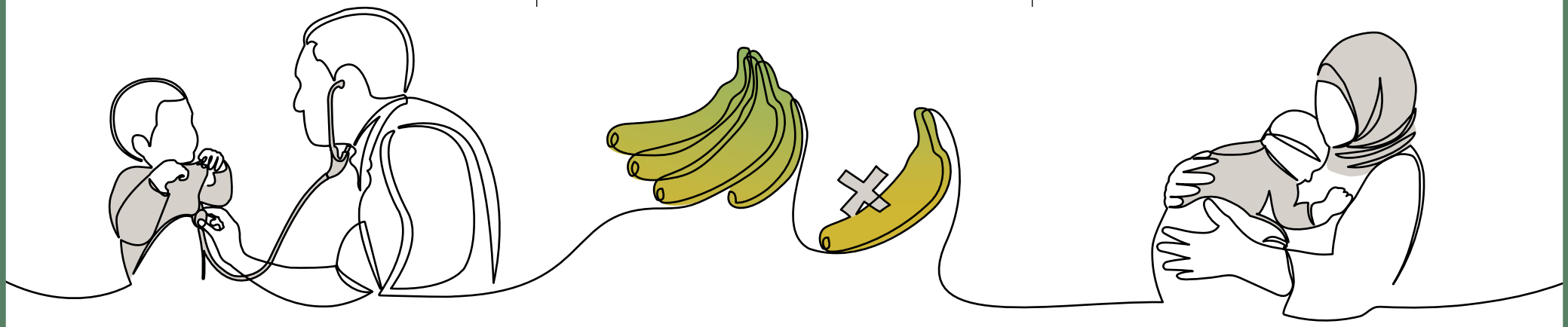
Implement food safety regulations

Key Facts

In 2010, there were 600 million cases of foodborne illnesses globally and 420,000 deaths.

Between 2008 and 2013, fruit and vegetables alone represented about 20% of all EU food export refusals, largely due to the violation of pesticide residue limits.

There are a range of foodborne mycotoxins, of which the most dangerous are aflatoxins, ochratoxins and Fusarium toxins.



40% of the foodborne disease burden is among children under 5 years of age.

Aflatoxin contamination was a contributing factor to the decline in West Africa's share of the groundnut market, from 77% in the 1960s to 4% in 2010, resulting in a loss of around US$1.6 billion.

High levels of aflatoxin in humans have been shown to be associated with maternal anaemia, low birth weight babies and child stunting, as well as potentially fatal aflatoxicosis and liver cancer.

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Implement food safety regulations

Policy Recommendations

Integrate food safety with agriculture and nutrition policymaking and strengthen food safety information systems and regulatory frameworks.

Support national research to better understand the sources of contamination and the economic cost of foodborne illness.

Supply farmers and food manufacturers with higher quality inputs to help prevent crop and food contamination, and improve on-farm storage practices.

Improve market incentives for food safety and quality management, especially for informal markets, e.g. voluntary training and certification schemes.

Invest in roads, storage facilities and cold chain technologies, as well as enhance the timeliness of trade, to reduce food perishability.

Promote public awareness of the importance of food handling practices and greater dietary diversification.

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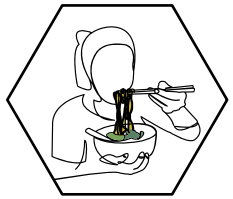
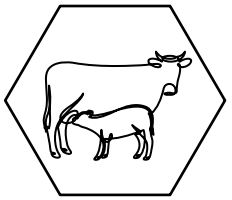
Implement food safety regulations

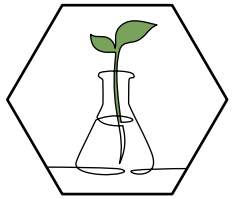
Policy Examples



Revised food safety laws
In 2011, the government of Vietnam revised food safety laws to address the safety of street food for both vendors and consumers. It committed to providing training on hygiene and food safety.



Training and certification
In Kenya, a scheme to give small-scale milk vendors access to training and certification resulted in benefits for farmers, vendors and consumers, as well as the national economy.



Better aflatoxin control
A project to test better aflatoxin control in farmers' fields in Nigeria combines technical innovation (biological control) with incentives for adoption (farmers groups and creating premium markets).

Partnership for Aflatoxin Control
Partnership for Aflatoxin Control in Africa was established to coordinate aflatoxin mitigation across the health, agriculture and trade sectors, and to provide information management systems and laboratory testing facilities.

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Global Panel on Agriculture and Food Systems for Nutrition

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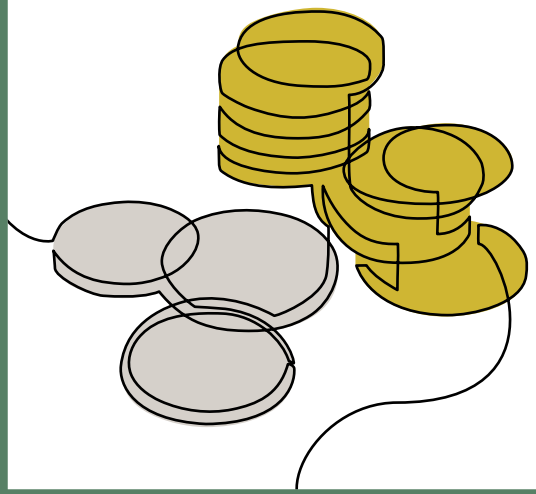
The economic advantages of healthy diets

Evidence

Poor diets carry a significant economic burden for individuals and for entire economies. A 2013 assessment suggested that undernutrition, micronutrient deficiencies, and overweight at today's levels cost the global economy up to US$3.5 trillion. This level of economic burden acts as a major impediment to government efforts to reduce poverty and to achieve important targets such as the Sustainable Development Goals (SDGs).



At the national level, costs arise from four main pathways:

1. **Mortality.** Up to 45% of all preventable child deaths are attributable to undernutrition. Severely undernourished children are up to nine times more likely to die than well-nourished children. Maternal mortality (linked to severe anaemia) and reduced adult life expectancy (linked to obesity and related health complications) are also linked with increased mortality.

2. **Ill health.** Treatment costs are borne by families as well as by health and insurance systems. For example, a full course of therapy to save the life of a severely wasted child costs between US$100 and US$200 per child. At the same time, the per capita healthcare costs of treating obesity in the United States alone has been shown to be over 80% higher for severely or morbidly obese adults than for adults with a healthy weight.

3. **Impaired physical growth.** Sub-optimal physical growth, often coupled with life-long susceptibility to illnesses, reduces economic gain through lowered labour productivity or absenteeism from work. The cost to low-income nations of productivity foregone due to undernutrition has been estimated as 3 to 16% of GDP. Similarly, in high-income settings like the United States, job absenteeism linked to obesity causes lost output equivalent to US$4.3 billion each year, costing employers US$506 annually per obese worker.

4. **Impaired cognitive development.** Poor nutrition from birth, continuing through school and adolescence, impairs cognitive development, delays school-attendance and reduces attainment, resulting in lost employment and socialisation opportunities throughout life. For instance, in Guatemala it was shown that stunted six-year-old children carried the risk of losing the equivalent of four grades of schooling through impaired cognitive development.

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The economic advantages of healthy diets

Key Facts

Eliminating child nutrition could increase GNP by 11% in Africa and Asia.

For a typical African country, every dollar invested in reducing chronic undernutrition in children yields a US$16 return.

If 15 African countries attained the 2025 World Health Assembly (WHA) target of a 40% reduction in chronic undernutrition, this could add US$83 billion to national incomes.

Wasting causes economic losses in lost productivity amounting to US$48 billion in India, US$4.6 billion in Bangladesh, and more than US$3 billion in Ethiopia and the Democratic Republic of Congo.

Public spending on diabetes in 2010 was around 12% of total health expenditure worldwide.

By 2030, if obesity trends continue, obesity-related medical costs in the United States alone could reach US$66 billion a year, contributing to a global total of roughly US$500 billion annually.

In England the added spending on medical and social care associated with malnutrition in 2011–12 was almost £20 billion, or more than 15% of total public expenditure.

Cross-country data suggests that a loss of 1% of potential attained height in adulthood reduces earnings by 2.4%.

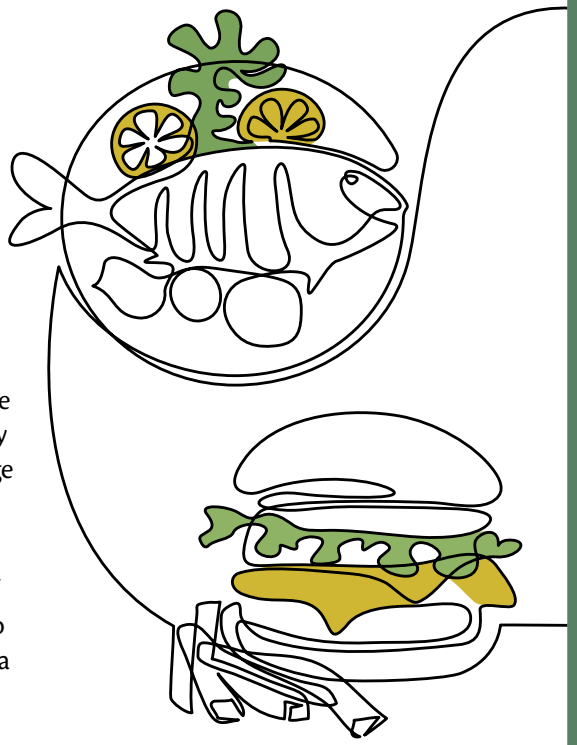
Stunted children receive almost 20% less in annual income than if they had not been stunted.

According to the United Nations Children's Fund (UNICEF), children who are undernourished "achieve less in school" and "are paid less when they enter the workforce."

Low vitamin A status among mothers and children across Africa can be associated with an annual loss of up to 1% of GNP.

The cumulative economic cost of cognitive impairment and lower labour productivity due to iron-deficiency anaemia is on average 4% of GDP for low-income countries.

The World Bank estimates that the cost of providing evidence-based interventions to achieve WHA targets for stunting, anaemia in women, and exclusive breastfeeding, would amount to US$7 billion per year. Far less than the cost of inaction.



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The economic advantages of healthy diets

Policy Recommendations

Encourage governments to calculate the direct and indirect costs of malnutrition in all its forms.

Standardise metrics on cost, so that findings are clear and comparable to policymakers.

Ensure that policy and programme interventions across the food system are locally appropriate, scalable, viable and costed.

Establish a *Common Results Framework* to shape the monitoring and reporting of progress across sectors.

Generate rigorous data to assess the cost-effectiveness of actions, e.g. strengthen national nutrition and food information surveillance.

Urgently address knowledge gaps and data deficiencies on the costs and benefits of better diets.

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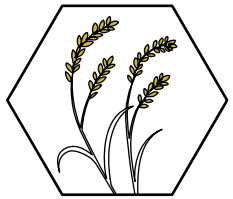
The economic advantages of healthy diets

Policy Examples



Cost-effectiveness of micronutrient interventions
The FAO has calculated that an annual investment of US$1.2 billion in improving the micronutrient supply globally, through a) supplementation, b) food fortification and/or c) biofortification of staple crops, would result in "better health, fewer deaths and increased future earnings" of up to US$15.3 billion per year: a 13-to-1 benefit-to-cost ratio.

Returns on investment
The World Bank calculated that US$7 billion per year, in addition to existing resource allocations over the next ten years, would allow the world to reach global WHA targets by 2025 for reducing stunting, anaemia in women, and increasing exclusive breastfeeding, while also better managing the impacts of wasting. This investment would result in 3.7 million child lives saved, more than 65 million fewer children being stunted, and 265 million fewer women suffering from anaemia compared to 2015.

Cost of Hunger
The 'Cost of Hunger' analysis for 12 countries in Africa showed that halving the prevalence of child stunting by 2025 would lead to a decrease in medical treatments, lower repetition rates in the education system and an increase in productivity and savings. The average annual savings amounted to US$3 million per year for Swaziland, to US$133 million for Egypt and as high as US$376 million in Ethiopia.

Obesity-related medical costs
FBy 2030, if obesity trends continue, obesity-related medical costs in the United States along could reach $66 billion a year, contributing to a global total of roughly US$500 billion annually, thereby imposing huge new burdens on the health budgets of emerging countries

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Enhance consumer demand

Evidence

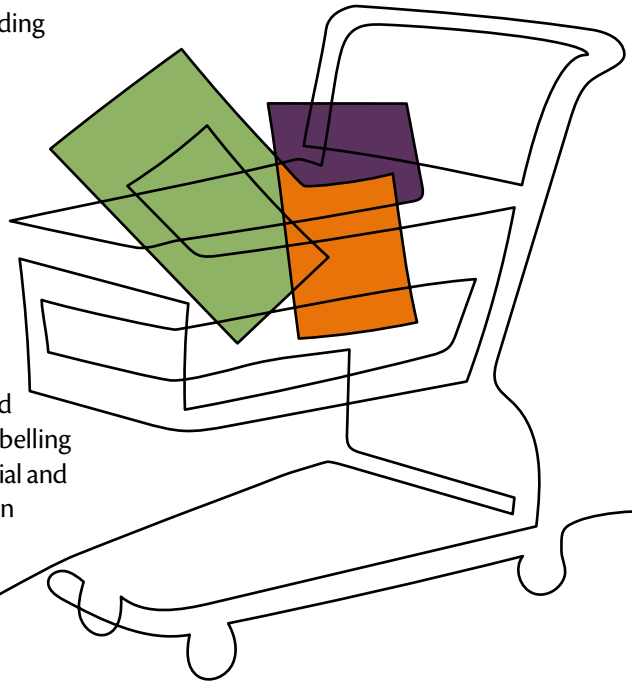
Today's food systems are not helping consumers make good food choices consistent with optimal nutrition outcomes. There is a need to inform, educate and enable consumers to make the right food and beverage choices that will lead to the consumption of healthy, high-quality diets and also encourage consumer activism towards health and nutrition as public goods.

Consumers are faced with constraints in the supply, access, price, information, diversity, safety and quality of foods that make up a healthy diet. Consequently, many consumers make food choices that are inconsistent with good health.

For many consumers in low – and middle-income countries, nutritious foods such as fruits, vegetables, dairy and fish are simply unavailable or unaffordable. For example, eating five portions of fruit and vegetables per day would cost low-income households in Bangladesh, India, Pakistan and Zimbabwe 52% of their household income.

Policymakers have a role to play to educate, encourage and enable consumers to improve dietary choices. Consumers also have a role to play by demanding food items that will create a shift in food producers towards healthier products.

Multi-sector interventions that could help consumers to demand healthier diets include: the introduction of Food Based Dietary Guidelines; better nutrition education and healthy eating campaigns, fruit and vegetable promotion; nutrition labelling to promote high-quality diets; social and behaviour change communication strategies; and providing income subsidies and social protection schemes.



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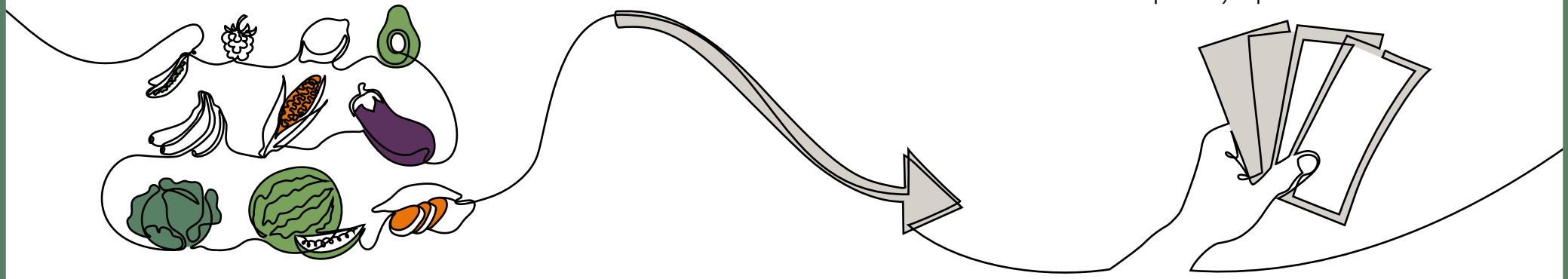
Enhance consumer demand

Key Facts

Eating 10 portions of fruit and vegetables a day has been shown to be associated with a 31% reduction in dying prematurely.

Vegetable consumption has declined in several regions in the period 1990–2013, including South-East Asia, North America and Latin American countries.

Food Based Dietary Guidelines (FBDGs) provide an important framework for policy development, as well as an educational and communication tool to positively impact consumer behaviour.



According to the World Health Organization (WHO), mass media campaigns are one of their 'Best Buys' for the prevention and control of Non-Communicable Diseases (NCDs).

Social and behaviour change communication (SBCC) is a fundamental component of successful nutrition interventions. It can shift attitudes and cultural norms to produce changes in nutrition behaviour.

Evaluations of fresh food vouchers schemes in low-income areas have shown that they can increase dietary diversity and reduce acute malnutrition. Nutrition education is critical to leverage these benefits.

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Enhance consumer demand

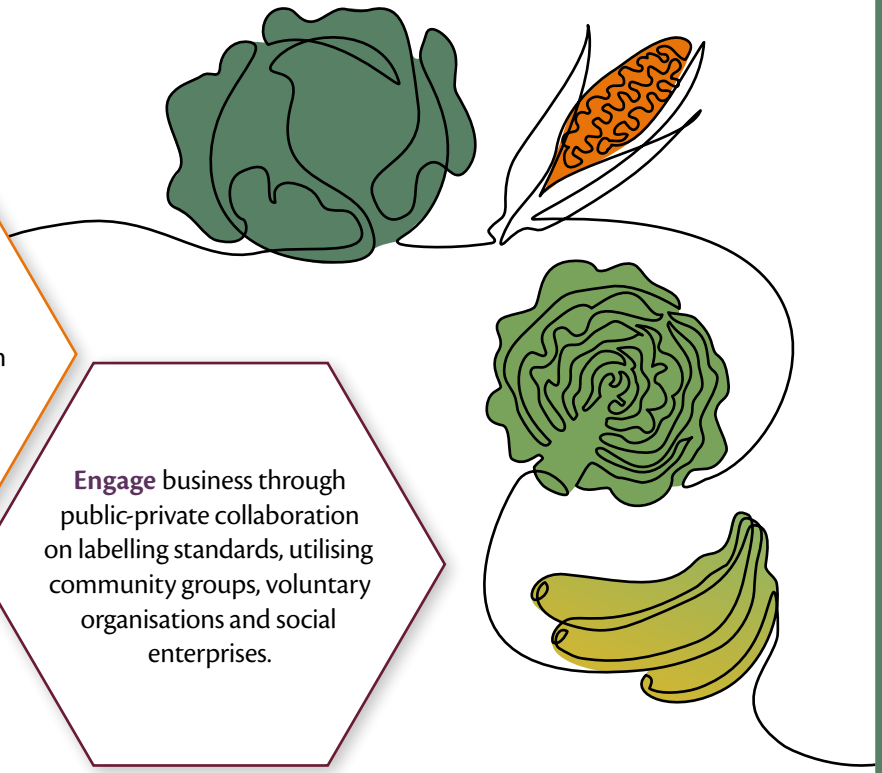
Policy Recommendations

Establish national standards for healthy diets through Food Based Dietary Guidelines that are aligned with environmental sustainability goals.

Educate consumers to make healthier dietary choices, through nutrition education, public awareness campaigns, better food labelling and integrating diet quality into wider policy interventions.

Increase availability and affordability of healthy food through income subsidies and social protection schemes, and social and behaviour change programmes.

Engage business through public-private collaboration on labelling standards, utilising community groups, voluntary organisations and social enterprises.



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Enhance consumer demand

Policy Examples

Towards Sustainable Nutrition Improvement Project

In Mozambique, the Towards Sustainable Nutrition Improvement Project increased the intake of vitamin A in children using an integrated, multi-sector approach. It combined: 1) increasing the availability of orange-fleshed sweet potato to local farmers; 2) developing learning sessions with childcare providers; and 3) linking farmers to traders and informing consumers about where they could purchase these potatoes. It also used a social behaviour change communication component with support from radio and television.

Front-of-package food labelling

Chile implemented legislation in 2012 to incorporate front-of-package food labelling by using a black octagon to warn consumers that the food products were high in sugar, sodium, fats and energy. This has led to an increased awareness of nutrition messages.

Alive and Thrive programme

The Alive and Thrive programme in Bangladesh, Ethiopia, and Vietnam used a multi-component approach combining data and communications to plan, assess, and evaluate the interventions. Over 4 years this approach led to an increase of between 8 and 44% in exclusive breastfeeding. In Bangladesh, there was a 32% increase in children consuming a diverse diet.

World Food Programme food vouchers

Families in northern Somalia can access a more balanced diet through World Food Programme food vouchers. Families receive US$80 of vouchers each month to buy a variety of foods including rice, cooking oil and fresh meat. The scheme is very popular and has boosted the economy of local traders, as well as increasing the number of children presented for nutrition screening.

Let's Go Local campaign

The 2005 Federated States of Micronesia (FSM) Let's Go Local campaign brought together social and behavioural change, skills training, and investment to increase production of high beta-carotene crops. The campaign aimed to promote sustainable production and the consumption of nutritious local foods using a wide range of communications media. The evaluation found that the average household diets had significantly higher micronutrient intake and greater dietary diversity.

Sugar sweetened beverages

In Mexico, a media campaign in 2012 warned consumers about the effects of sugar sweetened beverages using images of the complications of diabetes (e.g. amputations and blindness). Combined with the introduction of a tax, this led to a decrease in the consumption of sugar sweetened beverages in the country.

5-a-day Corporation

The 5-a-day Corporation in Chile is a non-profit organisation that designed a campaign to promote the message "Eat at least two dishes of vegetables and three different coloured fruits every day". It has resulted in significant increases in fruit and vegetable consumption.

USAID Kore Lavi programme

The USAID Kore Lavi programme in Haiti provided vulnerable households with monthly electronic and paper food vouchers, which could be exchanged for locally produced foods, including fresh fruits and vegetables. More than 18,000 additional households gained access to locally produced nutritious foods.

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Reduce food loss and waste

Evidence

Loss and waste of nutritious foods needs to be an urgent 'new' priority for improving diets and nutrition. Both fundamentally affect the availability and affordability of foods which make up healthy diets.

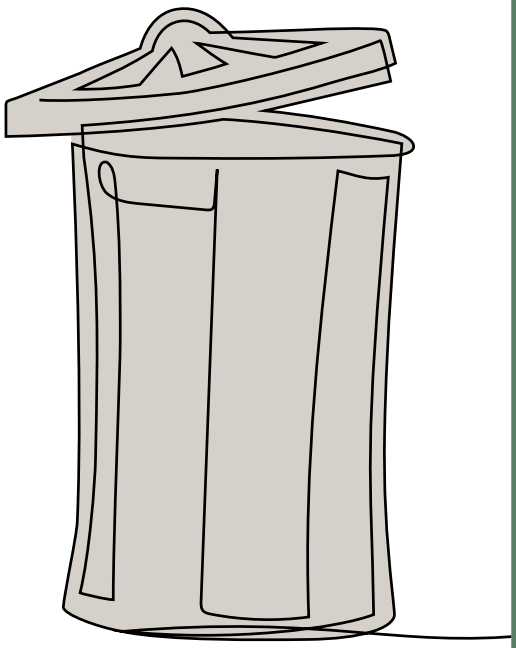
Every year, approximately 1.3 billion metric tons of food produced for human consumption, one third of the total, never reaches the consumer's plate or bowl.

Food waste: refers to the discarding of food appropriate for human consumption downstream in the value chain, particularly at the retail and consumer levels, due to aesthetic quality, spoilage (actual or perceived) and consumer waste.

Food loss: refers to a decrease in quantity or quality (appearance, flavour, texture and nutritional value) of food intended for human consumption, e.g. inefficiencies in agricultural production, harvesting, post-harvest handling, transportation and storage of crops (notably pathogenic microorganisms), or during food transformation.

Addressing loss and waste in nutrient-rich foods presents a particular challenge. Foods such as fruits and vegetables, seeds and nuts, dairy products, meat, fish and seafood are highly perishable and often prone to pests and disease, making them disproportionately susceptible to both loss and waste.

Reducing loss and waste in nutritious foods would yield substantial benefits far beyond addressing hunger and malnutrition, to encompass economies and the natural environment. The gains made would contribute to the efficiencies needed to address climate change. Eating more of the nutrient-rich food already being produced would unlock savings in water and energy consumption, land use, and resources used in industrial food fortification. And the scale and pace of food production would not need to increase at the rates currently required to feed an extra 1 billion people by 2030.



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Reduce food loss and waste

Key Facts

Approximately 1.3 billion metric tons, or one third, of food available for human consumption never reaches the consumer's plate or bowl. This approximates to US$940 billion in worldwide economic losses per year.

Each year more than half of all the fruits and vegetables produced globally are lost or wasted, as well as around 25% of all the meat produced – equivalent to 75 million cows.

In lower-income countries, over 40% of the losses of edible parts of foods occur in the post-harvest and processing parts of the food system, while in high-income countries, more than 40% of food waste occurs at retail and consumer levels.

Globally, over one third of the total fish and seafood harvested each year is lost or wasted. In high-income countries, much of this occurs at the consumer level, while in low-income countries substantial losses occur in the distribution/retail sectors.

Fruit and vegetables have the highest overall rates of loss and waste. Across most regions, significantly more than half of all the fruit and vegetables produced are lost and wasted – rising to more than 70% in the case of North Africa, West and Central Asia, and Latin America.

Eating more of the nutrient-rich food already being produced would unlock savings in water and energy consumption and land use. In addition, the scale and pace of food production would not need to increase at the rates currently required to meet the demand of an additional 1 billion people by 2030.

The average global global amount of vitamin A produced in human-edible crops was found to be nearly 22% greater than that required to meet the totality of human needs. However, after loss and waste, the amount available for consumption was 11% less than that required.

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Reduce food loss and waste

Policy Recommendations

Educating all food systems stakeholders to prioritise the reduction of food loss and waste.

Taking **practical steps** for nutrient retention within the food system. Policymakers need to develop a plan that focuses on perishable, nutritious foods and all parts of the food system, including consumer behaviour.

Improving public and private infrastructure for well-functioning and efficient food systems. Efficient market, storage, cold chain and processing infrastructure can all play important roles in helping to avoid losses.

Two further priorities are also important for researchers, scientists and donors, as well as policymakers:

Encouraging innovative solutions to protect nutrients. Innovative technologies have great potential to protect nutrients from farm to fork.

Closing the data gap, i.e. improving data collection and analysis.

Closing the knowledge gap on losses and waste, e.g. identify cost-effective interventions that can be scaled up.

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Reduce food loss and waste

Policy Examples

Policy: National policies/ programmes to reduce food loss and waste
In Argentina, the Ministerial Resolution 392/2015 created the National Programme for Food Loss and Waste Reduction.

Policy: Improved infrastructure
The Market Infrastructure, Value Addition and Rural Finance (MIVARF) project, led by the Government of Tanzania, is investing in roads, packing houses and food processing centres, post-harvest technologies and agro-processing, nutrient-preserving storage/ processing, and refrigerated transport.

Policy: Adapted cold chain developments
The Government of India established the National Centre for Cold Chain Development (NCCD) in 2012, to promote and develop integrated cold chains in India for perishable agriculture and horticulture produce.

Policy: Capacity building, education, training and extension services
The Postharvest Education Foundation (PEF) is a non-profit organisation training young people in lower-income countries on various aspects of post-harvest handling of perishable commodities including fruits, vegetables and root crops.

Policy: Food banks
Food for All Africa Programme – a food recovery organisation that operates West Africa's first food bank in Ghana – was established to rescue edible surplus food from stakeholders within the food value chain and supply to vulnerable beneficiaries.

Policy: Public/private coalitions
Champions 12.3 was created to bring together leaders from the public and private sectors in all parts of the world to promote the need to to reduce food loss and waste.

Technology: Cold chain
Promethean Power Systems has created an accessible chilling technology which has thermal battery backup, allowing it to operate reliably in rural areas of India where electricity supply is intermittent.

ColdHubs was created as a 'plug and play' modular, solar-powered walk-in cold room for 24/7 off-grid storage and preservation of perishable foods in low – and middle-income countries (e.g. Nigeria).

Technology: Processing
Multi-flash innovative drying technology that has been developed in Brazil to obtain high-quality dried fruit and vegetables, reducing process time and operational costs.

Solar dryer technologies for rapid drying of fruits, vegetables, spices and fish. Solar dryers are relatively cheap, easy to build, do not require electricity or fuel and produce zero greenhouse gas emissions, but they maintain quality and nutrient content better than traditional on-the-floor sun drying. They have been used in countries such as Bangladesh, India, and Rwanda.

Technology: Packaging
Nanotechnology – A Hexanal 'smart delivery' liner built with nano-particles derived from banana and coconut fibres that reduces fruit and vegetable losses has been used in India and Sri Lanka.

Mazzi (Kenya) is a milk transport bottle that helps to maximise the amount of milk that makes it to market successfully, resulting in less spoilage and spillage.

Technology: Information technology
'Reuter's Market Light Farmer' provides market prices via a mobile app.

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Enhancing food environments

Evidence

Diet quality is influenced by the food environment – which is the space in which people acquire food. Food environments consist of the collective physical, economic, policy and socio-cultural surroundings, opportunities and conditions which create everyday prompts that shape people's dietary preferences and choices.

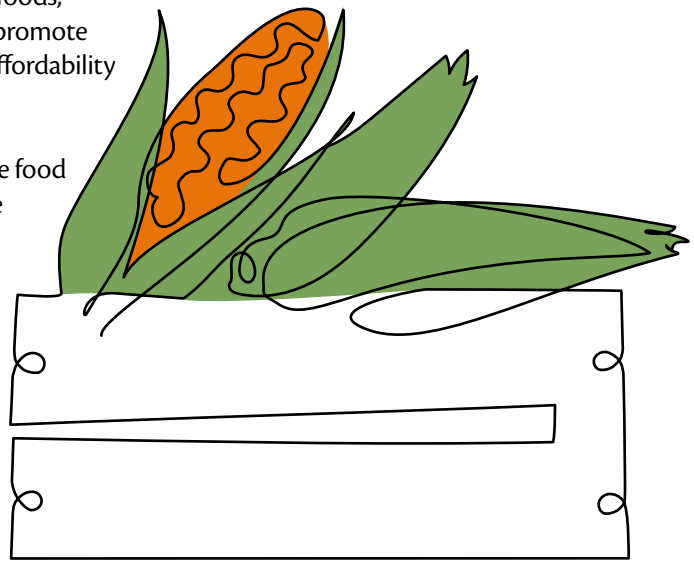
Key dimensions of food environments include food availability, accessibility, affordability, desirability and convenience, as well as vendor and product properties, and promotional information. Food acquisition is thus the result of complex socio-ecological interactions between people and their wider environment.

Food environments are changing fast, particularly in low – and middle-income countries. For many consumers, traditional diets, comprised largely of minimally-processed staple foods, are shifting. Diets globally are increasingly incorporating ultra-processed food products, i.e. foods high in fat, sugar, salt, and calories, which often have limited nutritional value.

Business as usual will result in growing problems of diet-related malnutrition. Changes in global, regional and national policies, investment patterns, technologies, and infrastructure are needed to ensure that food systems, and hence the food environments in which people choose their foods, are transformed in ways that promote greater diversity, availability, affordability and safety of nutritious foods.

The key policy areas within the food environment where this can be achieved are:

- Economic instruments and fiscal measures
- Food advertising and product promotion
- Food transformation, reformulation and processing
- Food labelling
- Providing high-quality foods in public institutions
- Improving the supply of nutritious foods



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Enhancing food environments

Key Facts

In 2000, sales of ultra-processed foods and beverages in the upper-middle-income countries were one-third of those in the high-income countries. Just 15 years later, they accounted for more than half.

75% of world food sales are of processed foods, whose largest manufacturers control more than a third of the global market.

In East and Southern Africa, highly processed food accounts for more than one third of the purchased food market.

A study, which evaluated price changes between 1990 and 2012 in the USA, UK, Mexico, Brazil, South Korea and China, shows that fruit and vegetable prices increased by 2–3% per year, while the prices of many energy-dense processed foods decreased.

Foreign investments in the food sector have also been increasing rapidly in the developing world, rising from 54 billion USD in 1980 to 1,350 billion USD in 2012.

Fewer than 27% of countries had implemented taxes on sugar-sweetened beverages and foods high in fat, sugar and salt by 2015.

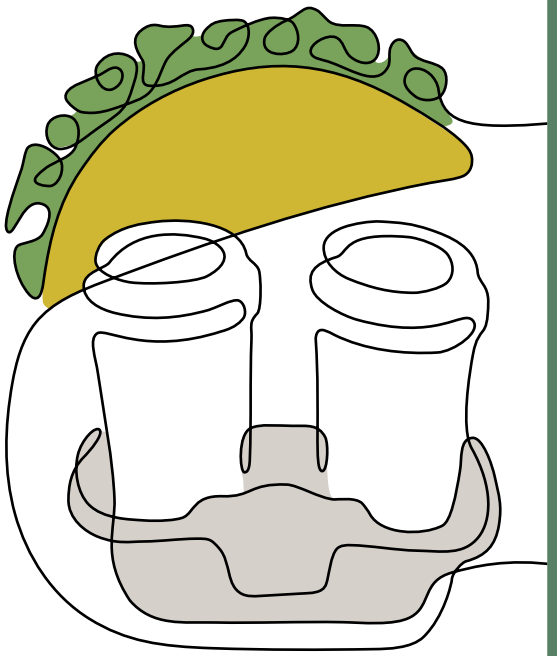
The amount that food and beverage companies invested in advertising accounted for 17% of all global media spending in 2012.

Despite WHO recommendations, only 8% of countries regulate the marketing of foods and beverages to children while only 36% of countries have implemented provisions of the International Code of Marketing of Breast-milk Substitutes.

Processing can help increase food availability, extend seasonality and make food safer to eat. Food fortification can add nutritional value, e.g. fortifying salt with iodine can reduce goitre and foetal brain damage. But processing can also lower the nutritional quality, for example producing trans-fats from soya oil.

Food labels can help consumers make informed decisions either by providing nutrient content, or by using interpretative labels (graphics, symbols or colours) related to the nutrient content.

Global funding in public-sector agricultural research is still focused primarily on rice, wheat, maize and other grains. About 45% of private sector agricultural research investment is on maize, with little attention to nutritious crops such as fruits and vegetables, pulses, seeds and nuts.



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Enhancing food environments

Policy Recommendations

Implement fiscal incentives and disincentives to promote consumption of more nutrition-rich foods, e.g. taxes and subsidies.

Establish norms and specific limits for the marketing of less nutritious foods to children and adolescents.

Extend the reach of healthier reformulated products, e.g. fruit, vegetables, dairy, nuts and legumes.

Improve the supply of nutritious foods by realigning agricultural subsidies towards fruits, vegetables, pulses, seeds and nuts.

Ensure better provision of high-quality foods in public institutions, including schools, hospitals, prisons and administrative institutions. Private organisations can also improve the food environment within workplace settings.

Develop metrics and reporting data on the quality of food environments.

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Enhancing food environments

Policy Examples

In 2014, the Mexican government implemented **two food taxes**: (1) an excise tax on sugar-sweetened beverages and (2) a sales tax on several highly energy-dense foods. One year after implementing a 1 peso per litre excise tax (approximately a 10% price increase based on 2013 prices), purchases of sugar-sweetened beverages in stores reduced by 12%. This change was mainly observed among households of low-socioeconomic status.

In 2015, Chile adopted the most comprehensive **marketing restriction law** in the world to date (Law No. 20,606), where food companies are required to place front-of-package labels on foods and beverages that are high in sugar, salt, saturated fats and energy. The law prohibits the advertising and marketing of these target foods to children aged 14 and younger, nor within establishments of preschool, primary or high school education.

In Hungary, a **"Public Health Product tax" (PHPT)** was introduced in 2011 on the salt, sugar and caffeine content of ready-to-consume food products (e.g. soft drinks, energy drinks and pre-packaged sugar-sweetened foods). Since 2012 the income from the tax has flowed to the public health insurance fund, making up around 1% of the fund's income. 16–28% of consumers of PHPT products changed their consumption habits in response to the introduction of the tax.

Chile, South Korea, Mexico, Denmark and Latvia have worked with the food industry to develop **codes for "responsible" marketing to children**. However, only 8% of countries have adopted regulations to marketing foods and beverages to children.

In South Korea, TV advertising of target food products to children under 18 years of age is prohibited during and after programmes shown between 5–7pm and during other children's programmes. This regulation took effect in 2010 and has had a positive impact on the South Korean food environment by stimulating around 50% of food companies to reformulate their products.

The Senegalese government established a **National Fortification Alliance (COSFAM)** and made food fortification mandatory in 2009 in partnership with the Global Alliance for Improved Nutrition (GAIN). The country has been fortifying wheat flour with iron and folic acid, and vegetable oil with vitamin A, to address key micronutrient deficiencies in the population.

Following the establishment of a national working group on **food fortification**, the Ugandan government passed legislation in 2011 on the fortification of three staple foods. In 2012, this led to 10 food companies fortifying products; 95% of vegetable oil was fortified with provitamin A, and 40% of wheat flour was fortified with iron.

The Workplace Health Promotion Programme launched in Singapore in 2000 offers grants for workplaces to invest in obesity-related health promotion. 57% of workplaces now participate in this initiative.

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Engage the private sector

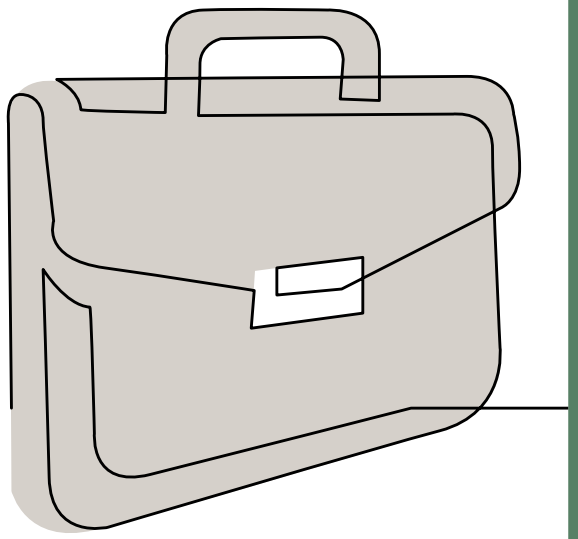
Evidence

Some governments in low – and middle-income countries are stepping up efforts to improve diets, but there remain few successful examples where governments have harnessed the market power of the private sector. Diverse private sector actors (e.g. smallholder farmers, agribusiness, food and beverage manufacturers, food retailers, food service providers and industry and trade associations) shape global and local food systems in ways that have considerable potential to influence the availability, price, nutritional quality, desirability and demand for more healthy food choices. This is a huge missed opportunity which must be rectified.

Public sector actions alone will not be enough. The private sector also has a major role in shaping diets and food systems, mainly through food processing, product development, and product reformulation, as well as supporting commercial food fortification and the informal food retail sector. Whilst the food industry has long been criticised for its part in making food environments unhealthier, it has also demonstrated considerable potential to make them healthier.

The food industry already does much to meet the nutritional needs of a rapidly growing global population, but it tends to focus on food products rather than enhancing diets and food systems per se. Policymakers need to be realistic about their own limits in influencing consumer behaviour. Similarly, they need to be pragmatic in persuading industry partners to play a more active role in improving diets. This includes the private sector in both formal and informal markets.

The key is to establish a common understanding where the right mix of policy regulations and incentives can be developed allowing the private sector to profit from a shift in the balance of their activities in favour of food products that are more nutritious, affordable and accessible.



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Engage the private sector

Key Facts

In Brazil the contribution of processed and ultra-processed products to dietary energy has risen from 20.3% in 1987 to 32.1% in 2009 in households located in urban areas.

A study in Kenya, which has the fastest supermarket growth in sub-Saharan Africa, found that the purchase of highly and ultra-processed foods from supermarkets significantly affected consumers' nutritional outcomes, leading to an increase in adult body mass index.

In South Africa, the agro-processing sector contributes about 10% of GDP. In India, it employs around 18% of the country's industrial work force.

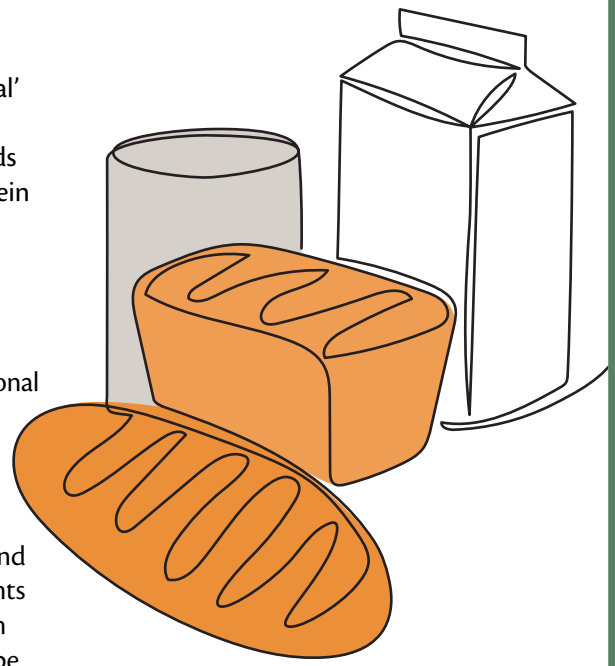
In Argentina in 2013, the government made mandatory maximum levels of sodium permitted in meat products, soups, seasoning mixes, bread and starch products, and tinned foods. Between 2011 and 2015, national average daily salt intake per person fell by 2 grams.

In Mexico, Central America and Southeast Asia, the supermarket share is 10%–50% of the retail market. In sub-Saharan Africa (outside South Africa) and South Asia, it is less than 1%.

In Kenya, Zambia and Nicaragua over 90% of all fruits and vegetables are purchased in traditional retail outlets. In Zambia and Kenya, modern supermarkets primarily supply to households in the top 20% of income distribution.

A review of 23 studies (mostly conducted in Africa) found that the daily energy intake from 'informal' street foods was 13%-50% in adults and 13%-40% in children. Street foods contribute significantly to daily protein intake, and often provide 50% of the recommended daily allowance.

Staple food fortification was recently ranked among the top three international development priorities by the Copenhagen Consensus Centre which calculated that the annual cost of increasing iodised salt access to reach 80% of the population of South Asia and sub-Saharan Africa would be just 5 cents per person treated, or US$19 million in total. The benefits were calculated to be worth as much as US$570 million in health-care savings and increased productivity.



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Engage the private sector

Policy Recommendations

Policymakers and the private sector should develop a common understanding of the critical role of diet quality in nutrition to address the following questions:

Managing risks. A role for insurance – How can risks associated with developing, producing and selling more nutritious foods be minimised?

Public incentives for appropriate action in the private sector – How should governments incentivise private companies to improve the quality of food products?

Infrastructure – How can infrastructure planning be better geared toward reducing food losses and promoting year-round access to enhanced diets?

Promoting consumer demand for healthy diets – How can consumer demand for high-quality diets and nutritious food products be created and promoted so that companies have the confidence to invest and take risks in delivering more nutritious foods?

Building trust – How can governments ensure that engagement with for-profit companies to promote universal access to healthy diets is underpinned by core principles of transparency and accountability?

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Engage the private sector

Policy Examples

Trinidad and Tobago Agri-business Association (TTABA) is a 'For Development Company' established in May 2006 by agri-business with government support. It promotes traditional Caribbean food habits and processes fruits and vegetables into frozen, cubed, packaged and branded products.

Azuri Health Ltd, for example, was established in Kenya in 2010, and is one of the largest suppliers of dried fruits (pineapples, passion fruit, mangoes, bananas and coconuts) in East Africa. It aims to provide alternative healthy snacks for the growing population and reduce post-harvest losses for farmers.

The Giang Fisheries Association started to produce organic catfish in Vietnam with the help of a PPP between the German Technical Cooperation Agency (GTZ), the non-governmental organisation (NGO) Naturland and the private German fish-importing company Binca Fisch GmbH, leading to higher fish quality. It has also increased export opportunities, reduced rejection rates at international borders and expanded the market.

The Grameen Danone Foods Ltd (GDFL) in Bangladesh, a social enterprise established as a joint venture between Groupe Danone and Grameen Enterprises. It manufactures and distributes two fortified yogurt products to poor consumers, predominantly in rural areas. Both products are fortified with 30% of the recommended daily amount (RDA) of zinc, iodine, iron and vitamin A, and cost around US$0.10.

The Scottish Food and Drink Federation (SFDF)'s Reformulation Programme is a free government service for food manufacturing SMEs in Scotland with tailored advice to help them reduce the fat, sugars and salt content of their products. The service helps businesses with low product-development resource or reformulation experience. Between 2011 and 2014, the programme supported around 50 producers across Scotland which led to significant reductions in salt, saturated fat and caloric content of their products.

The Fortify West Africa (FWA) initiative is a public-private partnership which aims to reach 70% coverage of vitamin A fortified cooking oil and 70% coverage of wheat flour fortified with iron, zinc, folic acid and B vitamins in the region. As of 2011, approximately 55 million people in West Africa were consuming these fortified products.

Ying Bang Bao (YYB), a powdered complementary non-commercial food supplement (CFS) was developed and distributed in China by Biomate, a private company with a nationwide distribution network in grocery stores. YYB contains nine nutrients based on those likely to be missing in a Chinese child's diet. It has been shown to reduce child anaemia and increase IQ.

The 'Makati Vendors Programme of the City', which was started in 1992, involves 760 Philippine street vendors, most of whom are women. They sell their cooked food, which is based on local products (rice and vegetables), in the vicinity of schools, bus stops and stations. The programme aims to provide the urban poor of Makati with an alternative source of income, and encourages cleanliness and hygiene at point of sale, whilst more likely to provide healthy alternatives to ultra-processed foods.

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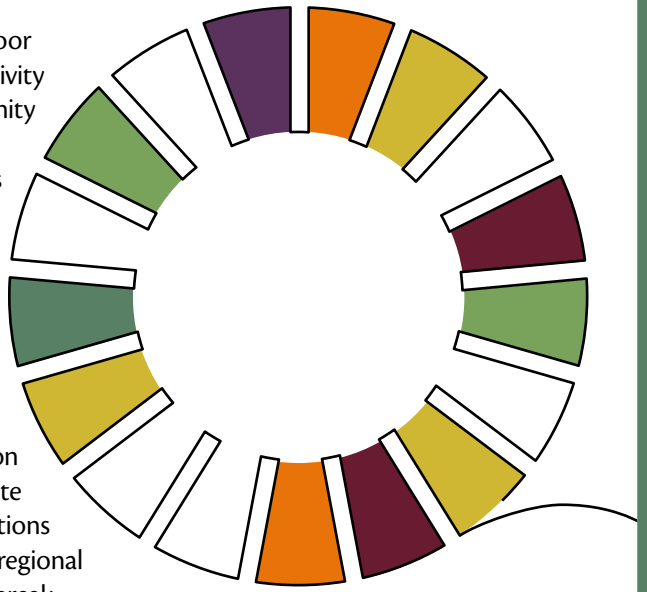
Putting diets at the heart of the SDGs

Evidence

The 17 Sustainable Development Goals (SDGs) were adopted by the 193 Member States of the UN General Assembly in 2015. There has been slow and uneven progress towards achieving these goals, in part due to a continued 'siloed' approach to policy-making, despite the UN's emphasis on the need for cross-sectoral working. For SDGs to be successfully delivered, synergies need to be formed at all levels, from household to community to nation, and across multiple sectors.

One critically important policy area that connects many of SDGs is the provision of healthy, high-quality diets. Invisible in terms of SDG language and not mentioned among the many targets, healthy diets are a foundation underpinning successful progress toward targets in health, agriculture, inequality, poverty and sustainable consumption.

Failure to recognise the central role of high-quality diets in addressing so many development challenges (e.g. low educational attainment, poor physical growth, low labour productivity and more), risks missing an opportunity for governments and partners to invest in the essential policy actions that cut across conventional silos and help them reach their SDGs.



Achieving high-quality diets for all is critically important in accelerating progress of at least 11 of the 17 SDGs, and not just for SDG 2. It can help release the brake on progress and help countries accelerate the delivery of their SDGs. These actions will require high-level leadership at regional and national levels to connect and break down traditional sector silos.

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Putting diets at the heart of the SDGs

Key Facts

Diet quality influences the following SDG targets:

Low-income groups are at high risk of malnutrition, but malnutrition also fuels greater poverty. A 1% loss in adult height due to childhood stunting is associated with a 1.4% loss in economic productivity and 20% reduction in income.

Delivering high-quality diets will engender a virtuous cycle of a healthier and more productive workforce, leading to increased prosperity, reduced hunger, and better food security.

Good nutrition reduces the risk of morbidity and mortality for a range of diseases. Six of the top nine risk factors for the global burden of disease are now related to diet.

Stunting places children in a lifetime of increased risks from NCDs and sub-optimal breastfeeding is responsible for almost 12% of total deaths.

Adults who are overweight or obese are at increased risk of NCDs with severe impacts on health and wellbeing, e.g. type 2 diabetes, stroke and cardiovascular disease.

Poor nutrition fundamentally impairs a person's ability to benefit from education. Stunting before the age of two years predicts poorer cognitive and educational outcomes in later childhood and adolescence.

Poor female nutrition early in life impacts learning potential and productivity, and increases reproductive and maternal health risks. Women in many low – and middle-income countries typically eat a lower quantity and variety of nutritious foods than their male counterparts.

Malnutrition, in all its forms, carries huge direct and indirect costs. The cost to low-income nations of productivity foregone due to undernutrition has been estimated as 3 to 16% of GDP.

The effects of stunting can be passed on from one generation to another.

Limiting food waste, overconsumption and rises in overweight and obesity by influencing dietary choices could help reduce the pressure on food production. Each year, around one third of all food produced, equivalent to 1.3 billion tons, worth around US$1 trillion, is wasted.

The food system is responsible for up to one third of all human-caused greenhouse gas emissions, from manufacture of fertilizer to food storage and packaging.

Better informed consumer demand for high-quality, diverse, safe diets can be used to stimulate demand for food products linked to sustainable production. There is also a growing consensus on the need to price scarce resources, such as land and water. The global food system uses around 70% of fresh water.

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Putting diets at the heart of the SDGs

Policy Recommendations

While policies and actions will depend heavily on local contexts, the key priorities for accelerating progress across the SDGs are:

Widen national policy approaches which ensure well-functioning food systems are delivering safe and healthy diets for all. In many countries, policy development needs to give careful consideration to the triple burden of malnutrition (underweight, micronutrient deficiencies, and overweight and obesity).

Address barriers to healthy diets for vulnerable groups. The 2030 Sustainable Development Agenda makes an explicit pledge to "leave no one behind". Food price volatility has a particularly serious impact on the diet quality of low-income urban households.

Focus on improving diets for infants, young children, adolescent girls and women. Women and adolescent girls are particularly at risk from the health impacts of low-quality diets.

Step up efforts to collect data on diet quality to inform policy action. New diet quality indicators that measure the consumption of items such as sugar, salt and trans-fats are urgently needed.

Adopt a food systems approach to improving diets and achieving the SDGs with coordinated action across several policy domains. For example, a consumer behaviour policy that promotes nutritious foods will be more successful if agricultural policies have improved production of those foods.

Pay explicit attention to diet quality in developing strategies to achieve the Sustainable Development Goals. Putting diet quality at the centre of national plans will help to release the brakes on progress towards the SDGs.

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How can urbanisation influence the food system and diets?

Evidence

By 2050, there will be an additional 2.5 billion urban residents, primarily in Africa and Asia. In sub-Saharan Africa, almost 60% of people already live in cities that have populations between 300,000 to 500,000. Urbanisation presents a complex and dynamic demographic phenomenon which interacts strongly with globalisation, income growth, migration, climate change, population growth, income inequality, health and sustainability.

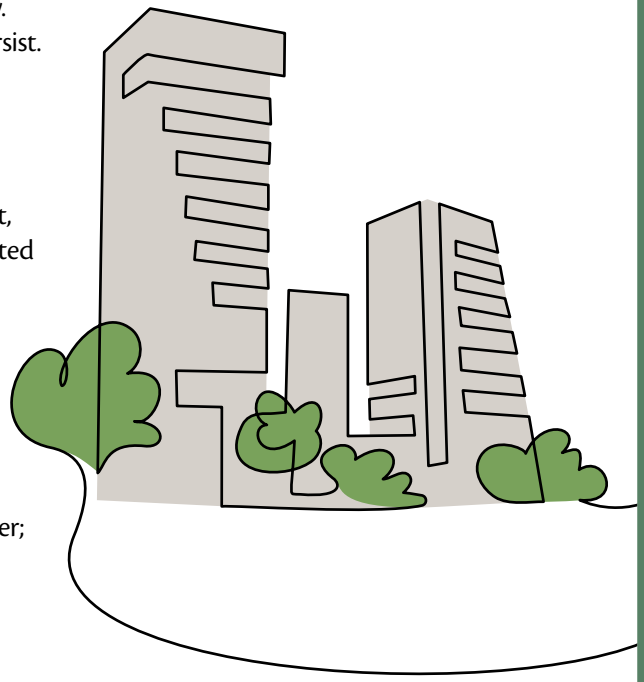
Urban diets are particularly challenging because they appear to be evolving at a faster pace than rural diets – due to changing social environments and poverty reduction. Urban diets are typically characterised by greater access to cheap calories via highly processed foods; a greater diversity of fresh foods such as legumes, vegetables and fruits; processed foods with beneficial nutrients; and animal-sourced foods.

However, urban environments are also characterised by increasing rates of malnutrition. This runs counter to a commonly held belief that greater wealth in urban centres, relative to rural areas, leads to better nutrition. There is evidence showing that as the economies of developing countries grow and urbanisation accelerates, child stunting tends to decrease, but at a slower rate than the concurrent rise in adult overweight and obesity. Also, micronutrient deficiencies persist.

As such, urban populations face a 'triple burden' of malnutrition, where stunting and micronutrient deficiencies coexist with overweight, obesity and the associated diet-related non-communicable diseases.

Policymakers and urban leaders have a wide range of opportunities to provide greater access to safe, affordable and nutritious foods, through influencing:

- urban consumer purchasing power;
- food transformation and retail marketing in the formal and informal sector;
- market and trade systems;
- urban food production; and
- food safety.



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How can urbanisation influence the food system and diets?

Key Facts

By 2050, there will be an additional 2.5 billion urban residents, with nearly 90% of the increase concentrated in Africa and Asia, equivalent to the entire world population as it was in 1950.

The proportion of stunted children living in cities has increased from 23% to 31%.

By 2020, up to 85%t of the poor in Latin America are expected to live in towns and cities.

In Malawi, the rates of anaemia in women were higher in urban residents compared to those living in rural areas.

In China, deficiencies of micronutrients in children were found to be higher in rural areas than urban areas.

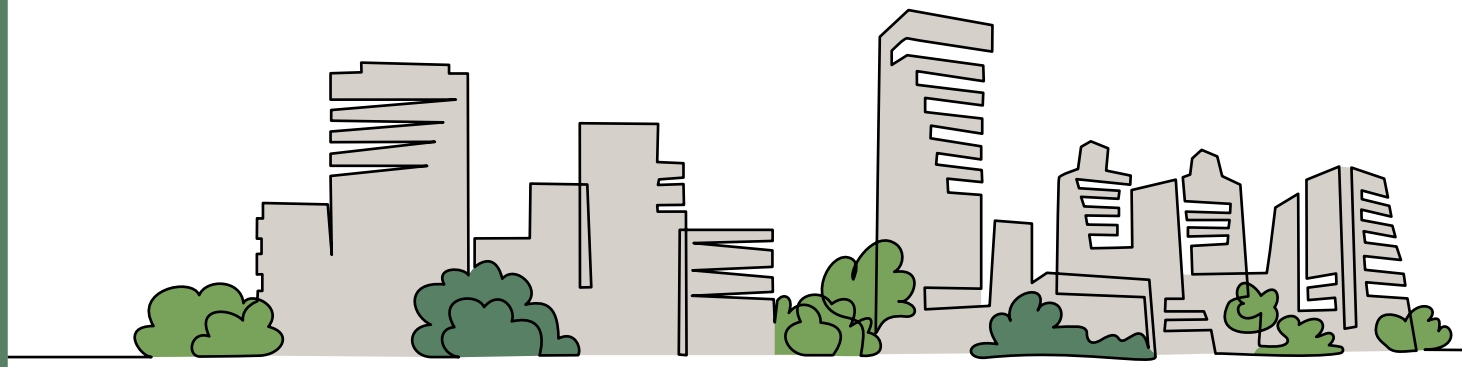
Urban areas have higher density of social media networks, commercial networks and information flows. This can be used to promote and market both unhealthy and healthy foods.

In Indian and Chinese cities, the prevalence of obesity is three to four times higher than in rural areas. In Africa, over a third of the urban population is now overweight or obese, with urban women almost three times more likely to be overweight or obese compared to their rural counterparts.

The urban poor frequently rely on informal 'street' foods, which can vary from 1% in Mozambique to 20% in Tanzania. In Nigeria, adolescents obtained 40 to 70% of their food from street vendors.

In a review of 23 studies the majority of which were conducted in sub-Saharan Africa, daily energy intake from street foods in adults ranged from 13% to 50% and in children from 13% to 40%.

Recent projections show that, by 2030, urban expansion will result in a 1.8%–2.4% loss of global croplands. About 80% of global cropland loss from urban expansion will take place in Asia and Africa.



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How can urbanisation influence the food system and diets?

Recommendations – Priority areas for action

Governance:

City/Municipal government policymakers at the local level should be the primary authority, developing an 'urban food charter' (embodying food system principles) as a plan for action.

National governments should promote the decentralisation and empower urban leaders, spread best practice to enhance diet quality and nutritional outcomes, aligned with legislative arrangements and capacity building.

Civil society organisations should facilitate and participate in cross-sector collaborations and act as a challenge function, holding all actors to account.

The business sector should view urban markets as an opportunity for higher profits, and a spur to industrial innovation.

Research:

Which governance processes directly affect the quality of urban diets?

How are urban consumer preferences changing across diverse urban settings?

What evidence exists on the most cost-effective interventions across food systems?

How do 'hidden' aspects of urban food systems affect demand, e.g. spatial layout, transport systems?

What role do food industry stakeholders have in shaping future urban food choices and higher quality diets?

How can big data on food purchases, prices, locations and food costs be better used to inform local policy?

Policy:

Policy priority: High-quality diets must be a policy priority for urban populations, to prevent a growing nutritional crisis in cities.

Local champions: Policymakers at a local level need to take a leading role in championing better diets and nutrition, and this requires them to be both mandated and empowered to act.

Urban opportunities: Different sectors can capitalise on the unique opportunities presented within urban food systems.

Wider policy: There is a need to connect with policy areas far beyond food environments and food systems.

Diversity: It is essential to address the needs of different urban population groups in the diverse urban environment.

Obesity: Policies need to be more focussed on addressing the specific challenges associated with rising rates of overweight and obesity.

Data: Experiences, data and information on improving urban diets needs to be collected, rigorously analysed and shared.

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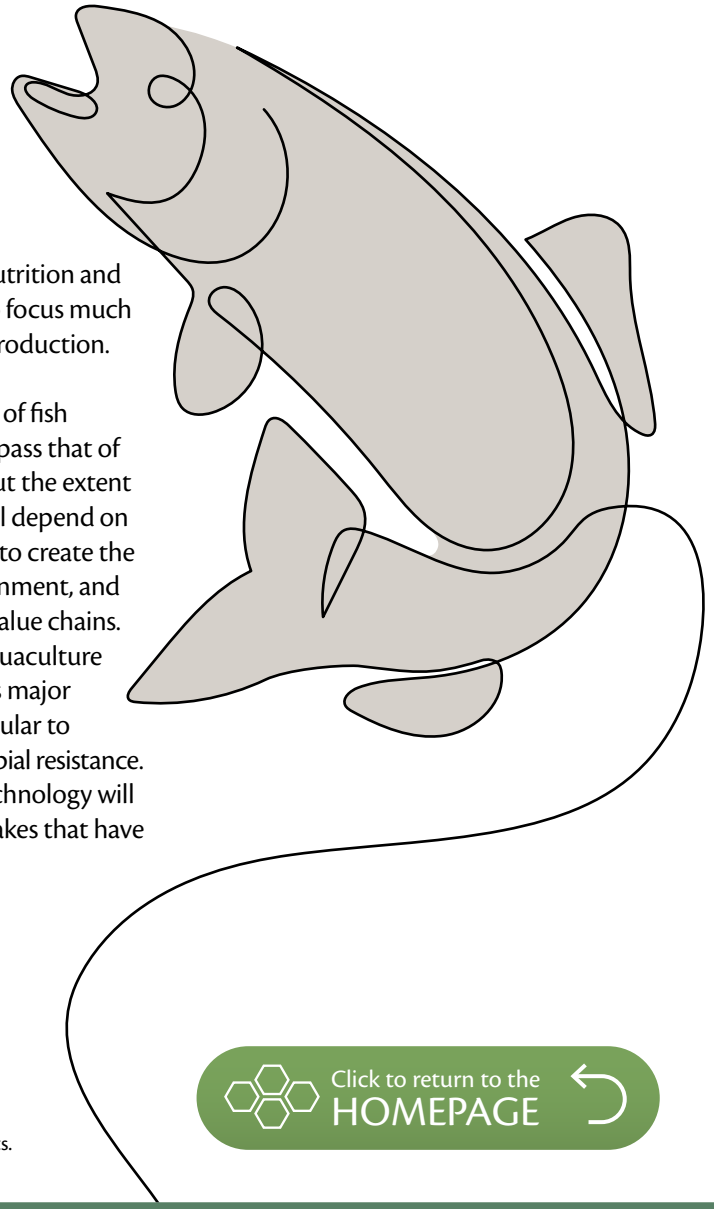
Aquaculture

Evidence

Fish[1] represents a key component of a healthy diet, given the protein, omega-3 fatty acid and micronutrient profile it provides, and the diversity of fish available. However, the importance of fish in providing nutrition security in LMICs is often overlooked, and fish consumption is much lower in many LMICs than in high-income countries.

Aquaculture, the farming of aquatic animals both in salt water and fresh water, is now playing an increasingly important role in the sustainable production of fish. Producing fish through aquaculture has the potential to deliver diverse benefits to low – and middle-income countries. Firstly, it can enhance the quality of diets and the health of populations through improved nutrition. Aquaculture also provides considerable employment through its value chain, accounting for 20.5 million jobs globally in 2018. However, despite its many potential opportunities, aquaculture, together with capture fisheries, is too often sidelined in policies and dialogues on nutrition and food systems. These tend to focus much more on land-based food production.

Worldwide, the production of fish from aquaculture could surpass that of capture fisheries by 2024. But the extent to which this is achieved will depend on policymakers taking action to create the right enabling policy environment, and to promote investment in value chains. Further expansion of the aquaculture sector also needs to address major challenges, relating in particular to sustainability and antimicrobial resistance. Using new practices and technology will be key to avoiding the mistakes that have beset the sector in the past.



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1 Fish are taken to indicate fish, crustaceans, molluscs, and other aquatic animals, but exclude aquatic mammals, reptiles, seaweeds, and other aquatic plants.

Aquaculture

Key Facts

Aquaculture is arguably the fastest growing agricultural subsector, and while its rate of growth is expected to slow, production is projected to reach the 105 million tons per year that the world needs by 2029.

Fish consumption globally grew 3.1% annually from 1961 to 2017, outpacing population growth over the same period.

Average global consumption more than doubled over this period (from 9.0 kg to 20.5 kg per capita – live weight equivalents) predominantly due to wealthy consumers in high-income countries, and consumers in parts of Asia.

Globally, fish accounted for an estimated 17% of animal protein in 2017 and provided 3.3 billion people with 20% of their average per capita intake of animal protein.

Some fish are among the richest dietary sources of the long chain omega-3 fatty acids, eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA), which have important health benefits, and are linked with reduced adult mortality.

In 2017, over one third of fish stocks were being fished beyond biologically sustainable levels, rising from 10% in 1974.

China accounted for 58% of total global aquaculture production in 2018 (producing 47.6 million tonnes) while about 30% came from the rest of Asia, with India (8.6%), Indonesia (6.6%) and Vietnam (5.0%) being the next three largest producers.

Aquaculture at scale in Africa remains largely confined to a few countries and has a small share of the global market (2.7% of the world's production in 2018). However, it is growing rapidly in Egypt, Nigeria, Uganda, Ghana, Kenya, Zambia and South Africa.

Around 20.5 million people globally were employed in the primary sector of aquaculture in 2018, with about 95% located in Asia and 2% in Africa.

In Africa the number of jobs linked to aquaculture has more than tripled (100,000 to 386,000) since 2000.

Most workers (58%) in the post-harvest value-addition and marketing activities of fish value chains tend to be women.

An estimated 35% of the global fisheries and aquaculture harvest is lost or wasted every year.

Fish produced from aquaculture differs markedly in its environmental footprint depending on how it is produced against a background of increasing prevalence of capture fish stocks being overfished.

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Aquaculture

Recommendations

Governments:

1. Incorporate consideration of fish and related products into agriculture and trade policies, updated national food-based dietary guidelines, and nutrition and health policies and strategies.
2. Integrate food security and nutrition issues into policy decisions relating to fisheries and aquaculture. Too often decisions focus on economic considerations, neglecting the nutrition and health implications of policies in this sector.
3. Encourage entrepreneurship by SMEs involved in aquaculture. Many of the actions that support the growth of small businesses can also help support the growth of aquaculture.
4. Promote inclusive growth. Women and local communities should benefit from opportunities for aquaculture value chain development.
5. Resolve competition for land. Policy choices relating to inland aquaculture projects should be informed by studies of the trade-offs which take a wide perspective of costs and benefits.

Multiple stakeholders working together:

6. Encourage investment to enhance the diversity and profitability of feed options across LMIC markets. Governments, their development partners, and private sector entities all have a role to play.
7. Address the growing threat of antimicrobial resistant bacteria. This needs to be a priority for all countries in view of the threat to commercial growth, animal and human health, and contamination of the environment and food chain. A 'One Health' approach is essential.
8. Prioritise the goal of sustainability. Sustainability in new and existing aquaculture systems needs to be a priority, not least in view of the threat of climate change and the relentless degradation of so many environmental resources.
9. Address loss and waste in fish value chains. Systematic assessment tools need to be developed to capture the multiple dimensions of loss, and used to inform actions to prevent loss.

Researchers:

10. Identify alternatives to meal and fish oil from capture fisheries, particularly those which make use of local inputs and which are scalable in LMICs. Research has highlighted the potential to decouple the fish feed industry from reliance on wild catch inputs from capture fisheries, with both ecological and nutritional benefits.
11. Realise the potential of genetic improvement of fish species. Increased investment is needed to target the genetic improvement of fish species, particularly those that are widely consumed in LMICs such as tilapia, carp, and catfish.

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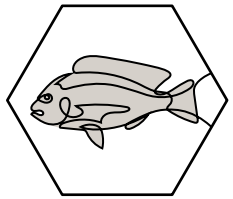
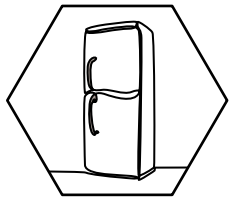
Aquaculture

Policy Examples



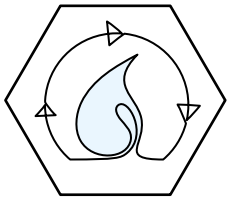
Genetic improvement

In the Genetically Improved Farmed Tilapia (GIFT) breeding programme initiated by WorldFish, the improved strain of tilapia sustained 10-15% gains in growth per generation compared with fish used at the start of the breeding programme. Now in its 18th generation, the GIFT strain of tilapia has been disseminated to at least 16 countries, 15 of which are LMICs. Certain tilapia involved in breeding experiments for the GIFT project recently proved resistant to the tilapia lake virus.



Addressing loss and waste

In 2018 West 'Are'Are Rokotanikeni Women's Association in combination with WorldFish provided solar powered freezers to nine villages in the Solomon Islands. Women were able to rent out freezer space for fish and other perishable foods which they sold for profit in the villages. A committee of women recorded the earnings of each freezer, with the aim of earning enough to keep the freezer running by covering repair costs. After one year, 487 people had used the freezers and 1000 kg of fish had been stored, and the women had saved over US$ 3,000.



Land water interrelationships

Innovative solutions which integrate agriculture with aquaculture can produce multiple benefits. For example, fish farms in Egypt producing tilapia and catfish use the water in which the fish were farmed to grow lettuce, basil and mint. Not only does this help to conserve water, the water from aquaculture is fertilised by fish waste and therefore reduces the need to add further fertilisers.

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Fragile Contexts

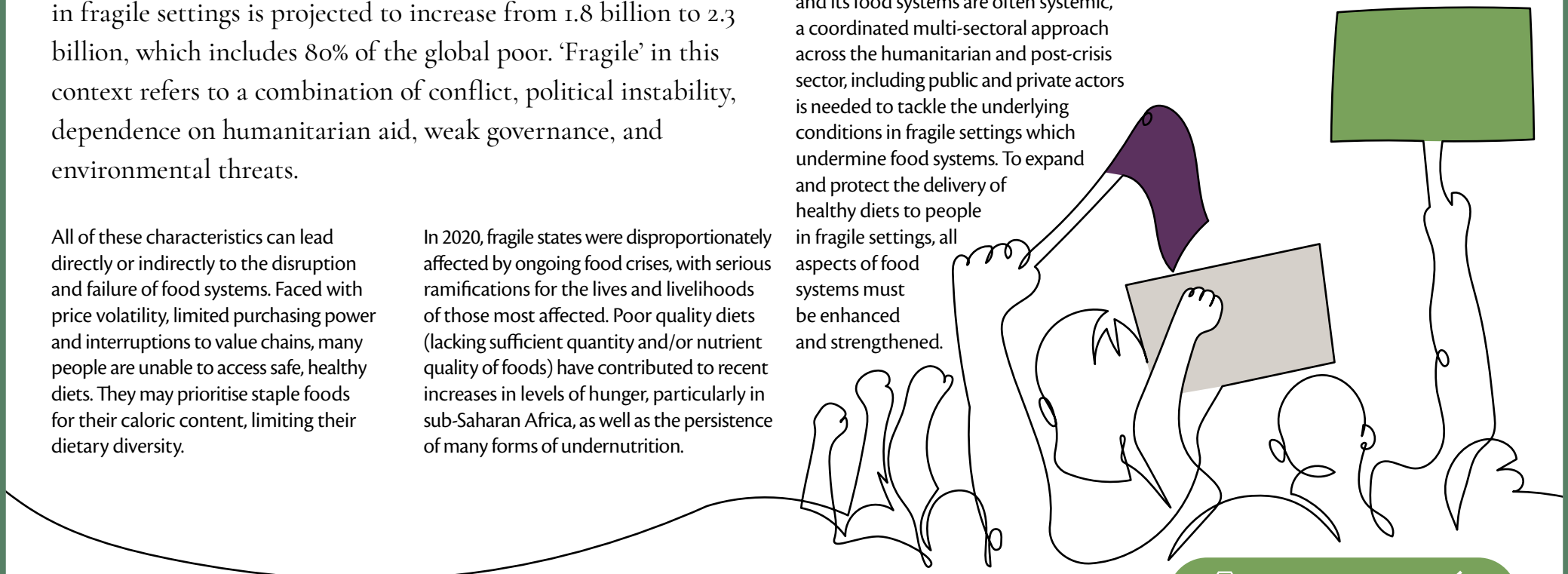
Evidence

According to the OECD, by 2030, the number of people living in fragile settings is projected to increase from 1.8 billion to 2.3 billion, which includes 80% of the global poor. 'Fragile' in this context refers to a combination of conflict, political instability, dependence on humanitarian aid, weak governance, and environmental threats.

All of these characteristics can lead directly or indirectly to the disruption and failure of food systems. Faced with price volatility, limited purchasing power and interruptions to value chains, many people are unable to access safe, healthy diets. They may prioritise staple foods for their caloric content, limiting their dietary diversity.

In 2020, fragile states were disproportionately affected by ongoing food crises, with serious ramifications for the lives and livelihoods of those most affected. Poor quality diets (lacking sufficient quantity and/or nutrient quality of foods) have contributed to recent increases in levels of hunger, particularly in sub-Saharan Africa, as well as the persistence of many forms of undernutrition.

Since the reasons for the fragility of a country and its food systems are often systemic, a coordinated multi-sectoral approach across the humanitarian and post-crisis sector, including public and private actors is needed to tackle the underlying conditions in fragile settings which undermine food systems. To expand and protect the delivery of healthy diets to people in fragile settings, all aspects of food systems must be enhanced and strengthened.



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Fragile Contexts

Key Facts

By 2030, the number of people living in fragile settings is projected to reach 2.3 billion, which includes 80% of the global poor. That represents another 500 million people over today's 1.8 billion.

For example, smallholder households in Niger (which faces frequent droughts, terrorist threats, locusts, and extreme levels of poverty) cover about 40% of their food needs from their own production and struggle to make up the difference from market purchases. This lack of access to affordable nutrient-rich foods is in part why only 10% of infants aged 6 to 23 months in Niger are fed 'a minimally diverse diet.'

In 2018, there were 52 ongoing state-based armed conflicts, and 76 non-state conflicts. Together, these contributed to an estimated US$1.2 trillion in global economic losses.

In conflict-affected countries in sub-Saharan Africa, the number of undernourished people increased by 23.4 million between 2015 and 2018.

It has been estimated that every US$1 spent on peacebuilding could reduce the costs of conflict by US$16.

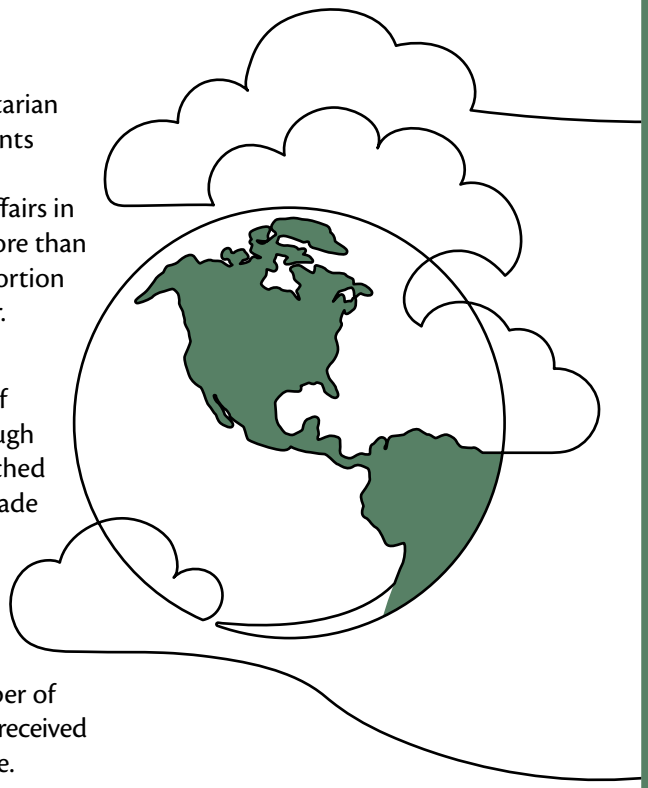
In 2019, smallholder producers in fragile states in the Horn of Africa experienced two consecutive poor rainy seasons, leading to germination failure and crop wilting. Somalia, for example, experienced a 60% reduction in output during the main harvest season, and reaped the lowest cereal harvest since 1995.

The evolving climate crisis is expected to disrupt weather patterns, particularly rainfall and temperature, increasing the risk of drought, making it difficult to plan planting and harvest seasons.

Of the US$13.5 billion in humanitarian aid contributions from governments recorded by UN Office for the Coordination of Humanitarian Affairs in 2017, the food sector received more than US$3.7 billion – the highest proportion of funding allocated to any sector.

By the end of 2019, the amount of humanitarian aid requested through UN-coordinated appeals had reached US$29.7 billion. Commitments made in response to the appeals led to a shortfall of US$13.74 billion.

Humanitarian funds have also been converging on a small number of countries. In 2017, seven countries received 52% of all humanitarian assistance.



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Fragile Contexts

Recommendations

The following priorities should govern the development of strategies to secure healthy diets in fragile contexts

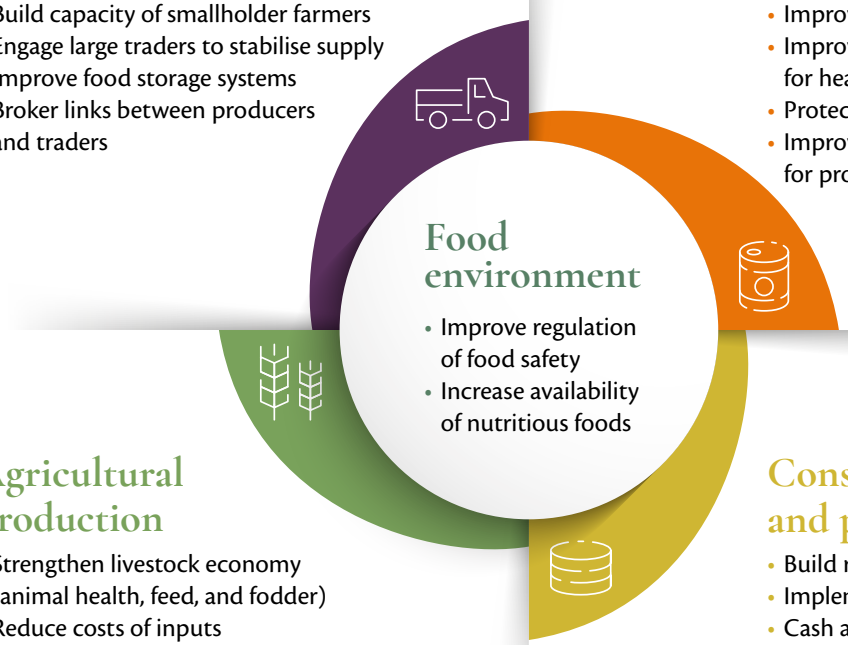
1. **Pursue an end-to-end policy approach to food systems in fragile environments.**
2. **Focus on the needs of the most vulnerable.** Climate impacts directly affect the most nutritionally vulnerable people in fragile settings, who often are also poor and marginalized.
3. **Focus on nourishing as well as hunger.**
4. **Take action across entire food systems.** People are not fed just by agricultural production, but by entire food systems.
5. **Monitor and anticipate.** Adopting a systems approach to identify and monitor shocks to food security and access to healthy diets in fragile settings is essential.
6. **Strengthen response capability.** Implement preventative measures aimed at averting or minimising the impacts of shock.
7. **Build resilience to manage chronic fragility and address the underlying causes of fragility.**
8. **Invest for the longer term:**
   - **a.** Build the capacity of small businesses.
   - **b.** Invest in infrastructure.
   - **c.** Improve food storage and invest in the development of processing.

Market and trade systems
(exchange and movement of food)

- Restore buildings and roads
- Build capacity of smallholder farmers
- Engage large traders to stabilise supply
- Improve food storage systems
- Broker links between producers and traders

Food transformation
(food processing and retail)

- Strengthen supply chains
- Improve regulation of food safety
- Improve food storage systems for healthy diets
- Protect electricity supplies
- Improve access to credit for processors and retailers



Agricultural production

- Strengthen livestock economy (animal health, feed, and fodder)
- Reduce costs of inputs
- Build capacity of smallholder farmers
- Infrastructure development

Consumer demand and purchasing power

- Build resilience of livelihoods
- Implement social safety nets
- Cash and voucher assistance to increase purchasing power
- Promote nutrition education

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Fragile Contexts

Policy Examples

Cash and voucher assistance

- From 2012 to 2016, WFP's e-cards injected over US$1.3 billion into the economies of Syrian refugee host countries across the Middle East. In a study of cash – and voucher-delivered assistance for Syrian refugees in Lebanon, unrestricted cash assistance had a greater impact in improving dietary diversity than vouchers. Unrestricted cash increased purchasing power as recipients could access the full market rather than only the WFP shops where vouchers could be spent.
- WFP established the Kenya Retail Engagement Initiative to improve the value chains which supply refugee markets. It:
  - Addressed inefficiencies within the food value chains that supply markets to increase the purchasing power of refugees and the local community.
  - Improved the availability and affordability of fresh produce and nutrient-rich foods.
  - Contributed to self-reliance by creating economic opportunities.

Social Safety Nets

- The Productive Safety Net Programme (PSNP) is a shock-responsive social protection programme established by the Ethiopian government. Through provision of multi-annual food or cash transfers, PSNP targets chronically food insecure rural households, to increase their resilience to food shortages. Over seven million people have been supported by the PSNP, one of the largest safety net programmes in the world. It has led to improved access to social services, and GDP has increased by approximately 1% through the stimulation of both production and demand. Important environmental improvements included a 40-53% reduction in soil erosion, an increase in water availability and quality, and increased biodiversity.

Infrastructure development

- Access to energy allows for cold and other improved storage systems and helps to reduce food lost in the post-harvest value chain. In 2014 the World Bank supported a project in Mali to expand access to electricity in rural areas and increase the use of renewable energy in rural electricity supplies through private sector participation. Since the implementation of this project, rural access to electricity has increased from 1% to 16.88% with the involvement of 63 private operators.

Strengthening livestock economies

- In the West Bank region, the Food and Agriculture Organisation (FAO) promotes the use of hydroponic technology, a method in which plants can be grown without soil, amongst vulnerable herders and their cooperatives. This technology enables the production of low-cost, high-quality fodder throughout the year, increasing resilience to drought and price volatility.
- A capacity-building package in the Borana pastoral system in Ethiopia was designed in 2000 to diversify the livelihoods of pastoral women, improve living standards, and enhance livestock marketing. Participants who underwent capacity building adapted their livelihood strategies to include more small-business activity and diversification.

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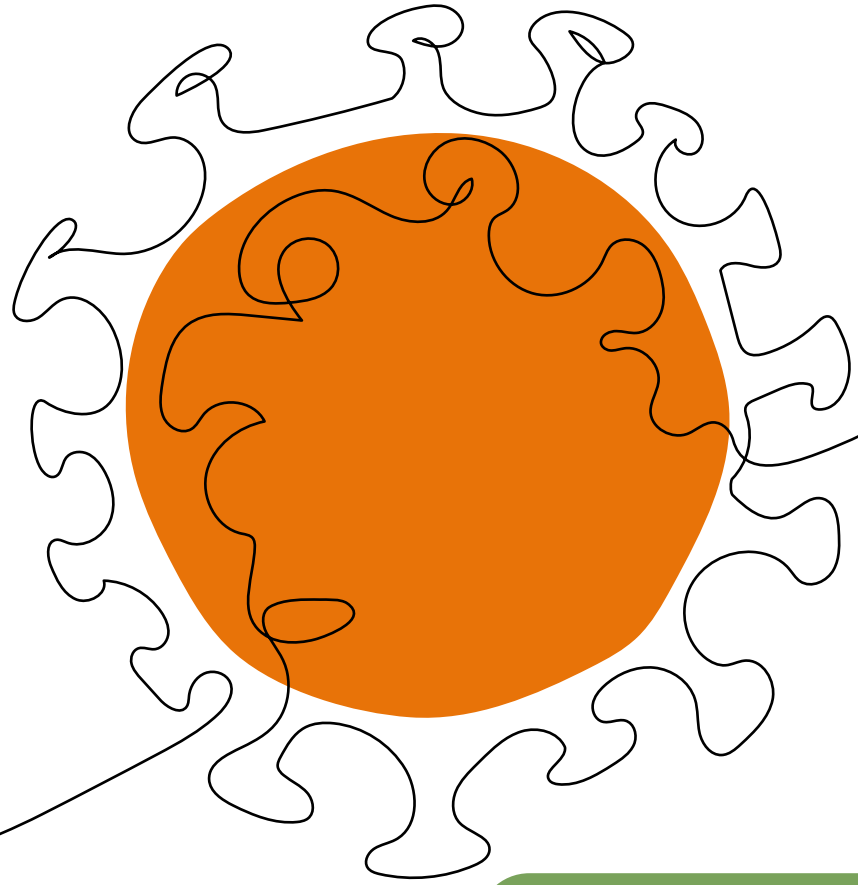
COVID-19

Evidence

In 2020, the lockdowns imposed in response to the COVID-19 pandemic caused considerable distress to consumers, retailers, transporters, and producers alike. While this has been a global challenge, the impact has been felt disproportionately by low-income workers and consumers, particularly in urban settings, and in nations or parts of countries with the weakest healthcare systems and with the most fragile food systems.

The COVID-19 pandemic has exposed the fragility of food systems, and the reliance that we all place on them to deliver the food we need. The current crisis offers an opportunity for policymakers to think differently about how food systems function in their countries. The World Health Organisation has called for the promotion of healthy, sustainable food systems as an important component of a global recovery from the virus. The key challenge is how to make diets, food businesses, farming practices, storage technologies, regulatory systems, and price instruments better able to sustain food systems which deliver healthy diets for everyone. A cross-sectoral, system-wide lens must be applied to weigh up the impacts and trade-offs for different interventions.



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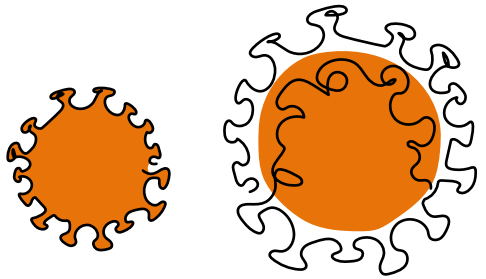
COVID-19

Key Facts (as of August 2021)



720-811m

According to the SOFI 2021 report, between 720 and 811 million people worldwide were experiencing hunger in 2020. This is an increase of 70-168 million people compared to 2019.

97m

The World Bank estimate that the pandemic led to 97 million more people in poverty in 2020.

↓20m

While the World Bank predicts a reduction of 20 million people living in poverty worldwide in 2021, this is not likely to be experienced equally. Predictions indicate that this reduction is likely to be seen in high – and middle-income countries, while low-income countries may still experience increases in poverty in 2021.

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COVID-19

Recommendations (Note: these are generally applicable to pandemics, and are not specific to COVID)

Consumer-focused actions:

1. **Protect all consumers (rural as well as urban) against lasting damage to their health by ensuring that immediate nutritional needs are met.** It is vital to ensure that access to support is context specific and available to all who need it – not just to those who are easy to reach.
2. **Monitor food prices and be prepared to intervene to protect affordability of healthy diets.** Ongoing surveillance of food baskets is important to guide the timely introduction of cash transfers or vouchers, or direct distribution of specific foods to the most vulnerable.
3. **Ensure effective public messaging on the importance of consuming healthy diets during the pandemic,** and accompany this with information on steps being taken locally to promote access to foods containing essential micronutrients.
4. **Actively regulate and prosecute fake claims on the safety of food products and food supplements.**

Actions to support food systems:

5. **Keep trade in food commodities flowing.** At the national level, policy makers need to focus on ensuring a supply of food which is accessible and affordable to consumers, particularly the poorest.
6. **Promote an enhanced supply of nutrient-rich local foods as well as staples.** This includes ensuring the availability of necessary farm labour, the continuation of relevant farm activities and use of appropriate measures to reduce food waste.
7. **Protect the viability of small and medium sized businesses throughout the food chain.** This means ensuring that they have sufficient liquidity to keep operating, and can safely employ their workers, many of whom are women.
8. **Avoid measures that cause longer term harm to food system viability.** A clear focus is needed on actions to protect the vulnerable today, but using strategies that will increase the resilience of food systems for tomorrow.
9. **Assess and monitor policies and actions in real time.** A major effort is required to build an evidence base to assess the effectiveness of specific policy actions in responding to specific needs – and to determine what could work better in future.
10. **Monitor medium-term projections closely.**

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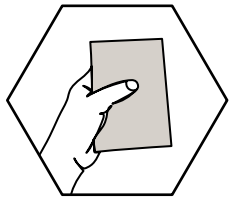
COVID-19

Policy Examples



China's green channel pass
To protect the value chains of nutrient-rich, perishable foods, China introduced a fast-track 'green channel', in which vehicles transporting fresh food could pass through COVID-19 checkpoints easily by holding a government-issued pass.

Nepal's 'agri-ambulances'
In Nepal a farmers' cooperative is using "agri-ambulances" to transport fresh food directly to consumers, who were previously struggling to access fresh, nutrient-rich foods.

Fresh food deliveries in Fiji
In some lockdown areas in Fiji, the Agriculture Marketing Authority bought fresh food from suppliers and delivered it straight to vendors every day.

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Global Panel on Agriculture and Food Systems for Nutrition

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Trade

Evidence

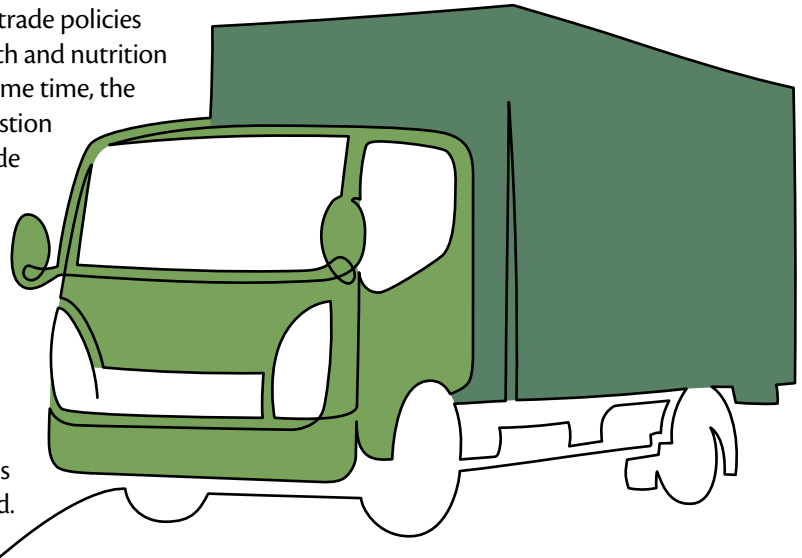
Trade instruments are important tools available to governments to balance the supply and demand of food. Seasonal and inter-annual variability in local food supplies, along with rising incomes, are leading to a growing demand for foods that often have to be sourced from outside a country's borders.

Trade, therefore, plays a vital role in affecting diets through its influence on the stability and diversity of the food supply, absolute and relative food prices, and household and national level incomes. However, trade policy also has considerable potential to lever improvements in diets, although it is seldom used explicitly for that purpose.

Trade is not an easy route through which to improve diets. Given the highly political nature of trade agendas and their underlying economic objectives, professionals and analysts concentrating on trade mechanisms tend to ignore their role in nutrition.

Beyond imports, trade can also influence the availability and price of foods, and can encourage countries to specialise in particular types of agricultural and food production, including cash crops for export, leading to increased global outputs.

Recent shifts in global trade policy suggest that action in favour of sustainable food and nutrition systems could be feasible and governments should move urgently to better align trade policies with their health and nutrition goals. At the same time, the important question of whether trade in nutritious foods actually enhances the consumption of those foods either in the exporting or the importing countries needs to be addressed.



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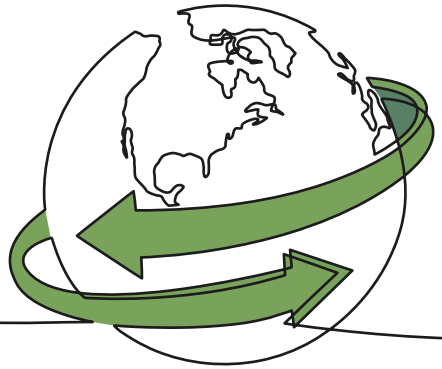
Trade

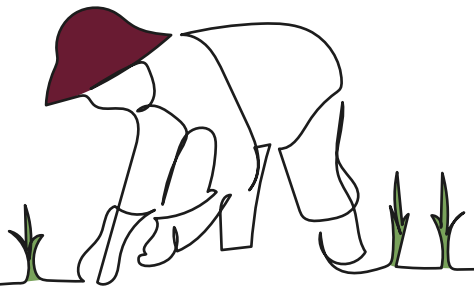
Key Facts

There is currently a substantial mismatch between global food production and the foods that comprise healthy diets.



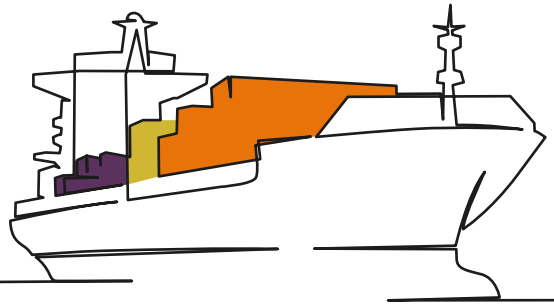
Global trade in food has increased significantly in the past half century, both in terms of the quantity and value of products and commodities traded. Today, of every 100kg of food produced, 17kg is traded internationally, increasing to 50kg and 56kg for nuts and oils respectively.

Food that is traded is critically important to both producers and consumers. For countries with a production deficit, imports make a vital contribution to the food supply.



A recent OECD report highlights the expanding role of LMICs as major agro-food exporters and importers, with Brazil, Russia, India, Indonesia, China and South Africa leading the way. Between 2000 and 2016, LMICs' share of world agricultural exports rose from 29% to 39%, while their share of world agricultural imports grew from 21% to 32%.

A more extreme example is Singapore which imported over 90% of its food in 2018. In the same year, it was listed as the world's most food secure country.



Growth in food exports during 1993-2016 was greatest in regions with the highest levels of malnutrition: South Asia, sub-Saharan Africa, and Latin America, Central America and the Caribbean.

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Trade

Recommendations

1. **Policymakers should be especially alert to the effects of trade policies on the importing of processed foods, with special attention paid to ultra-processed foods.** Processed foods may be particularly conducive to trade, as they are often less perishable than fresh fruit and vegetables.
2. **Specific traded foods should only be viewed as 'healthy' or 'unhealthy' within the context of a national or local diet.** For example, notwithstanding the above comments about ultra-processed foods, consumption of imported processed nutritious foods with an extended shelf life can be beneficial.
3. **Close attention should be paid to policies that influence relative prices of foods within their country's markets.** In particular, policymakers have the opportunity to consider trade policies to shift incentives and relative prices in ways that support higher consumption of nutrient-rich, rather than nutrient-poor foods.
4. **High priority should be given to trade policies that help specifically to increase the availability and therefore reduce the price of nutrient-rich foods, as this can particularly benefit the poor.**
5. **Food trade can be especially beneficial in managing price volatility and risks associated with climate change.** Governments should resist the imposition of export restrictions at times of sharp food price spikes, and look instead to lowering tariffs and VAT to encourage trade flows. Food price volatility is a growing concern because of the effects of climate change and extreme weather events on crop production.
6. **Export of high-nutrient foods is not necessarily undesirable and should be considered in the overall context of the nutrient value and affordability of food imports.**
7. **The incidence of informal trade should be a particular focus for policymakers.** This can lower the efficiency of health, safety and environmental protection policy measures, as well as measures to prevent the spread of animal diseases.
8. **Policymakers should pay close attention to trade agreements which embody strong investor protections, as they can be particularly problematic.** These protections may introduce substantial changes to regulatory regimes, enabling significant impacts on domestic policy.
9. **Countries can circumvent the risks of trade agreements with strong investor protection (see 8 above) by aligning nutrition-focused trade policies with WTO rules and making (i) policies non-discriminatory on domestic and foreign products, and (ii) using domestic policy rather than trade policy to address some diet quality issues.**
10. **Consideration needs to be given to imports from countries which apply less stringent social and environmental protection policies in order to evaluate the long-term effects on domestic production.** While such imports may, in the short term, help to improve food security and be relatively cheap, accompanying measures may be needed to protect domestic producers against unfair competition.
11. **There is an urgent need for policy measures which encompass international supply chains to promote the sustainable production of nutritious foods for high-quality diets.**

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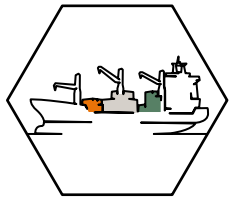
Trade

Policy Examples

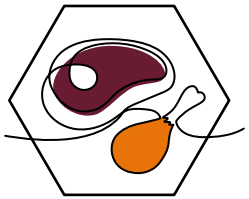


Increased food availability

In a study of 151 countries spanning all income levels, trade openness (calculated as the volume of trade (real exports plus imports) over real GDP) was found to have beneficial effects for dietary energy supply, dietary diversity and diet quality.

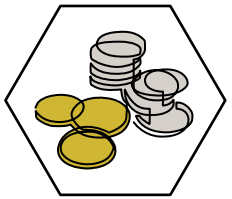
Easing import duties on staples

In the aftermath of the 2007/8 food price crisis, many countries implemented trade policy measures aimed at reducing food prices for consumers. These included lowering tariffs and VAT to facilitate trade and promote price stability. For example, Nigeria cut duties on rice imports from 100% to 2.7%, the Republic of Congo reduced VAT levied on a range of basic imported foods from 18% to 5%, and Kenya removed VAT on rice and bread entirely.



Food standards policy in Ghana

In the early 1990s, in response to health concerns about fatty meat and rising meat imports, Ghana implemented a food standards policy to reduce the availability of low quality, high-fat meats in its food supply. Collaboration between the Ministries of Trade, Health and Agriculture led to the development of evidence-based standards which applied to both imported and domestic meat and were therefore 'non-discriminatory' and 'not more trade-restrictive than necessary', in accordance with WTO rules.



Fiji's import duty on palm oil

The government of Fiji recently approved an import duty of 32% on palm oil to curb saturated fat intakes, and address high levels of obesity and heart disease, meeting with very little opposition. This duty increase was within the WTO-bound tariff rates, reducing the scope for contestation on trade grounds. Subsequent analysis of this policy suggests that Fiji represents a small market share for palm oil exporters, and this is likely to have contributed to the lack of criticism or contestation.

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Optimising the benefits from subsidies

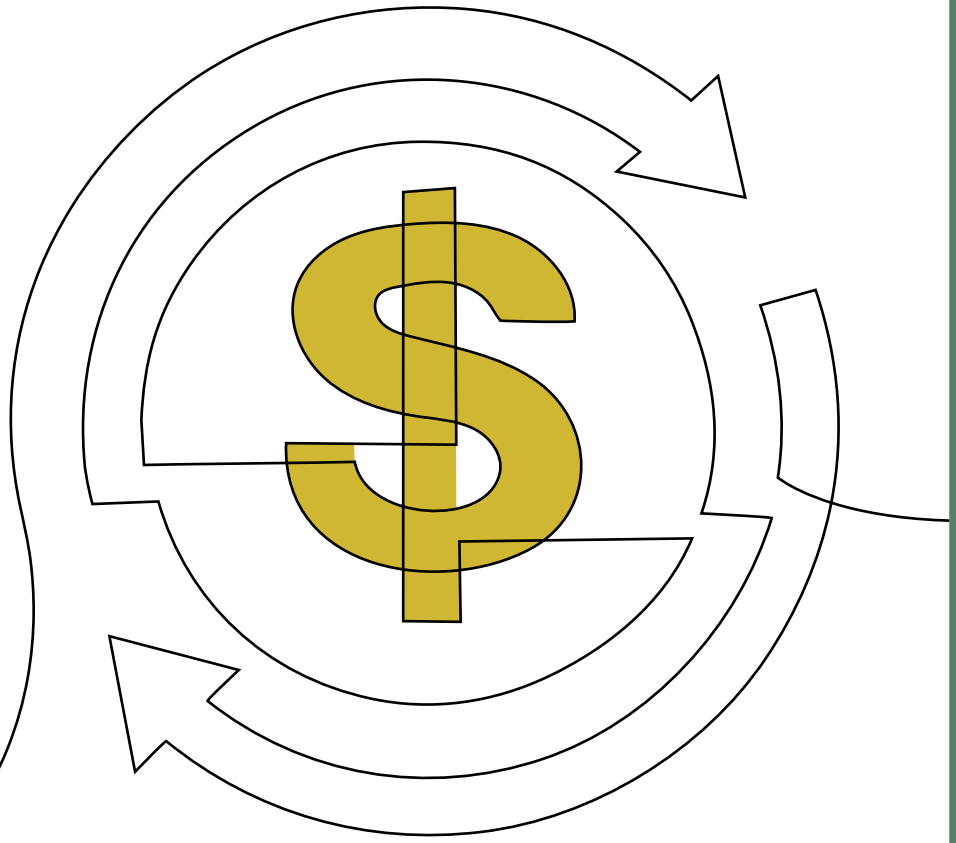
Evidence

New modelling demonstrates the potential benefits that could be unlocked if Africa's policymakers consider repurposing existing subsidies, and even increasing the overall level of subsidies provided.

The case for change is strong. Subsidies in sub-Saharan Africa (SSA) are driving greenhouse gas emissions and encouraging agricultural practices that degrade natural environments already under increasing stress. Today's subsidies also fail to deliver healthy diets for countless millions in Africa. This situation is unsustainable.

The new modelling work has shown the potential for agricultural subsidies to yield potential win-wins in terms of diets and health, the environment and economic growth. However, it also shows that repurposing subsidies needs to be done carefully – to avoid unintended consequences and to manage potential tradeoffs in outcomes.

For example, substantially scaling up subsides in SSA could create large income gains. But it is important to consider how increased subsidies are targeted in terms of health versus the environment. For example, coupling the additional subsidies in favour of producing nutrient-rich and relatively sustainable horticultural products could yield better health benefits but be worse for the environment compared with untargeted subsidies.



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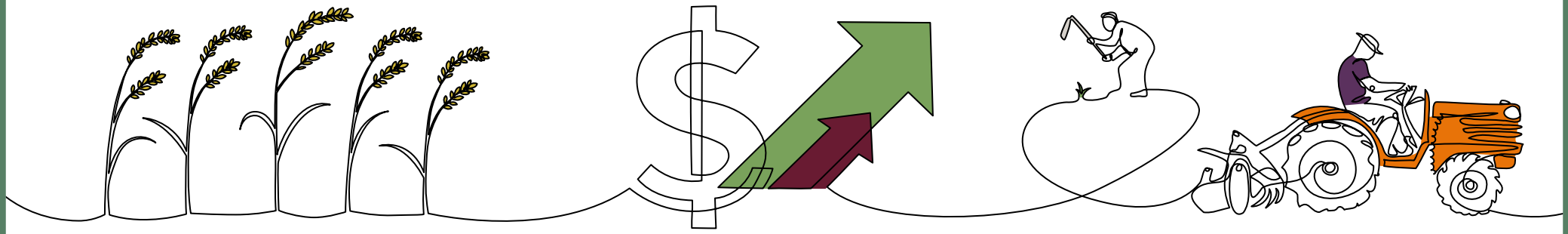
Optimising the benefits from subsidies

Key Facts

Worldwide, governments spend more than US$817 billion annually to support the agriculture sector. These mostly promote productivity-enhancing technologies, stabilise producers' incomes, and promote food security – especially for staple grains.

In 2015, sub-Saharan Africa spent an estimated US$680 million on agricultural subsides, in support of a sector that in 2016 contributed around US$291 billion to the continent's overall Gross Domestic Product (GDP). This is very low in comparison with OECD countries.

Current global governmental support for agriculture (including subsidies) delivers low value for money. Some studies argue that existing subsidies can favour wealthier farmers, causing a widening gap between the rich and poor.



There is considerable potential for existing subsidies to be repurposed to better promote the health of populations, to benefit the environment, and to support the incomes of farmers and the poor.

If agricultural support were to be increased in Africa in line with the Malabo Declaration, additional funds for subsidies, if appropriately focused, could support nutrition goals across Africa through better quality local diets.

Subsidies in high-income countries (HICs) also have substantial effects on agriculture in low- and middle-income countries (LMICs) – for example, by affecting the market prices for tradeable commodities, they influence the affordability of food and the incomes of farmers in those countries.

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Optimising the benefits from subsidies

Recommendations

Reallocating support within the agricultural sector should become a key consideration as countries seek to transform food systems.

An integrated policy approach is needed – support for agriculture needs to be considered within a broader context of other solutions for food system transformation.

Future investment priorities include research and development in the production of vegetables and fruits, and the development of supply chains using water-saving technologies.

Accompanying measures may be needed. For example, encouraging the production of nutrient-rich foods may need to be aligned with measures to influence consumer demand.

A nuanced approach is needed which addresses potential trade-offs – for example between nutrition and environmental priorities.

Diminishing returns may result if subsidies are increased beyond a certain point.

Multiple wins should be sought in agricultural subsidies – around diets and health, the environment and economic growth.

A sensitive approach is needed when repurposing subsidies to avoid potentially unintended consequences – many poor households as well as economic sectors depend on agricultural activity.

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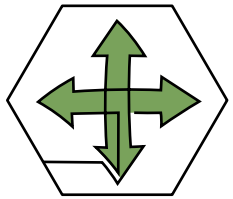
Optimising the benefits from subsidies

Policy Examples



Modelling scenarios

New modelling presented in the accompanying policy brief considers the outcomes of four contrasting scenarios – on production, consumption, economic indicators and environmental factors. The scenarios are:

A. Removing agricultural subsidies across sub-Saharan Africa (SSA).

B. OECD and major non-OECD countries abolishing their agricultural support payments.

C. Increasing subsidies in SSA in line with African leaders delivering on the Malabo Declaration to increase support for agriculture and rural development to 10% of GDP. In this scenario the subsidies are paid unconditionally.

D. Subsidies are increased in SSA in line with the Malabo declaration, but here they are focused on foods with beneficial health and environmental characteristics, such as fruits, vegetables, legumes and nuts.

Malawi

In 2005, Malawi introduced the Farm Input Subsidy Program (FISP), which distributes vouchers to poor agricultural households. The goal of FISP was to enhance food self-sufficiency by increasing smallholder farmers' access to and use of improved agricultural inputs, thereby boosting the incomes of resource-poor farmers. This program positively influenced the production of food. But it also showed that subsidy programmes, when accessible to those who need them, can also help address gender inequalities in the agricultural sector.

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Global Panel on Agriculture and Food Systems for Nutrition

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