

# Food systems and how they relate to malnutrition in low- and middle-income countries (LMICs)

Scoping Brief | July 2021



Eleanor Crook Foundation

This year, 2021, is critical for nutrition, and issues around food systems will take centre stage. The Food Systems Summit<sup>1</sup> will take place in September, and the United Nations (UN) General Assembly and the third Nutrition for Growth Summit<sup>2</sup> will take place in December. It is important for everyone working to reduce malnutrition in low- and middle-income countries (LMICs) to gain a better understanding of the relevant aspects of food systems so we can contribute to these

conversations and maximise momentum during this important year for nutrition. This brief has been developed to help the nutrition community contribute to conversations at these key moments and to capitalise on the opportunities offered to drive forward actions to reduce malnutrition in LMICs. It does this by summarising relevant aspects of food systems and suggesting key entry points for engagement.



## Background to food systems

The system that is defined by the activities, infrastructure and people involved in feeding the global population is known as the 'food system' and it influences most of the drivers of malnutrition. The global food system impacts a number of the 17 Sustainable Development Goals (SDGs): SDG 2 (end hunger), SDG 3 (improve health), SDG 8 (decent work and economic growth), SDG 12 (responsible consumption and production), SDG 13 (climate action), SDG 14 (life below water) and SDG 15 (life on land). It is therefore rightly receiving increasing attention (Pereira *et al.*, 2020). While nutrition is an important aspect of food systems, it is not the only objective, as food systems also play an important role in private sector profits, global trade, economic development, climate change and environmental sustainability. According to the 2017 Global Burden of Disease data, poor diet is the leading cause of death in all six regions of the globe (Afshin *et al.*, 2019). Today's food systems are broken and do not deliver nutritious, safe, affordable and sustainable diets; instead, actually undermine nutrition in several ways, particularly for vulnerable and marginalised populations (Branca *et al.*, 2019). In order to understand the priority actions to transform food systems, we must first understand the key components of the food system, the key pressures and the key stakeholders.

**Key components:** There are many ways of conceptualising food systems, and many different models have been proposed (see the example of one conceptual framework in **Figure 1**). In general, components of food systems include:

- **food supply chains**, which include food production, agriculture, food storage, distribution, processing, selling and waste disposal

- **food environments**, which are the physical, economic, political and socio-cultural contexts in which consumers interact with food systems to procure, prepare and ultimately consume food, including both the external environment and the internal/personal environment
- **consumer behaviours** and diets, which include choices, knowledge and issues around nutrition transitions; both the food environment and individual factors affect consumer behaviour.

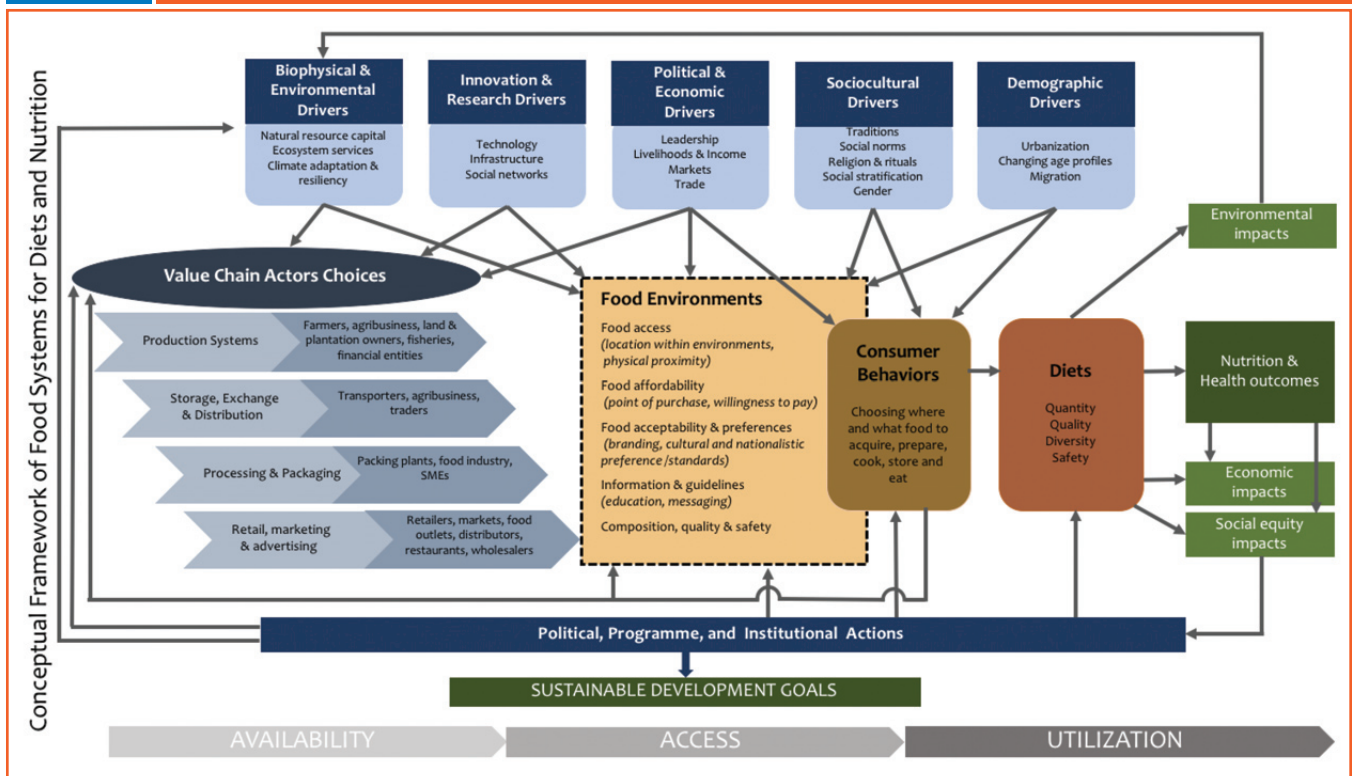
Multiple sources have also applied labels to different 'types' of food system, as they vary greatly by context. Food systems can be considered 'traditional', 'mixed' or 'modern', or synonyms of these:

- **traditional or rural food systems:** minimally processed seasonal foods and informal markets with short food supply chains
- **mixed, informal or expanding food systems:** food producers rely on formal and informal markets to sell crops; processed/packaged foods are more accessible with branding; advertising is common; there is little access to information on food-based dietary guidelines; and food safety and quality standards exist but are often not followed

<sup>1</sup> The Food Systems Summit was convened by the UN Secretary General as part of the Decade of Action on Nutrition to achieve the Sustainable Development Goals (SDGs) by 2030.

<sup>2</sup> Organised by the International Coalition for Advocacy on Nutrition and the Scaling Up Nutrition movement (along with other partners), this summit seeks political and donor commitment halfway through the UN Decade of Action on Nutrition.

**Figure 1** Conceptual framework of food systems for nutrition



Source: the High Level Panel of Experts on Food Security and Nutrition (Fanzo *et al.*, 2017)

- **modern, industrialised, commercialised or consolidated food systems:** diverse options year-round; high processing and packaging; informal and accessible markets in high-income areas and food deserts in low-income areas; consumers have access to detailed information on food labels, etc.; food safety is monitored and enforced.

**Key pressures:** Current food systems are widely recognised to be subject to a large number of pressures resulting in suboptimal function and ultimately in poor global diets, regarding both quantity and quality. Worldwide food production does not currently match global nutritional needs (GLOPAN, 2020, Willett *et al.*, 2019). Agriculture is becoming increasingly dependent on a small number of intensified monocultures and producing more fruits, vegetables and nuts is required in order to meet recommended dietary requirements. Population growth, urbanisation, globalisation and increases in some consumer incomes are affecting equities in access to healthy diets (GLOPAN, 2020). These demographic changes are resulting in longer supply chains for food, more processing and greater availability in the variety of foods, particularly increases in ultra-processed foods (UPFs) (Food Systems Dashboard, 2020). Despite increased availability, economic access to healthy foods is decreasing (Hirvonen *et al.*, 2020). Climate change is another pressure increasingly influencing the quality and quantity of food that can be produced and our ability to distribute it equitably (Fanzo *et al.*, 2018). The diets of low-income households are putting them at greater risk of malnutrition at both ends of the nutrition spectrum (undernutrition and overnutrition); this is resulting in the increased prevalence of non-communicable diseases (NCDs) and a double burden of malnutrition (FAO *et al.*, 2020). The consumer behaviour aspect of food systems is also heavily influenced by people's access to information. Transnational companies with aggressive and unregulated marketing campaigns currently have

some of the loudest voices, again putting pressure on the ability of food systems to deliver healthy diets for all.

**Key stakeholders and policies:** International stakeholders influencing food systems for nutrition largely fall within the following categories: governments and trade bodies; UN agencies; non-governmental organisations (NGOs); private sector businesses; academics; consumers; and smallholder farmers. While UN agencies and NGOs generally support struggling food systems and advocate for improvements for vulnerable people, governments and trade bodies set policies that affect food prices and access to products for everyone. Stakeholders working within food systems – including smallholder farmers, private sector businesses and consumers – are influential in dictating supply and demand for different foods.

National and international policies can have a significant influence on food systems and therefore on resultant diets. Many of the

### Other key resources hubs for food systems learning

EAT forum: <https://eatforum.org/eat-lancet-commission/>

Food systems dashboard: <https://foodsystemsdashboard.org/>

IFPRI: [www.ifpri.org/](http://www.ifpri.org/)

Harvest Plus: [www.harvestplus.org/](http://www.harvestplus.org/)

Research Program on Agriculture for Nutrition and Health: <https://a4nh.cgiar.org/>

Agriculture, Health and Nutrition Academy: [www.anh-academy.org/](http://www.anh-academy.org/)

The UN Economic Commission for Europe (UNECE) food systems and COVID resources: <https://unece.org/covid-19-and-food-systems>



pressures highlighted here call for greater regulation of food systems. Most trade deals currently protect trade by encouraging imports and exports, which limits the ability of governments to regulate unhealthy foods and support shorter, healthier supply chains. Examples of policies that support healthy diets include those that combat the effects of globalisation by supporting small farmers; support local supply chains by fostering links between fresh produce and markets; and discourage consumption of unhealthy processed foods, such as through taxation of high-sugar drinks. The **NOURISHING Framework** is a useful tool that collates and shares examples of positive food systems policies.

**Key actions to transform food systems for nutrition:** Given the pressures mentioned above, several papers and recent reports on food systems for nutrition have mentioned the following actions as priorities for transforming food systems (Branca *et al.*, 2019, GLOPAN, 2020, Fanzo *et al.*, 2017).

- Changes to policy and improved investment in more efficient and shorter supply chains would improve consumer access to perishable, nutrient-rich, diverse foods. These may include national schemes to make fruit available in schools; investing in storage and cold-chain infrastructures to reduce post-harvest losses; and providing farmers with information and market access to diversify production
- Practical priorities for improving food environments include managing food price volatility; promoting the development and use of national dietary guidelines in policy-making; restricting the commercial promotion of low-nutrient and UPFs; and controlling food labelling. Nutrition-sensitive trade policies should consider the double burden of malnutrition rather than accepting that the liberalisation of trade to reduce undernutrition will inevitably increase the prevalence of overnutrition and NCDs

- To help consumers make healthy choices, nations should have clear and easy-to-understand guidelines on healthy diets. School feeding programmes and social protection programmes (for example cash or food baskets) also need to align with these healthy eating goals. Actions that improve women's empowerment and teach cooking, growing and healthy eating in schools will also help change behaviours
- Optimal breastfeeding and complementary feeding are important 'double-duty' actions that can tackle several forms of malnutrition at the same time. Empowering women, who play a key role in global agriculture and household diets, must also be included across multiple food systems actions.

The recent Foresight 2.0 Report (2020) by the Global Panel on Agriculture and Food Systems for Nutrition (GLOPAN) divides priority policy actions into four areas of transformation: availability, accessibility, desirability and affordability of healthy and sustainable diets (Figure 2).

### Impact of COVID-19 on food systems

COVID-19 has brought many of the existing challenges within food systems into sharp focus, as well as creating new challenges. It has taught us about some of the perils of long supply chains and globalisation; it has also demonstrated the breadth and importance of key workers within food systems, which involve an enormous number of actors doing a huge number of roles, all of which are needed for the system to function properly (Carducci *et al.*, 2021, IPES, 2020).

COVID-19-related disruptions have led to increased food prices in the entire agri-food system, particularly for perishable and high nutrient value food chains (Carducci *et al.*, 2021). Disruptions to food availability have been widely reported, particularly for imported and perishable foods. Small and medium-sized

**Figure 2** Priority actions for transforming food systems for nutrition (GLOPAN, 2020)



enterprises are being heavily impacted by pandemic control measures in most countries, with widespread reports of decreased sales, difficulty paying staff and difficulty accessing inputs. This results in a loss of income for business owners and staff and decreased ability to afford nutritious diets. The sudden changes in the food system have been impacting lower-income households the most, further increasing inequity in accessing nutritious diets (GAIN, 2020). Simulations assessing the impact of COVID-19 suggest almost 150 million more people fell into extreme poverty and food insecurity in 2020. This is likely to result in substantial changes in food consumption patterns, with adverse nutritional consequences (Laborde *et al.*, 2021).

Border restrictions and lockdowns have slowed harvests in some parts of the world, leaving millions of seasonal workers without livelihoods and constraining the transportation of food to markets. Meat processing plants and food markets have been forced to close in many locations due to serious COVID-19 outbreaks among workers. Farmers have been burying perishable produce or dumping milk as a result of supply chain disruption and falling consumer demand (UN, 2020). Food

production at farm level is constrained, with workers unable to travel to farms due to travel bans (WFP/FAO, 2020). The pandemic has also come at a time when food security and food systems are already under strain. Conflict, natural disaster, climate change and the arrival of pests and plagues on a transcontinental scale preceded COVID-19 and were already undermining food security in many contexts (UN, 2020).

Despite all these challenges, the crisis has offered a glimpse of new and more resilient food systems, as communities have come together to plug gaps and public authorities have taken extraordinary steps to secure the production and provisioning of food (Béné, 2020, IFPRI, 2021). However, crises could also be used by powerful actors to accelerate unsustainable business-as-usual approaches. The upcoming UN Food Systems Summit may be an opportunity to resist a return to pre-COVID-19 broken systems and take measure to 'build back better', as well as to implement measures to improve resilience to future crises (IPES, 2020). UNECE is maintaining an up-to-date **repository** for key UN messages and available evidence, analysis and tools relating to COVID-19 and food systems.



## Ways in which those working to combat malnutrition in LMICs can engage with the food systems agenda

**T**his report aims to highlight aspects and actions for food systems transformation that build towards ending malnutrition for women and children in LMICs. While improving nutrition is a key angle of the upcoming UN Food Systems Summit (Box 1), it is by no means the only angle. It must compete for attention alongside interests in economic development, global trade, private sector profits and environmental priorities. A cohesive approach from vested sectors and stakeholders is needed to ensure nutrition remains at the top of this agenda, especially nutrition of vulnerable groups such as women and children in LMICs.

While food systems influence all the basic causes of malnutrition along with many of the underlying causes (as defined in the UNICEF conceptual framework), a number of specialist areas within global nutrition need more attention within food systems transformation. Below, we highlight the effects of food systems on nutrition in fragile environments; the relevance of food systems for infant and young child feeding (IYCF); the relevance of food systems for the nutrition of school-aged children and adolescents; and the effect of food systems on the prevention and treatment of wasting and stunting.

### Food systems in fragile environments

There are 1.8 billion people currently living in fragile settings, and this figure is expected to rise to 2.3 billion by 2030 (OECD, 2018). These settings are characterised by interconnected and accumulating challenges of insecurity and conflict, political instability and weak governance, environmental shocks and climatic changes, entrenched poverty and dependence on humanitarian aid (GLOPAN, 2020). People living in fragile contexts are three times more likely to be undernourished than those living in stable environments (FAO, 2019). Many of the

causes of undernutrition in these contexts are as a result of direct or indirect disruptions to the food system. Such disruptions include decreased local production (particularly as a large proportion of those living in fragile environments are small-scale agriculturalists or pastoralists), disrupted markets, limited processing abilities, ruptured supply chains and fractured infrastructure networks. These disruptions can lead to unpredictable food supplies, increased demand that can drive up food prices and limited food diversity options (WFP, 2020). Furthermore, the causal relationship is two-way: poorly functioning food systems and a lack of access to food can further exacerbate and contribute to conflict and fragility (World Vision UK, 2013).

Important nutrition interventions in fragile contexts – such as food aid, livelihoods promotion and resilient agriculture and interventions bridging the humanitarian–development nexus – are all relevant to the food systems agenda. In-kind food assistance, a life-saving solution in fragile contexts, has not been successful in rebuilding and strengthening food systems (GLOPAN, 2020). It is increasingly recognised that multisectoral development actions need to be combined with humanitarian aid in fragile contexts to build resilient food systems (ENN, 2019) (WFP, 2020).

The GLOPAN policy brief on 'Strengthening food systems in fragile contexts' (2020) outlines key actions for building a resilient food system. These include actions across agricultural production, market and trade systems, food processing and retail, as well as actions to improve consumer demand and purchasing power (GLOPAN, 2020). A range of examples of strengthening food systems through a multisectoral and systems-led approach have also been noted, such as cash and voucher assistance and social safety net programmes, which

## Box 1 The UN Food Systems Summit, 2021

*"We believe in a world where healthy, sustainable and inclusive food systems, allow people and planet to thrive. It is a world without poverty or hunger, a world of inclusive growth, environmental sustainability, and social justice. It is a resilient world where no one is left behind."*

– Agnes Kalibata, Special Envoy for 2021 Food Systems Summit

This summit will be an important milestone for global food systems, with strong attendance from high-level policy-makers. It precedes the Nutrition for Growth Summit, which is also taking place in 2021, so opportunities to link the two meetings should be maximised in order to ensure adequate consideration of the effect of food systems on global nutrition. The Summit "seeks to energise and accelerate our collective journey to eliminate hunger, create more inclusive and healthier food systems, and safeguard the health of our planet."

**The five 'action tracks' guiding the Summit are as follows.**

- 1. Ensure access to safe and nutritious food for all:** Deliver zero hunger and improve levels of nutrition, enabling all people to be well nourished and healthy (led by GAIN)
- 2. Shift to sustainable consumption patterns:** Change consumer behaviour, create demand for sustainably produced agri- and ocean food products and help reduce waste (led by EAT)
- 3. Boost nature-positive production at sufficient scale:** Work to develop end-to-end solutions along the food value chain with a view to planetary boundaries. It will act to reduce emissions and increase carbon capture (thereby limiting anthropogenic contributions to climate change); and to promote the regeneration, restoration and protection of critical ecosystems to conserve biodiversity, protect land and water and reduce food loss and energy usage (led by WWF International)
- 4. Advance equitable livelihoods:** Ensure that food systems developments expand inclusion, creating jobs to eliminate poverty and raise income (led by CARE USA)
- 5. Build resilience to vulnerabilities, shocks and stress:** Act to ensure

allow people to purchase food themselves while simultaneously supporting local markets (ODI, 2015; GLOPAN, 2020). Other smaller-scale examples include infrastructure investment, improving agricultural irrigation schemes, developing resilient agri-food value chains, using hydroponic technology, solar-powered food storage, building the capacity of small businesses and supporting access to land and livelihoods for refugees. While supporting nutrition interventions in fragile contexts, there is an important opportunity to support context-appropriate, food systems strengthening initiatives, ideally fast-tracking some of the transformation actions needed in all contexts. These will require nutritionists to work with other sectors to support, for example: investment in short supply chains for perishable products; the creation of national policies around dietary guidelines and regulation of the food industry; and the inclusion of healthy eating information as part of the education system.

### Infant and Young Child Feeding (IYCF)

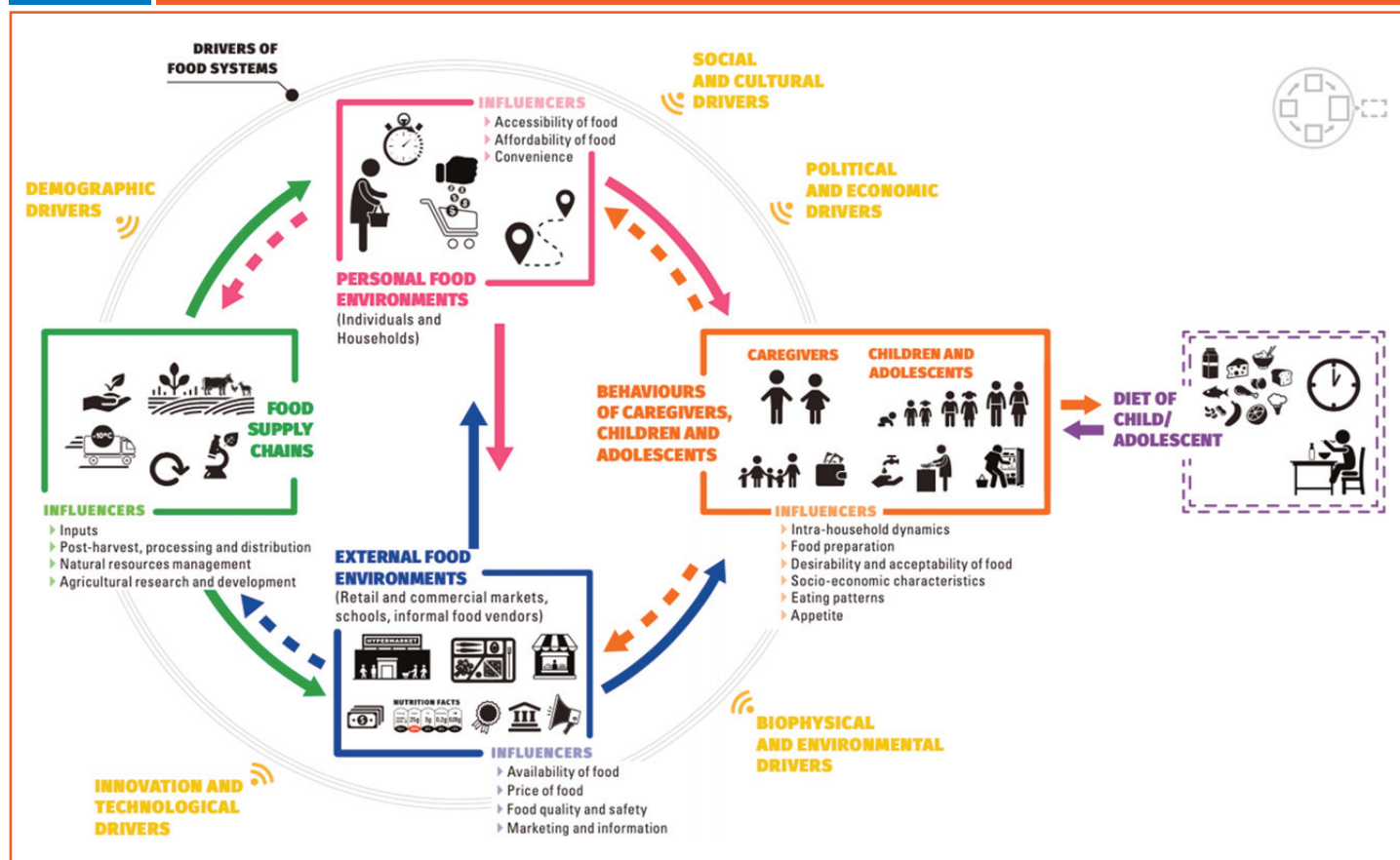
Much of the evidence and many of the discussions surrounding food systems transformations to date have considered the

nutrition of the general population, but few put the nutrition of children at the centre of the approach. The 'Innocenti Framework' developed by UNICEF provides this important child-centred approach to understanding food systems and their influence on the diets of children and adolescents (Figure 3). A recent paper defines a 'child-centred food system' as one that makes healthy diets available, affordable, appealing and aspirational (AAAA) for children (0-18 years) in the context of their lives (Hawkes, 2020). While the diets of all children and adolescents require a specific focus, IYCF is an especially niche, yet pivotal, time period for nutrition. IYCF includes factors around breastfeeding, maternal diets, breastmilk substitutes and complementary feeding. While there is much literature on both food systems generally and on IYCF in particular, their overlap has so far been minimal. The child-centred approach to food systems provides step-by-step actions for creating a context-specific package of interventions, all of which can also be applied to IYCF (Hawkes, 2020). The authors advise first assessing the range of nutrition problems relevant to the context, then identifying healthy foods that should be made more AAAA to address these nutritional problems. Qualitative studies and supply chain analyses should then be used to understand how food systems are influencing whether children are eating these 'healthy' foods, and what incentives or disincentives are needed within supply chains to create healthier food environments. This can then guide the development of a complementary package of interventions. The IYCF community has a good understanding of the nutritional problems in many contexts (usually including underweight, stunting, micronutrient deficiencies and suboptimal immune functions associated with disruptions to breastfeeding), as well as of the optimal foods that need to be made AAAA (breastmilk and, after 6 months, sources of protein; sources of micronutrients). However, there is far less discourse and evidence on the latter half of the process: to understand how food systems influence whether infants are eating these 'healthy' foods, and what incentives or disincentives are needed within supply chains.

Examples of food systems interventions influencing IYCF include: regulation of trade and promotion of breastfeeding substitutes; policies around maternity leave for working mothers; investment in breastmilk bank infrastructures; interventions to increase public knowledge of optimal IYCF practices; regulation of commercially available baby foods; and nutrition-sensitive agriculture and livestock interventions for improving access to healthy complementary foods in farming communities. However, a recent systematic review of the food systems interventions literature found only a handful of studies assessing the impact of food systems interventions on breastfeeding outcomes (3ie, 2020). Those studies that were found focused almost exclusively on peer support, counselling and education interventions or on food fortification interventions targeting maternal diets. Only eight identified studies intervened within food production systems, distribution and storage, processing and packaging or food waste management to improve IYCF. Although there was some evidence regarding direct provision of food, cash-for-food programmes and the provision of supplements to improve IYCF, there were no studies on areas with potential for national-scale impact such as government price manipulations and regulation of food labelling, advertising and safety. While we know much work has taken (and continues to take) place on the regulation of breastmilk substitutes advertising, evidence of the impact of this on breastfeeding and infant nutrition is either not being generated, or not being captured by those assessing food systems interventions.



**Figure 3** UNICEF Innocenti Food System Framework (UNICEF and GAIN, 2018)



The links between food systems transformation and optimal IYCF are plentiful. However, as stakeholders working to improve IYCF, we need to go further in our exploration of these links. As with all the other topics being discussed here, this will require a multisectoral approach and, ideally, the development of cohesive priority actions for engaging in current food systems conversations. The topics highlighted in this report are intended as a starting point for moving towards those cohesive priorities for engagement.

### Nutrition of adolescents and school-aged children

Adolescents and school-aged children (5-19 years) are one of the groups that are most susceptible to current issues caused by broken food systems. Adolescence is a critical period of growth and development that influences a whole lifetime of health risks and eating habits, as well as influencing the health and development of any future offspring (World Health Organization, 2017). Malnutrition in middle childhood and adolescence also contributes to a lack of national economic development, with negative consequences for the human capital of countries (World Bank, 2018). While quality nutritional data on this group are currently lacking, we do know that malnutrition among adolescents and school-aged children includes micronutrient deficiencies, undernutrition, overweight and obesity and poor quality diets (Benedict *et al.*, 2018). For instance, nearly half of adolescent girls do not eat three meals a day and many skip breakfast (Keats *et al.*, 2018a). Many adolescents consume fast foods on a daily basis and fail to consume nutritious foods, such as fruits and vegetables (Keats *et al.*, 2018b). Adolescents and children are especially susceptible to the power of marketing by

large food corporations, which contributes to their poor diets due to the current lack of regulation (Hawkes *et al.*, 2020). Food systems interventions offer a promising avenue to improve access to healthy foods, and school settings may be an important entry point (Canavan and Fawzi, 2019). School feeding programmes have the potential to address aspects of the double burden of malnutrition, as well as having other benefits for social protection and delaying early marriage and early pregnancy. Home-grown school feeding can also change the eating preferences of households, improve smallholder production and improve investment in rural economies (Drake *et al.*, 2017). Broader school nutrition interventions, such as WHO's **nutrition-friendly schools initiative**, include educational and physical activity interventions in order to promote healthy lifestyle patterns for children, as well as having the potential to engage parents and community members in preventing child malnutrition in all its forms. Information campaigns targeting adolescents who do not attend school have also had successful impacts on adolescent diets, and micronutrient supplementation interventions have successfully reduced anaemia, prevalent among adolescents in many settings (Salam *et al.*, 2016).

Nutritionists working with this neglected age group could benefit from sharing lessons learnt with those working in the area of food systems transformation. Joining forces to improve regulation of nutrition information and marketing targeted at this age group, improving institutional nutrition policies and initiatives (such as in schools) and developing agricultural supply chains to provide school meals could all have considerable impacts on adolescent nutrition and on wider food systems.

## Childhood wasting, stunting and food systems

While this topic certainly overlaps with some of the food systems considerations within fragile contexts and IYCF, the prevention, early detection and treatment of childhood wasting and stunting also has some important considerations within the food systems agenda. The child-centred approach to food systems transformation can be directly applied to the prevention of wasting and stunting, with 'game-changing' consequences. The success stories around stunting reduction have all utilised multi-sector approaches that have often included elements of food systems transformation. In a recent analysis of five 'stunting reduction exemplar countries', improvement in maternal nutrition was one of the top contributors in reducing child stunting, as a large proportion of stunting is a result of in utero growth faltering. The analysis also showed that some key determinants of stunting can be impacted by food systems transformation, including improving parental education, national economic growth, breastfeeding practices and crop yields. For example, in Ethiopia, up to 32% of the improvements in child stunting levels since 1990 have been estimated to come from increased consumable crop yields (Bhutta *et al.*, 2020).

Evidence also exists of the effect on child linear growth of providing improved seeds, improving livestock access and providing agricultural information interventions (3ie, 2020). A recent systematic review of food systems intervention literature found the greatest body of evidence impacting stunting and underweight came from food fortification interventions, direct provision of foods, provision of micronutrient supplements and peer support/nutrition counselling interventions (3ie, 2020). As with the IYCF example above, some stunting prevention strategies to date have focused on direct provision of foods rather than on more sustainable systems transformation. For example, promising evidence regarding the regular consumption of eggs on child nutrition status emerged several years ago (Stewart *et al.*, 2019, Iannotti *et al.*, 2017), but evidence on how to support food systems to increase the availability, affordability and appeal of eggs remains lacking. Stunted children do not consume enough animal source foods in general (Shapiro *et al.*, 2017); ensuring they have adequate levels of this during the critical period between six and 24 months could have significant effects in reducing stunting (Zaharia *et al.*, 2021, Kaimila *et al.*, 2019). Conversely, interventions to support livelihoods and food systems for pastoralists communities vulnerable to environmental shocks have demonstrated success in developing more nutritious and shock-resistant systems, but have not yet been widely linked to child undernutrition (Sadler and Mitchard, 2012).

Besides prevention, the management of wasting also has some unique food systems considerations. Ready-to-use therapeutic foods (RUTF) are currently recommended for the treatment of severe wasting, whereas moderate wasting can be managed either by provision of supplementary foods or through nutrition counselling, depending on the level of food insecurity in the context (WHO, 2013). The system surrounding the provision of

RUTF is a microcosm of wider food systems and needs similar transformations to those recommended more generally. Such transformation includes shorter supply chains that may be fostered, among other efforts, through local production; cohesive but efficient product regulation of content and safety standards; and investment in national infrastructure for RUTF logistics, ideally within national health supply chains (Mates and Sadler, 2020). Recovery from wasting also depends on access to healthy complementary foods alongside effective communication strategies. A food systems approach is essential for widespread improvements in this area.

## Practical actions for the nutrition community

Although there is a plethora of existing food systems knowledge and evidence within the areas of nutrition mentioned above, these topics are often not articulated together. The evidence base regarding the impact of interventions within food systems on nutrition is vast, but complicated and somewhat disorganised, which can make it difficult for policy-makers, donors and practitioners to navigate. There is especially a need to identify and translate relevant evidence of food systems interventions for improving undernutrition in LMICs, since the links here are not always directly apparent and these topics and related food systems discussions can often be siloed.

Nutrition actors need to draw expertise from a wide range of stakeholders to bring evidence from food systems approaches into the field of nutrition. Some emerging and exciting initiatives are taking a food systems approach to nourishing the future of children, a potential interest of the new Biden administration in the US, which may be highly effective in bringing these stakeholders together. There is also a role for condensing and demystifying food systems discussions (as well as for food systems discussions within the nutrition sector) to bring clarity and consistency of direction to the topic of food systems transformation for nutrition in LMICs. Discussions and consensus are also needed on how and where the nutrition sector should engage with the private sector, an important yet often contentious issue, particularly regarding potential conflict of interests.

Nutrition actors must engage with the UN Food Systems Summit, and they are doing so. It will be particularly important for them to help disseminate key learnings and actions following the Summit back to others in the nutrition community. The key nutrition entry points highlighted in this brief need to be championed to those working in the food systems space and at the Summit. One way to do this is to attend and engage with events around the relevant 'game-changers' at the Summit, including the Wasting Reset in Action Track 1 led by ENN (which has been combined with the game-changer on the UN Global Action Plan (GAP) submitted by FAO and WFP under AT5) and Improving Children's Diets in Action Track 1 led by UNICEF. Harnessing the momentum around current food systems transformation will need a coherent and consistent list of priorities from the nutrition community, and we will need to ensure we are all armed with relevant food systems knowledge to be able to engage in these discussions most effectively.

## Acknowledgments

This report was compiled by Natasha Lelijveld, Natalie Sessions, Gwénola Desplats, Kelsey Grey, Chloe Angood and Emily Mates. With thanks to Eleanor Crook Foundation and the Government of Ireland's Department of Foreign Affairs for generously funding this work.

# References

- AFSHIN, A, SUR, PJ, FAY, KA, CORNABY, L, FERRARA, G, SALAMA, JS, MULLANY, EC, ABATE, KH, ABBAFATI, C & ABEBE, Z 2019. Health effects of dietary risks in 195 countries, 1990–2017: a systematic analysis for the Global Burden of Disease Study 2017. *The Lancet*, 393, 1958–1972.
- BÉNÉ, C 2020. Resilience of local food systems and links to food security—A review of some important concepts in the context of COVID-19 and other shocks. *Food Security*, 1–18.
- BENEDICT, RK, SCHMALE, A & NAMASTE, S. Adolescent Nutrition 2000–2017: DHS Data on Adolescents Age 15–19. 2018. ICF.
- BHUTTA, ZA, AKSEER, N, KEATS, EC, VAIVADA, T, BAKER, S, HORTON, SE, KATZ, J, MENON, P, PIWOZ, E & SHEKAR, M 2020. How countries can reduce child stunting at scale: lessons from exemplar countries. *The American journal of clinical nutrition*, 112, 894S–904S.
- BRANCA, F, LARTEY, A, OENEMA, S, AGUAYO, V, STORDALEN, GA, RICHARDSON, R, ARVELO, M & AFSHIN, A 2019. Transforming the food system to fight non-communicable diseases. *Bmj*, 364.
- CANAVAN, CR & FAWZI, WW 2019. Addressing knowledge gaps in adolescent nutrition: toward advancing public health and sustainable development. *Current developments in nutrition*, 3, nzz062.
- CARDUCCI, B, KEATS, E, RUEL, M, HADDAD, L, OSENDARP, S & BHUTTA, Z 2021. Food systems, diets and nutrition in the wake of COVID-19. *Nature Food*, 2, 68–70.
- DRAKE, L, FERNANDES, M, AURINO, E, KIAMBA, J, GIYOSE, B, BURBANO, C, ALDERMAN, H, MAI, L, MITCHELL, A & GELLI, A 2017. School feeding programs in middle childhood and adolescence.
- FANZO, J, ARABI, M, BURLINGAME, B, HADDAD, L, KIMENJU, S, MILLER, G, NIE, F, RECINE, E, SERRA-MAJEM, L & SINHA, D 2017. Nutrition and food systems. Report. High Level Panel of Experts on Food Security and Nutrition of the ....
- FANZO, J, DAVIS, C, MCLAREN, R & CHOUFANI, J 2018. The effect of climate change across food systems: Implications for nutrition outcomes. *Global Food Security*, 18, 12–19.
- FAO, IFAD, UNICEF, WFP & WHO 2020. The State of Food Security and Nutrition in the World. FAO.
- FOOD SYSTEMS DASHBOARD. 2020. *Food Systems Dashboard* [Online]. Available: <https://foodsystemsdashboard.org/> [Accessed 10th September 2020 2020].
- GLOPAN 2020. Global Panel on Agriculture and Food Systems for Nutrition: Future Food Systems: For people, our planet and prosperity. London, UK.
- HAWKES, C, FOX, E, DOWNS, SM, FANZO, J & NEVE, K 2020. Child-centered food systems: Reorienting food systems towards healthy diets for children. *Global Food Security*, 27, 100414.
- HIRVONEN, K, BAI, Y, HEADEY, D & MASTERS, WA 2020. Affordability of the EAT–Lancet reference diet: a global analysis. *Lancet Glob Health*, 8, e59–66.
- IANNOTTI, LL, LUTTER, CK, STEWART, CP, RIOFRÍO, CAG, MALO, C, REINHART, G, PALACIOS, A, KARP, C, CHAPNICK, M & COX, K 2017. Eggs in early complementary feeding and child growth: a randomized controlled trial. *Pediatrics*, 140.
- IFPRI 2021. International Food Policy Research Institute. 2021 Global Food Policy Report: Transforming Food Systems after COVID-19. Washington, DC: International Food Policy Research Institute.
- IPES 2020. The International Panel of Experts on Sustainable Food Systems (IPES) Special Report on COVID-19 and the Crisis in Food Systems. Brussels, Belgium.
- KAIMILA, Y, DIVALA, O, AGAPOVA, SE, STEPHENSON, KB, THAKWALAKWA, C, TREHAN, I, MANARY, MJ & MALETA, KM 2019. Consumption of animal-source protein is associated with improved height-for-age z scores in rural Malawian children aged 12–36 months. *Nutrients*, 11, 480.
- KEATS, EC, RAPPAPORT, A, JAIN, R, OH, C, SHAH, S & BHUTTA, ZA 2018a. Diet and Eating Practices among Adolescent Girls.
- KEATS, EC, RAPPAPORT, AI, SHAH, S, OH, C, JAIN, R & BHUTTA, ZA 2018b. The dietary intake and practices of adolescent girls in low- and middle-income countries: a systematic review. *Nutrients*, 10, 1978.



---

LABORDE, D, MARTIN, W & VOS, R 2021. Impacts of COVID-19 on global poverty, food security, and diets: Insights from global model scenario analysis. *Agricultural Economics*.

---

MATES, E & SADLER, K 2020. Ready-to-use Therapeutic Food (RUTF) Scoping Study.

---

PEREIRA, LM, DRIMIE, S, MACIEJEWSKI, K, TONISSEN, PB & BIGGS, RO 2020. Food System Transformation: Integrating a Political-Economy and Social-Ecological Approach to Regime Shifts. *International Journal of Environmental Research and Public Health*, 17, 1313.

---

SADLER, K & MITCHARD, E 2012. Impact of livestock support on animal milk supply and child nutrition in Ethiopia. *Field Exchange* 44, 8.

---

SALAM, RA, HOODA, M, DAS, JK, ARSHAD, A, LASSI, ZS, MIDDLETON, P & BHUTTA, ZA 2016. Interventions to improve adolescent nutrition: a systematic review and meta-analysis. *Journal of Adolescent Health*, 59, S29-S39.

---

SHAPIRO, MJ, DOWNS, S, QUELHAS, D, KREIS, K, KRAEMER, K & FANZO, J 2017. The Association Between Animal Source Foods and Stunting in Children Aged 6 Months to 5 Years: A Systematic Review. *The FASEB Journal*, 31, 639.31-639.31.

---

STEWART, CP, CASWELL, B, IANNOTTI, L, LUTTER, C, ARNOLD, CD, CHIPATALA, R, PRADO, EL & MALETA, K 2019. The effect of eggs on early child growth in rural Malawi: the Mazira Project randomized controlled trial. *The American journal of clinical nutrition*, 110, 1026-1033.

---

UN 2020. Policy Brief: The impact of COVID-19 on Food Systems and Nutrition. Washington DC: United Nations Sustainable Development Group.

---

UNICEF & GAIN 2018. Food Systems for Children and Adolescents; Working Together to Secure Nutritious Diets.

---

WHO 2013 Updates on the management of severe acute malnutrition in infants and children (Guideline)

---

WILLETT, W, ROCKSTRÖM, J, LOKEN, B, SPRINGMANN, M, LANG, T, VERMEULEN, S, GARNETT, T, TILMAN, D, DECLERCK, F & WOOD, A 2019. Food in the Anthropocene: the EAT-Lancet Commission on healthy diets from sustainable food systems. *The Lancet*, 393, 447-492.

---

WORLD BANK 2018. The Human Capital Project. Washington DC: World Bank.

---

WORLD HEALTH ORGANIZATION 2017. Global accelerated action for the health of adolescents (AA-HA!): guidance to support country implementation.

---

ZAHARIA, S, GHOSH, S, SHRESTHA, R, MANOHAR, S, THORNE-LYMAN, AL, BASHAASHA, B, KABUNGA, N, GURUNG, S, NAMIREMBE, G & APPEL, KH 2021. Sustained intake of animal-sourced foods is associated with less stunting in young children. *Nature Food*, 2, 246-254.

---



**ENN**

2nd Floor, Marlborough House, 69 High Street, Kidlington, Oxfordshire, OX5 2DN

Tel: +44 (0)1865 372340 | [www.ennonline.net](http://www.ennonline.net) | [office@ennonline.net](mailto:office@ennonline.net)

Charity registration no: 1115156. Company registration no: 4889844