<*pullquotes*>

Achieving food security is dependent on availability, accessibility, utilisation and stability

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<straphead>Food security

<header1>Food systems approach

<header2>Reversing the trajectory of food insecurity in Africa

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<blurb>A goal of the United Nations is to end hunger by 2030 but diverse factors, including global warming, conflict and now the war in Ukraine, place that ambition in jeopardy. *AMIENA BAYAT, CLAIRE QUINN, JULIAN MAY and HEMISH GOVERA* argue that the world can end hunger in Africa if it takes proper note of the framework of the African food systems approach.

<subhead1>Introduction

The 17 Global Goals that make up the 2030 Agenda for Sustainable Development includes the goal to end world hunger by 2030. Sustainable Development Goal (SDG) 2 aims to ensure that everyone has access to enough food that is nutrient-rich throughout the year by 2030, particularly children and the most vulnerable sections of society. The 2030 target to end world hunger, however, is under threat due to a number of issues, including resource shortages, food insecurity, obesity, malnutrition, climate crisis, inequality, conflicts and environmental degradation. These developments will have an adverse effect on food systems, which are predicted to deteriorate, made worse by the conflict in Ukraine (Global Report on Food Crises, 2022).

Food security is a condition in which everyone has physical, social and financial access to enough safe, wholesome food that satisfies their nutritional needs and food preferences so that they can lead active, healthy lives at all times (FAO, 1996). Food security also emphasises the significance of eating a balanced diet (Battersby, 2022; FAO, 2004). Three variables affect food security i.e. whether the geographical region produces enough food to feed its population; whether the food supply is steady and able to withstand risks such as droughts; and whether people are able to access food both physically and financially (Johns Hopkins Center for a Liveable Future, 2016).

Food availability refers to supply-side factors and is determined by <ital>*inter alia*<*ital*> stock positions, rates of food production and trade performance. People's access to food considers the economic and physical aspects of the demand side and is concerned with incomes, expenditure, markets and prices. Utilisation deals with food preferences, the quality and safety of diets, and the intra-household distribution of food. The stability of these factors over time and vulnerability to their fluctuations are also important. The stability dimension includes risks and shocks arising from climate change, political instability, economic conditions and pandemics (FSNet-Africa, 2021).

In 2020, the High-Level Panel of Experts of the UN's Food and Agriculture Organization (FAO) proposed adding two further dimensions: agency and sustainability. Agency refers to the capacity of individuals and groups to make their voices heard and make decisions about their food systems. Sustainability refers to the long-term viability of the ecological and social bases of food systems (Clapp <ital>*et*

al<ital.,> 2022). If due attention is not paid to all six dimensions, food security cannot be achieved (Battersby, 2022).

A food system can be defined as the process that turns natural and human-made resources and inputs into food (Pinstrup-Andersen, 2007). It is the result of all of the activities and interactions that take place along the entire food value chain, which includes the provision of inputs, the production of agricultural products, transportation, processing, retail, wholesale, and food preparation, as well as consumption and disposal (Bendjebbar and Bricas, 2019). Although each food system functions differently, the majority have some of the same fundamental production, processing, distribution, consumption and waste management procedures. Along with ensuring food security and nutrition, food systems also need to have a positive impact on the environment and the socioeconomic system.

This article highlights the African food systems approach as a conceptual framework to identify and formulate transformative interventions to mitigate food system crises which pose significant current and future risks and challenges for food security in South Africa and Africa as a whole.

<subhead1>Food insecurity in Africa

According to the British Red Cross (2022), Africa is facing a food crisis that could see 146 million people go hungry due to various enduring reasons. In Africa, food availability is at risk from population increase, soil degradation, conflict, deforestation and urban sprawl which crowds out productive land and limits opportunities to extend cropped areas. When combined, these factors significantly increase the vulnerability of food systems, which impacts food access, availability, use and stability placing millions of people at risk of extreme hunger. Food safety is a major concern: a third of world deaths attributable to food safety are in Africa (Bendjebbar and Bricas, 2019).

Conflicts have a detrimental impact on food security. In 2017, conflict and disasters displaced an additional 30.6 million people, which affected the food security of 143 African nations and territories. One impact of conflict is stunting, which affects 34% of children under the age of five in countries affected by conflicts compared to 20% of all children of that age in non-conflict countries (Bendjebbar and Bricas, 2019).

In South Africa, households are also facing a food insecurity crisis (Battersby, 2022). According to Statistics South Africa (2022), the percentage of South Africa's population impacted by moderate food insecurity and the number of people categorised as seriously food insecure was 10.1 million (17.3%), while the number of people with severe food insecurity was 4.1 million (7%) in 2019. Abrahams (2022)

concurred that food insecurity is a result of income and affordability levels, with roughly 55.5% of South African households living below the upper bound poverty line in a state of food insecurity.

Food insecurity was exacerbated by the Covid-19 pandemic, which induced lockdowns that significantly disrupted food supply chains and resulted in the loss of lives and revenue. Data from Statistics South Africa (2020) state that around 23.6% of South Africans faced moderate to severe food insecurity in 2020 as a result of Covid-19, while approximately 14.9% experienced severe food insecurity. The pandemic has seriously hindered efforts to achieve South Africa's National Development Plan (NDP) and the SDGs aim of eliminating hunger by 2030 (Statistics South Africa, 2020).

<subhead1>The food systems approach

Food systems differ across multiple dimensions according to how food production, distribution and consumption activities are defined with regard to their impact on the environment, societies and economies. The food systems approach takes a more comprehensive approach to agricultural production and offers a framework for understanding how food system changes relate to food security and the environment. The approach considers the various components of the food system as well as the connections between them. It looks at all activities connected to food production, processing, distribution and consumption on the one hand, and the outcomes of these activities in terms of food security (including nutrition), socioeconomic factors (income, employment) and the environment (biodiversity, climate) on the other. Systems thinking is distinguished by its view of behaviour as an interaction between subsystems in which feedback plays a crucial role, as opposed to a straightforward chain of cause-and-effect interactions. The method emphasises the connections between the many components of the food system and the results of systemic actions in terms of socioeconomics, the environment and climate (FSNet-Africa, 2021).

This sets system thinking apart from other techniques where interventions are frequently created to make the most use of the available resources (natural resources, labour, capital). In order to increase efficiency and profitability, this typically entails using technical breakthroughs across companies, industries and/or chains (Van Berkum <ital>*et al*.,<ital> 2018).

Other approaches analyse the effects of interventions on the environment (CO_2 emissions), the market (prices, incomes) linked to natural resource depletion, whilst not considering feedback from the ecosystem and/or socioeconomic system for the farm, industry or chain. Food systems thinking provides a chance to add feedback from outcomes outside of those that directly relate to food production and consumption when analysing the results of policy actions. This way of thinking "steps back" from the scene of the intervention (Van Berkum <ital>*et al.,<ital>* 2018).

Additionally, the food system approach emphasises policy directions that affect the food production system rather than just the value chain (Van Berkum <ital>*et al.,<ital>* 2018). In some situations, strategies for tackling food and nutrition security have placed an undue emphasis on agriculture, portraying the problem as the result of weak production, market imperfections or poor governance.

With the emphasis on boosting food production, bridging yield gaps to increase availability and reducing costs and wastage to promote access, the utilisation and stability dimensions as well as the agency of food system players run the risk of being overlooked. It may also deflect attention from factors that contribute to food security but are unrelated to the food system, such as inequality, poverty and prejudice. These cannot be addressed by traditional food and nutrition policies and necessitate an integrated, intersectoral strategy. The holistic food systems approach is a better analytical model than a strategy that merely takes the production component into account (Van Berkum <ital>*et al.,<ital>* 2018).

<subhead1>FSNet-Africa's approach to the African food system

The Food Systems Research Network for Africa (FSNet-Africa) is a collaboration between the University of Pretoria (UP) – which is host of the African Research Universities Association's (ARUA's) Centre of Excellence in Sustainable Food Systems – the University of Leeds (UoL) and the Food, Agriculture and Natural Resources Policy Analysis Network (FANRPAN). FSNet-Africa's research on African food systems is based on its "Framework for Researching African Food Systems" project, which aims to strengthen the analytical capabilities of food systems researchers through a structured programme of research leadership development. The project presented a conceptual outline of the definitions, components of, and linkages within, the African food systems. It drew on several levels in the operation of food systems and their dynamics and explored the characteristics and challenges confronting the food systems in Africa using the Economic Commission for Africa's (ECA's) evidence base.

In mapping African food systems, the primary drivers influencing food systems in low-income nations fall into seven groups: bio-physical and environmental; socioeconomic; economic; territorial; demographic; infrastructure and technology; and political and governance.

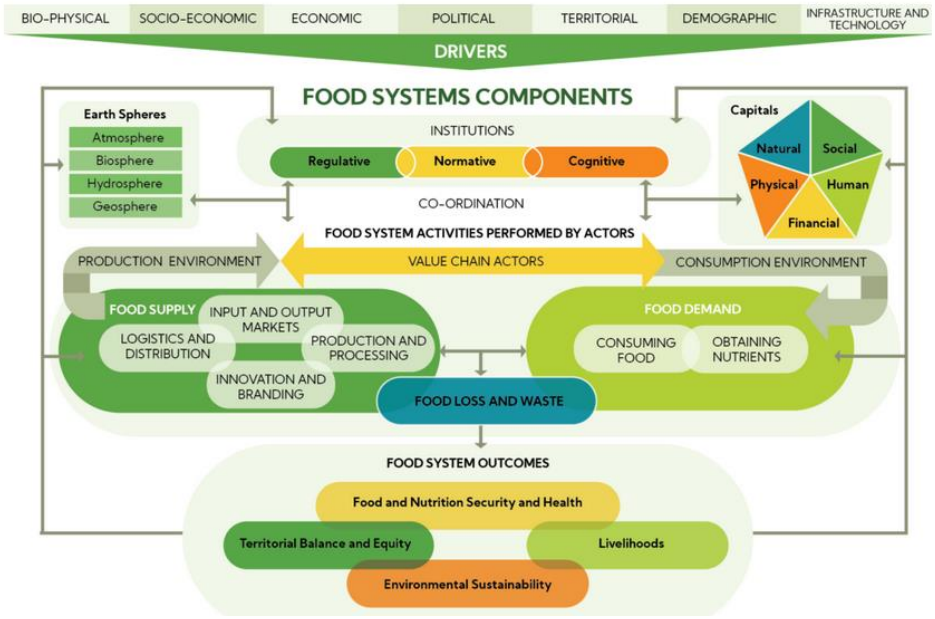
Bio-physical and territorial drivers refer to the availability, pollution and climate with regard to natural resources that shape the production side of food production. Examples of demographic drivers include population expansion, urban crawl and population displacement. These factors have a significant impact on food demand with regard to quantity required, type and quality of food consumed and the context in which food is produced. Innovations in technology and infrastructure are crucial factors in the food system influencing both supply and demand. Social traditions, education, health, values and identity are

all examples of socio-cultural drivers. They also include culture, religion and rituals. By affecting lifestyles, social norms, attitudes and cultures with regard to food, these have an impact on diets and the food environment. Political factors include government, laws, conflicts and humanitarian crises, which also have an impact on many factors affecting food systems (Bendjebbar and Bricas, 2019).

The framework considers the dynamics of growth and development in a particular environment (nation, region, livelihood zone or sub-national district), modifications to infrastructure and technologies, drivers of power and governance at local, national and international levels, socioeconomic characteristics such as skills and patriarchy, and demographic changes such as health systems and the effects of global pandemics (Van Berkum <ital>*et al.,*<ital> 2018).

The figure below outlines and maps the components of the African food system and their relationships. The factors shaping both food demand and supply are illustrated at the top of the diagram.

FSNet-Africa's framework for mapping African food systems



Source: FSNet-Africa (2021) as adapted from Brunori, et al. (2015)

The analytical framework depicted in the figure includes the institutions, values and cultures that influence preferences and choices in the food system, along with the capitals (combinations of financial, natural, physical, human and social assets used to produce or acquire food), the biological and ecological

realms available to the system and the activities carried out by the various actors in the system. The principle of “farm to fork” is present, with food waste and loss occurring at each stage. These activities of a food system may be organised as value chains that are short (low-input subsistence farmer to her family) or long (agro-chemical company to urban consumer via industrialised farms and multinational retail corporations) (Van Berkum <ital>*et al.,<ital>* 2018).

The food system impacts on three conditions/goals essential for human existence and has the potential to guide policies that address all three objectives: security of access to food and nutrition; rural and urban livelihoods, and specifically rural development; and environmental sustainability.

The conceptual framework proposes capitals that are relevant to food systems, including political and cultural capitals. Recently digital capital has been identified as a potential new asset that brings together access and use of information and communication technologies (FSNet-Africa, 2021).

The model also focuses attention on the interconnected components of the physical environment within which a specific food system operates and includes the atmosphere, hydrosphere, biosphere and lithosphere (Van Berkum <ital>*et al.,<ital>* 2018).

The environment in which food is produced, the environment in which it is consumed, the value chains connecting them, and the waste that occurs are all parts of the food system. When these components are analysed, supply-oriented assessments that concentrate on increasing food production in the face of demographic and climatic pressures may be included. The value chain, which connects supply (production) and demand (consumption), is the subject of midstream-oriented analysis. Here, better institutions and markets as well as lower transaction costs and risks are the keys to improving performance. Demand-oriented strategies place special emphasis on consumer behaviour, food access and cost, and balanced diets. Last but not least, system-wide approaches focus on developing responsive, adaptable food systems through better governance to resolve trade-offs and make use of synergies (Van Berkum <ital>*et al.,<ital>* 2018).

Social institutions are acknowledged as being a part of the food system, although only being tangentially related to food demand/production and food supply/consumption. Instead of organisational structures, institutions in this case are the official and informal rules that govern behaviour. The Framework for Researching African Food Systems identifies these as regulative, normative and cognitive establishments. Regulative institutions refer to public sector conventions, policies and procedures. Normative institutions are not as formal as regulative institutions and are morally controlled. Cognitive institutions guide what is culturally or conceptually acceptable to actors and include priorities, problem agendas, beliefs, paradigms, models of reality and language (Van Berkum <ital>*et al.,<ital>* 2018).

The Framework's objective was to critically translate evidence generated from the research findings into policy solutions that are feasible and practical interventions aimed at supporting the attainment of Africa's SDGs. The achievement of the SDGs is viewed as the primary transformative function of the African food system. That is the scope of the transformation's paths for institutional, social and environmental change, as well as its sustained elimination of famine and universal access to affordable, safe, healthy and nourishing food (SDG 2). This idea emphasises the potential for food systems to improve inclusive and fair livelihood options towards eradicating poverty (SDGs 1, 8 and 10). As a result, dismal developments could result in loss of livelihoods, especially for the most vulnerable individuals, hence escalating inequality and environmental devastation. The realisation of SDGs 12, 14 and 15 depends on the reparative effects of food systems transition on biodiversity and natural resources. Increased resilience and adaptation to risks and shocks at all levels are essential for addressing the challenge of climate change (SDG 13). Promoting demand restraint (i.e. encouraging consumers to choose fewer items of higher nutritional quality over more items of lower quality) and improving governance, coordination, accountability and stakeholder agency are other methods to realise transformative paths (FSNet-Africa, 2021).

Regarding African food systems, the continent comprises diverse food cultures and food environments owing to its heterogeneity, with over 2,000 languages and 3,000 ethnic groups across 54 countries. As a result, the biosphere, the globalising political economy and the globalisation of culture are all included in the global food regime, which includes the drivers and mechanisms of a food system. However, the concept of African food systems acknowledges, among other things, the common history of colonialism and underdevelopment and its detrimental effects on Africa's integration into the global food system and the investments, international partnerships and laws made under the auspices of pan-African governance and institutional experiments, such as the African Union (AU) and ARUA. Other examples include the growing integration of African nations as trading partners, investors, farmers, workers and consumers, which is prioritised by programmes such as the Africa Continental Free Trade Area (AfCFTA) and the shared understanding of the opportunities and challenges that face African governments and citizens as well as how to address them, as encapsulated by Agenda 2063, the Comprehensive Africa Agriculture Development Programme (CAADP) and the One Africa Voice initiative (FSNet-Africa, 2021).

Developments in the African food system indicate a declining employment and agricultural share as well as a slow performance when compared to other regions. The environment for producing food on a worldwide scale has evolved from family farms to industrialised commodity production and ultra-processing (sold through fresh produce marketplaces and small businesses). Food consumption based on mass distribution, globalised trade, etc. are further characteristics of this. Similar structural change is

taking place in Africa, and it has improved overall wellbeing while reducing rural poverty (FSNet-Africa, 2021).

However, those who work in the food industry are disproportionately affected by poverty, hunger and significant food insecurity. Unfortunately, smallholder farmers have diminishing access to land and receive inadequate compensation as a result of the current trends of capital-intensive, industrialised and large-scale commercial and farmland consolidation. Insecure employment on industrial farms and rural-to-urban migration in pursuit of employment prospects are other detrimental effects. Small-scale enterprises, insufficient utilisation of non-organic inputs and technology, condensed local supply chains and spot-exchange-based market transactions are the main characteristics of many African food systems. However, 60% of the world's uncultivated arable land is found in Africa, with only 8% of this land area being used for crop production, while its people are overly reliant on agriculture for a living (FSNet-Africa, 2021).

The majority of food produced in Africa is produced by small and medium-sized businesses along all value chains, including street vendors in the unorganised sector. This exemplifies how the African food system is represented in context. In spite of this, African food systems and their outcomes are evolving quickly. Over the past three decades, supply linkages between rural and urban areas have grown by 600-800%, which has boosted food availability and accessibility. Between 1990-92 and 2014-16, the prevalence of undernutrition in Africa, which is defined as having insufficient food consumption to meet nutritional energy requirements, decreased from 33% to 23.2% (FSNet-Africa, 2021).

Changes are occurring in all areas of food production and consumption in Africa with regard to the food ecosystems, though the effects on changes in poverty, food and nutrition security, and livelihoods are uneven. African food markets are expected to rise sixfold by 2025, with urban demand for processed staples driving the majority of the growth. Between 2010 and 2040, this is anticipated to increase five to tenfold, having a substantial influence on the continent (FSNet-Africa, 2021).

FSNet-Africa has proposed certain evidence-based interventions that are essential for aiding stakeholders in the food system to make decisions that are well-informed. This calls for "mapping food systems," "mapping the policy landscape" and "understanding paths to the plate" across the priority nations of FSNet-Africa. The many functions of participants in the informal food economy, which are largely disregarded by policy, should receive due consideration. The project highlights the necessity for research into the processes by which better agribusinesses and lucrative jobs are created and lost, and why. It also emphasises the necessity of recalibrating the assistance required by players in the formal

and informal food sectors to encourage workforce development, small, medium and microenterprises, and the employment of young people (FSNet-Africa, 2021).

<subhead1>Conclusion

In conclusion, the primary trends influencing African food systems and economies include rapid urbanisation, rising incomes and a growing middle class. These trends work in concert to affect consumer demand and alter consumer lifestyles, tastes and choices. Trends in the supply of staples and increased processed food consumption have westernised African food supply systems and altered the makeup of the labour market in terms of the shares of non-agricultural jobs in country regions. In the same way structural transformation patterns have been reinforced. Building resilient food systems that can withstand risks of climate change and safeguarding the livelihoods of underprivileged and marginalised food stakeholders are among the challenges facing African food systems. Therefore, improved sector governance and integrated African food systems are crucial to the viability of changing to sustainable food systems in Africa. The territorial balance between urban and rural areas, as well as across administrative and related boundaries, should serve as the basis for this.

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