



MOVING FOOD FORWARD

# How can scaling access to safe nutrition through sustainable food packaging contribute to more secure food systems?

White paper series in collaboration with EY-Parthenon

# Foreword

In our white paper, ‘How could global food systems better sustain our planet and its people by 2040?’, we highlighted how current food systems cannot sustain our planet and its people in the long term, unless they transition towards more ecologically, socially, and economically viable conditions.<sup>1</sup> This transition requires us to reimagine the ‘art of the possible’ by bringing policymakers, businesses, communities, and consumers on a journey that is safe and just.

The FAO defines four primary dimensions of food security: availability, access, utilisation, and stability.<sup>2</sup> Achieving food security, namely the United Nations Sustainable Development Goal 2, Zero Hunger<sup>3</sup>, requires all four dimensions to be fulfilled simultaneously.

In this paper, our focus is on scaling access to safe nutrition and how collective action through policy, partnerships, technology, and financing can contribute to improving economic and physical food access.

■ Focus of this paper



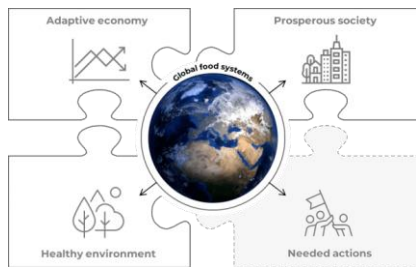
Tetra Pak is committed to making food safe and available, everywhere. One way to improve food availability and access is to improve how food is processed, packaged, and transported globally.

Aseptic processing and packaging solutions can contribute to improving food access. Aseptic solutions are designed to protect liquid food from oxygen, light, contamination, and physical damage, retaining food colour, texture, taste and nutrition for up to 12 months, with no need of preservatives or cold chain distribution.<sup>4</sup>

We acknowledge that improving access to safe nutrition requires collective actions across geographies and value chains, which we cannot achieve alone. Thus, the aim of this paper is to:

- Increase awareness of the key challenges ahead and highlight the importance of taking action
- Provide perspectives on the key transition enablers that decision makers should acknowledge
- Invite decision makers to take collective actions across the value chain to advance the transition

## Tetra Pak white paper series: Actions to drive the transition



This pathway paper is the fifth part of a white paper series focused on the safe and just transition towards more sustainable food systems<sup>4</sup>.

By examining each pathway, we identify the critical actions and collective efforts needed to drive meaningful change.

In this paper, we discuss the role of aseptic technology and packaging in supporting food access and availability and highlight key enablers to make the needed transition.

White paper	Global focus areas and collective actions to drive safe and just transition
Pathway paper	Enabling transition towards more sustainable dairy
Pathway paper	Innovating for new food sources
Pathway paper	Reducing food loss and waste
Pathway paper	Scaling access to safe nutrition via sustainable food packaging

# The challenge: Providing access to safe food to a rapidly growing global population

**Global hunger, which is measured by the prevalence of undernourishment, affects over 9% of the global population.<sup>5</sup> Hunger is still on the rise in developing regions, and projections to 2030 suggest that 600 million people will suffer from chronic undernourishment.<sup>5</sup>**

In 2022, 2.4 billion people lacked affordable access to safe, nutritious and adequate food throughout the year.<sup>5</sup> Going forward, global food systems are facing an immense challenge to achieve the SDG target of eradicating hunger by 2030, with projections indicating that almost 600 million people will be chronically undernourished, half of them in Africa.<sup>5</sup>

The impact of food insecurity is largely due to the lack of economic and physical access to food, alongside other structural challenges.<sup>14</sup> Rapid population growth, particularly in Southern Asia and sub-Saharan Africa, is expected in the coming years, with sub-Saharan Africa undergoing the most rapid urbanisation. By 2050, its urban population is predicted quadruple, with Southern Asia's urban population expected to more than double<sup>5</sup>, bringing significant changes in consumption habits and food supply chains that result in growing demand for packaged and pre-prepared foods.<sup>5</sup>

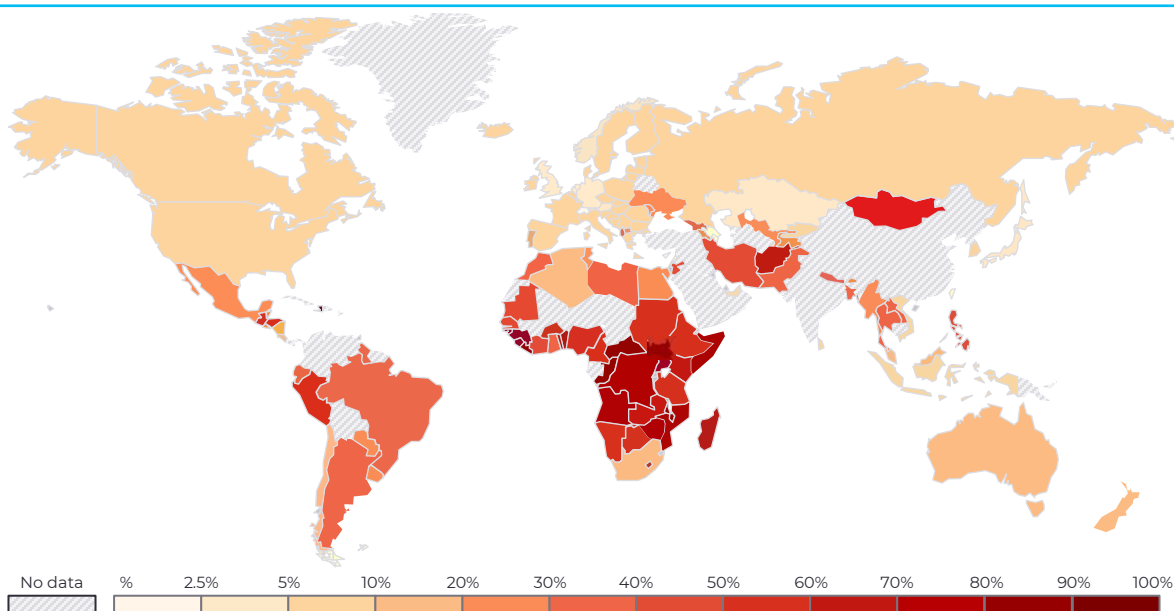
**Well-designed food processing technologies and packaging solutions can strengthen food supply chains, and advance access to safe and nutritious food.<sup>20</sup>**

To tackle food insecurity, malnutrition, and the cost of healthy diets, food system stakeholders should seek solutions that should foster linkages along the food system value chains creating economic development opportunities for win-win situations in terms of economic development and access to affordable, healthy diets.<sup>5</sup>

In terms of enabling technology and innovation, the food processing and packaging sector can contribute by increasing the availability of nutrient-dense foods, slowing down or stopping the natural processes of decay, extending shelf-life, and facilitating the storage and distribution of food.

Food packaging is fundamental to expanding food access to people around the world. Aseptic processing and packaging solutions can improve food safety and quality at ambient temperature and facilitates storage and distribution, and thus access to food, including in rural and remote areas and in times of reduced food supply, whilst helping reduce food waste.<sup>4,20</sup>

Share of population with moderate or severe food insecurity (2020)



Source: Food and Agriculture Organisation of the United Nations; OurWorldInData<sup>6</sup>

# Enabling the transition: Policy mechanisms




**Coherent policy interventions are critical to promoting the food systems transition, enhancing food security, and facilitating access to affordable and safe nutrition.<sup>5, 16</sup>**

While scientific and technological advances can significantly expand food access, implementing coherent policy interventions is crucial. Several policy considerations can advance countries' efforts towards promoting food security, affordable access to safe food, and implementing agricultural innovation systems, as part of the broader food system transformation.<sup>5,15,21</sup>

However, creating a suitable enabling environment remains a major challenge, requiring policy coherence at both national and subnational levels. Therefore, it is recommended to promote robust multilevel governance across national and regional policies.<sup>5</sup>



Examples of policy approaches for improving food security and accessibility

					
Increase investments in agricultural R&D at global and national levels	✓	✓			✓
Improve access to agricultural technologies and financing for smallholder farmers					✓
Strengthen education and extension services for farmers to enhance productivity and resiliency					✓
Build evidence base for integrating healthy food access into health care programmes serving people at the risk of food insecurity	✓				
Expand the coverage of school feeding programmes globally, so that more children can gain access to safe nutrition	✓				✓
Increase investments to infrastructure development (storage, refrigeration, transport)	✓	✓			✓
Reduce trade barriers to facilitate movement of food	✓				
Increase investments in programmes that help people purchase healthy foods	✓	✓			✓
Promote nutrition programmes to increase awareness of healthy diets					✓
Support policy coherence for food security	✓				✓

Sources: Adapted from United Nations Conference on Trade and Development<sup>16</sup>, Tetra Pak<sup>4,20,22</sup> Waxman & Martinchek (2023)<sup>21</sup>

## Collective actions needed

It is vital for policymakers to implement measures that aim to strengthen and expand local food value chains, including infrastructure and enhance technological capabilities related to food processing and packaging, especially in regions that lack established food supply chains. Providing training programmes for local producers and supplying incentives to activities that improve access to nutritious foods are also necessary steps in reducing malnutrition that negatively affects both human health and environmental sustainability.<sup>5</sup>

# Enabling the transition: Partnerships

**Partnerships are essential at different stages of food systems to transfer knowledge and build resilience, especially in regions with underdeveloped food supply chains.<sup>19</sup>**

Public interventions alone may be insufficient in addressing food security, particularly in developing countries where these interventions might be weak due to the informal nature of food value chains. In such cases, complementary strategies, such as multi-stakeholder partnerships (MSPs), including public–private partnerships (PPPs) are considered to offer opportunities to improve food security management through the adoption of approaches that are practical and more suitable to the available resources, existing capacities, and incentives within agri-food value chains.<sup>17</sup>

Partnerships play a key role in facilitating the exchange of experiences, technologies, and expertise, enabling the dissemination of crucial knowledge for successful implementation of practices that can enhance access to food. The High-Level Panel of Experts on Food Security and Nutrition (HLPE) has identified five primary functions that MSPs can perform among stakeholders who directly and indirectly shape food systems at various stages of the food supply chain.<sup>9</sup>

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Five main functions for MSPs

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Function	Description
Knowledge co-generation and capacity building	Transdisciplinary, participatory, and solution-oriented multi-stakeholder partnerships can drive R&D on complex food safety related issues. These partnerships should also involve non-scientific stakeholders, such as farmers and local communities, to adapt the science or results to the needs of those who apply them in practice.
Advocacy	Raising awareness and advocating to improve food security globally. These MSPs are usually initiated and led by public agencies or by private sector. Private actors are considered to have a significant influence on consumer behaviour and therefore, their knowledge and expertise is critical in advocacy MSPs.
Standard-setting	Market-based standards contribute to strengthening the link between food producers in developing countries and consumers in developed countries. Market-based standards refer to sustainable practices, such as certifications or adapted best practices.
Action	Operationally and results-orientated MSPs contribute to food security and sustainable development by delivering goods and services as well as implementing programmes and projects that involve activities ranging from natural resource management and agricultural development to food processing and distribution.
Fundraising and resource mobilisation	International financial institutions and multilateral development banks can collaborate with donor governments and private sector to use collect resources by being active in the other domains of intervention. Microfinance and/or innovative and blended financial instruments can be used as instruments to mobilise resources.

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Source: Adapted from HLPE 2018 Multi-stakeholder partnerships report<sup>9</sup>

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## Collective actions needed

To accelerate transformation in developing countries, increasing awareness and knowledge of food safety among producers and consumers is critical. In this regard, partnerships can be instrumental. New business models and ecosystems can act as means for small businesses and smallholder farmers gaining access to technologies that advance food safety and security.

Through multi-stakeholder partnerships, linkages between stakeholders in food value chains can be enhanced, capital mobilised more efficiently, and critical knowledge and capacity built to support the establishment of necessary infrastructure to improve access to safe food, especially in the most vulnerable regions.<sup>20</sup>



# Enabling the transition: Technology

**Minimizing food loss and waste is a crucial factor in increasing availability and food access, and various technological interventions can be beneficial.**

Food losses during production, storage, and transport, as well as food waste by retailers and consumers, have a significant impact on food access. This is worsened by limited technological capabilities in food production, processing, and packaging, particularly among smallholder farmers who lack access to ready markets and infrastructure such as electricity and refrigeration. This often results in inadequate storage, leading to spoiled food.<sup>16</sup>

To tackle food security concerns, a range of technologies can play a vital role in the production and consumption processes. Preservation technologies, such as improved storage, aseptic packaging, refrigeration, and transportation capacity, can significantly enhance the ability to offer safe and accessible food in regions where adequate infrastructure in cold chains, electricity, potable water, is lacking.<sup>22</sup>

While packaging and processing can offer solutions to improved food access, the implementation of these technologies needs to be done with a reduced climate impact, while also driving circularity<sup>4,5,16</sup>

Examples of technological challenges and opportunities for food security and access

Food security	Challenges	Examples of technologies
Food availability (Production)	Biotic and abiotic stress	Herbicides and pesticides
	Improving crop productivity	Genetic engineering
	Improving soil fertility	Synthetic and organic fertilisers
Food access (Midstream)	Post-harvest loss (storage, refrigeration, transport)	Preservation technologies, sterilization technologies, e.g., UHT, aseptic packaging and coating
	Need for processing and harvesting equipment	Threshers and agro-processing technologies, e.g., fortification and micronutrients
Food utilisation (Downstream)	Lack of nutritious foods	High-nutrient staple crops
	Lack of information on healthy diets	Dissemination of nutrition information
Food stability (Systems)	Inability to predict when and how to farm	Forecasting technologies and sensors for detecting crop stress
	Lack of financial mechanisms to ensure income	Index-based insurance for crop and livestock

Sources: Adapted from UNCTAD<sup>16</sup>, de Bruin & Holleman (2023)<sup>5</sup>, Tetra Pak<sup>4</sup>

## Collective actions needed

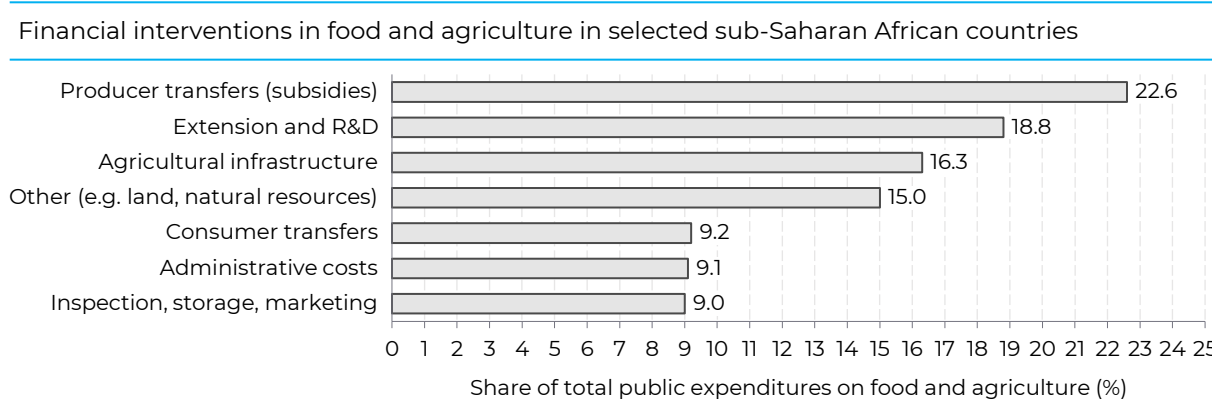
The strategic deployment of technology and innovation can be a crucial driver for improved food systems, especially from a food security and access perspective. Scaling access to technological solutions is necessary across the four pillars of food security. This requires governments to invest in supportive infrastructure, and industries to commit to utilisation of sustainable resources and technological innovation.<sup>16</sup> At national level, partnerships can also stem from circular business models leveraging agricultural residues through, for example, mobile small scale food processing and packaging units, contributing to improved food access.

# Enabling the transition: Financing

## Optimising public expenditure and investment for safer food systems in developing countries

Public expenditure and investments are effective tools to influence and shape food systems. To optimise the usage of limited resources, it is important to prioritise investments in those areas where returns are higher. Agricultural research and development (R&D), extension services, and infrastructure are crucial for improving productivity levels, yet they tend to be severely underfunded in low to middle income countries. Furthermore, while transfers to farmers and other small food producers can enhance productivity, their long-term returns have been estimated to be lower than investments in public goods.<sup>18,13</sup>

According to the public expenditure data, selected sub-Saharan African countries\* primarily allocate resources towards food production through input subsidies. However, using a large proportion of the budget on input subsidies may not be the most effective approach to ensure sectoral growth and affordability of safe food.<sup>13</sup>



Source: The State of Food Security and Nutrition in the World 2020 report<sup>18</sup>

## Accelerating food safety by directing financing towards agricultural infrastructure and R&D

Sufficient agricultural infrastructure and post-production facilities are the key levers for the development of modern and safe food supply chains. Investments in infrastructure, including transportation, processing, storage and wholesale of food, have the potential to promote food export, contributing to increased access to food.<sup>13</sup>

Collaborating with both regional and international non-governmental organisations, as well as other stakeholders, can enhance the capacity of national agricultural research and extension systems, facilitate sharing of knowledge and best practices and innovations for increased production and productivity.<sup>17</sup>

Small producers may face difficulties in transitioning to sustainable and safe food production practices due to a lack of funding. Therefore, development financiers and other private investors play a significant role in addressing these issues by utilising capital as a catalyst for change.<sup>11</sup>

Further, long-term investment solutions that account for hidden costs relating to climate, biodiversity, human health and livelihoods may play a role in mobilising capital and resources to initiatives that contribute to increased access to safe food.<sup>23</sup>

## Collective actions needed

Simply driving temporary productivity with input subsidies is not enough to accelerate food security. Both public and private investments, that are properly incentivised based on their societal benefits, are needed to provide sustainable food value chains in the long term, and ultimately, making safe food affordable for all.

\*Benin, Burkina Faso, Ethiopia, Ghana, Kenya, Malawi, Mali, Mozambique, Rwanda, Senegal, Uganda, United Republic of Tanzania

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