



# Improving nutrition through enhanced food environments

Food systems are failing to deliver secure access to safe, high-quality diets for everyone. In this context, it is essential to improve food environments so that they can deliver a range of benefits: improved nutrition, healthier populations, and more productive economies. This brief considers current evidence on what works and provides recommendations for action that affect supply dynamics of the food system, aimed at both public and private sector actors.

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## ABOUT THE GLOBAL PANEL ON AGRICULTURE AND FOOD SYSTEMS FOR NUTRITION:

**The Global Panel is an independent group of influential experts with a commitment to tackling global challenges in food and nutrition security. It works to ensure that agriculture and food systems support access to nutritious foods at every stage of life.**

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# Executive Summary

Nutrition is a new global priority, reflected in the current UN-designated Decade of Action on Nutrition. The 2016 Foresight report of the Global Panel on Agriculture and Food Systems for Nutrition lays out the scale of the crisis: more than three billion people around the world are currently affected by malnutrition as a direct impact of low-quality diets. More than two billion have insufficient vitamins and minerals, and incidences of overweight and obesity are growing in every region. The latter are of particular concern, being responsible for the rise of diet-related non-communicable diseases (NCDs), including Type 2 diabetes, cardiovascular disease and certain forms of cancer.

The challenge for policymakers around the world is to implement the policies and actions that are needed to 'fix' today's food systems, which are failing to deliver secure access to safe, high-quality diets for everyone. In this context, it is essential to improve food environments so that they can deliver a range of benefits: improved nutrition, healthier populations, and more productive local economies.

The Global Panel's Foresight report emphasises that high-quality diets can only be achieved by implementing coordinated, nutrition-enhancing policies across the whole food system. Such actions represent a way for nations around the world to use quality diets as a key policy entry point for tackling all forms of malnutrition, from persistent undernutrition to overweight and obesity. This brief considers current evidence on what works and provides recommendations aimed at both public and private sector actors. They relate to actions that affect supply dynamics of the food system: namely, fiscal incentives; the marketing of key products to children; extending the reach of more nutritious reformulated products; improving the supply of nutritious foods; the provision of high-quality foods in public institutions; and better metrics and data on the quality of food environments. A separate brief will address demand-side dynamics. The need for diverse actors to work together: government authorities, agribusiness, food manufacturers and retailers, as well as wider civil society is also discussed.

“ This brief provides compelling evidence showing the huge opportunity for governments and the private sector to work together in the food environment to improve the nutritional quality of the food available on the market. ”

**Sir John Beddington, Co-Chair of the Global Panel, and former UK Chief Scientific Advisor**



# Introduction



Nutrition is a new global priority, reflected in the UN's newly-launched Decade of Action on Nutrition. The 2016 Foresight report of the Global Panel on Agriculture and Food Systems for Nutrition<sup>1</sup> sets out the scale of the crisis: more than two billion people suffer from a serious lack of vitamins and minerals, and over 200 million children are stunted or wasted, with undernutrition being attributable for the deaths of three million children under five every year<sup>2,3</sup>. At the same time, nearly two billion people across the world are now overweight or obese, fueling a rise in diet-related non-communicable diseases (NCDs), such as Type 2 diabetes, cardiovascular disease and certain forms of cancer<sup>4</sup>. In other words, one or more forms of malnutrition now affect every country on the planet<sup>5</sup>. While chronic undernutrition, including many vitamin and mineral deficiencies, has declined slowly, the rise of overweight and obesity has more than offset such gains.

The bottom line is that today's food systems are failing to drive improvements in nutrition; and, without decisive action, malnutrition will continue to grow in scale and impact. This will have severe implications for health. The risk factors associated with low-quality, less nutritious diets already pose a greater risk to health than unsafe sex, alcohol, drug and tobacco use combined<sup>1</sup>. Therefore, an urgent challenge for policymakers across the world is to ensure that people not only have enough food, but also have access to the right kinds of foods. Defeating hunger and undernutrition must now be aligned with new efforts towards preventing and reversing the rising prevalence of overweight, obesity and diet-related NCDs.

Low-quality diets underpin all forms of malnutrition. Diet quality is influenced by the *food environment*, defined as the interface that mediates the acquisition of foods to people within the wider food system<sup>6</sup>. Food environments consist of the collective physical, economic, policy and socio-cultural

surroundings, opportunities and conditions<sup>7</sup> which create everyday prompts, shaping people's dietary preferences and choices as well as nutritional status<sup>8</sup>.

Key dimensions of food environments include food availability, accessibility, affordability, desirability and convenience<sup>9</sup>, as well as vendor and product properties, and promotional information<sup>6</sup>. Recent frameworks have built on existing conceptual work<sup>10</sup> by mapping these dimensions to personal and external food environment domains, reflecting the reality that food acquisition is the result of complex socio-ecological interactions between people and their wider environment<sup>6</sup>.

In this policy brief, the Global Panel explains why policymakers in low- and middle-income countries must focus anew on efforts to promote food environments which are more supportive of high-quality diets to enable better nutrition and health for all<sup>11</sup>. It draws important lessons from past actions that some governments and private sector actors have taken to improve nutrition. It highlights evidence that can contribute to increasing the foods available in people's food environments, facilitating improved diet quality. And it gives recommendations on actions and interventions which should be taken and implemented, by both public and private sector actors, in the fast-moving, dynamic and globalised environment that characterises today's food systems.

The brief specifically considers supply-side factors that shape food environments, for example policies affecting food product composition, labelling, commercial product promotion, relative prices, provision in public institutions and trade. A subsequent brief will consider policies and interventions directed at demand-side factors, such as consumer education, consumption smoothing, and choice. Both aspects are equally important and should be considered together by policymakers.

# How the food environment relates to the food system

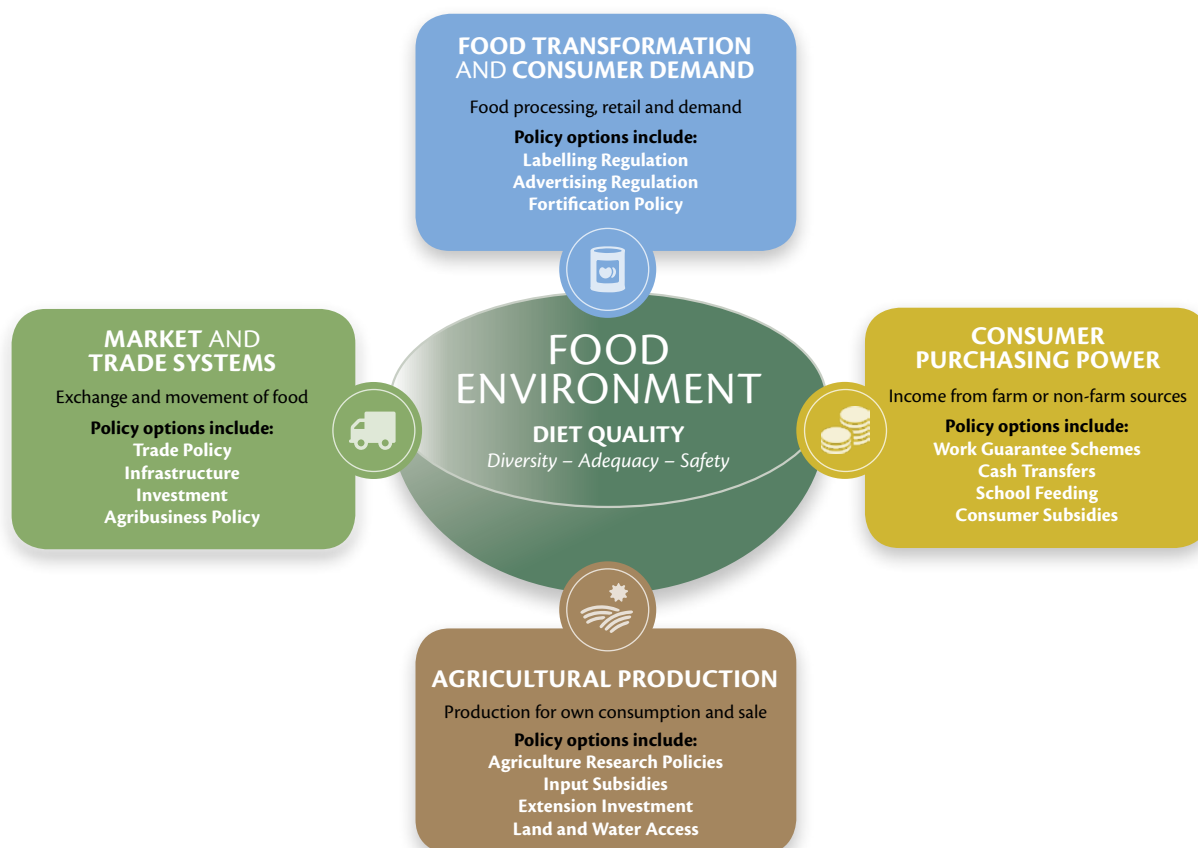
Food and nutrition policies should, at a minimum, be supportive of food environments in which all people can access a high-quality diet. There is a consensus that a nutritious, high-quality diet should include a diversity of foods which are safe, providing appropriate energy and macronutrients (e.g. protein, fat and carbohydrate) as well as essential micronutrients. A high-quality, nutritious diet, as recommended by the World Health Organization (WHO) is characterised as being low in sugar, processed meats and salt, with plenty of fruits and vegetables, wholegrains, fibre, nuts and seeds. Replacement of saturated and industrial trans-fats with unsaturated fats is advised<sup>12</sup>. These product and nutrient specifications are rapidly being incorporated into many of the world's national food-based dietary guidelines (FBDG).

As shown in Figure 1, the food environment is influenced by actions and policies across the food system; these collectively determine the availability, accessibility, affordability, and

desirability of foods to consumers<sup>2</sup>. Ensuring strong institutional and technical (human resource) capacities to enable effective policy implementation will be an essential first step in moving forward to address the challenges of improving food environments and nutrition.

Together, actions in all of the four domains of the food system – driven by a host of independent agents – create a complex food environment which can be evaluated in terms of one key outcome: the quality of dietary choices available to consumers. In previous briefs, the Global Panel argues for specific policy interventions in agricultural production, market and trade systems, as well as consumer purchasing power that can contribute to a healthier food environment. They include recommendations for policymakers on, for example, biofortified crops<sup>13</sup>, food price volatility<sup>14</sup>, and school feeding programmes<sup>15</sup> which can increase the availability, affordability and access to nutritious foods respectively.

**Figure 1: Conceptual framework of links between diet quality and food systems<sup>2</sup>**





# How changing food systems are reshaping food environments

Today, the global food system, and many national food systems, are failing to support the development of national and local food environments which adequately promote good nutrition and health. While the average per capita food supply worldwide increased from 2,200 calories/cap/day in 1960 to 2,800 calories/cap/day in 2009<sup>16</sup>, malnutrition is growing in every country, rich and poor.

Food environments are changing fast, particularly in low- and middle-income countries. For many of their consumers, dietary patterns comprised of minimally-processed food, which they grew themselves or purchased from local markets, are no longer the norm. Low-income populations in low- and middle-income countries are increasingly incorporating ultra-processed food products into their diets (i.e. foods high in fat, sugar, salt, and calories, with little nutritional value) (Box 1). The amount of money spent on soft drinks, ready-to-eat meals, snacks and ice cream has also increased dramatically. For example, between 2007 and 2012, this rose by 75% in Brazil, 50% in Colombia, 42% in Thailand and 15% in South Africa<sup>17</sup>.

Many of the 'short food chains' that characterise rural low-income food environments have already begun to include products derived from long supply chains – foods that are sourced from greater distances, even internationally. Agricultural commodities are now more likely to be processed or reformulated on a long journey to retail markets<sup>18</sup>.

The changing food environment, therefore, increasingly reflects substantial changes to fresh and processed foods available to consumers. The Global Panel's Foresight report, draws together evidence on these changes. It shows that

## Box 1: Ultra-processed food products

The term 'ultra-processed food products' (UFPs) was coined to refer to industrial formulations manufactured from substances derived from foods or synthesised from other organic sources. They typically contain little or no wholefoods, are ready-to-consume or heat up and are fatty, salty or sugary and depleted in dietary fibre, protein, various micronutrients and other bioactive compounds.

Examples include: sweet, fatty or salty packaged snack products, ice cream, sugar-sweetened beverages, chocolates, confectionery, French fries, burgers and hot dogs, and poultry and fish nuggets. (The full list can be found in Annex 4 of the Foresight report<sup>1</sup>). It is important to note that the extent to which UFPs affect a diet depends on how much they are consumed relative to other, nutritious dietary components.



in most low- and middle-income countries, fruit and vegetable availability cannot meet the population's recommended intakes of 400g/day, and the availability of pulses has declined<sup>1</sup>.

The production and sale of ultra-processed food products has increased globally, particularly in low- and middle-income countries. For example, 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. Fifteen years later, they were more than half<sup>19</sup>.

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<sup>20</sup>. These investments have played a role in shaping the market for ultra-processed foods. Although the data are limited, it is reasonable to assume that availability and consumption of these products will continue to increase in low- and middle-income countries<sup>21</sup>.

Changes in food prices can also influence what consumers purchase and consume. Evidence suggests that the cost of nutritious foods in the diet has risen more than that of energy-dense processed options in high- and upper-middle-income countries, encouraging the consumption of low-quality diets. For example, 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<sup>22</sup>.

Rising income is allowing households in low- and middle-income countries to access more food, as well as a greater diversity of foods. While this is key to ensuring a high-quality diet, more income also brings with it access to a greater quantity and variety of ultra-processed food products that do not contribute to improving diet quality. For example, as national income increases, the consumption of fruits, seafood and milk all rise, as does the amount of polyunsaturated fats in the diet. But vegetable consumption declines, as does intake of fibre. Similarly, rising incomes bring greater consumption of red meat, fats and oils, processed meats, sugar-sweetened beverages, and sodium<sup>23</sup>. In other words, there is now compelling evidence that both 'good' and 'bad' diversity in diets is associated with rising income<sup>24</sup>.

Simply allowing the current market forces that are driving the global food system to continue with 'business as usual' trends will, according to the Global Panel's Foresight report, result in a continued pattern of malnutrition and ill-health. Changes in global, regional and national policies, investment patterns, technologies, and infrastructure are needed now to ensure that food environments around the world – and especially those in low- and middle-income countries – are transformed in ways that promote greater diversity, availability, affordability and safety of nutritious foods.



# Actions to shape the food environment for improved diets and nutrition

How can policymakers decide what actions will be effective to shape the food environment for improved diets and nutrition? How can they be prioritised? As highlighted by the Foresight report, a first step before deciding on actions for improving diet quality, is for policymakers to identify the 'gap' between what people are eating and the high-quality diets that would reduce malnutrition and promote health. This process involves working backwards through the food subsystems, taking the population and food systems characteristics into account, to identify realistic actions that could address the gaps.

Most of the empirical evidence currently available on food policies aimed at enhancing diet quality is derived from interventions in high- and middle-income countries, rather than in low-income countries<sup>25</sup>. However, for all countries, a key principle is that all food-based solutions to nutritional problems must be adapted to the needs and abilities of a particular target group, and should be flexible enough to meet the variation relating to different age groups, or different socio-economic classes. This requires an understanding of the current quality of diet of a given population, to compare with appropriate and up-to-date FBDC.

The globalisation of food systems and economic growth in low- and middle-income countries is leading to more diversified markets and retail environments, more availability and consumption of processed foods and more intense food marketing initiatives<sup>1</sup>. Low-income countries have recognised the need for governments to play a new role in: facilitating the supply of value-added, often traded products that are in

high demand among urban populations; legislating food quality and safety requirements; regulating industry food processing standards linked to product development, and labelling and advertising. In other words, poverty reduction around the world has fuelled rapid shifts in global food systems, which are reducing differences between lower- and higher-income countries.

There are numerous public and private sector opportunities to intervene in the food system, beyond promoting food output, where the goal is to improve consumers' ability to access food that is nutritious and affordable. The following section presents evidence of the effectiveness of a range of policies and actions that can help shape the food environment for improved nutrition and health outcomes.

## Economic instruments and fiscal measures

Food prices are an important driver of dietary choice. They are the result of costs incurred throughout the supply chain, adjusted for profits, risks, and market advantage of the private businesses operating in the system. Perceived 'affordability' of food items in the marketplace exerts a significant influence on what people purchase and eat.

Governments have responded to peoples' economic inability to purchase the foods they need by: imposing controls on retail prices by fiat; intervening directly in markets to ensure 'fair' prices, especially of staple grains; or redistributing general revenues to provide targeted income support to nutritionally-vulnerable



populations as part of social protection policies. Few governments have used fiscal or price-control measures to influence food prices selectively to improve nutrition and health outcomes<sup>26</sup>.

Evidence suggests, however, that fiscal measures, mainly through taxes and subsidies applied to food, could contribute to improving nutrition and health by influencing what consumers buy and consume<sup>27,28</sup>. Positive effects of fiscal policies can be amplified if a target food tax is combined with a subsidy on nutritious foods, for example fruits and vegetables or other specific foods<sup>8</sup>. As such, price policies have been considered as an important tool to address the main barriers to the consumption of nutritious foods and to protect health<sup>29</sup>.

“Middle-income countries now buy more than half of the world’s ultra-processed food. If we want people to consume high-quality diets, we have to work on implementing fiscal policies and promote new behaviours.”

**Prof. K. Srinath Reddy, President of the Public Health Foundation of India, and Panel Member**

#### *Taxing less nutritious foods*

Systematic reviews suggest that taxes on less nutritious foods and drinks, for instance those high in saturated fats, sugar and salt, are associated with beneficial dietary change at the population level, and have the potential to lead to positive nutrition and health outcomes<sup>30,31</sup>.

The use of tax to discourage the consumption of sugar-sweetened beverages and ultra-processed foods has been implemented in Mexico, Hungary (see Box 2) Finland, France, Norway, and some states of the USA. A recent systematic review has shown that taxes on sugar-sweetened beverages consistently decrease their consumption<sup>35</sup>. An evidence gap that still needs to be addressed is to quantify the impact of a ‘sugar-sweetened beverages tax’ on improving body weight and other diet-related health risk factors.

Taxing foods high in saturated fats, sugar or salt may also create incentives for the private sector to modify their products to produce more nutritious items that can be marketed successfully. For instance, after introduction of the Public Health Product tax in Hungary, 40% of food producers carried out product reformulation (Box 2)<sup>36</sup>.

Many of these policy initiatives have been directed at diet-related overweight, obesity and NCDs in the food environments of high-income countries. However, they are increasingly relevant to low- and middle-income country settings, where diet and health patterns are converging on those of high-income countries. If the direction of current food system policies remains the same, estimates indicate that by 2030, the number of overweight and

### **Box 2: Taxing less nutritious foods in Mexico and Hungary**

In 2014, the Mexican government implemented two taxes: (1) an excise tax on sugar-sweetened beverages and (2) a sales tax on several highly energy-dense foods<sup>32</sup>. 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. The post-tax trend in purchases of untaxed beverages, mainly related to bottled water, were 4% higher than the pre-tax trend over the same period<sup>33</sup>.

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. In 2014, an impact assessment showed that 16-28% of consumers of PHPT products changed their consumption habits in response to the introduction of the tax. From those, 7-16% chose a cheaper, often more nutritious product; 5-16% consumed less of the PHPT product and 5-11% changed to another or substituted other food (often a more nutritious alternative)<sup>34</sup>.

### **Box 3: The main lessons from countries that have introduced taxes on target foods<sup>27,18</sup>**

- The design of any tax should be logical and based on a clear public health rationale;
- Health and consumption impacts should be estimated before implementation of taxes, and monitored and documented after;
- To have a noticeable impact on consumption patterns, tax rates must not be too low – evidence shows the strongest effects for sugar-sweetened beverages occurred in the range of 20-50%, and for fruit and vegetables subsidies in the range of 10-30% to reduce and increase consumption, respectively;
- Taxing a single food or ingredient may not lead to an improvement in diets since people can increase consumption of other similarly less nutritious items.

obese adults in China will have increased by 51.2%<sup>37</sup>, while Bangladesh will have more adults with Type 2 diabetes than Mexico and Indonesia. The number of people with Type 2 diabetes in Nigeria is forecast to double from 3.1 million to 6.1 million between 2011 and 2030<sup>38</sup>.

### Subsidising nutrient-rich foods

Food subsidies have mainly been applied by countries to enable affordability of staple foods among low-income populations, supporting access mainly to calories, rather than a range of nutrients. Although subsidised staple foods such as rice, maize and bread can provide an essential safety net for food-insecure populations, they can also promote a monotonous diet with inadequate micronutrient content and excessive energy<sup>18</sup>.

Beyond the food subsidies that have been applied to increase the consumption of staple foods, other types of food price interventions can be used to promote high-quality diets. Evidence on the implementation of vouchers, financial incentives and 'fruit and vegetable boxes' in high-income countries has shown that subsidies on more nutritious foods significantly increased the purchase and consumption of promoted foods within low-income groups<sup>39,40</sup>.

In the USA, the "Healthy Incentives Pilot", a retail-based subsidy programme, implemented with the aim of making fruit and vegetables more affordable for participants of the Supplemental Nutrition Assistance Program (SNAP), had positive impacts on targeted fruit and vegetable consumption. Participants in the programme who received an incentive of 30 cents for every dollar they spent on targeted fruits and vegetables consumed 25% more of these food items each day, compared to those not enrolled<sup>41</sup>. In South Africa, a 10% cash-back rebate programme for nutritious foods led to an increase of 5.7% in fruit and vegetables purchased, and a 5.6% decrease in the purchase of less nutritious foods, as a proportion of total food expenditure<sup>42</sup>.

Other studies have shown modest impacts of subsidies on the purchase and consumption of more nutritious foods<sup>43</sup>. This may be related to the size and nature of the subsidy, or the suggestion that subsidies are more effective when combined with targeted food taxes<sup>8</sup>. For example, although a consumer price subsidy of pulses, implemented by four Indian states through the Public Distribution System (PDS) significantly increased their consumption, the size of the effect was not large enough and the subsidies induced substitution with other food items<sup>44</sup>.

While the evidence on the impact of subsidies on the consumption of higher-diet quality is generally positive in high-income countries, more rigorous data are required to understand their effects on diet quality and health in low- and middle-income countries.

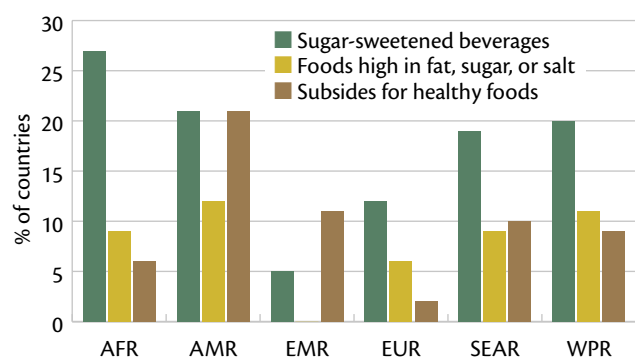
### Challenges in implementing fiscal measures

Only a small number of countries use economic incentives as a public health tool (Figure 2)<sup>26</sup>. This is despite the WHO recommendation to governments to apply fiscal measures as part of its Global Action Plan on the Prevention and Control of NCDs; the WHO Comprehensive Implementation Plan on Maternal, Infant and Young Child Nutrition; and, more recently, by the WHO Commission on Ending Childhood Obesity<sup>45</sup>.

Figure 2 shows that fewer than 27% of countries, across all regions, implemented taxes on sugar-sweetened beverages and foods high in fat, sugar and salt in 2015. The figures are even lower for subsidies and incentives in high-quality foods. Apart from the WHO Region of the Americas (AMR) and the Eastern Mediterranean Region (EMR), fewer than 10% of countries in all other regions used food subsidies as a policy tool to promote the consumption of more nutritious foods.

Countries also face other challenges that can act as barriers to implementing fiscal measures (Box 3). These include taxes set at levels that are too low to influence behaviour, a lack of capacity for tax administration, or a lack of resources to monitor and evaluate health impacts. These barriers can be even more significant in low- and middle-income countries because of lack of data and investment.

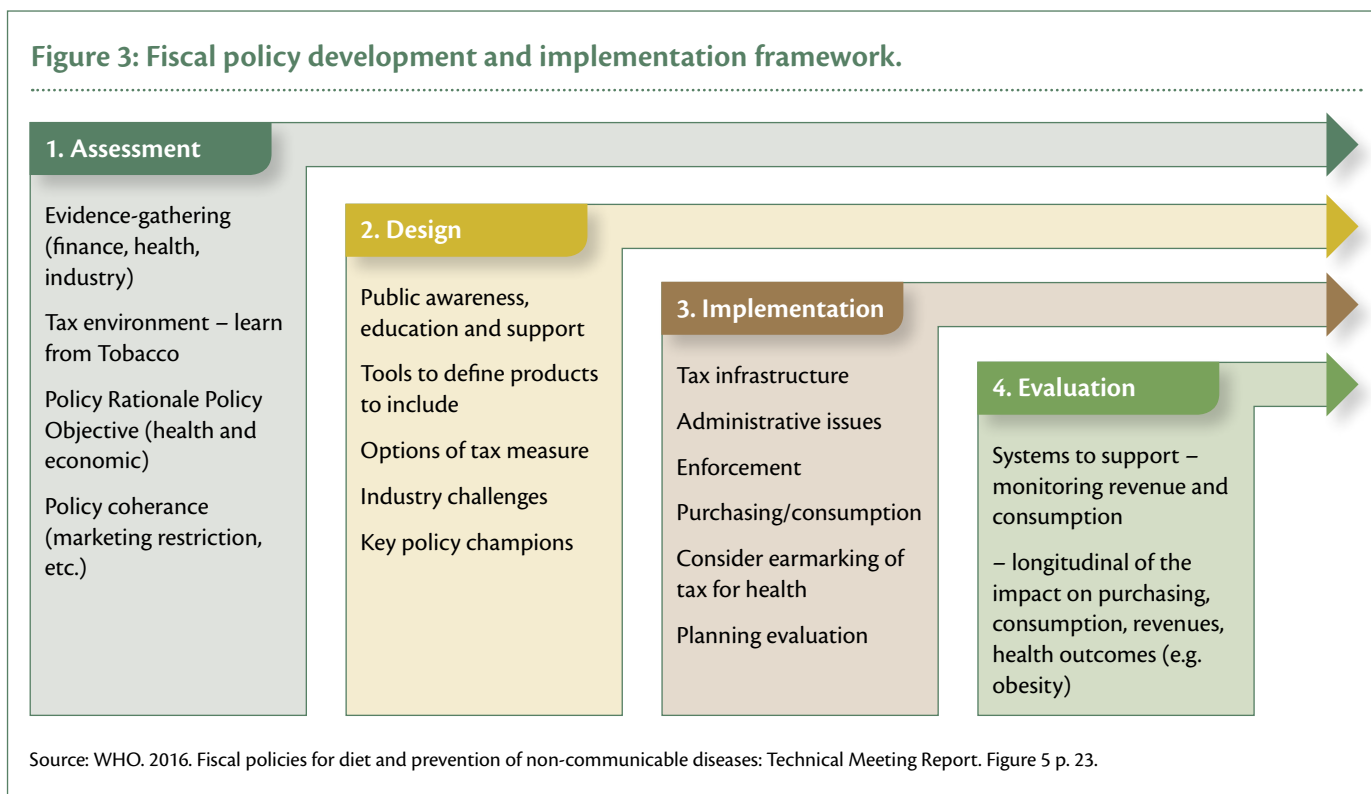
**Figure 2: Percentage of countries implementing fiscal interventions by category, by WHO region in 2015<sup>i</sup>.**



Data Source: WHO. 2016. Assessing national capacity for the prevention and control of non-communicable diseases: Report of the 2015 global survey. Figure 4 p. 32.

<sup>i</sup>AFR: WHO African Region; AMR: WHO Region of Americas; EMR: WHO Eastern Mediterranean Region; EUR: WHO European Region; SEAR: WHO South-East Asia Region; WPR: WHO Western Pacific Region. Total number of countries/number of responding countries/response rate: AFR: 47/ 35/ 75%; AMR: 35/ 34/ 97%; EMR: 21/ 20/ 95%; EUR: 53/ 52/ 98%; SEAR: 11/ 11/ 100%; WPR: 27/ 25/ 93%. Trends in national capacity for NCDs were derived from comparing the results of the 2015 survey with those from the capacity surveys conducted in 2013 and 2010 by WHO. Figure 2 demonstrates the number of countries that indicated they have implemented fiscal measures.

**Figure 3: Fiscal policy development and implementation framework.**



The WHO has produced a framework to help support fiscal policy development for nutrition of which evaluation of the impact of economic instruments is a key component (Figure 3).

### Restricting food advertising and product promotion

Advertising and marketing in the food system is a powerful behaviour change mechanism which attracts heavy investment from the private sector, charities, civil groups and governments. The amount that food and beverage companies invested in advertising accounted for 17% of all global media spending in 2012<sup>46</sup>. Most of the research and policy action on food marketing has focused on the advertising of foods to children.

#### Advertising to children

Evidence from systematic reviews demonstrates that advertising and other forms of food marketing to children can directly influence their food preferences<sup>47,48,49</sup>. Despite WHO recommendations<sup>50</sup>, 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<sup>5</sup>.

The 2016 Access to Nutrition Index reports that 16 of the 22 largest food and beverage companies worldwide committed to either not advertising any foods to children under 12 or to restrict marketing to more nutritious foods. However, there is a need to measure whether these commitments are being

implemented effectively and the impacts that they have achieved. Similar commitments have not been made to children over 12 and consequently this group is being exposed to, and influenced by, marketing of less nutritious foods<sup>51</sup>. The Index also reports that the breast-milk substitutes policies and practices of the six companies assessed, which accounted for USD 33.7 billion of global baby food sales, did not meet the recommendations set out in the International Code.

The full impact of policy interventions to restrict the marketing and advertising of less nutritious foods to children on their subsequent dietary choices and later health indicators has not been fully evaluated. But there are good examples where governments have successfully implemented multi-sector legal marketing frameworks to promote high-quality diets.

In 2015, Chile adopted the most comprehensive marketing restriction law in the world to date (Law No. 20,606)<sup>52</sup>. Since the law was implemented, food companies have been required to place front-of-package labels on foods and beverages that are high in sugar ( $\geq 10\text{g}/100\text{g}$ ), sodium ( $\geq 400\text{mg}/100\text{g}$ ), saturated fats ( $\geq 4\text{g}/100\text{g}$ ) and energy ( $\geq 275\text{kcal}/100\text{g}$ ). The law prohibits the advertising and marketing of these target foods to children aged 14 and younger. Further, these foods are not to be sold, marketed, promoted or advertised within establishments of preschool, primary or high school education<sup>53</sup>. Subsequent evaluation of this comprehensive strategy in terms of its impact on the quality of diets and health outcomes will be essential.

In South Korea, TV advertising of target food products to children under 18 years of age is prohibited during and after programmes shown between 5-7 pm 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<sup>54</sup>.

The governments of Mexico, Denmark and Latvia have also developed, together with the food industry, codes for 'responsible' marketing to children. These include, for example, restricting the commercial promotion of foods high in sugar, salt and fat, mainly by adopting laws that prohibit various forms of advertising through television, internet, videogames and product placements<sup>55</sup>.

#### *Actions by the public and private sector to promote better food choices*

In addition to measures to influence advertising to children, there are other opportunities for public-private partnerships to promote higher-quality diets through advertising and marketing.

Multinational companies are well placed to play an active role, which can span across many countries, for example, through sales of similar products in different markets. Access to high-quality diets could be improved if international organisations and governments together established global norms to regulate food advertising and product promotion by these businesses.

One possibility at national level would be to establish a single policy on marketing, applied to all media channels in which firms

operate and prioritising more nutritious foods in their marketing investments<sup>50</sup>. Part of the success in South Korea in maintaining nutritious traditional diets and keeping rates of obesity and NCDs at much lower levels than in other countries has been through the use of industry-developed social marketing techniques to promote the consumption of relatively nutritious traditional food<sup>9</sup>.

A further example of public-private partnerships to promote more nutritious food is from the UK. Here the Food Standards Agency's salt reduction campaign reduced the average salt intake of the UK population between 2003 and 2007 by approximately 10%. This initiative consisted of a public campaign to raise consumer awareness, working with the food industry to reduce levels of salt in foods, and front-of-pack labelling to provide additional information to consumers on the levels of salt (and other nutrients) in food<sup>56,57</sup>. The public campaign increased awareness of the benefits of reducing salt intake on health, with 43% of adults in 2009 claiming to have made a special effort to reduce salt in their diet compared with 34% of adults in 2004, before the campaign commenced.

It is important to underline the critical role of public authorities to ensure adequate capacity to provide effective monitoring and enforcement of regulations on food advertisements and product promotion. This appears to be an area of under-investment in some regions. For example, several countries in Africa have implemented policies to restrict marketing and advertising but the capacity to monitor efficacy remains low<sup>26,27</sup>.





## Food transformation and processing

Food transformation is the process by which foods are turned into consumable products. Although many crops such as roots, fruits and vegetables can go almost straight from field to retail, there is a lot of waste and loss in the supply chain for fresh, perishable products. Poor infrastructure availability (energy for chilling, freezing; roads and ports for rapid transport; good information services to allow for rapid border crossing) and seasonality are also factors with which many low- and middle-income countries have to deal<sup>1</sup>. How food is processed can also influence its nutritional quality and the form in which it is available for consumers<sup>1</sup>.

The diversity of processing techniques can have mixed implications for diet quality. Some forms of processing can help increase food availability, extend seasonality and make food safer to eat. Food fortification can also add nutritional value (Box 4). Yet processing can also lower the nutritional quality of products by, for example, producing trans-fats from soya oil, and ultra-processed foods from a range of different ingredients so they become energy-dense, high in free sugars, fats and salt, and low in dietary fibre<sup>59</sup>.

From the perspective of generating policy impact in the food environment to explicitly improve diet quality, two key entry points in the food transformation subsystem are fortification and reformulation.

### Food fortification

Food fortification has proven to be an effective strategy to address micronutrient deficiencies in many countries<sup>60</sup>. Biofortification, which is the process of improving the nutritional quality of food crops through agronomic practices, conventional plant breeding, or modern biotechnology, also has the potential to complement programmes that add micronutrients to foods during processing<sup>13</sup>.

### Box 4: The importance of preserving leafy African vegetables

Leafy green leaves of cassava, sweet potato, papaya and pumpkin are widely eaten in Africa because of their nutritious content, taste and low cost. As such, they can play an important role in helping to reduce hunger and malnutrition but need to be preserved correctly as they are highly perishable. Improved technologies for drying, such as solar dryers, are becoming more common, allowing produce to retain higher quantities of vitamins than through traditional sun drying. These driers can also be valuable in preserving surpluses of other home-grown nutritious foods, particularly vegetables and fruits<sup>58</sup>.

### Box 5: Mandatory fortification: salt iodisation

Iodine is essential for the synthesis of thyroid hormones, which are involved in growth, development and control of metabolic processes in the body. Iodine deficiency can cause goitre, but it may also result in irreversible brain damage in the foetus and infant, and retarded psychomotor development in children<sup>61</sup>. Salt iodisation is the preferred strategy for control of iodine deficiency disorders.

According to the FAO, "salt iodisation can reach 80 to 90 % of a target population at an annual cost of approximately USD 0.05 per person, while fortification of flour with iron can reach up to 70 percent of a target population for about USD 0.12 per person"<sup>18</sup>. For example, the Government of Uganda has banned the importation of non-iodised salt, and 95% of all households now consume iodised salt<sup>62</sup>.

## Box 6: Food fortification in Senegal

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, in order to address key micronutrient deficiencies in the population. For example, half of women of reproductive age are at high risk of inadequate micronutrient intake. An impact evaluation of fortification conducted by GAIN in Senegal in 2014 demonstrated that 85% of women in reproductive age were consuming flour with added iron and 73% using cooking oil fortified with vitamin A at least once a week<sup>63</sup>.

## Box 7: Food Fortification in Uganda

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. Other food companies, such as those producing sugar, have also expressed a desire to participate in food fortification<sup>62</sup>.

The mandatory fortification of wheat flour with folic acid and salt iodisation illustrates what can be achieved (Boxes 5 and 6). These fortified foods have helped reduce birth defects and brain damage, respectively, in many countries<sup>13</sup>.

Fortifying widely-consumed foods involves public-private partnerships and can be an economically efficient way to treat micronutrient deficiencies. Fortification technologies can easily be applied by small-scale food processors who are able to reach the most vulnerable people and remote areas in low- and middle-income countries, mainly through wet markets and small retail outlets (Box 7)<sup>18</sup>. However, the public sector needs to set local nutrition priorities and regulations to monitor the safety and compliance of fortification.

Fortification should not be thought of as a substitute for a well-balanced and diverse diet, but as a complement. The need for fortification should decline as diet diversity increases, as education levels improve and incomes rise. However, with 2 billion people globally facing critical micronutrient deficiencies, these nutrient-specific interventions using cost-effective food vehicles to deliver essential nutrients should still be an option for consideration.

The Global Panel has already recommended that, for effective food fortification, public-private partnerships need to set appropriate standards, establish monitoring mechanisms, and investigate new ways to process and package nutrient-rich, affordable foods<sup>13</sup>.

### *Product reformulation*

Over time the food industry has added and removed ingredients, and therefore nutrients, from food products in response to various drivers, including public health recommendations, regulatory actions and consumer demand<sup>64</sup>.

One policy that has been broadly implemented by the food industry, working with governments, is sodium/salt reduction. This is an important and cost-effective way of reducing the risk of cardiovascular diseases and hypertension. For example: 46% of adults aged 25 and over suffer from hypertension in sub-Saharan Africa<sup>65</sup>. A review of policies to encourage the food industry to reduce salt in food found that 59 countries had initiatives in place, while a further 12 reported future plans to do so<sup>66</sup>. In Argentina, the government adopted a law on mandatory maximum levels of sodium permitted in meat products, soups, seasoning mixes, bread and starch products and tinned foods. This led to a rapid response from the food industry and between 2011 and 2015, average daily salt intake fell by 2 grams per day, from 11.2 to 9.2 grams<sup>5</sup>. The WHO is supporting African countries in their efforts to reduce salt intake through the provision of technical support and in the development of guidelines, policies, norms and standards. The aim is to improve the implementation and monitoring of relevant initiatives, and to reduce salt intake by 30% by 2025.



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Denmark's "Whole Grain Partnership" is another example of a public-private partnership, which aims to encourage the consumption of wholegrains. Partners included businesses, government, retail and trade. One of the main outcomes of this initiative was the development of new wholegrain foods with low levels of fat, sugar and salt, identified by a logo. Through this partnership, the consumption of wholegrains within the Danish population increased substantially, from 36g to 63g per day between 2004 and 2013<sup>67</sup>.

These examples follow the WHO guidance on nutritious diets, specifically on limiting salt intake and stimulating the consumption of wholegrains, and demonstrate that the reformulation of foods can lead to positive diet-related outcomes. There is a huge opportunity for governments and the private sector to work together to improve the nutrient profile of foods available to consumers in their food environment.

## Food labelling

At the very least, the main influence of food labelling on diet quality has been to encourage the food industry to reformulate foods<sup>8</sup>. Food labels are produced through voluntary or mandatory codes developed between the food industry and policymakers, and can inform consumers on:

- the qualities of the product
- the appropriate use of the product
- the benefits of the product
- possible risks from the product

- where and how the product is produced<sup>68</sup>
- the best before date

Food labels can help consumers make nutrition-based decisions either by providing lists of nutrient content, or by using interpretative labels (graphics, symbols or colours) related to the nutrient content. New forms of digital information for smartphones, computers and telephones, such as SmartLabel<sup>69</sup>, have also been developed to facilitate the access to detailed information about food and beverage products. Systematic reviews have suggested that nutrition labelling, particularly interpretative labels, may be an effective approach to empowering consumers to choose more nutritious foods<sup>70,71,72</sup>, although the adoption, accuracy and compliance can be problematic<sup>73</sup>.

Mandatory disclosure of information about the nutritional content of packaged food can also influence the behaviour of food processors and retailers, encouraging reformulation. For example, mandatory labelling of trans-fats in the USA incentivised the food industry to remove this ingredient from their foods<sup>74</sup>. In 2014, six European Union countries also limited trans-fats through regulation<sup>75</sup>.

Whilst progress has been made, food labelling remains a controversial issue for the private sector, legislators and civil society groups. In Europe, widespread adoption of the UK's traffic light labelling scheme has been criticised. Critics argue that the scheme does not account for the amounts of food eaten, relative to the diet. In addition, the scheme may have unintended consequences. For example, salmon could be negatively labelled as a high-fat food, when it is in fact an important source of health-promoting fish oils.

Whatever standards are adopted by countries, labels should be understood by the consumer and be accurate. Experience suggests that despite continuing debate on the best information and format, labelling has encouraged food companies to pay greater attention to nutrition. More evidence of how consumers use labels, and how to achieve effective communication of science-based information is urgently needed from around the world to better assist policymakers in defining future standards and requirements.

### Providing high-quality foods in public institutions

Procuring and providing high-quality diets using public sector purchasing power, for example in schools, hospitals, across the armed forces and in the prison system, has the potential to shape the norms around foods that contribute to high-quality diets and incentivise suppliers and contractors to align their value chains accordingly<sup>1</sup> (Box 8).

Of note is the provision of improved nutrition through schools<sup>15</sup>. The availability of fruits and vegetables in schools has been associated with enhancing attitudes and consumption of these items, both inside and outside schools, through repeated exposure<sup>77,78</sup>. Providing nutritionally balanced school meals, alongside complementary nutrition education and health measures, can deliver improved school performance, nutrition literacy as well as employment and income in later life. School meals also have broader advantages, for example by encouraging school enrolment for girls at critical nutritional stages, or, by procuring school food from local farmers, enhancing local agricultural production and establishing stable markets for producers<sup>15</sup>.

The availability of food for pupils to purchase in schools is also an important issue. In the USA and the UK, for example, requirements for foods allowed to be sold in schools have been revised. In 2014, a United States Department of Agriculture (USDA) initiative, Smart Snacks in Schools, required any snacks sold in schools to meet calorie, sugar, fat and sodium limits<sup>79</sup>. In the UK, comprehensive food standards were introduced in 2015, with mandatory guidance for schools on the absence of drinks with added sugar, crisps, chocolate or sweets in school meals or vending machines, and provision of no more than two portions of deep fried, breaded or battered foods per week<sup>80</sup>.

Working with the private sector, the concept of providing high-quality foods can also be extended to the workplace. The Workplace Health Promotion Programme launched in Singapore in 2000 offers grants for workplaces to invest in health-promoting efforts, targeted at obesity and other priority areas. Fifty-seven percent of workplaces now participate in this initiative<sup>81</sup>.

### Box 8: School meal initiatives in Kenya<sup>76</sup>

Kenya has developed a Home Grown School Meals programme based on cash transfers. Under this model, the World Food Programme transfers cash to the bank accounts of schools so they can purchase fresh food locally for the daily menu. The amount of cash the schools receive depends on the enrolment rate and number of school days. The model has in-built flexibility to decide produce to buy, when and how much. The food is procured by school committees on which teachers, parents and community members are represented. This approach ensures accountability and transparency and reduces mismanagement of cash or food.

The development of public procurement programmes in low- and middle-income countries has historically, and understandably, been focused on the provision of adequate calories. In high-income countries and some low- and middle-income countries, efforts have been underway for some years to refocus on diet quality. Many low- and middle-income countries should consider using food and nutrient-based standards to guide their food procurement<sup>1</sup>. As yet, these standards are largely absent for lower-income countries. For example, only 2 out of 31 low-income countries and 12 out of 51 low- to middle-income countries have FBDG<sup>82</sup>. Governments need to play a leading role in developing and implementing these standards to enhance food environments and the diet quality.

### Improving the supply of nutritious foods

The agricultural production subsystem (Figure 1) is vitally important as it provides the basis of what foods are available to consumers in the food environment. At the global level, the diversity of production of broad food groups has changed very little over time, with the focus on three main cereal crops<sup>84,85</sup>. It is important to note that the entire food system value chain is dominated by the private sector. This includes multinational businesses, national private food industries, small and medium sized enterprises (SMEs), agribusiness enterprises, small-holder farmers and market women. Policies that connect these businesses to the supply of nutritious foods in the marketplace for high-quality diets are an important requirement.

Funding in global agricultural research public-sector institutions is still focused primarily on rice, wheat, maize and other grains. About 45% of private sector agricultural research investment is on maize<sup>86</sup>. Both research and agricultural production pay



relatively little attention to nutritious crops such as fruits and vegetables, pulses, seeds and nuts. It is clear that this needs to change<sup>87</sup>. However, the Consultative Group on International Agricultural Research (CGIAR) is making progress in this area, having committed to mainstreaming nutrition in all crop-breeding programmes, and through its attempts to direct more research to diversity and healthy agriculture<sup>88</sup>. Newer technologies, such as aero- and hydroponics, are also being developed to be both climate and energy smart while enabling higher volumes of fruits and vegetables to be grown on less lands and closer to urban consumption centres, and reducing the need for costly cold chain transportation.

Strengthening the linkages between production, consumption and demand through value chain development for nutritious foods is also key to ensuring diversified production enters into food environments (Box 9)<sup>89</sup>. SMEs can play an important role in delivering more nutritious foods throughout food supply chains and developing alternative food systems (Box 10).

### Box 9: Diversifying crops in Mali

In Tiby, Mali, the farmers have been given assistance in introducing high value and nutritious crops and improved varieties of fruit and vegetables. This has been linked to training in farming methods and the management of crop diversity. These combined initiatives have yielded considerable reductions in levels of chronic undernutrition among children under five years of age<sup>83</sup>.

### Box 10: The Marketplace for Nutritious Food project

The Marketplace for Nutritious Food, for example, is a programme managed by GAIN, with initial funding from the United States Agency for International Development (USAID). It is designed to strengthen and foster innovation, as well as provide investment to SMEs with the aim of bringing affordable nutritious foods to market. This project has been launched in three countries (Kenya, Mozambique and Rwanda) and has supported over 30 companies<sup>90</sup>.

Nutrition-sensitive value chains require an enabling environment of public and private policies, and interventions to ensure that they reach low-income consumers, and that producer prices provide incentives for quality and sustainable production<sup>18</sup>.



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### Incentives and rules to create a healthy retail and food service environment

Retailers and food outlets (e.g. food stores, supermarkets, food stalls, wet markets, convenience stores, etc.) are the means through which consumers access the food supply. These settings offer several potentially powerful entry points in food retail where policymakers can intervene.

An approach to make better quality diets available and reduce the appeal of lower-quality diets has been tried in some high-income countries. In 2014, the US Congress established the 'Healthy Food Financing Initiative', in which states use funds to incentivise retailers to sell nutritious foods in underserved areas<sup>25</sup>. The 'Healthier Dining Programme' implemented in Singapore in 2014, encourages food operators to offer lower calorie meals and use more nutritious ingredients such as oils with reduced saturated fat content, and/or wholegrains, without compromising taste and accessibility. The number of more nutritious meals sold more than doubled, from 525,000 in June 2014 to 1.1 million in September 2015<sup>25</sup>.

Planners, local government officials, food retailers and food policy councils can help ensure a healthy food environment at the city level. For example, in 2008, New York City provided 1,000 licenses for Green Carts, which were issued to street vendors who sell exclusively fresh fruit and vegetables in neighbourhoods with limited access to nutritious foods<sup>91</sup>.

Initiatives to promote high-quality diets in food retail have been vastly underused, especially in low- and middle-income countries. Improving the delivery of these actions needs to involve wider implementation. This requires better evidence on the availability of foods within communities and in-store food environments, and impact assessments that these interventions may have on food consumption and health.

# Summary of recommendations for policymakers

There are three clear principles that need to guide policies and actions to ensure high-quality food environments.

**First, it is essential to bring together the efforts of the private sector, civil society and government to improve food environments and shift consumer preferences towards more nutritious, high-quality diets.**

This is not just a task for agriculture and health ministries, or indeed for governments alone. Other actors play critically important roles in delivering higher-quality diets. Multinational and local agribusiness and food service companies increasingly influence what is grown, processed and consumed. Retailers can increase the availability of, and access to, high-quality diverse diets while food manufacturers can process foods to be more micronutrient-rich. Technologists can develop innovative products, processes, and management practices to preserve nutrients, reduce food waste, enhance efficiency and lower prices for nutritious foods.

**Second, an effective policy development process should start by identifying the nutritional challenges that need to be prioritised.** These should be linked to specific public health problems and based on detailed information on what people actually consume in their diets.

**Third, all food-based solutions to nutritional problems must be adapted to the needs and abilities of the target group and must be flexible enough to meet the great variation that exists in populations – to reflect the needs of, for example, different age groups and different socio-economic classes.**





Following on from these three principles, the recommendations presented below summarise the key areas of action outlined in this policy brief:

### **Shaping fiscal incentives**

Governments should carefully assess and seek to shape the range of fiscal incentives and disincentives which influence decisions made by farmers, the food industry and retailers. Taxes and subsidies, particularly when combined with a subsidy on nutritious foods, such as fruit and vegetables, can also influence consumer choices. Overall, the goal must be to encourage higher-quality diets by enhancing supply and reducing the cost of high-quality food options. Policy coherence is essential to ensure optimal impact of fiscal policies on diets.

### **Restricting the marketing of food products to children**

Governments need to play a more active role in establishing acceptable norms and specific limits to the marketing of less nutritious foods to children and adolescents. For example, in the case of infants, it is vital to ensure full implementation of the International Code of Marketing of Breast-milk Substitutes.

Besides restricting advertising (in line with WHO recommendations), actions are needed on appropriate sales promotions, packaging, and sponsorship of ultra-processed food products. The private sector should be encouraged to participate in multi-stakeholder processes that establish codes of conduct for responsible business practices around marketing and advertising, including non-traditional channels (e.g. social media). These are required to reduce the adverse impact of highly processed foods and to promote higher-quality diets. All steps taken by public or private sector entities aimed at improving appropriate information flows about food choices to the consumer should be carefully evaluated and reported annually.

### **Extending the reach of more nutritious reformulated products**

The private sector should act quickly to reduce the levels of ingredients defined by the WHO as being injurious to health (including excessive salt, free sugars, trans-fats, etc.), while also limiting portion sizes. Industry stakeholders should invest in new technologies to produce, store and transport fruit, vegetables, dairy, nuts and seeds, aquatic products, legumes and other nutrient-dense foods. These investments would provide additional opportunities for improvements in commercial production, processing and storage technologies to increase the availability of nutritious foods to consumers.



### **Improving the supply of nutritious foods**

Government subsidies for agriculture (research or trade) should be critically evaluated in terms of their contribution to high-quality diets. Current public sector support to securing the food supply is overwhelmingly focused on a few grain commodities, while little is done to facilitate or enhance availability of nutrient-dense foods<sup>92</sup>. Governments must rebalance the emphasis of their agriculture and trade policies to be more in line with the desired local dietary and health outcomes. This includes developing national FBDG<sup>93</sup>, and using them to guide policymakers, rather than merely as a nutritional education tool. The public sector can also invest in SMEs and build capacity for the production of more nutritious food options. The implementation of mandatory standards in public health institutions can also demonstrate positive benefits in enhancing nutrition outcomes in children, workers and other groups.

### **Ensuring better provision of high-quality foods in public institutions**

Governments need to set an example. They should establish strong nutrition standards and food policies for foods offered in public institutions. High-quality foods should be more available and affordable in public facilities, including schools, hospitals, prisons and administrative institutions, while the availability of less nutritious foods should be restricted. Private organisations can also improve the food environment within, workplace settings. There are many opportunities to limit or discourage the availability of less nutritious foods and to make nutritious options more affordable and appealing.

### **Developing metrics and reporting data on the quality of food environments**

Close monitoring of the range and quality of foods in the food environment is essential and will require the adoption of new metrics for government statistics. It will also be important to assess the outcomes of policy actions to evaluate how consumer behaviour and health outcomes change. Governments should support the development of innovative and appropriate measures to evaluate policy actions on food environments. The International Network for Food and Obesity/Non-communicable Diseases Research (INFORMAS) has developed the high-quality food environment policy index to assess the extent of government policy implementation on food environments, in comparison with international best practice. Also, the FAO and the WHO are developing a Global Individual Food Consumption Tool (FAO/WHO/GIFT) to help understand what people are actually eating<sup>94</sup>.

The food industry also has a role to play in publishing metrics as part of its reporting on corporate social responsibility or corporate governance. The framework of the Consumer Goods Forum Health and Wellness Progress Report<sup>95</sup> provides a useful structure for this activity. It seeks to identify specific policies such as improvements on product reformulation, nutrition labelling, restrictions on marketing and advertising and general education programmes affecting the company and its stakeholders. It also aims to monitor progress through specific actions and measure outcomes of the programmes and policies established to support nutrition policy including internal and external measures of progress.

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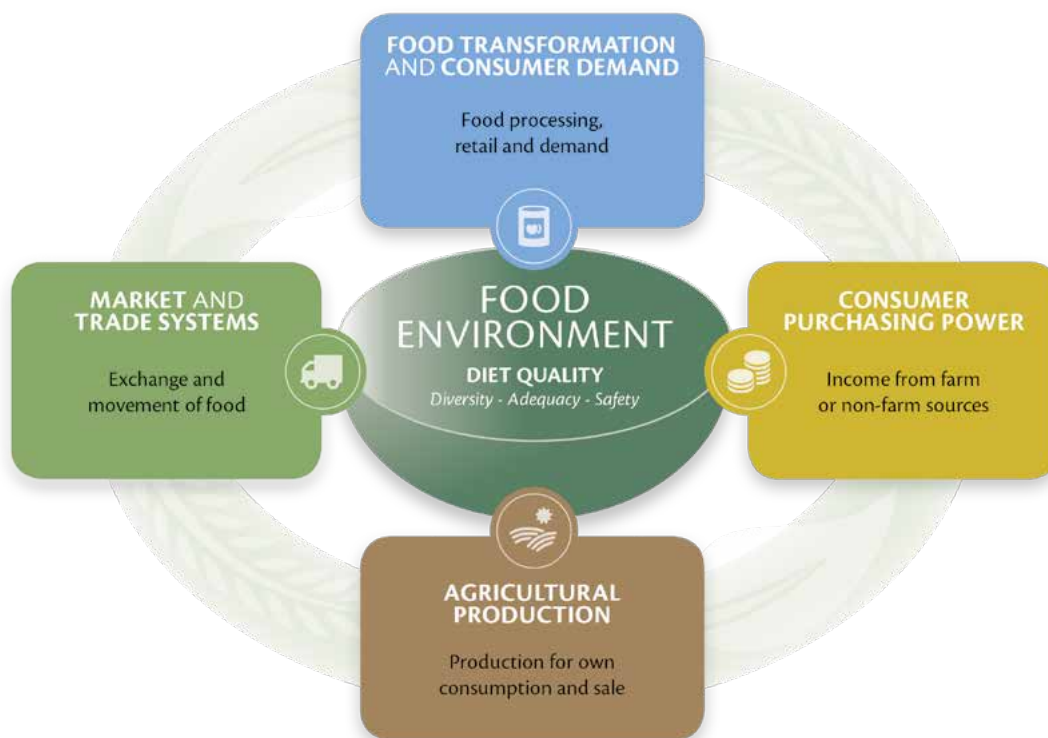
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# How can Agriculture and Food System Policies improve Nutrition?

The multiple burdens on health created today for low- and middle-income countries by food-related nutrition problems include not only persistent undernutrition and stunting, but also widespread vitamin and mineral deficiencies and growing prevalence of overweight, obesity and non-communicable diseases. These different forms of malnutrition limit people's opportunity to live healthy and productive lives, and impede the growth of economies and whole societies.

The food environment from which consumers should be able to create high-quality diets is influenced by four domains of economic activity:



In each of these domains, there is a range of policies that can have enormous influence on nutritional outcomes. In the Global Panel's Technical Brief No.1, we explain how these policies can influence nutrition, both positively and negatively. We make an argument for an integrated approach, drawing on policies from across these domains, and the need for more empirical evidence to identify successful approaches.

Find out more here: [www.glopan.org/technical-brief](http://www.glopan.org/technical-brief)



Improving nutrition through enhanced food environments provides six key policy options within the agricultural production, market and trade and food transformation domains to help governments address all forms of malnutrition

Download Policy Brief No. 7 here: <http://www.glopan.org/food-environments>

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