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Urbanization is transforming agrifood systems across the rural–urban continuum creating challenges and opportunities to access affordable healthy diets

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Urbanization is transforming agrifood systems across the rural–urban continuum creating challenges and opportunities to access affordable healthy diets

**Background paper for *The State of Food
Security and Nutrition in the World 2023***

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Abstract

This background paper to *The State of Food Security and Nutrition in the World 2023* discusses the dynamics and drivers of urbanization, the associated changes in agrifood systems and the corresponding risks and opportunities to ensuring access to affordable healthy diets for all. The paper is based on a systematic review and meta-analysis of evidence from scientific papers and informed by new analyses conducted for the 2023 edition of *The State of Food Security and Nutrition in the World*. A conceptual framework is presented for understanding the different pathways through which urbanization is driving changes in agrifood systems across the rural–urban continuum, and is, in turn, affecting access to affordable healthy diets.

The report finds that urbanization, combined with interconnected changes in incomes, employment and lifestyles, is driving changes throughout agrifood systems across the rural–urban continuum, from food production, food processing, food distribution and procurement, to consumer behaviour. These changes represent both challenges and opportunities to ensure everyone has access to affordable healthy diets.

Urbanization, combined with other factors is driving a diversification of diets, including increased consumption of dairy, fish, meat, vegetables, fruits, and legumes – foods that constitute a healthy diet. However, the impact of this process is mixed, leading to some sectors of the population having greater access to diverse diets, while others find such access diminished. In almost every world region the availability of vegetables and fruits is insufficient to meet the daily requirements of a healthy diet. Moreover, the spread and increased consumption of convenience foods, including pre-prepared, highly processed, and fast foods, which are often energy dense and high in fats, sugars and/or salt, are increasingly abundant and cheap.

The increased demand for high-value crops, such as fruits and vegetables and processed food products, including in rural areas has led to significant growth in longer, more formal and complex food value chains, providing more income opportunities in on- and off-farm employment. As growing urban areas become better connected to rural areas, rural producers often have better access to agricultural inputs and services, allowing for improved productivity and diversification, which typically increases their income. However, there is also the risk that small farmers in peri-urban areas lose their land and livelihoods due to urban expansion.

Keywords: urbanization, rural–urban continuum, agrifood systems, healthy diets.

JEL codes: I15, O18, Q13, R11, R22.

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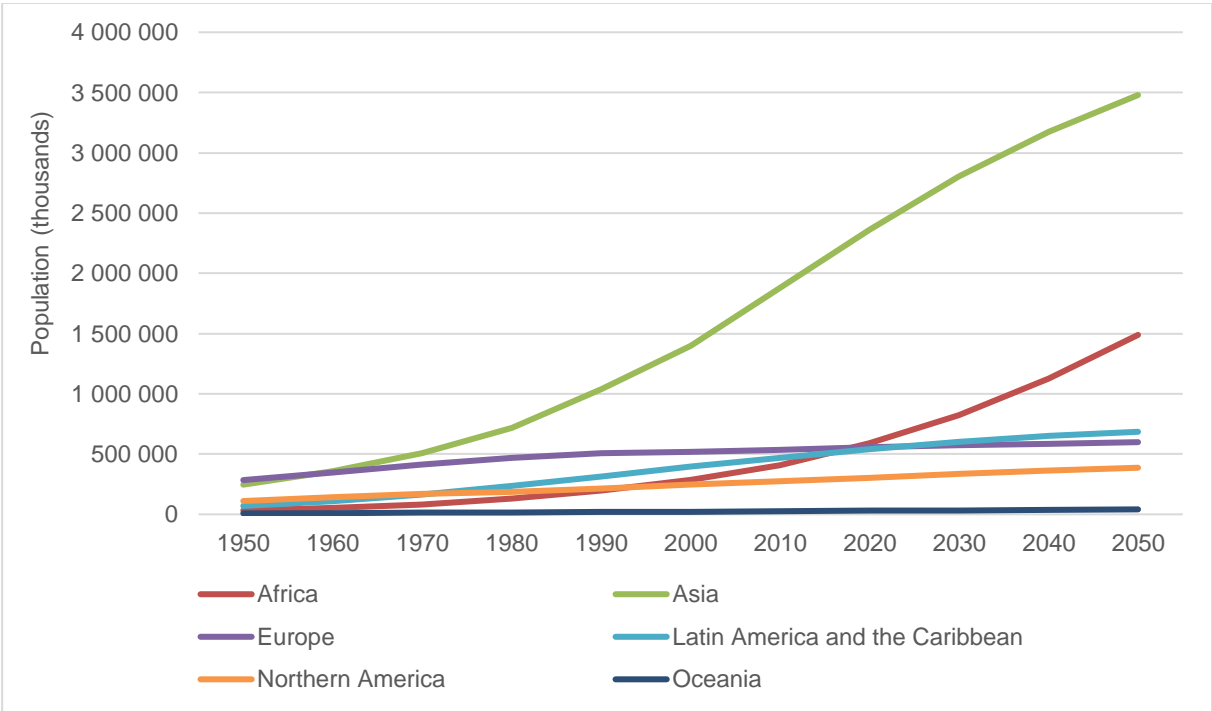
1 Introduction

Ending hunger, food insecurity and malnutrition in all its forms by 2030 will happen in an era of urbanization. Achieving these global goals will require a profound understanding how urbanization affects agrifood systems across the rural–urban continuum, creating challenges and opportunities in access to affordable healthy diets.

Urbanization, although it happens at different rates across countries, in conjunction with the dynamics of globalization and the growth of a more affluent middle class (often urban), affects food preferences and changes diets (Tefft *et al.*, 2018). The transformation of diets, combined with a range of other major developments including environmental degradation and climate change, lingering poverty and inequality, geopolitical events, and governance challenges, has major implications for how food is produced, traded, and consumed. These implications include changes in midstream and downstream activities of agrifood systems, including processing, marketing, and regulating agrifood trade, as well as the rise of rural factor markets especially for agricultural services, and changes in agricultural technology and input use.

Currently, urbanization is mostly affecting agrifood systems in Africa and Asia. In Europe, North America, Oceania and Latin America, the greatest part of urban growth took place in the twentieth century and earlier, as illustrated in Figure 1 and Figure 2. Still, future global urban growth will be profound due to the large and growing African and Asian populations. By 2050, 68 percent of the world’s population will live in cities (7 of every 10 people) will live in cities, compared to 56 percent in 2021 (UN DESA, 2022a). In low-income countries, the urban population is growing more than twice as fast (4 percent annually) as the rural population (1.8 percent annually) (UN DESA, 2022a). By 2030, the urban population in low- and middle-income countries is projected to exceed 4 billion people, more than double the number in 2000. In contrast, the rural population is projected to increase minimally, to around 3 billion, only slightly higher than 2.95 billion in 2000 (UN DESA, 2022a). In fact, in most regions, including Latin America and Europe, rural populations are declining (although rural populations are still increasing in some regions, such as in the African drylands) (Ligtvoet *et al.*, 2018). Sub-Saharan Africa and South Asia are projected to face the most rapid increases in urbanization, both in absolute and relative increases. At the same time, these regions face the biggest challenges in terms of poverty and access to affordable healthy diets.

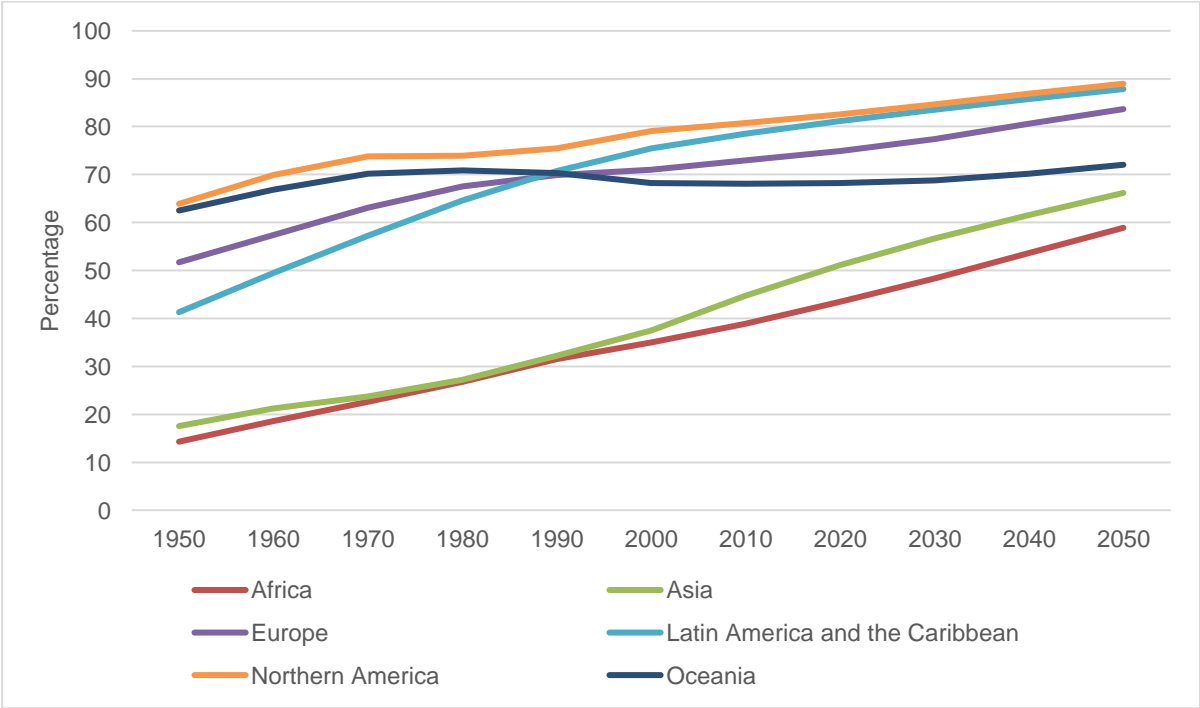
Figure 1. Urban population by region, 1950–2050



Note: From 2018 onwards, the numbers are projections.

Source: UN DESA (United Nations Department of Economic and Social Affairs). 2018. World Urbanization Prospects 2018. In: *United Nations*. [Cited 1 February 2023]. <https://population.un.org/wup>

Figure 2. Urban share by region, 1950–2050



Note: From 2018 onwards, the numbers are projections.

Source: UN DESA. 2018. World Urbanization Prospects 2018. In: *United Nations*. [Cited 1 February 2023]. <https://population.un.org/wup>

Changes in agrifood systems due to urbanization are affecting people and their livelihoods across the rural–urban continuum. Depending on the drivers and patterns of urbanization, urbanization can create both challenges and opportunities to access affordable healthy diets and to end hunger, food insecurity and malnutrition in all their forms. These challenges and opportunities follow from the change from traditional and mostly rural agrifood systems based on local market linkages and employment opportunities in farming, to a system with more complex market linkages and more diverse employment opportunities along the food value chain, including in processing, marketing and even research.

The availability and accessibility of both healthy and unhealthy diets is often higher in urban areas because of developing urban infrastructures as well as household characteristics, including higher purchasing power and changing lifestyles. However, in countries where urbanization is not substantially driven by economic growth, vulnerable urban dwellers, including rural migrants, often have limited access to affordable nutritious foods as they are disproportionately impacted by high food prices. Additionally, urbanization is often accompanied by increased economic inequality and an increase in the urban poor population (Battersby and Watson, 2019). Future urbanization is projected to evolve alongside rising overall welfare, but with high entrenched inequality, having major consequences for access to affordable healthy diets.

This background paper to *The State of Food Security and Nutrition in the World 2023* (FAO *et al.*, 2023) discusses the impacts of urbanization on agrifood systems and, subsequently, on access to affordable healthy diets. Since urbanization does not act upon agrifood systems in isolation, but rather, is intertwined with changes and the growth of economies and associated per capita incomes, developments in education, trade agreements and globalization, it is difficult to determine the precise impact of urbanization dynamics, and the impacts are different in each context. This report focusses on the generic associated changes in agrifood systems following urbanization. The report proceeds as follows: Chapter 2 discusses the drivers and patterns of urbanization and its impacts on the agrifood system across the rural–urban continuum. Chapter 3 presents the methodology of the structured literature research which informed the development of the conceptual framework. Chapter 4 introduces the conceptual framework and continues with a discussion of how urbanization affects agrifood systems across the rural–urban continuum. Chapter 5 discusses how these changes in agrifood systems enable or hinder access to affordable healthy diets.

2 Drivers, patterns and dynamics of urbanization

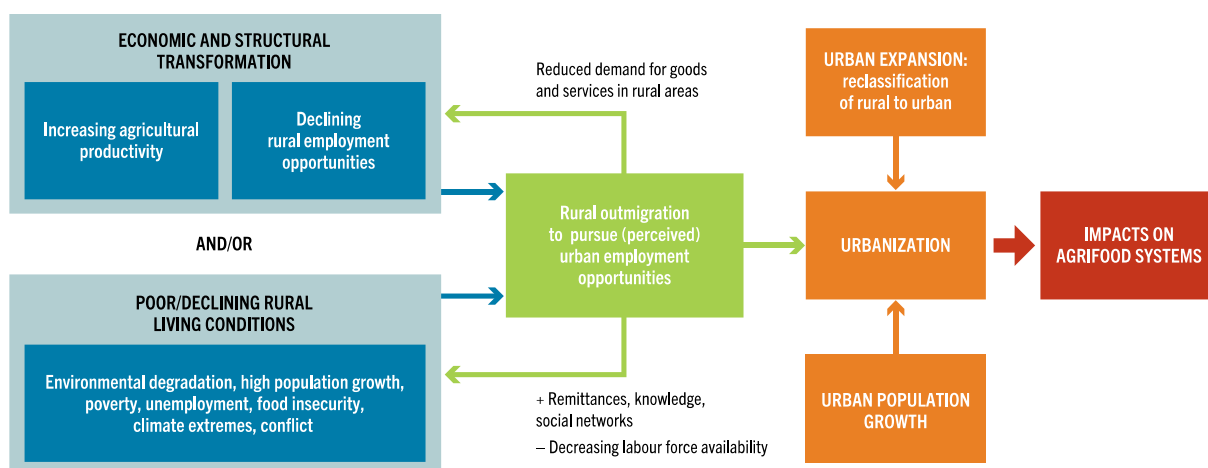
2.1 Drivers of urbanization

Urbanization is a multifaceted social, cultural, economic, and physical process that is the result of growing urban populations, the physical expansion of cities (the reclassification of land from rural to urban) and migration from rural to urban areas, as conceptualized in Figure 3. This process is complex and context-dependent, driven by intertwined factors including the growth of agriculture, policy choices, natural resource availability and other events such as conflict, climate extremes and environmental degradation.

Since World War II, many parts of the world have rapidly urbanized, with the urban share of the world's population rising from 30 percent in 1950 to 57 percent in 2021. By 2050, it is projected to reach 68 percent (UN DESA, 2022a). Historically, urbanization often went hand in hand with country and per capita income growth driven by structural transformation. The theory of structural transformation describes the transformation of economies, initiated with an increase in agricultural productivity in rural areas leading to an agricultural surplus. The additional income from this surplus generates demand for other goods and services, stimulating off-farm sectors of the economy (Jayne, Chamberlin and Benfica, 2018). This leads to a gradual shift of jobs from the primary agricultural sector to jobs in the secondary and tertiary sectors, typically located in urban areas. This encourages rural-to-urban migration, resulting in an economic transformation from a mainly agrarian to a more diversified national economy (Christiaensen and Martin, 2018). This leads to the rise of a modern industrial and service economy, and a demographic transition from high to low rates of birth and death (Christiaensen and Martin, 2018; Davis and Henderson, 2003).

In the process of structural transformation, agriculture continues to be the reserve labour pool until dynamism in the non-farm sector pulls labour out of farming. Growth in non-farm sectors and shifts in the labour force away from farming have gradually contributed to land consolidation and rising farm sizes in most world regions. Most of Asia has now passed the turning point where average farm sizes cease to decline, while, in Africa, average farm size is expected to continue to fall, posing challenges to agricultural development (Masters *et al.*, 2013). In parallel, more affluent urbanites increasingly acquire farmland in sub-Saharan Africa, which contributes to the increase in average farm size, although these dynamics differ from region to region (Debonne *et al.*, 2021; Jayne *et al.*, 2016).

Figure 3. Drivers of urbanization



Source: Authors' own elaboration.

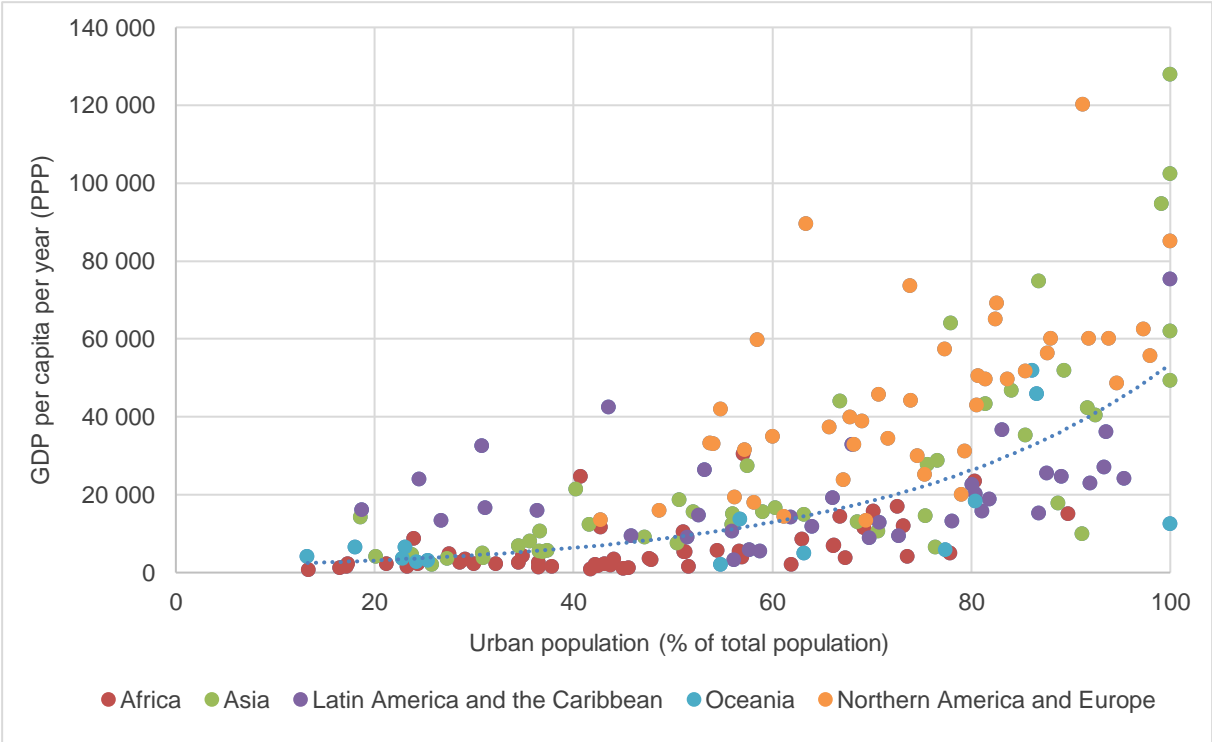
Rural transformation is embedded in structural transformation, and it occurs as agriculture's relationship to the rest of the economy changes. Rural transformation refers to the process of inclusive and sustainable improvements of rural livelihoods following rising productivity of (smallholder) agriculture, increasing marketable surpluses, rising off-farm employment opportunities, better access to services and infrastructure, and the capacity to influence policy, embedded in national processes of economic growth and structural transformation (IFAD, 2016a). This process inherently involves strengthening rural–urban linkages, which connect agriculture to the manufacturing and service sectors as they expand – a process that leads to increases in agricultural productivity and marketable surpluses, to the diversification of production patterns and livelihoods, and to better access to public services and infrastructure in rural areas. Urbanization can contribute to rural transformation, although this requires policies specific to each context that create enabling conditions (de Bruin, Dengerink and van Vliet, 2021).

Although countries with a high share of the population living in urban areas are often relatively prosperous, there is no univocal relationship between urbanization and economic growth. (Castells-Quintana and Wenban-Smith, 2020; Henderson, 2010). While many countries follow the pathway of structural transformation, some do not. Figure 4 and Figure 5 show that, although a tendency can be observed whereby levels of urbanization (measured by the share of the urban population) increases as GDP per capita at purchasing power parity (PPP) increases and levels of urbanization increase along with increases in agricultural production, there is no one-to-one relationship. For example, in 2019, 91 percent of Jordan's population was urban, but the country's GDP per capita was relatively low, at almost USD 10 000 PPP per year. Likewise, in Gabon, 90 percent of the population was living in cities in 2019, but the country's GDP per capita was around USD 15 000 PPP per year. Furthermore, small island countries and territories (Antigua and Barbuda, Saint Kitts and Nevis, and Aruba), as well as small landlocked countries, have lower levels of urbanization than expected, considering their relatively high GDP per capita.

In the late twentieth century, urbanization without structural transformation and economic growth occurred in some of the poorest countries of the world (Jedwab and Vollrath, 2015). The absolute size of cities increased quickly in these countries, while city size became less

indicative of city living standards than in the past. In these countries, urbanization is associated with other developments. First, overall population growth leads to growth in both urban and rural areas. However, without increases in agricultural productivity, rural population growth results in land fragmentation and economically unviable farms and lack of livelihood opportunities in rural areas. Rural inhabitants then migrate to cities where opportunities may be limited (because of lack of economic growth), resulting in increased urban poverty. This urban population growth stretches the capacity of urban infrastructure and social services to the limit. This is particularly the case in rapidly growing urban areas, where investments have not kept pace with urban expansion. In this case, living standards will not rise to the level normally associated with urbanization (Adger *et al.*, 2015; Selod and Shilpi, 2021). Furthermore, urbanization without economic growth is often linked to poor rural living conditions, including poverty, lack of employment or underemployment, lack of infrastructure, lack of access to services, food insecurity, and environmental degradation (Adger *et al.*, 2015; ScienceDirect, 2023; Selod and Shilpi, 2021).

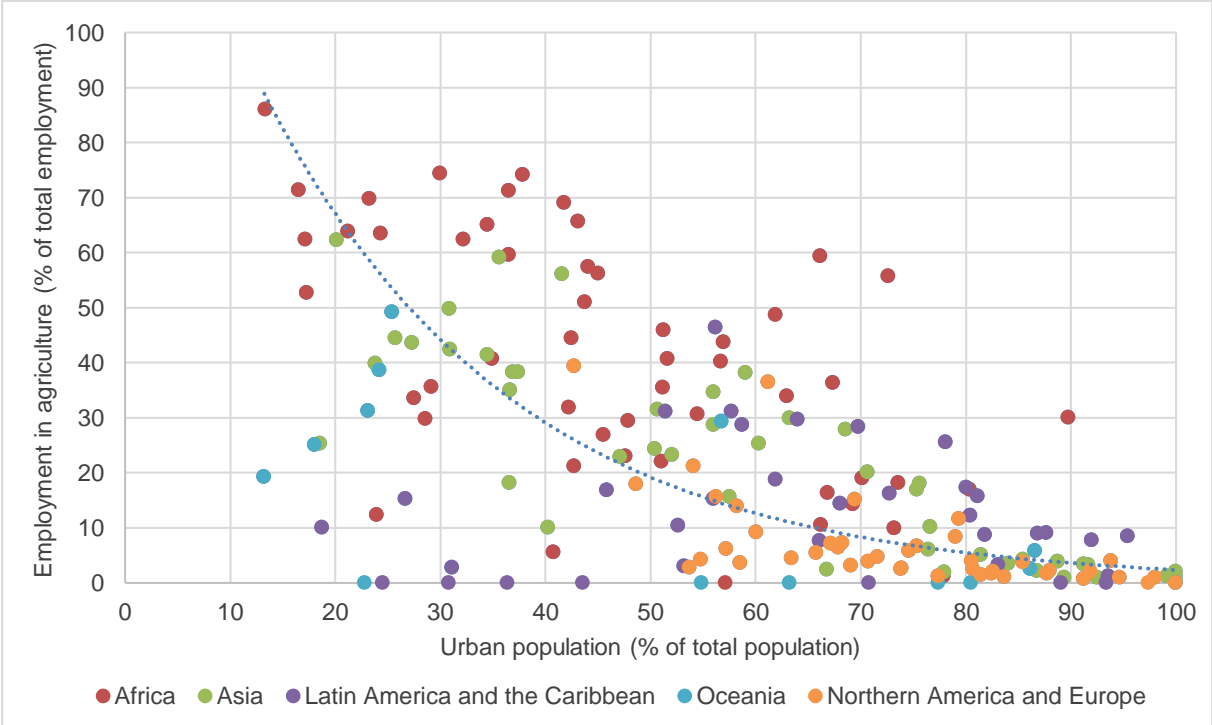
Figure 4. GDP per capita PPP and level of urbanization



Note: Each dot represents a country.

Source: World Bank. 2023. DataBank. In: *World Bank*. [Cited 23 May 2023]. <https://data.worldbank.org>

Figure 5. Level of urbanization and percent of employment in agriculture



Note: Each dot represents a country.

Source: World Bank. 2023. DataBank. In: *World Bank*. [Cited 23 May 2023]. <https://data.worldbank.org>

Although there is intraregional variation, the experiences of Latin America, East Asia and Southeast Asia from 1990 to 2010 demonstrate the poverty-reducing impact of structural transformation (FAO, 2017; IFAD, 2016b). On the other hand, South Asia and sub-Saharan Africa have lagged behind in structural transformation as a result of the low productivity of subsistence agriculture, limited scope for industrialization and rapid rates of population growth and urbanization (FAO, 2017). Especially in sub-Saharan Africa, poverty reduction alongside urbanization is less evident than historically observed in other regions (Turok and McGranahan, 2013). Until the late 1990s, sub-Saharan Africa had the highest rate of urbanization in the world. However, this took place during lagging performances in agriculture and in its broader economy.¹ In the late 1990s, however, per capita income growth in the region began to increase significantly, outpacing many countries in the world. Nevertheless, some aspects of the economic transformation deviate from structural transformations driven by urbanization elsewhere (Jayne *et al.*, 2016). For example, rural populations continue to grow as most African countries are urbanizing and the flow of labour from farm to off-farm sectors of the economy does not always hold (Jayne *et al.*, 2016). Moreover, urban-based households, many of which are medium-scale investor farmers, control a sizeable share of national agricultural land and continue to invest there.

¹ In sub-Saharan Africa the urban population share rose by a factor of 3.2, from 11 percent in 1950 to 36 percent in 2010. In comparison, Asia’s urban population share during this period increased only 2.5 times (from 18 percent to 44 percent), and Latin America’s 1.9 times, from 41 percent to 79 percent (Tschirley, Haggblade and Reardon, 2014).

There are several factors that contribute to rural–urban migration in addition to the perceived economic opportunities in cities. Increasingly, climate change and environmental degradation are a factor, in some cases reducing rural–urban migration, while in other cases increasing it, depending on the community and the individual affected (Mueller *et al.*, 2020). Generally, in low-income rural regions, the lower the per capita income, the larger the share of the labour force employed in agriculture (including forestry and fisheries). This means that more people in these regions depend on natural resources for their livelihoods and are therefore more vulnerable to climate change and environmental degradation (Mortreux, de Campos and Adger, 2018). If the agriculture sector is weakened from the effects of climate change and environmental degradation, these populations may be compelled to migrate to urban areas in search of work (Afifi, 2011; Neumann and Hermans, 2017).

On the other hand, migration may be neither possible nor desirable for all affected population. Some of the poorest and most vulnerable groups, including women, children, and the elderly, can become trapped in rural areas, their mobility constrained by insufficient resources or social norms. Evidence also indicates that others may choose to remain in high-risk areas due to a strong attachment to their ancestral land and livelihoods (Adams, 2016). With the growing magnitude of climate change impacts, future rural–urban migration may be increasingly affected.

While migration to cities presents risks and opportunities, those who remain in rural areas, whether willingly or unwillingly, are disproportionately vulnerable to climate change impacts, which will have adverse implications for their future livelihoods and food security.

Where there are recurrent climate shocks, patterns of movement can become cyclical, pre-emptive and/or permanent because of perceived future risk. For example, evidence from Bangladesh suggests that around 22 percent of rural households affected by tidal-surge floods and 16 percent of those affected by riverbank erosion have migrated to urban areas (Penning-Roswell, Sultana and Thompson, 2013). Evidence from sub-Saharan Africa shows that, between 1960 and 2000, nearly 50 percent of net migration (estimated at 5 million people) was due to changes in temperature and rainfall, which affected agricultural production and brought about a reduction in farm incomes and rural wages, thus spurring rural-to-urban movement (EUROSTAT, 2000).

Sending one or more family members to cities to work in sectors other than agriculture, especially for poor rural households, is often important to reduce the risk of hunger and extreme poverty and to cope with possible adverse shocks the household might face. For example, evidence from the Sidama District in southern Ethiopia shows that households whose members were anxious about a decrease in quality and quantity of food were more likely to decide that an adult should migrate in search of employment to support better lives for themselves and the family (Regassa and Stoecker, 2012). Additional evidence from the same country confirmed these results: for households without a migrant member, the inability to feed the family compared to neighbouring households with migrant members increased by four times the propensity for a member of the family to migrate in search of work (Tegegne and Penker, 2016).

There is also an increasing occurrence of forced displacement from rural areas to urban areas, often because of disasters or conflict. Displaced populations are increasingly concentrating in cities, with 61 percent of the 26 million refugees (UNHCR, 2019), and two out of three internally displaced persons, residing in urban areas in 2019 (UNHCR, 2020).

2.2 Patterns and dynamics of urbanization

With urban expansion and improved road and communication infrastructure increasingly affecting a large part of rural areas, the distinction between rural and urban areas is becoming ever more blurred. A large share of the new urban dwellers is expected to live in peri-urban areas – the “urban fringe” outside the formal city limits – adds to this development. Increasingly, rural and urban areas are fewer separate spaces in their own right, but rather two ends of a spectrum, connected via numerous linkages across a rural–urban continuum.

In many African and Asian cities, investments in housing, public infrastructure and other public services are lagging, which affects their spatial expansion. Large cities in Africa and Asia struggle to provide basic infrastructure and utilities to the fast-growing edges of urban areas, resulting in urban slums with poor roads, services and housing (Abu-Salia, Osumanu and Ahmed, 2015; Barrett *et al.*, 2022). In other words, these continents are “suburbanizing” – with more urban inhabitants living in the newly developing neighbourhoods further from the city centre. In these peri-urban areas, people often have ties to both rural agriculture and urban jobs.

Despite the increasingly blurred distinction between rural and urban areas, global populations are still regularly categorized as living either in urban centres or in rural areas. This distinction can be attributed to data limitations on the one hand and, on the other hand, to the practicality of separating rural and urban areas into two categories (generally for governance purposes, as national ministries are habitually divided by rural and urban mandates) (Cattaneo *et al.*, 2022; Forster and Mattheisen, 2016). This simplified dichotomy also tends to focus attention on the urban–rural divide, with the conclusion that rural areas typically lag behind their urban counterparts in terms of economic development (Bailey, Jensen and Ransom, 2014; Love and Loh, 2020). The separation between rural and urban areas is, however, decreasing, both in science and in policy, due to the interconnectedness of the two areas.

How regions urbanize in terms of spatial patterns and in terms of rural–urban linkages affect the impacts of urbanization on agrifood systems. Where urban growth takes place and whether it takes place in large cities or in intermediate and small cities or towns, shapes who has access to services, markets, and inputs. (Box 1 provides more detail on the definition of city sizes.) The growth of intermediate and small cities and towns has been promoted explicitly by several local, national and international policies, emphasized by the New Urban Agenda (Agergaard *et al.*, 2019; Dupont, 2005; ESCWA, 2020). This is because intermediate and small cities and towns play a pivotal role in providing access to inputs and market opportunities for rural actors not residing close to major cities. Infrastructure and facilities in intermediate and small cities and towns are important for the connections between different urban centres and between urban centres and rural hinterlands, facilitating access to more dispersed patterns of pre- and post-harvest facilities such as collection hubs, (cold) storage, distribution and processing centres (Allen, Heinrigs and Heo, 2018; Dorosh and Thurlow, 2013; Dupont, 2005). This is conceptualized in Figure 6.

Box 1. Defining city sizes

Definitions of city size and city types differ among countries, as well as among scholars and practitioners. Numerous designations are given indicating size and function, such as primary, secondary, or tertiary cities, indicating the role of a city within a national context. Often, a threshold of 5 000 inhabitants is used to indicate that an area is urban, although Japan and China are outliers, using minimums of 50 000 and 100 000 inhabitants, respectively.

There is also no standard classification definition of “peri-urban”, and the term is applied to a mix of informal and formal settlements around urban areas. In general, however, peri-urban refers to the geographic edge of a city; that is, the urban fringe outside the formal city limits. Peri-urban areas are often described as the landscape interface or transition zone between urban and rural areas.

For the purposes of the discussion and analysis in chapters 3, 4 and 5 of this report, the terms urban, peri-urban, and rural are used according to Urban Rural Catchment Areas (URCA) definitions.

Based on combined URCA urban area subcategories, urban areas are defined as follows:

- large cities: population of over 1 million people
- intermediate cities: 0.25 to 1 million people
- small cities: 50 000 to 250 000 people
- towns: 20 000 to 50 000 people

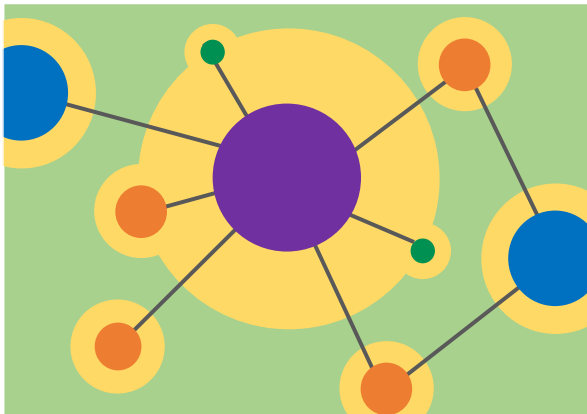
Furthermore, based on URCA subcategories, peri-urban and rural areas are defined as follows:

- Peri-urban consists of three URCA subcategories: less than 1 hour to large city, less than 1 hour to an intermediate city, less than 1 hour to a small city.
- Rural also consists of three URCA subcategories: less than 1 hour to a town, 1 to 2 hours to a city or town, more than 2 hours to a city or town.

Source: Adapted from FAO. 2021. Global Urban Rural Catchment Areas (URCA) Grid – 2021. In: FAO. [Cited 4 May 2023].

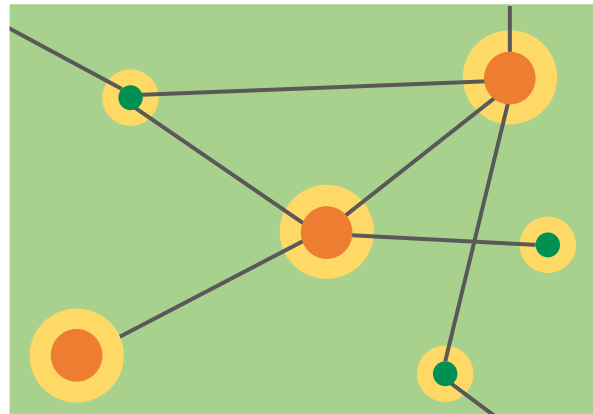
Figure 6. Patterns of urbanization

a. Dense metropolitanization around large and intermediate cities



- Centralized markets and demand
- More centralized economic growth
- Higher levels of economic inequality
- Increased risk of slums and urban poverty

b. Dispersed, small city and town urbanization



- Decentralized markets and demand
- Scattered centres of economic growth
- More dispersed non-farm employment
- More inclusive growth

● LARGE CITY
 ● INTERMEDIATE CITY
 ● SMALL CITY
 ● TOWN
 ● SPHERE OF INFLUENCE
 — CONNECTIVITY

Source: Adapted from de Bruin, S., Dengerink, J. & van Vliet, J. 2021. Urbanisation as driver of food system transformation and opportunities for rural livelihoods. *Food Security*, 13: 781–798. <https://doi.org/10.1007/s12571-021-01182-8>

The quality of rural–urban linkages affect food security and the availability, access and affordability of healthy diets (GIZ, FAO and RUAF Foundation, 2017), as well as shaping the livelihoods of urban and rural primary producers, processors and traders (Blay-Palmer *et al.*, 2018). Rural agricultural livelihoods often depend on their connection to peri-urban and urban food markets, while cities depend on surrounding peri-urban and rural areas for food and ecosystem services (Akkoyunlu, 2015; Da Silva and Fan, 2017). For example, agriculture in the proximity of urban centres often flourishes through more intensive production of high-value crops (Swain and Teufel, 2017). How well rural areas are connected to large, intermediate, and small cities and towns will determine to a great extent the quality of rural–urban linkages, for example, in terms of the generation and (re)distribution of employment via (temporary) migration, access to markets for agricultural products, financial support and exchange of information and knowledge.

More generally, the growth of intermediate and small cities has been found to matter more than the growth of large cities in reducing poverty at the national level (Christiaensen, De Weerd and Todo, 2013; Gibson *et al.*, 2017). Increasing populations in large cities seem to have little effect on poverty reduction and, in some cases, even increase poverty and decrease urban food security (Imai, Gaiha and Garbero, 2018). A growing concentration of people in large cities, such as Dakar and Lagos, can create a disconnect with neighbouring rural areas when import dependencies are high. As these coastal cities increasingly rely on food imports from overseas, they become less reliant on connections with their rural hinterlands (Vorley and Lançon, 2016a). On the other hand, smaller cities tend to contribute more reducing regional poverty, as they provide increased access to local non-farm employment for the poor and have lower costs of living (Christiaensen and Todo, 2014; Gibson *et al.*, 2017).

Small cities and towns have a key role to play in the achievement of sustainable development and improved food security and nutrition as concentrators of 60 percent of urban food demand (FAO, 2017). These urban areas are important to exploit the features of the territories in which all urban areas are immersed and their dense networks of interdependencies. The proximity of towns to rural areas and their close interaction with rural areas makes them key strategic sites for the creation of sustainable rural–urban territories.

Small cities and towns dominate large parts of the Americas, Europe and sub-Saharan Africa, whereas larger cities are more prominent in the densely populated regions of Asia, such as India and eastern China (Cattaneo, Nelson and McMenemy, 2021). Although large cities are home to more than 40 percent of the world’s urban population, less than one-third of the global rural population gravitates around large cities (Cattaneo, Nelson and McMenemy, 2021). Defining urbanization and operationalizing the rural–urban continuum

There is no shared international definition of what an urban area is. As such, comparing urban areas as defined by each country can be problematic (van Huijstee *et al.*, 2018). Countries can base their classification of urban areas on political/administrative aspects, morphological characteristics related to population density and size or built-up area, or the functions that areas have for their inhabitants (OECD and SWAC, 2020). The limited comparability transfers directly to globally reported and often-used urban population statistics generated by the United Nations Department of Economic and Social Affairs (UN DESA), which classify areas as urban according to the criteria used by each country or territory (UN DESA, 2022b).

There have been advances in methodologies for delineating urban and rural areas for international and regional statistical comparison, although these are not widely adopted (United Nations, 2022). The Joint Research Centre developed the Degree of Urbanization (DEGURBA) (European Commission, 2020a) based on the global human settlement layer in 2018 (European Commission, 2018). DEGURBA is an approach for classifying areas across the rural–urban continuum to facilitate international statistical comparison. The development was supported by six international organizations (the European Union, OECD, the World Bank, FAO, UN-Habitat, and the International Labour Organization) and was endorsed by the UN Statistical Commission. It consists of two levels. The DEGURBA was developed explicitly to facilitate the international comparison of the indicators of the Sustainable Development Goals (Dijkstra *et al.*, 2021). The methodology identifies cities, towns, semi-dense areas, and rural areas. Areas are defined as cities if they have a population of at least 50 000 inhabitants in contiguous dense grid cells (>1 500 inhabitants per km²). Towns and semi-dense areas are those which have populations of at least 5 000 inhabitants in contiguous grid cells, with a density of at least 300 inhabitants per km². Rural areas consist mostly of low-density grid cells, with less than 300 inhabitants per km². By using these three classes, instead of only urban and rural, the DEGURBA captures a rural–urban continuum based on population densities.

By applying one global definition of “urban”, based on population density and total population, instead of following country-based definitions, some differences can be observed between the widely used UN DESA data and the DEGURBA. Especially in Africa and Asia, the population share in nationally defined urban areas is much smaller than in urban areas and closer to the population share in cities alone as defined by the DEGURBA (Table 1). In the Americas, Europe and Oceania, data by UN DESA and DEGURBA are quite similar. Given that three-quarters of the global population lives in Asia and Africa, the global results also show a much lower share of the population living in rural areas using the DEGURBA than the share that is

based on national definitions. Globally, nationally defined cities with at least 300 000 inhabitants match the cities as defined by the DEGURBA.

Table 1. Population shares by Degree of Urbanization and nationally defined urban areas by United Nations region, 2015

	Degree of Urbanization (DEGURBA)			Urban area nationally defined	Difference in urban population share
	Cities	Towns and semi-dense areas	Rural areas		
	(%)				(percentage points)
AFRICA					
Northern Africa	58	25	17	51	32
Middle Africa	55	19	25	47	27
Eastern Africa	39	32	29	26	45
Western Africa	47	24	29	44	27
Southern Africa	43	23	34	62	4
ASIA					
Eastern Asia	45	32	24	60	17
Western Asia	59	22	19	70	11
Central Asia	37	43	21	48	32
South-eastern Asia	46	23	31	47	22
Southern Asia	52	22	25	34	40
AMERICA					
Northern America	48	24	28	82	-10
Central America	53	22	25	74	2
Caribbean	46	33	21	70	9
South America	57	23	20	84	-4
EUROPE					
Northern Europe	47	28	24	82	-6
Western Europe	35	33	32	79	-11
Eastern Europe	39	29	32	69	-1
Southern Europe	39	33	28	71	1
OCEANIA	48	27	25	69	7
WORLD	48	26	26	54	20

Notes: Urban population is population in cities plus in towns and semi-dense areas. Sums do not always add up due to rounding.

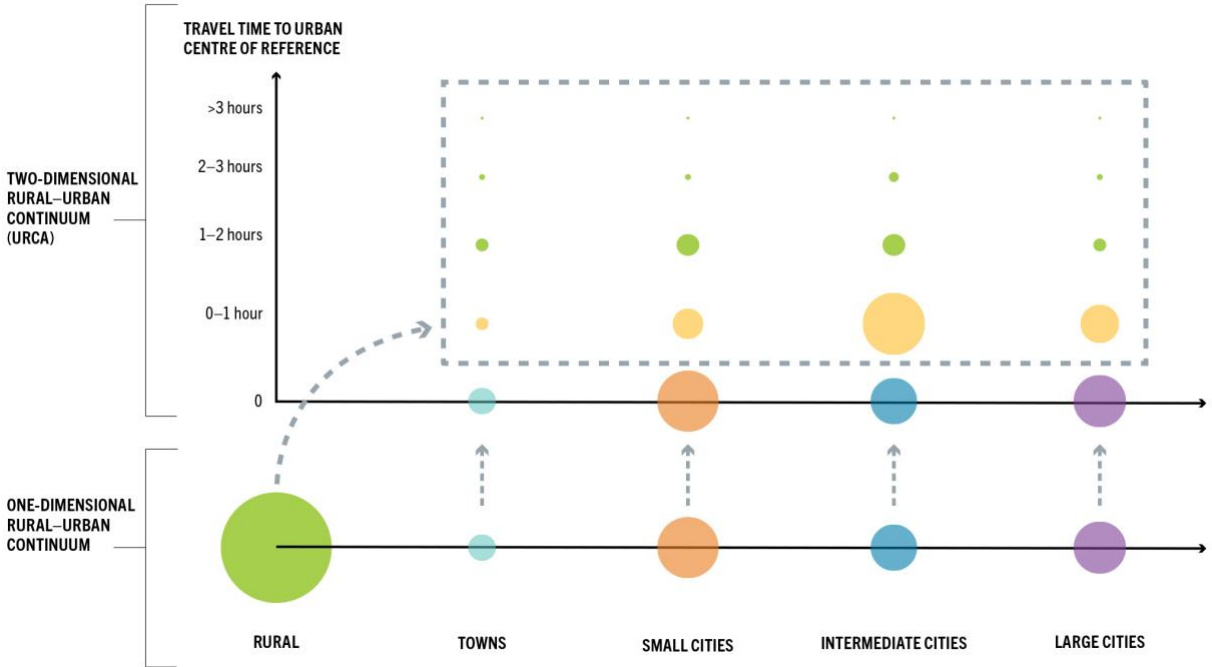
Source: Dijkstra, L., Florczyk, A.J., Freire, S., Kemper, T., Melchiorri, M., Pesaresi, M. & Schiavina, M. 2021. Applying the Degree of Urbanisation to the globe: A new harmonised definition reveals a different picture of global urbanisation. *Journal of Urban Economics*, 125, 103312. <https://doi.org/10.1016/j.jue.2020.103312>

Building on the DEGURBA classification, the URCA (FAO, 2021) further advances the global mapping of the rural–urban continuum (Figure 7) (Cattaneo, Nelson and McMenomy, 2021). Following the DEGRUBA, urban centres are defined along a gradient based on population size and density, whereby the city size is a proxy for the breadth of services and opportunities provided by an urban centre. The URCA approach builds on the central place theory (CPT).

The CPT is a set of assumptions and propositions that explain why hierarchically tiered centres are found at certain favoured locations on the economic landscape (Mulligan, Partridge and Carruthers, 2012). For example, retail trade and service activities often tend to cluster. The URCA approach builds on the CPT by assuming that city size is a proxy for the breadth of services and opportunities provided by an urban centre.

Different from the DEGURBA classification, rural locations are classified in the URCA approach using the shortest travel time to an urban centre, as a proxy for the cost of accessing goods, services and employment opportunities, applying an urban hierarchy based on city size. In other words, where the DEGURBA classification is a one-dimensional, urban–rural gradient based on population size and density, URCA is two-dimensional, with an urban gradient based on population size and density, and rural locations based on the travel time to the nearest urban centre of different sizes (Figure 7).

Figure 7. Rural–urban continuum based on the Urban Rural Catchment Areas dataset



Notes: The figure is a stylized representation of the URCA-defined rural–urban continuum which has a two-dimensional gradient, and the more common one-dimensional conceptualization of a rural–urban continuum. The size of the bubble roughly expresses population sizes based on the URCA dataset of global population distribution across the rural–urban continuum in 2015.

Source: Adapted from FAO. 2021. Global Urban Rural Catchment Areas (URCA) Grid – 2021. In: FAO. [Cited 12 June 2023]. <https://data.apps.fao.org/?share=g-3c88219e20d55c7ce70c8b3b0459001a>

The URCA approach allows for the identification of the share of the population that falls in a specific category of the continuum, rather than placing the entire population in a single territory or functional area. This categorization allows for more detailed analysis regarding consumption and production across the continuum. Table 2 describes the basic categories that are included in the rural–urban continuum. Consequently, different categories of rural areas are attributed to different urban areas, such as: rural areas <1 hour travel from a city >5 million people.

Table 2. URCA definition of categories across the rural–urban continuum

Rural				Urban						
Hours travel time to one of seven urban agglomerations				Agglomerations based on population size						
>3 hours*	3–2 hours	2–1 hour	<1 hour	>5 million people	1–5 million people	0.5–1 million people	250–500 thousand people	100–250 thousand people	50–100 thousand people	20–50 thousand people

Note: *Considered as either hinterland or dispersed towns, being that they do not gravitate around any urban agglomeration and are hence not part of the rural–urban continuum.

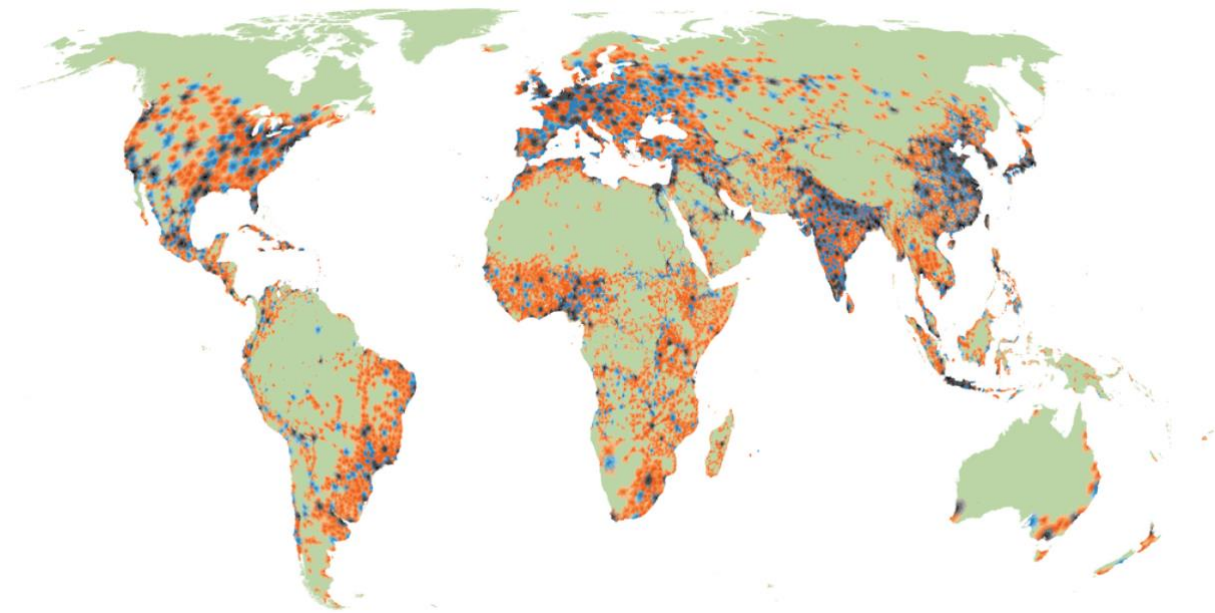
Source: FAO. 2021. Global Urban Rural Catchment Areas (URCA) Grid – 2021. In: FAO. [Cited 4 May 2023]. <https://data.apps.fao.org/?share=g-3c88219e20d55c7ce70c8b3b0459001a>

The URCA methodological approach provides insights on the diversity of patterns of urbanization and rural–urban linkages around the world. The global dataset identifies catchment areas of urban centres of different sizes and how many people gravitate towards each city or town, providing a full spatial representation of the connection between rural areas and urban centres. Catchment areas are the areas from which a city attracts a population that uses its services and economic opportunities. In operationalizing the rural–urban continuum in this way, the interfaces between rural and urban areas are viewed as a place of exchange and socioeconomic interaction, rather than one bounded territorial space. This provides a spatial and functional representation of the connection between rural areas and urban centres which is comparable across countries. This categorization, illustrated in Figure 8, when combined with household survey data, allows for more detailed analysis regarding food consumption and production across the rural–urban continuum, which is discussed in Chapter 4 of *The State of Food Security and Nutrition in the World 2023* (FAO et al., 2023).

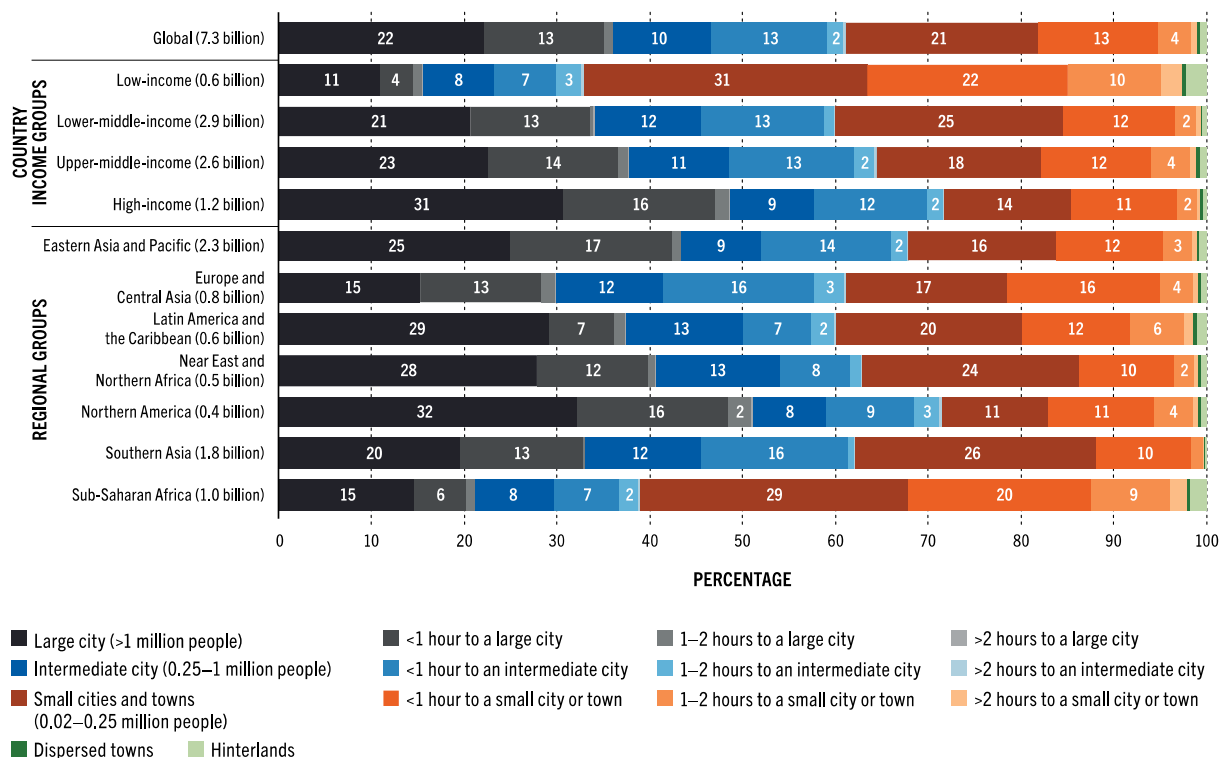
The URCA global mapping reveals unequal access to services, with around 3.4 billion people living in peri-urban and rural locations (Cattaneo, Nelson and McMenemy, 2021). Moreover, one-fourth of the global population lives in peri-urban areas of intermediate and small cities and towns, which challenges the centrality of large cities to development. In low-income countries, 64 percent of the population lives either in small cities and towns or within the catchment areas of the cities and towns. This has major implications for access to services and employment opportunities. Intermediate and small cities appear to provide catchment areas for proportionately more people gravitating around them than larger cities.

Figure 8. Global mapping and distribution of population by rural–urban continuum (URCA) in 2015

a. Global map of rural–urban continuum (URCA) in 2015



b. Global population distribution across the rural–urban continuum (URCA) in 2015, by country income group and regional group



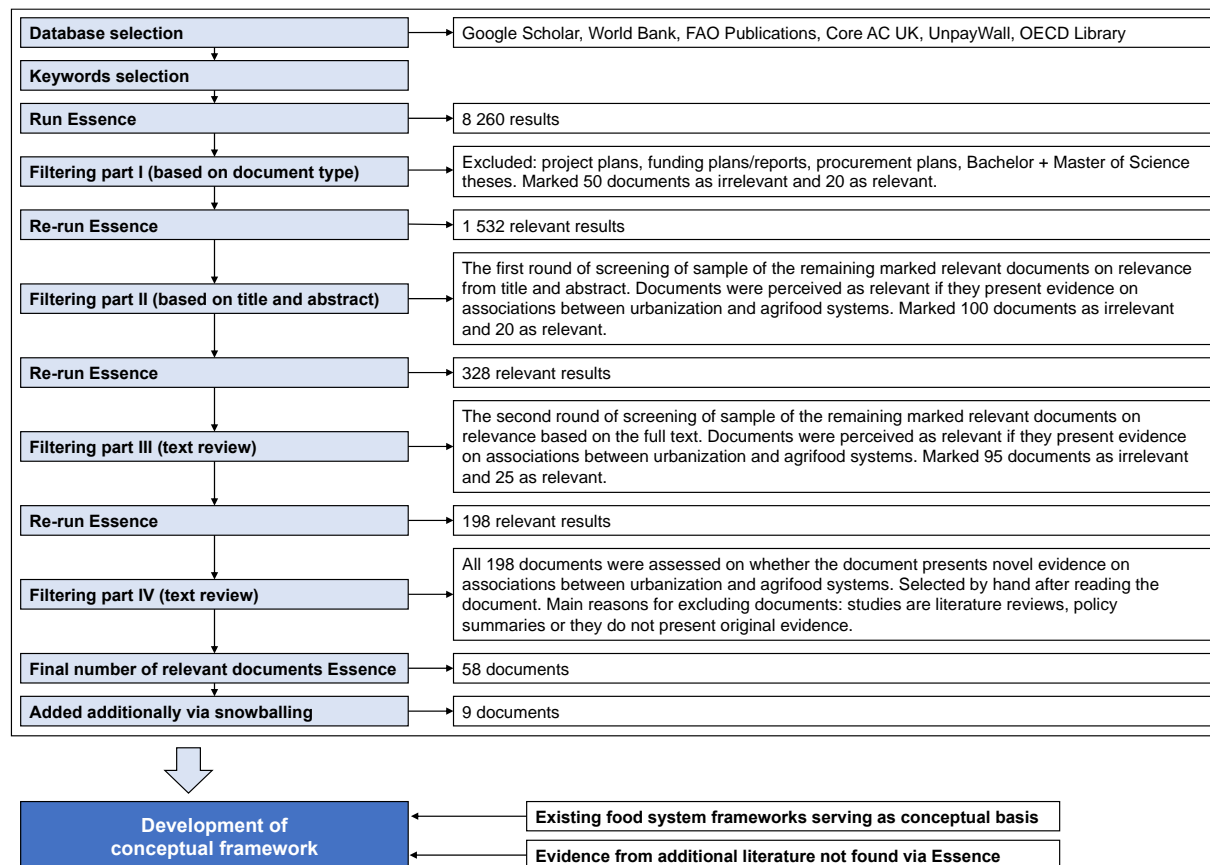
Source: Adapted from Cattaneo, A., Nelson, A. & McMenemy, T. 2021. Global mapping of urban–rural catchment areas reveals unequal access to services. *PNAS (Proceedings of the National Academy of Sciences of the United States of America)*, 118(2): e2011990118. <https://doi.org/10.1073/pnas.2011990118>

3 Developing the conceptual framework

3.1 Methodological approach

To develop the conceptual framework presented in *The State of Food Security and Nutrition 2023* two complementary methods were used. The first was a systematic structural literature review of scientific studies and meta-analysis of evidence on the associations or impacts of urbanization on agrifood systems across the rural–urban continuum. The design of this review followed the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA, see David Moher [2009]), and was implemented using an integrated research tool, Expert Search Semantic ENriChmEnt (Essence), developed by the FAO Data Lab. Second, the systematic review was supplemented with additional literature, including findings in reviews and other documents that were not part of the initial structural literature review. The flow diagram summarizing the methodological approach inspired by the PRISMA approach, is presented in Figure 9.

Figure 9. Methodological steps and results yielded to develop the conceptual framework



Source: Authors' own elaboration.

3.1.1 Document collection

The systematic structural literature review was based on a selection of open-access studies published between 2000 and 2022 in Google Scholar, World Bank, FAO Publications, Core AC UK, Unpaywall, and OECD Library in English. The keywords that were used are provided in Annex 1. The Essence program – a research tool for searching, monitoring, analytics and text mining of large document sets – was used to collect cases. Essence was developed by the FAO Data Lab and offered to other teams and divisions, enabling them to manage their research and data projects autonomously. The tool supports multiple data sources to search and download open-access documents (including Google Scholar, World Bank, International Monetary Fund and others). These articles, including their full text, are then stored and available for searching through a semantic search engine. Essence offers filters, allowing users to aggregate results by selecting values identified when the documents were downloaded or exploiting annotations added collaboratively. Specific filters and relevant documents can also be found using an artificial intelligence method that can be applied to the scraped texts. By marking a subset of the retrieved documents as relevant or irrelevant, Essence learns which type of documents, in terms of content, are perceived as relevant. The tool learns and extends the users' selections to the rest of the retrieved database.

A subset of documents was marked as relevant or irrelevant, in four rounds, in order to train Essence in marking which documents would potentially be relevant for the structured literature review. Figure 9 provides further details regarding the specific steps in this process. Documents that were considered irrelevant include procurement plans, project plans, project evaluations, funding documents and Bachelor and Master theses, as well as documents and studies that did not discuss urbanization or components of food systems. Documents were marked relevant when they presented original evidence on the associations or impacts of urbanization on agrifood systems. Urbanization could be included in the relevant documents in different ways: 1) the physical expansion of urban areas; 2) rural-to-urban migration; 3) growing urban populations.

Documents that provided a review of existing literature or that did not specifically address the impacts of urbanization (such as studies presenting consumption patterns of various income groups in urban settings) were not included. However, some of these documents were used to sustain the wider background paper. Eligibility criteria was not limited to specific methodological approaches or specific scales of analysis. Although this hampers the comparability of cases, applying stricter criteria would yield trade-offs in terms of the potential number of cases included.

The papers found in the systematic search were subsequently used for a round of snowball sampling; that is, the literature references of relevant documents were tracked down to look for additional relevant case studies. Subsequently, all articles were assessed in more detail for inclusion in the review, using the previously mentioned eligibility criteria. Publications that separately described and analysed the impacts of urbanization on agrifood systems were treated as separate cases in this review. Case studies published by the same authors, not including a new type of methodological or theoretical approach, and referring to the same case study area and period, were treated as one case. In all other instances, the studies were coded separately.

Besides the structured literature review, Chapter 3 of *The State of Food Security and Nutrition in the World 2023* (FAO et al., 2023), and more specifically the conceptual framework, was

informed by a wider collection of documents on urbanization, agrifood systems and healthy diets. The structured literature review did not yield sufficient insights on all elements of the agrifood system. The incomplete results can be partially explained by the fact that there is limited literature on some subtopics, but also by possible limitations of Essence.

3.1.2 Document coding applied in the structural literature review

For all documents analysed in the structural literature review, the following information was coded: case study location, data acquisition method, category and subcategory, impact (description), focus of the study across the rural–urban continuum and whether impacts on food security or healthy diets were reported. Impacts were placed into various categories and subcategories, which are summarized in Table 3. The categories and subcategories were defined based on the existing conceptual food system framework in FAO *et al.* (2020).

Table 3. Categories and subcategories

Category	Subcategories
Diet/consumption	Diet change, food demand, affordability, processed foods, food away from home
Midstream/trade	Value chains (processing, distribution, transportation, marketing), trade (national, global), food markets (formal, informal), food deserts/swamps
Food production	Diversification, commercial, productivity, production factors, technology, land use, farm size, natural capital

Source: Authors' own elaboration.

3.1.3 From coding to the conceptual framework

The coding of the categories and subcategories and the main impacts derived from the assessed literature formed the basis for the conceptual framework, which was enriched with other literature. The conceptual framework was initially drafted based on the preliminary results, using existing conceptual food system frameworks as a basis, such as the conceptual figures presented in *The State of Food Security and Nutrition in the World 2021* (FAO *et al.*, 2021) and the report *Food security and nutrition: building a global narrative towards 2030* (HLPE, 2020). Subsequently, a focus meeting with the multi-agency (FAO, IFAD, UNICEF, WFP and WHO) writing team of *The State of Food Security and Nutrition in the World 2023* was held in February 2023 to improve the clarity of the framework as well as the key messages. Consequently, the framework was improved through an iterative process involving the writing team, other experts and the authors of this report.

3.1.4 Limitations

The chosen approach does have some limitations. A major limitation is the opaque functioning of Essence in selecting which documents are considered relevant and which are not. This may have resulted in missing relevant case study documents. Another important limitation is the exclusive focus on documents in English. This has restricted the inclusion of possibly relevant documents in other languages. A last key limitation is the focus on the 2000 to 2022 time period. Because this period was the reference period, most case studies included in the review focus on Asian and African developments, probably because urbanization has been a major societal development during this period. In the other world regions, the processes of urbanization were especially dominant before the year 2000.

3.2 Descriptive results

The systematic search yielded 67 publications that report on a total of 74 impacts of urbanization on agrifood systems. Additionally, a wider array of documents was analysed, including literature reviews. Table 4 presents the types of data used in the studies included in the structured literature review. Most studies (51 out of 67, or 76 percent) use survey data as a method to gain first-hand insight into the impacts of urbanization. Almost half the studies (32 out of 67) use interview or focus group data, while fewer studies (12 out of 67) use spatial or secondary data, such as observations or policy documents. Most of the studies (43 studies) apply one method, whereas the remainder of the studies applied two or three methods to obtain their results. Table 5 summarizes the main results of the structural literature review, complemented with insights from additional literature. The next chapter provides more detailed analysis of the case studies, supplemented with other literature.

Geographically, the studies are concentrated in Asia: Bangladesh, China (2x), India (10x), Indonesia (5x), the Philippines (2x), Saudi Arabia, Taiwan Province of China, Thailand (2x), Viet Nam (4x), Central Asia, South Asia, and all of Asia (2x); and in Africa: Benin, Burkina Faso, Cameroon, Egypt, Ethiopia (5x), Ghana (5x), Kenya (4x), Mali, Mozambique, Namibia (5x), Nigeria (4x), South Africa, the United Republic of Tanzania (2x), Uganda, Zambia (3x), Eastern Africa (2x), and Southern Africa. Overall, 34 studies were performed in Africa, 32 in Asia, 2 in Latin America and the Caribbean and 1 in Oceania.

Table 4. Types of data used in assessed case studies of structural literature review

Spatial data	Large-scale survey data	Literature/secondary data (e.g. observations)	Interview/focus group data
12	51	12	32

Source: Authors' own elaboration.

Table 5. Summary of main results of structural literature review and insights obtained from additional literature

Category, number of studies and data type	Number of studies	Subcategory	Summary of main impacts reported
Consumption 25 studies Spatial data (1x) Survey data (21x) Literature/ secondary data (1x) Interview/focus group data (5x)	3	Affordability	Incoming migrants are often food insecure due to low and insecure incomes. People staying behind can become more food insecure due to migration of family members, resulting in less labour capacity. But remittances can also increase the affordability of healthy food.
	Additional literature		The affordability of healthy diets for poor urban dwellers is mostly low. The most easily available and affordable diets are mostly unhealthy. In more urbanized areas, nutritious foods that contribute to healthy diets are more expensive, or in some cases unavailable. Poorer households are inclined to spend their resources on more affordable food and aim to fill caloric needs over purchasing high-quality food. However, overall, healthy diets tend to be more affordable in urban areas, which can be attributed to higher overall incomes.
	20	Diet change	Urbanization changes diets in various ways. Overall, less traditional foods are consumed (e.g. wild meat or traditional staples) and more convenient, processed foods are consumed. More healthy and diverse foods are consumed by those who can afford it. For poor urban dwellers, diets can become less healthy. Overall, diets shift towards more animal products, sugar and fats, although this is linked to income.
	Additional literature		No additional insights.
	12	Processed foods	Urbanization drives an increase in the consumption of processed foods due to lifestyle changes among all income groups. Women are more likely to work outside their homes, increasing the need for convenient, easy-to-prepare and fast foods. But the rise in consumption of processed foods differs widely between countries – some studies observe a sharp increase in urban areas, while other studies only observe minor differences between urban and rural areas.
	Additional literature		No additional insights.
	0	Food demand	No studies were found regarding rising urban food demand.
	Additional literature		In sub-Saharan Africa and South Asia, overall urban food demand is expected to rise two to four times more than rural demand because of the concentration of welfare and the growing urban population.

Category, number of studies and data type	Number of studies	Subcategory	Summary of main impacts reported
	4	Food away from home	Urban and peri-urban households eat more often outside their homes than their rural counterparts. This due to changing lifestyles and different food environments.
	Additional literature		No additional insights.
Midstream, retail & trade 16 studies Spatial data (2x) Survey data (12x) Literature/secondary data (3x) Interview/focus group data (10x)	4	Value chains	Increasing urban demand for processed foods has led to longer and more complex value chains. In some big economies (e.g., China, India, Viet Nam) privatization of value chains have led to a wave of foreign direct investment in processing facilities. Many public retail firms have been privatized or dismantled.
	Additional literature		No additional insights.
	14	Food markets	Both formal and informal urban food markets are growing. On the one hand, markets are formalizing and modernizing, which is reflected in an increase in the number of supermarkets in many large cities. However, in many countries across Asia and Africa, informal open markets and food vendors are the most important source of household food purchases.
	Additional literature		No additional insights.
	1	Food deserts and food swamps	In informal, poor settlements in urban areas, nutritious foods are less available (although several authors question the use of the food deserts concept in the context of low-income countries).
	Additional literature		Some of the peri-urban slums in large cities of rapidly urbanizing countries are food deserts, in which people have limited access to food in general and to diverse nutritious foods due to the absence or low density of food entry points and inadequate access to other services, including health and education.
	-	Trade	No studies were found that provide original evidence on the impact of urbanization on food trade.
	Additional literature		Most foods in urbanizing countries are traded domestically. Most of the food trade in sub-Saharan Africa and South Asia is still conducted through informal channels, yet the share of formalized trade is increasing in many regions. As with domestic trade, a huge proportion of regional international trade in sub-Saharan Africa is informal, and regional trade agreements have not curtailed this high level of informality.

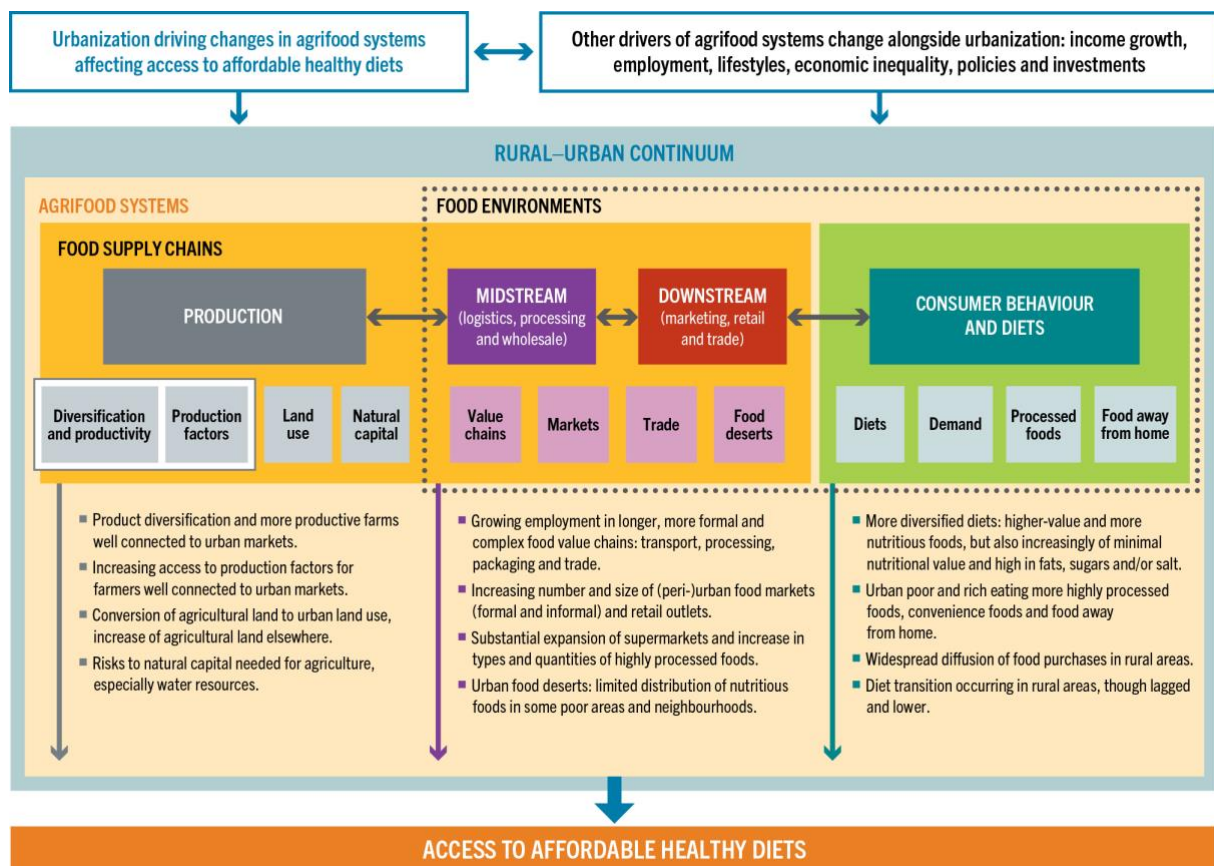
Category, number of studies and data type	Number of studies	Subcategory	Summary of main impacts reported
Production 28 studies Spatial data (9x) Survey data (15x) Literature/ secondary data (7x) Interview/focus group data (15x)	17	Land use	Urban expansion leads to the conversion of agricultural land into urban land uses. Often, this leads to an increase in farming activities elsewhere, often on natural lands, but this is not always possible, as for example in Egypt. Depending on land governance mechanisms, farmers owning land in areas that are being converted to urban land use can sell their land for a decent price or may lose their land.
	Additional literature		No additional insights.
	8	Production factors	Urbanization has diverse impacts on production factors. It can decrease the availability of farm labour as young people, especially, tend to migrate from rural to urban areas, while remittances from family members who have migrated are invested in farms. Urbanization can also increase the use of inputs for those farmers who have decent access to urban markets and education.
	Additional literature		No additional insights.
	3	Diversification	Farmers who are well connected to urban areas, e.g., due to improved road networks, have been able to diversify towards high-value crops to meet the more diverse demand in urban centres.
	Additional literature		In rural settings, nutrition education could stimulate the diversification of food production, which could help to improve the availability of nutritious foods.
	7	Productivity	Farmers who are well connected to growing urban markets often increase their productivity due to growing food demand.
	Additional literature		No additional insights.
	2	Natural capital	In water-stressed areas, urbanization often increases water stress. Additionally, urbanization causes water pollution.
Additional literature		No additional insights.	

Source: Authors' own elaboration.

3.3 The conceptual framework

Figure 10 presents the conceptual framework based on the results of the structural literature review, meta-analysis of evidence from additional scientific studies and new analysis presented in Chapter 4 of *The State of Food Security and Nutrition in the World 2023* report on changes in food demand and supply across the rural–urban continuum (FAO *et al.*, 2023). The conceptual framework shows the different pathways along which urbanization is bringing about changes in agrifood systems across the rural–urban continuum and affecting access to affordable healthy diets. Figure 10 recognizes that urbanization does not change agrifood systems in isolation – it changes agrifood systems in interaction with other drivers, including policies and governance, population growth, economic growth and inequality.

Figure 10. Pathways through which urbanization affects agrifood systems and access to affordable healthy diets



Source: Authors' own elaboration.

This conceptual framework breaks from the idea that agrifood systems mirror the traditional roles of rural vs urban areas; that is, that food production occurs in rural areas while food processing, retail and consumption occurs in urban areas. Food is not produced solely in rural areas; it is also produced in urban and peri-urban areas. There are both short and long food supply chains, and midstream processing serving long supply chains can be located away from urban areas. For these reasons, the rural–urban continuum in the framework is visualized the broader continuum in which agrifood systems operate.

To illustrate the pathways in which urbanization is driving change in agrifood systems, Figure 10 depicts three major components of agrifood systems and then identifies the ways in which urbanization is affecting them. The three main agrifood system components are: 1) consumer behaviour and diets; 2) midstream supply chains (including logistics, processing, and wholesale) and downstream activities (market, retail and trade); and 3) food production.

Moreover, as illustrated in Figure 10 and further explained in Chapter 4, food environments reflect a complex interplay among supply-side drivers, including food pricing, product placement and promotion, and demand-side drivers, including consumer preference and purchasing power. This complex interplay of supply and demand considerations is key to understanding how urbanization is driving changes in agrifood systems across the rural–urban continuum and affecting access to affordable healthy diets.

4 The impacts of urbanization on agrifood systems

4.1 Consumer behaviour and diets

As people move to urban areas, their diets and eating patterns change. Urbanization affects both what is eaten and where it is eaten – new foods are incorporated into diets, overall food consumption increases, diets diversify following changing employment profiles and lifestyles of both men and women (including commuting to work), and food needs and desires are reshaped. However, urbanization does not affect diets and consumption in isolation but, rather, in interaction with rising overall incomes and the globalization of food environments (Qaim, 2017).

Urbanization, in combination with income growth, shifts the demand for food – usually from traditional foods, especially staples, to more high-value products including dairy, fish, meat, vegetables and fruit, and to more convenient, often processed, foods, which are usually cheap and easily accessible. Research in several African countries shows that this diet transformation involves a shift towards saturated fats, trans fats, sugars and salts, and, often, towards highly processed foods in both urban and rural areas (Dolislager *et al.*, 2022; Sauer *et al.*, 2021). For example, the eating patterns of Tanzanian migrants change when they move from rural to urban areas, away from traditional staples, such as cassava and maize, towards more convenient foods such as rice and bread, and towards eating meals away from home (Cockx and De Weerd, 2016).

Urban food environments – the physical, economic and sociocultural factors that influence people's access to and consumption of food – generally provide a greater diversity of food products and places to buy food (Bren d'Amour *et al.*, 2020; Hawkes, Harris and Gillespie, 2017; Pingali *et al.*, 2019a). The wider range of food options includes nutritious foods that contribute to healthy diets, but also foods of high energy density and minimal nutritional value (Casari *et al.*, 2022). In some cases, urbanization affects eating habits due to the diminishing availability of indigenous foods. For example, Chaves *et al.* (2017) show that the consumption of wildlife in the Amazon is a rural-related tradition that decreases with time when people move to urban areas.

Although urban food environments differ from rural food environments, the food groups consumed within the same rural and urban income groups do not differ much. Major differences, however, can be observed between different income groups and different regions (de Bruin *et al.*, 2022). Although the total food expenditure increases as income increases, the share of food expenditure decreases (Gandhi and Zhou, 2014). Diet transformation also occurs in rural areas, though less and more slowly than in urban and peri-urban areas. New studies conducted in the last two years, including the analysis presented in *The State of Food Security and Nutrition in the World 2023* (FAO *et al.*, 2023), underscore the diffusion of diet transformation and change that is occurring across the rural–urban continuum, suggesting that indeed, increasingly, diets are transforming across the continuum, and there is no abrupt difference in this process between urban and rural settings.

Urban food demand is projected to further increase and change due to the growing urban population and the rise in average income. In South Asia and sub-Saharan Africa, the most rapidly urbanizing regions, urban food demand is expected to rise two to four times more than rural demand towards 2050 because of higher standards of living in urban areas and the overall growing urban population (Pingali *et al.*, 2019b; Zhou and Staatz, 2016). The exact food

demand increase will depend on the rate of urbanization and income differences between rural and urban areas.

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Urbanization is correlated with increased access to and consumption of processed foods. Evidence suggests that this increase, in both rural and urban areas and among both the rich and the poor, is driven primarily by opportunity costs in terms of time for both women and men (that is, time saved in consuming processed foods vs processing and preparing foods at home) and by food environment factors. In East Africa and Southern Africa, for example, processed foods have penetrated the diets of rural (36 percent) and urban (63 percent) households across all incomes (Dolislager, 2017). Other evidence from Africa (Dolislager *et al.*, 2022; Reardon *et al.*, 2021; Sauer *et al.*, 2021) shows that consumption of ultra-processed foods (such as sugar-sweetened beverages) comprises 12 percent of the total food consumption of the poor, versus 20 percent and 32 percent for the lower- and upper-middle-income groups. These shares are sensitive to increments of income and other variables, such as employment. Although the consumption of processed foods is increasing in both rural and urban areas, ample evidence shows that consumption is often higher in urban areas (Bren d'Amour *et al.*, 2020; Mottaleb and Mishra, 2023; Van *et al.*, 2021).

Processed foods, particularly highly processed foods, are often energy dense and high in fats, sugars and/or salt (Bren d'Amour *et al.*, 2020; Popkin and Nielsen, 2003). The increasing share of highly processed foods in consumption patterns, especially in urban areas, has negatively affected obesity levels and health conditions among urban dwellers (Reardon *et al.*, 2021). In many countries, obesity levels rose alongside urbanization. However, urbanization is correlated with obesity in a non-linear way: In low-income countries, obesity is higher in urban areas than in rural areas, while in high-income countries, the rural–urban obesity gap is reversed (Ameeye, 2020). In low-income countries, obesity is generally more prevalent among middle-aged adults from wealthy and urban environments (Chooi, Ding and Magkos, 2019).

As to the consumption of processed foods in rural areas, there is some evidence that this is impacted by proximity to an urban centre and the size of the urban centre (Bren d'Amour *et al.*, 2020; Dolislager, 2017). In Eastern Africa, evidence shows that the proximity-to-city effect is greatest for primary cities. These cities are likely to have large commercial networks that extend the market reach further into rural areas, resulting in increased engagement with urban markets by rural households. Another example comes from the Solomon Islands, where the consumption of ultra-processed foods is affected by the proximity to an urban centre, with rural regions close to urban centres consuming higher levels of processed and highly processed foods (Vogliano *et al.*, 2021).

Although urban food environments are diverse, some common differences between urban and rural food environments can be identified. In general, urban food environments provide more options regarding food products and places to buy food (supermarkets, food vendors and restaurants) (Pingali *et al.*, 2019a). Furthermore, studies show that in several countries, the food service sector is far more developed in urban areas and the amount spent on eating out

is significantly larger in urban areas than in rural areas for all income groups, (Bren d'Amour *et al.*, 2020; Popkin and Reardon, 2018). In addition, Bren d'Amour *et al.* (2020) show that in India, there is a significant positive correlation between processed food expenditure share and eating out, in that households that eat outside the home more often are also likely to spend more on processed foods. The higher urban consumption of food away from home can be linked to the more distinct separation of the living and work locations, improved (female) employment opportunities and long commuting distances in urban areas, which raise the opportunity costs of time spent buying and preparing food (Regmi and Dyck, 2001; Tschirley *et al.*, 2015a).

There is also a diffusion of food purchases in rural areas, more so than is commonly understood. The diet in these areas has shifted from mainly home-produced foods to, increasingly, market-purchased products. The rural poor are heavily engaged in purchasing food from markets and, overall, are net food buyers. In Eastern and Southern Africa, research shows that rural households buy 44 percent (in value terms) of the food they consume (Tschirley *et al.*, 2015a). A study of Bangladesh, Indonesia, Nepal and Viet Nam shows that rural households buy an even higher proportion of their food – 73 percent (in value terms) (Reardon *et al.*, 2014).

Studies show that while consumption of processed foods is higher in urban areas, in terms of the proportion of expenditure on food, rural consumption of processed foods is not much lower (Bren d'Amour *et al.*, 2020; Reardon *et al.*, 2021). In Eastern and Southern Africa, for example, 29 percent of total food outlays are spent on such food. Of these: 17 percent is spent on milled grains classified as minimally processed foods; 48 percent is spent on non-grain, minimally processed foods; and 35 percent is spent on highly processed foods (Reardon, 2015; Tschirley *et al.*, 2015a). Recent evidence from three African countries shows that the shares of processed foods of all types are surprisingly high among the poor and even the ultra-poor, in both rural and urban areas (Dolislager *et al.*, 2022; Reardon *et al.*, 2021; Sauer *et al.*, 2021).

Although urbanization and rising per capita income often occur simultaneously, these are separate processes, as urbanization can occur without substantial levels of economic growth (Chen *et al.*, 2014; Turok and McGranahan, 2013). Income growth is associated with reductions in undernutrition as well as increases in overweight (Webb and Block, 2012). This is mirrored in the overall percentage decrease of food-insecure people in sub-Saharan Africa and South Asia since 2000, where per capita incomes have been rising over the last few decades. As inequality, in terms of both income and property, has increased in most countries (Rao *et al.*, 2019), poverty headcounts and food insecurity have not decreased in line with increasing GDP, and the absolute number of people who are food insecure has increased. During the coming decade, inequality within and between rural and urban areas is projected to increase, unless corrective policies are established and implemented. (Rao *et al.*, 2019).

Overall, urbanization can have both positive and negative effects on food consumption and diets. While increased access to a wider variety of foods and cuisines can be beneficial, it is important to be aware of the potential negative health consequences associated with some of the changes in food consumption that occur in urban areas.

4.2 Food supply chains

4.2.1 Midstream and downstream food supply chains

Another pathway through which urbanization is affecting agrifood systems, driven by the significant changes in urban and rural food demand, is through the midstream and downstream segments of food supply chains (see Figure 10). The midstream segment consists of post farm gate activities related to food logistics, processing, and wholesale, including activities such as cleaning, sorting, packaging, transportation, storage, and wholesale of agricultural and food products. Sales in markets, retail sales and trade are often referred to as the downstream segment of food supply chains. Both the midstream and downstream segments are impacted by increased investment in infrastructure, such as roads, warehouses, and cold storage facilities, which often accompanies urbanization.

With cities growing and the diets of urban dwellers changing, the extent to which populations, especially urban and peri-urban populations can rely on local food production is constrained, and food distribution and trade change to meet the new demands. At most, 30 percent of the global population is estimated to be able to fulfil its demand for specific crops locally (within approximately a 100-km radius) (Kinnunen *et al.*, 2020; Kriewald *et al.*, 2019), and about 80 percent of food is supplied regionally (within a 500-km radius) (Pradhan *et al.*, 2020). However, although some of the foods consumed in urban areas must travel far to reach their destination, most foods are still produced and traded domestically. , e.g. this is 90–95 percent in Asia (Reardon, 2015).

In the case of sub-Saharan Africa, while most of the food trade in sub-Saharan Africa is still through informal channels, the share of formalised trade is rising in many regions (Battersby, 2017; Jayne, Chamberlin and Benfica, 2018; Porter, 2005; Reardon *et al.*, 2015). As with domestic trade, a huge proportion of regional international trade in sub-Saharan Africa is informal, and regional trade agreements have not curtailed this high level of informality (Golub, 2012). Although most foods consumed in cities are sourced domestically, urbanization has led to increased food imports in some regions. In some coastal cities of West Africa, imported foods are often easier to obtain and cheaper, especially in places where rural–urban connectivity is low due to limited infrastructure and weak supply chains (Vorley and Lançon, 2016b). More generally, large coastal cities and internationally well-connected cities are often well-linked to international markets, providing a higher variety of imported goods (Vorley and Lançon, 2016b).

Although some of the foods consumed in urban areas are imported, most foods are produced and traded domestically. This is consistent across regions and across most food groups (except oils and fats), and is particularly the case for fruits, vegetables, and animal source foods. For instance, food supply is overwhelmingly from domestic sources, estimated at roughly 90 to 95 percent for developing countries (Reardon, 2015). In other words, imports are a low share of food supply, and domestic supply chains really drive food supply. For countries around the world, food imports form a small share of total food supplies and mainly in a few products. Exceptions are the entire Near East and North Africa region, some countries in sub-Saharan Africa, as well as the Small Island Developing States. According to the latest World Trade Organization report, there are 32 net food-importing developing countries (WTO, 2023). For these countries, food imports can be substantial. For example, according to the OECD–FAO Agricultural Outlook, roughly 70 percent of all food commodities consumed in the Near East and North Africa are imported (OECD and FAO, 2022). Moreover, for most other

countries, imports are a low share of food supply, and mainly consist of a few products, such that domestic supply chains really drive food supply (Dolislager *et al.*, 2023).

Domestic food supply chains are usually long and criss-cross a country from supply zones to cities and rural areas (Reardon *et al.*, 2019b). Short, rural, local supply chains, or traditional food supply chains based around subsistence agriculture, only account for approximately 10 percent of the food economy in Africa and Southern Asia, and 5 percent in Southeast Asia and Latin America (Faye *et al.*, 2023; Liverpool-Tasie, Reardon and Belton, 2021; Reardon *et al.*, 2019b). On the other hand, long supply chains connecting rural producers to urban consumers through a web of labour-intensive agrifood SMEs are more prevalent, accounting for approximately 70 percent of the food economy in Africa and Southern Asia, and 50 percent in Southeast Asia and Latin America (Liverpool-Tasie, Reardon and Belton, 2021; Reardon *et al.*, 2019b). Modern food supply chains based around supermarkets and large processors tend to be long as well, stretching from rural areas to urban areas, but they also include international elements. Such long supply chains account for approximately 20 percent of agrifood systems in Africa and Southern Asia, and 45 percent in Southeast Asia and Latin America.

In sub-Saharan Africa, the region with the highest rates of hunger and a focus of the analysis in the next chapter, most of the food trade in sub-Saharan Africa is still conducted through informal channels, however the share of formalized trade is increasing in many regions (Battersby, 2017; Jayne, Chamberlin and Benfica, 2018; Porter, 2005; Reardon *et al.*, 2015). As with domestic trade, a huge proportion of regional international trade in sub-Saharan Africa is informal, and regional trade agreements have not curtailed this high level of informality (Golub, 2012). Although most foods consumed in cities are sourced domestically, urbanization has led to increased food imports in some regions. In some coastal cities of West Africa, imported foods are often easier to obtain and cheaper, especially in places where rural–urban connectivity is low due to limited infrastructure and weak supply chains (Vorley and Lançon, 2016b). More generally, large coastal cities and internationally well-connected cities often have solid links to international markets, providing a greater variety of imported goods (Vorley and Lançon, 2016b).

The development of domestic food supply chains in response to increased urban food demand and, in particular, the higher demand for high-value and processed products increases activities in the midstream (Reardon *et al.*, 2015). While packaged food sales were growing at only 2-3 percent annually in high-income countries, this was 13 percent, 28 percent, and 7 percent in low, lower-middle and upper-middle-income countries at the beginning of this century (Regmi and Gehlhar, 2005; Wilkinson and Rocha, 2009). Growing midstream activities can provide off-farm employment opportunities. For instance, in sub-Saharan Africa, off-farm employment within the agrifood system is currently growing more rapidly than employment in farming itself (Allen, Heinrigs and Heo, 2018). In particular, small and mid-sized enterprises (SMEs) in the midstream have proliferated rapidly over the past several decades and play an important role in transforming agrifood value chains in Africa, Asia and Latin America (Allen, Heinrigs and Heo, 2018). (See Table 6 for more details on the transformation of agrifood value chains.) Their spread has been most rapid in the transitional period from traditional to modern food supply chains, when urbanization leads to food value chains developing and growing long, but still fragmented. However, in some low-income and urbanizing countries, the midstream segments of the agrifood system are still at an early stage. In Mali, for instance, most cities still have a low diversity of packaged and processed foods, with the widest diversity of products

being available in the capital (Therriault et al., 2018). The absence of appropriate policies has been a factor hindering the proliferation of formal SMEs, particularly in the processing sector (Kelly and Ilie, 2021). But overall, in lower-income countries, the midstream accounts for 30 to 40 percent of the value-added and costs in food value chains (Reardon, 2015).

Additionally, due to the embeddedness of value chains in local economies, the middle segments can provide locally-adapted services and market linkages to farmers, thus contributing to enhancing food supply and strengthening rural economies (Kelly and Ilie, 2021). In Africa, SME food processors procure 95 percent of the total small farm supply and have become the largest investors in creating markets for agricultural produce in the region (Reardon *et al.*, 2019a). The productivity of this midstream is, therefore, as important as farm yield for food security in poor countries. The midstream (processing, wholesale and transport) and downstream (retail and food stalls) segments of the food supply chain together comprise 40 to 70 percent of food costs for urban Africans (Badiane and Makombe, 2015). As to rural areas, those situated near cities tend to experience a more rapid transformation of food value chains, including the development of the midstream (Reardon, 2015).

Table 6. The three stages of transformation of agrifood chains

	Traditional agrifood value chains	Transitional agrifood value chains	Modern agrifood value chains
Main enterprise type:			
Retail	Home enterprise	Small and medium enterprises (SMEs), wet markets	Supermarkets
Food service	None (home cooking)	Street vendors, independent restaurants	Fastfood chains, supermarkets and hypermarkets, independent restaurants
Processing	None (home processing)	SMEs, such as small mills	Large processors and food manufacturers
Wholesale	Brokers based in rural villages	Wholesalers based in urban markets	Off-market distribution companies
Logistics	Own logistics by brokers	SMEs providing third-party logistics	Large third-party logistics companies and freight forwarders
Supply chain length	Short, local	Long, rural–urban	Long, rural–urban, international
Exchange arrangements	No contracts, no standards	No contracts, public standards, some vertical integration	Emerging contracts, private standards, vertical integration
Technology	Labour intensive	Labour intensive	Capital intensive
Foreign direct investment	None	Emerging	Significant

Source: Adapted from Barrett, C.B., Reardon, T., Swinnen, J. & Zilberman, D. 2022. Agri-food Value Chain Revolutions in Low- and Middle-Income Countries. *Journal of Economic Literature*, 60 (4):1316–1377. <https://doi.org/10.1257/jel.20201539>

Studies show that SME employment in agrifood systems in processing, wholesale, transport and retail can be especially important to the employment of women and youth (European Commission, 2020b; FAO, 2023). While estimates of the number of people employed in food supply chains are scarce, several studies have estimated employment in agrifood systems as a whole for specific regions and subpopulations. For example, one study estimates that in Africa, Asia and Latin America, youth employment rates in agrifood systems are 61 percent, 39 percent and 48 percent, respectively (Dolislager *et al.*, 2021). Another study in Western Africa estimates that agrifood systems account for 66 percent of total employment and that processing and food vending/services are disproportionately female, with women comprising over 80 percent of workers in those sectors (Cities Alliance and African Development Bank, 2022). In the fisheries and aquaculture sector, women represent 50 percent of those employed in the entire aquatic value chain (including pre- and post-harvest) (FAO, 2022).

Furthermore, several studies highlight that, especially in low- and middle-income countries, where agrifood systems employ the largest number of workers, the transformation of these systems offers the promise of new jobs in both midstream and downstream activities (including in trade and transportation), particularly for large young populations (Townsend *et al.*, 2017; Tschirley *et al.*, 2015b; Yeboah and Jayne, 2018). A new study estimates that in 2019, worldwide, total employment in agrifood systems was 1.23 billion people (Davis *et al.*, 2023). Total agrifood systems employment in Africa is estimated at 62 percent, compared with 40 percent in Asia and 23 percent in the Americas. While the study does not disaggregate employment by the different components of agrifood systems, it does separate employment related to food supply, trade, and transportation. Of the 1.23 billion people employed in agrifood systems, 375 million are in jobs related to food supply, trade, and transportation. Trade and transportation jobs have an important impact in Africa, where the share of non-agricultural jobs in agrifood systems is between 5 percent and 14 percent. Across all regions in the world, the share ranges from 8 percent in Europe to 14 percent in Africa (Davis *et al.*, 2023).

Because of the changing and rising consumer demands and increased regulation of agrifood systems, urbanization is often associated with more formal and complex market linkages and, hence, more formal and complex food supply chains (Qaim, 2017). While informal food supply chains (that is, all food-related economic activities that take place among independent, small, or unregistered enterprises) have little to no government oversight in terms of monetary, regulatory, and institutional arrangements, such as taxation, formal food supply chains are regulated and taxed by governments on various levels.

Urbanization is generally followed by an increase in the number and size of urban food markets. Both formal and informal food markets have expanded in growing cities, depending on the demand and purchasing power of urban residents and on public and private investment in these markets. Reardon *et al.* (2015) estimate that the number of urban food markets in East Africa and Southern Africa has grown 600 to 800 percent over the last four decades. Reardon and Timmer (2014) estimate the number of urban food markets have grown by approximately 1 000 percent in Southeast Asia over the same period.

Large urban food markets can create the opportunity for the establishment of large supermarket chains, due to the clustering of potential consumers which attracts foreign investment (Pingali, 2007). Non-traditional foods can become more accessible because of trade liberalization and declining costs of transportation and communication. While

supermarkets can be linked to improved diet quality by providing greater access to nutritious foods (Tessier *et al.*, 2008), supermarket purchases have also been associated with increased consumption of energy-dense and highly processed foods (Asfaw, 2008, 2011; Baker *et al.*, 2020; Hawkes, 2008; Monteiro *et al.*, 2013; Qaim, 2017). The substantial expansion in the types, varieties, and quantities of highly processed foods sold worldwide can be associated with the expansion of supermarkets and hypermarkets, the industrialization of agrifood systems, technological change, and globalization, including market growth and the political activities of transnational food corporations. While there is wide variation between regions and countries, sales of highly processed foods are highest in Oceania and the Pacific, North America, Europe and Latin America, but are also growing rapidly in Asia, the Near East and Africa (Baker *et al.*, 2020).

How urbanization has affected the presence of supermarkets differs widely per region and city size. In Latin America, urbanization occurred in the 1980s, before the rise of supermarkets. In that region, the rise of supermarkets was more profoundly linked to privatization and the liberalization of food systems (Popkin and Reardon, 2018). In Asia, on the other hand, supermarket development was closely correlated with urbanization. The shift towards more supermarkets has been driven by a range of factors, including rising incomes, changing lifestyles, and increasing awareness of food safety and quality. However, open and wet markets, as well as informal kiosks and street vendors, are still important components of urban food culture in Asia (Reardon and Minten, 2011). In Thailand, for example, urban consumers frequently buy their fresh products at informal wet markets (Kelly *et al.*, 2015). In sub-Saharan Africa, the number of supermarkets has increased, mainly in major cities (Dolislager, 2017), but open-air markets still dominate (van Berkum, Achterbosch and Linderhof, 2017). In this region, the rise of supermarkets is hampered by relatively low incomes. According to van Berkum, Achterbosch and Linderhof, (2017), incomes of less than USD 1 000 per year are an important limitation for the expansion of supermarkets. Poor urban dwellers in particular buy most of their food at informal markets or street shops. For example, supermarkets account for only 3 percent and 0.4 percent, respectively, of all food expenditures of slum dwellers in Nairobi and Kampala (Wanyama *et al.*, 2019). Dolislager (2017) shows that in Zambia, the share of supermarkets in total food retailing is bigger in larger cities than in small cities.

As indicated, informal food retailers – such as street and market traders and small stores – remain abundant across the African continent and in many Asian countries (Kelly *et al.*, 2015; Skinner, 2018). Especially in sub-Saharan Africa, the vast majority of food sold in cities is still sold through informal channels – outdoor markets, kiosks and street vendors (Battersby, 2017; Dakora, 2012). In South and East Asia, the substantial role of formal markets developed earlier than in sub-Saharan Africa, but informal outdoor markets, kiosks and street vendors also dominate there (Reardon and Minten, 2011). Despite the growth of formal markets in some countries in sub-Saharan Africa (notably Kenya and South Africa) and in large parts of South Asia, in most places, informal markets are expected to remain in place (Neven *et al.*, 2009; Pingali *et al.*, 2019a). But in places where formal value chains expand, as in South Africa and Kenya, this expansion affects prices, quality and safety standards, often restricting access to sale channels for small-scale producers (Jayne, Mather and Mghenyi, 2010; Nickanor *et al.*, 2021).

More formalized food markets can have advantages in terms of efficiency and food safety, but there are also risks for actors along the food supply chain who are not part of the formal food economy, including small-scale farmers, food processors and food retailers. For instance, fees

for stalls in upgraded markets are often expensive, decreasing their accessibility for small-scale producers (Minten, Reardon and Chen, 2017). In the transition to more formal food markets, national and local government policies and practices can exclude, evict or relocate informal food markets or sellers, and reducing access to urban food markets for rural actors (Skinner, 2018). As informal markets will continue to serve large segments of the populations of sub-Saharan Africa and Asia, investing in facilities and spatial planning for informal markets is, therefore, at least as important as investing in formal markets. Understanding how informal value chains could best be sustained is of critical importance. However, this knowledge is often lacking (Crush and Young, 2019).

Urbanization and changing agrifood systems have also given rise to two new types of food environments where people have limited access to varied, nutritious foods: food deserts and food swamps. Food deserts are geographic areas where residents' access to diverse, fresh, or nutritious foods is limited or non-existent, due to the absence or low density of "food entry points" (i.e., accessible food markets) within a practical travelling distance. Food swamps are areas where there is an overabundance of foods of high energy density and minimal nutritional value, but little access to affordable, nutritious foods. Although both concepts are criticized for their narrow and inappropriate meaning (Battersby and Crush, 2014; Wagner *et al.*, 2019), urbanization can indeed affect the accessibility of both healthy and unhealthy foods, especially in growing informal neighbourhoods. While a new and growing phenomenon in urban slums of low- and middle-income countries, this problem was already well established in poorer neighbourhoods in high-income countries, especially the United States of America (Beaulac, Kristjansson and Cummins, 2009; HLPE, 2017). For example, Windhoek, the capital of Namibia, has experienced a rapid growth of informal peri-urban and urban settlements, which can be defined as food deserts due to the inaccessibility of healthy foods for most inhabitants (Crush, Nickanor and Kazembe, 2019).

4.2.2 Production

Urbanization affects agricultural production differently across the rural–urban continuum, depending on rural–urban connectivity and depending on local land-governance systems. In rural and peri-urban regions that are well connected to growing urban markets or storage and processing facilities, both small- and large-scale farmers are increasingly commercial, and relatively well served by agribusinesses providing inputs and farm output marketing (Sharma, 2016; Swain and Teufel, 2017). Farmers located close to urban markets often receive higher returns on their agricultural products and benefit most from growing markets for high-value products (Diao *et al.*, 2019; Tadesse, 2012). As urban areas grow closer to rural areas, rural producers may also have better access to agricultural inputs and services, allowing for improved productivity, which ideally leads to rising income levels (Christiaensen and Todo, 2014). Even agricultural zones that are quite far from towns and cities can be affected by urbanization, depending on their connectivity with urban areas, which is largely shaped by existing transport routes (Masters *et al.*, 2013). In Meru, Tanzania, urbanization has stimulated the demand for milk, a reliable source of income for smallholders in a region facing scarcity of fertile land (Hillbom, 2011). Improved access to inputs, backed up by stable institutions, were important conditions to facilitate the intensification of agriculture, resulting in higher incomes. Another example can be found in the rural regions around Delhi, India. There, vegetables, and dairy products are becoming increasingly important components of consumption in urban households. These changes in urban consumption have direct impacts on vegetable cultivation and dairy farming in the rural areas around Delhi: land that used to be cultivated with cereals

is increasingly being used for vegetable production and for keeping livestock, and agriculture productivity is rising (de Bruin *et al.*, 2022).

Although the production of perishables and dairy often increases around growing cities, the availability of vegetables and fruits² is insufficient to meet daily dietary requirements in almost every region of the world (Table 7). There are, however, notable differences across countries and within regions. Particularly concerning is the insufficient availability of all food groups apart from staple foods in Africa. There are, however, notable differences across countries and within regions. For example, the supply of vegetables is more than adequate in Asia (Dolislager *et al.*, 2023).

Table 7. The availability of food groups to meet a Healthy Diet Basket (HDB), by region (per capita per day), 2020

	Africa	Asia	Latin America and the Caribbean	Northern America	Europe	World
	(%)					
Staple foods	188	108	68	44	73	111
Animal source foods (except oils)	-33	40	143	331	258	71
Pulses, nuts and seeds	-38	-37	-42	-43	-67	-41
Vegetables	-55	25	-63	-20	-27	-4
Fruits	-40	-31	-2	-13	-24	-29
Fats and oils	-21	-3	67	100	82	12

Notes: Yellow highlights indicate where amounts of food available are insufficient to meet a Healthy Diet Basket (HDB). Food availability is based on FAO Food Balance Sheets data, and healthy diet requirements by food group are those of the Healthy Diet Basket used in the cost and affordability of a healthy diet in FAO *et al.* (2023).

Source: Dolislager, M.J., Holleman, C., Liverpool-Tasie, L.S.O. & Reardon, T. 2023. *Analysis of food demand and supply across the rural–urban continuum for selected countries in Africa – Background paper for The State of Food Security and Nutrition in the World 2023*. FAO Agricultural Development Economics Technical Study 23-09. Rome, FAO.

While agricultural production often diversifies and productivity increases around growing cities, millions of smallholder farmers in less-accessible or detached hinterlands remain cut off from the opportunities generated by growing urban food markets (Djurfeldt, 2015), due to low productivity and high transaction costs (Masters *et al.*, 2013). As such, farmers with limited access to urban markets have limited opportunities to profit from urban development. For instance, in sub-Saharan Africa, the adoption of high-input technology and crop productivity is found to be negatively correlated with travel time to urban centres (Dorosh *et al.*, 2012).

Another important direct impact of urban expansion is change in land use. As urban areas expand and farms in peri-urban areas are converted to urban use (by choice of the farmers or

² This finding is aligned with an analysis in the 2020 edition of *The State of Food Security and Nutrition in the World* (FAO *et al.*, 2020), which showed that the availability of fruits and vegetables for human consumption was below 400 g per capita per day, which is the recommended amount in FAO and World Health Organization guiding principles of a healthy diet (FAO and WHO, 2019). Further research is needed to determine the reasons behind this shortage of fruits and vegetables.

by compulsion), farmers often move further away from the cities and convert more remote natural areas, mostly forests and scrublands, into new farmland, thus decreasing biodiversity (van Vliet, 2019). In some countries, farmers receive high compensation for selling their land (Rondhi *et al.*, 2018), while in other countries, the dispossession of agricultural land is not compensated, resulting in the loss of livelihoods. Some farmers are pushed onto less favourable productive land, or to more remote villages, or are left with only the option of using unauthorized public spaces to continue production (Kuusaana and Eledi, 2015; Lasisi *et al.*, 2017).

Urbanization can affect production patterns in various ways. By 2030, the loss of cropland due to urbanization is projected to be 3 percent on average in Asia and Africa, resulting in a 6 percent, in Asia, and 9 percent, in Africa, loss of production, because agricultural land around cities is often more fertile than land farther away (precisely one of the reasons cities were established in those locations). Additionally, farmers close to cities are often more productive due to higher input use and knowledge levels (Bren d'Amour *et al.*, 2017). As such, productivity loss is higher than the absolute loss of land. In the Americas and Europe, the loss of cropland and production is much lower, with losses of around 1 percent of cropland and 1.2 percent of production. In most countries, production is relocated, although this is not possible everywhere. This is the case, for instance, in Egypt, where the amount of arable and fertile land is limited (Radwan *et al.*, 2019). However, urbanization is not necessarily incompatible with increased agricultural production or high consumption of water resources. This because although urban expansion patterns can raise problems, urbanization can also serve as a lever for modernizing production methods (OECD and SWAC, 2020). For example, a spatial mapping exercise by the OECD shows that, in the Sahel, urbanization has stimulated farming around towns and cities (OECD and SWAC, 2020), and these green farming areas contrast with the aridity of the surrounding area.

Urbanization can also affect farm size in several ways. Impacts in this regard depend on land tenure security, non-farm opportunities and the magnitude and impact of land purchases by urban buyers (Masters *et al.*, 2013; Swain and Teufel, 2017). In low-income countries, farm sizes have decreased from an average of 2.5 ha in 1960 to 1.5 in 2000 due to rural population growth (Lowder, Skoet and Raney, 2016). In general, farm size decreases until off-farm opportunities, often in cities, expand sufficiently to absorb all new incoming workers. Asia has now passed this turning point, so its average farm size can increase; while in Africa, average farm size is expected to continue to fall (Masters *et al.*, 2013). The growing acquisition of farmland by urban buyers in sub-Saharan Africa increases average farm size (Jayne *et al.*, 2016). The growth of emergent farmers in Nigeria and Zambia, for example, is partly attributable to land acquisition by salaried urbanites, which exacerbates rural income inequality given the higher incomes and access to greater resources (Muyanga *et al.*, 2019; Sitko and Jayne, 2014).

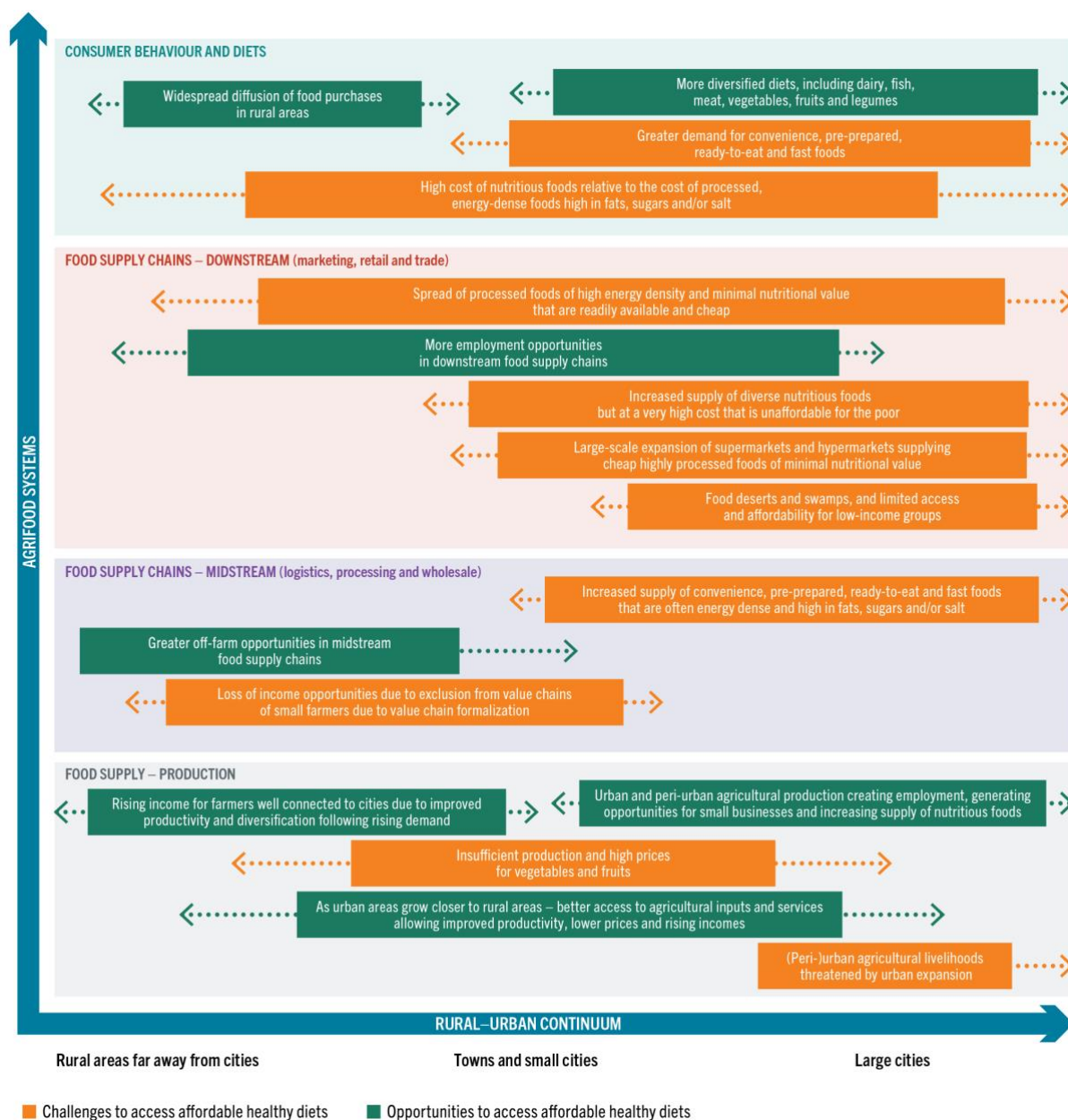
Urbanization can also affect natural capital in multiple ways (directly and indirectly). Urban expansion leads to the direct and indirect loss of natural areas and biodiversity. Urban expansion into rural areas can also lead to increased water and soil pollution, as well as waste management issues. Finally, urban diets require more industrialized supply chains and intensive production practices, which consume more water and energy and produce more waste and pollution.

5 How urbanization affects access to affordable healthy diets, food security and nutrition

While many studies have focused on urbanization and agrifood system transformation in recent years, there is limited shared understanding of how the nexus of these two processes affects access to affordable healthy diets, food security and nutrition, let alone using a rural–urban continuum lens. Data to support such a disaggregated rural–urban continuum analysis of this important nexus is extremely limited, as it requires household survey data with geo-spatial data, which is not readily available for most countries in the world. Chapter 4 of *The State of Food Security and Nutrition in the World 2023* (FAO *et al.*, 2023) explores this question, analysing variations in food demand, economic access to healthy diets and food security and nutrition across the rural–urban continuum, using selected country case studies as permitted by available data.

The analysis shows that urbanization can have both positive and negative impacts on access to affordable healthy diets and food security across the rural–urban continuum. It also shows that linkages between urbanization and access to affordable healthy diets are equivocal and highly dependent on local or national context-specific dynamics. These dynamics include investments in agrifood systems, rural and urban infrastructure, training and education, and economic policies. The analysis further identifies socioeconomic disparities in access to affordable healthy diets throughout the rural–urban continuum as a result of a number of structural challenges (FAO *et al.*, 2020; Vilar-Compte *et al.*, 2021). These include economic challenges related to the high cost of nutritious foods, which varies within countries and can be higher in poor neighbourhoods. Figure 11 summarizes the most important opportunities and risks across the rural–urban continuum.

Figure 11. Challenges and opportunities in accessing affordable healthy diets across the rural–urban continuum



Source: Authors' own elaboration.

5.1 Impacts of urbanization on urban dwellers' access to healthy diets

Often, overall access to and affordability of healthy diets is better and levels of food security are higher in cities than in rural areas (Casari *et al.*, 2022; GLOPAN, 2017; Headey *et al.*, 2018). Compared to rural settings, urban food environments are generally characterized by greater diversity and better availability of fresh foods such as legumes, vegetables and fruits, and other nutrient-rich foods (GLOPAN, 2017), and the overall consumption of fruits and vegetables by urban inhabitants is higher (Miller *et al.*, 2016). This is partly due to urban consumers having higher average incomes, creating a greater demand for perishables. But this observation can also be explained by the better food supply infrastructure, including the

increasing availability of refrigeration and supermarkets, particularly in middle-income countries. This overall urban advantage is observed in West Africa, for instance, where 18 percent of the rural population is undernourished vs 13 percent for the urban population (van Wesenbeeck, 2018); and in Ethiopia, where dietary diversity is higher in urban areas than in rural areas, and diverse diets are affordable to more people in urban than in rural areas (Gebru *et al.*, 2018). However, this does not hold for all countries. In South Africa, for example, the share of food insecure households is higher in urban areas than in rural areas (Stats SA, 2019); and in India, rural households of all income groups have higher average consumption of calories, proteins and micronutrients than urban households (Rao *et al.*, 2018). Furthermore, access to the greater variety of healthy foods in urban areas is not the same for all urban dwellers. In fact, the overall urban advantage in access to diverse and nutritious foods strongly diminishes as a function of socioeconomic status (Vilar-Compte *et al.*, 2021).

There are major social and health inequities in urban settings. With continuing urban growth, the absolute number of urban poor also increases. Increasing urbanization that also occurs alongside high and growing levels of urban poverty can result in severe urban food insecurity characterized by the consumption of less diversified and nutritious diets among poor urban households in the city. Urban household vulnerability to food insecurity can stem from a range of factors, including high levels of unemployment and poverty, high dependency ratios, low levels of home ownership, hyperinflation and high food prices (Battersby and Watson, 2019; Tacoli, McGranahan and Satterthwaite, 2015; Tawodzera, 2011; Vilar-Compte *et al.*, 2021). Vulnerability to food insecurity can be further exacerbated by a prolonged adverse sociopolitical climate that undermines national economic development.

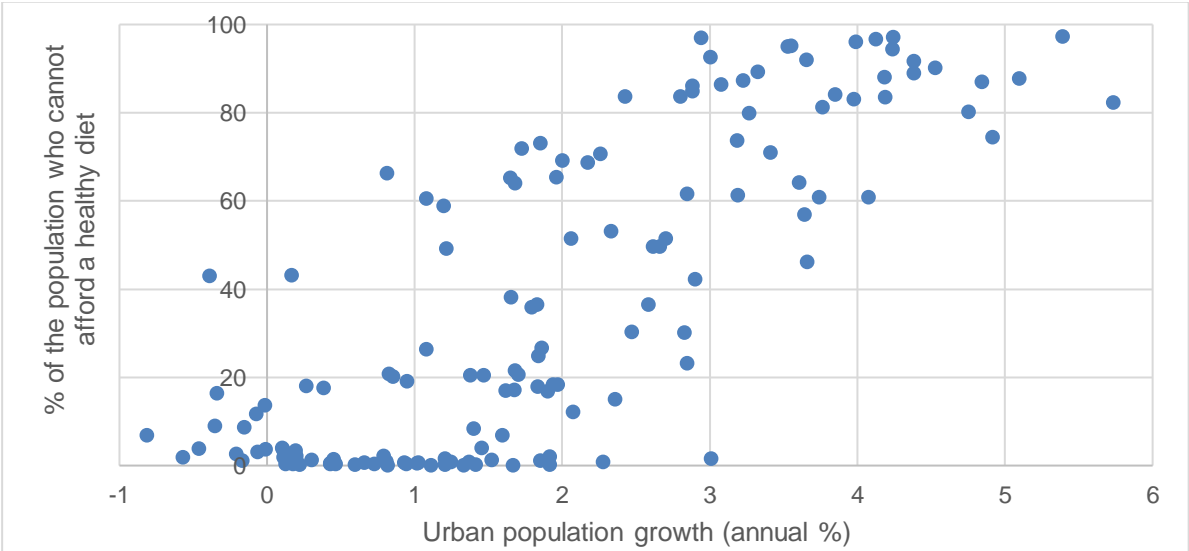
For urban dwellers living in poverty, the most easily available and affordable foods are usually not nutritious foods, but are energy dense foods high in fats, sugars and/or salt (Hawkes, Harris and Gillespie, 2017; Pingali *et al.*, 2019b; Ziraba, Fotso and Ochako, 2009). Access to nutritious foods that contribute to healthy diets, such as fish, fresh fruits and vegetables is limited for this sector of the urban population, as they tend to be more expensive in urbanized areas or are not available in their neighbourhoods. These poorer households are inclined to prioritize calories over quality, spending their resources on more affordable, energy-dense, minimal nutritional value food groups (Hawkes, Harris and Gillespie, 2017; Pingali *et al.*, 2019b). Furthermore, they depend mostly on their daily wages to buy food and, as such, are vulnerable to price spikes or other shocks, as illustrated by the impacts of COVID-19 (Klassen and Murphy, 2020).

In urban areas, an additional risk to access to affordable healthy diets is the rise of national and multinational supermarkets and fast food chains in urban centres. These outlets offer a ready and abundant supply of highly processed foods, energy-dense snacks, sweets and sugar-sweetened beverages. These developments have affected obesity levels and health conditions of urban dwellers negatively (Zou *et al.*, 2015). The rapidly increasing share of energy-dense foods of minimal nutritional value and highly processed foods, especially in urban consumption patterns, is linked to the rise of obesity and diet-related diseases (Reardon *et al.*, 2021). However, the increasing spread of processed and highly processed foods, not only in urban areas but across the rural–urban continuum, is a trend of great concern (see *FAO et al.* [2023], Chapter 4).

The urban poor are not the only ones affected by the rising availability of unhealthy foods in urban areas. Once mostly a high-income country problem, overweight and obesity have recently been on the rise in low- and middle-income countries (GLOPAN, 2017), especially among urban, middle-income households (Basu *et al.*, 2013). In low-income countries, particularly, obesity is a growing problem and generally more prevalent among middle-aged adults from wealthy and urban environments (Chooi, Din and Magkos, 2019). This has been fuelled by increasing urban incomes and the associated changes in urban consumption patterns, as many urban consumers tend to consume more sugar, fats, oils, and processed foods. While urban environments offer a wider selection and availability of nutritious foods compared to rural areas, this does not necessarily translate into healthier consumption choices. Urban have also been associated with greater consumption of pre-prepared, highly processed and fast foods, as well as more inactive lifestyles and fewer opportunities for physical exercise, which contributes to growing obesity and overweight (Machado-Rodrigues *et al.*, 2014). For example, in Chinese cities, the prevalence of obesity in urban areas is much higher than it is in rural areas: 10.1 percent vs 6.5 percent, respectively (Zou *et al.*, 2015). Additionally, a review of seven African countries found that urban women were almost three times more likely than their rural counterparts to be overweight or obese (Ziraba, Fotso and Ochako, 2009).

Overall, the most rapidly urbanizing countries are facing the biggest challenges in terms of affordability of a healthy diet (Figure 12) and food insecurity risks, emphasizing that urbanization without inclusive economic development and the development of infrastructure and properly functioning markets does not improve food security. In fact, when urbanization takes place without economic growth, especially in big cities, healthy diets become less affordable. Several studies show that the so-called “urban advantage” does not benefit the poorest, who – on the contrary – face disproportionate barriers to accessing and consuming a healthy diet and have an increased risk of food insecurity and malnutrition (Vilar-Compte *et al.*, 2021).

Figure 12. Affordability of a healthy diet and yearly urban population growth, 2020



Note: Each dot represents a country.

Sources: Authors’ own elaboration based on UN DESA. 2018. World Urbanization Prospects 2018. In: *United Nations*. [Cited 1 February 2023]. <https://population.un.org/wup> and FAO. 2023. FAOSTAT: Cost and Affordability of a Healthy Diet (CoAHD). In: *FAO*. [Cited 3 August 2023]. <https://www.fao.org/faostat/en/#data/CAHD>

Rural–urban migrants are often among those who lack sufficient access to affordable healthy diets in urban settings. When migration decisions reflect the push factors in rural areas (including conflict, poverty and lack of access to land) rather than the pull of better opportunities in urban areas, food security and nutrition outcomes can be compromised (ScienceDirect, 2023). Migrants fleeing difficulties in rural areas (push factors) generally find employment in the unstable, low-paid informal sector (Tacoli, McGranahan and Satterthwaite, 2015). They spend a large part of their disposable income on food, which puts them at a much higher risk of being food insecure. Additionally, most migrants from rural areas find housing in expanding informal neighbourhoods or slums, where the access to affordable healthy diets is limited (Figure 13). Furthermore, challenges around accessing food and the risk of food insecurity among rural–urban migrants are intensified during crises, including economic downturns the lead to loss of jobs, periods of hyper-inflation, or climate related disasters such as flooding (Sohel *et al.*, 2022; Xu, Crush and Zhong, 2023). Rural–urban migrants lack social protection coverage, and their neighbourhoods often fall outside the remit of urban planning. Social protection and food assistance programmes designed to facilitate food access – such as monetary or in-kind transfer schemes, community kitchens and food banks – are often insufficient to fully resolve food insecurity problems, because they do not address barriers such as lack of cooking facilities or food storage and competing health and housing expenses. The COVID-19 pandemic is an example of a situation in which urban low-income, informally-employed rural–urban migrants experienced food insecurity.

Figure 13. Affordability of a healthy diet and population living in slums, 2020



Note: Each dot represents a country.

Sources: Authors’ own elaboration based on World Bank. 2023. Population living in slums (% of urban population). In: *World Bank*. [Cited 3 August 2023]. <https://data.worldbank.org/indicator/EN.POP.SLUM.UR.ZS> and FAO. 2023. FAOSTAT: Cost and Affordability of a Healthy Diet (CoAHD). In: *FAO*. [Cited 3 August 2023]. <https://www.fao.org/faostat/en/#data/CAHD>

With regard to urbanization and gender differences in terms of food security, there is some evidence that these differences decline with urbanization. This may be due to changes in women’s socioeconomic status and roles in urban settings (Sun, Li and Rahut, 2021). For example, differences in food security between female- and male-headed households in South Africa are, on average, lower in urban areas than in rural areas, although female-headed

households are, on average, more food insecure in both areas (Tibesigwa and Visser, 2016). The study also confirms that all rural households are more likely to report chronic food insecurity.

5.2 Impacts of the formalization of food supply chains on access to healthy diets

The transition from less formal to more formal food supply chains, which often accompanies urbanization, poses challenges to access to affordable healthy diets. For instance, with urbanization, traditional markets often give way to more formal markets, such as supermarkets and convenience stores. While traditional markets tend to be the main source of fresh fruit and vegetables for low- and middle-income consumers, supermarkets and convenience stores primarily provide customers with processed and ultra-processed foods (Crush and Young, 2019; Skinner, 2018). (However, there is little evidence regarding the impact of the expansion of formal food markets on the urban informal food economy [Crush and Frayne, 2011].)

Food market formalization may also decrease the opportunities to sustain livelihoods along the food supply chain, across the rural–urban continuum. In Africa, for example, local and national policies and practices tend to exclude, evict and relocate informal food markets, affecting urban food security and access to urban food markets for rural actors (Skinner, 2018). Formalized markets can have advantages, such as food safety control, but fees for stalls in formal markets are often relatively expensive, which decreases the accessibility of these markets for many smallholder farmers and traders. In sub-Saharan Africa, nearly all smallholder farmers, most traders in food markets and many micro- and small-scale food processors and food retailers are not part of the formal food economy (Robinson and Yoshida, 2016). Thus, food market formalization and improvements in formal markets will not profit many food chain actors or consumers. Investing in facilities and spatial planning for informal markets is, therefore, at least as important as investing in formal markets (Crush and Young, 2019).

There is some evidence that urbanization and decreased gender differences in terms of food security go hand in hand. This could be explained by the notion that these differences seem to be less marked in urban areas. The gender gap in terms of food security can decline with urbanization as women’s socioeconomic status and traditional social roles change in urban settings (Sun, Li and Rahut, 2021). For example, differences in food security between female- and male-headed households in South Africa are, on average, lower in urban areas, although female-headed households are, on average, more food insecure in both areas (Tibesigwa and Visser, 2016). The study also confirms that all rural households are more likely to report chronic food insecurity.

5.3 Impacts of urbanization on rural dwellers’ access to healthy diets and on farm-based livelihoods

The processes of urbanization affect access to affordable healthy diets not only in growing cities but also in rural areas close to and, to a lesser extent, farther away from cities. Today, food insecurity issues are still most profound in rural areas. Over 80 percent of the extremely poor and around 75 percent of the moderately poor live in rural areas, and most of these people depend at least partly on food-system activities, primarily on food production (Castañeda *et al.*, 2016). There are differences, however, between where in rural areas people are situated. For example, there is some evidence that children in remote rural areas, far from urban centres, are vulnerable to seasonal differences affecting their nutrition status. A study

performed in the Democratic Republic of the Congo found that that gaps in nutrition between siblings and neighbours born at different times of a year are larger in more remote rural areas than in rural regions near towns. This could be explained, inter alia, by better access to food markets and health services in rural areas well-connected to these towns (Darrouzet-Nardi and Masters, 2017).

The impact of urbanization on farm-based livelihoods is diverse. For some rural dwellers, urbanization can provide opportunities for on- and off-farm employment, increasing access to healthy diets and improving food security levels. Especially in rural communities where agriculture completely dominates the economy, the growth of even small cities can play an important role in providing access to inputs, markets and non-farm activities, reducing poverty and improving food security (de Bruin, Dengerink and van Vliet, 2021; Satterthwaite, McGranahan and Tacoli, 2010). For farmers who are able profit from the rising and diversifying food demand in growing cities, urbanization can be an opportunity to improve their access to healthy diets. As discussed in Section 4.3.2, improved access to pre- and post-harvest services can facilitate intensification and diversification, resulting in higher incomes. Although no direct evidence could be found that this implies improved access to affordable healthy diets, this linkage is plausible.

On the other hand, as also discussed in Section 4.3.2, the loss of agricultural livelihoods to urban expansion can affect income security, reducing the affordability of healthy diets. For example, a study from Ghana shows that the change in land-use from agricultural to urban has resulted in increased food insecurity among most of the smallholder farmers previously farming these lands (Ziem Bonye, Yenglier Yiridomoh and Derbile, 2021).

The rural to urban outmigration of young people, often men, also provides both opportunities and risks to access to affordable healthy diets for those remaining in rural areas. In most countries in the global south, it is mostly men who migrate to cities to find employment in urban, non-farm sectors. In many rural regions, social and cultural norms restrict women's mobility and, hence, their possibility of migrating to cities. This leads to a number of women being left behind in rural communities. A larger share of women-headed households in rural areas affects how money is spent, since female-headed households often spend a larger share on food items their role in the consumption of healthy diets is key (Choithani, 2020; Maharjan, Bauer and Knerr, 2012). In some contexts, rural outmigration of men can result in substantial remittances that increase the accessibility of healthy diets and improve food security (Abadi *et al.*, 2018; Babatunde, 2018). Households that receive remittances can be better off in terms of total income, assets, calorie supply and micronutrient supply. Rural–urban migration can also contribute to resilience in the communities of origin, as those migrating to urban areas for work tend to contribute to the transfer to rural areas knowledge and other resources besides financial remittances (Scheffran, Marmer and Sow, 2012). Often, however, remittances are too low (or even absent) to replace the loss of vital workforce with hired labour (Bisht, Rana and Pal Ahlawat, 2020; Choithani, 2020; Duda, Fasse and Grote, 2018; Maharjan, Bauer and Knerr, 2012). In these situations, the lost labor and loss of the associated income or agricultural produce can result in decreasing access to healthy diets, or in increasing working hours for the women left behind who practice subsistence farming to maintain household food security.

In terms of malnutrition, studies generally show that rural populations face a higher burden of child undernutrition than urban populations (Smith, Ruel and Ndiaye, 2004; Srinivasan, Zanello and Shankar, 2013), not only (but especially) in sub-Saharan Africa, a region where many

households still live in remote, rural areas. Studies suggest there are no fundamental differences in the characteristics that determine child nutrition outcomes in urban and rural areas. Instead, differences are explained by the better urban environment, including greater choices and increased opportunities related to socioeconomic characteristics, from maternal and spousal education, wealth and employment to social and family networks, as well as access to health care and other services.

Urbanization typically entails improved access to non-food markets and services that are important for nutrition, such as schools, health clinics and non-farm labour markets that improve income stability (Headey, Bezemer and Hazell, 2010; Smith, Ruel and Ndiaye, 2004; Srinivasan, Zanello and Shankar, 2013). Other benefits of urban environments include maternal and spousal education and social and family networks. Studies generally show that rural populations face a higher burden of child undernutrition than urban populations (Smith, Ruel and Ndiaye, 2004; Srinivasan, Zanello and Shankar, 2013), (This is especially the case in sub-Saharan Africa where many households still live in remote, rural areas.)

Studies also suggest there are no fundamental differences in the characteristics that determine child nutrition outcomes in urban and rural areas. Instead, differences are explained by the better urban environment. Furthermore, proximity to towns can also weaken the relationship between agricultural shocks and child nutrition (Darrouzet-Nardi and Masters, 2017; Mulmi *et al.*, 2016). More recent studies find that market access can be an important determinant of dietary diversity and, hence, child nutrition outcomes (Hirvonen and Hoddinott, 2014; Hoddinott, Headey and Dereje, 2014; Sibhatu and Qaim, 2017). There is relatively little research, however, on the degree to which rural populations have access to urban markets and services and the associated differences in nutrition seen across rural and urban populations, or across gradients of rural remoteness (Headey *et al.*, 2018).

One study, which examined the linkages between child nutrition and urbanization and proximity to large urban centres in sub-Saharan Africa (Headey *et al.*, 2018), found that rural populations are characterized by worse nutrition outcomes than urban populations, but it also produced the somewhat unexpected result that the nutrition outcomes of more remote rural populations are not substantially worse than those of less remote rural populations. Furthermore, in keeping with previous analyses of rural–urban inequality in nutrition, it appears that the majority of this nutritional disadvantage is explained by differences in wealth, education, health and non-road infrastructure services across rural and urban areas (Headey *et al.*, 2018).

6 Conclusions

This background paper to *The State of Food Security and Nutrition in the World 2023* has discussed the drivers and patterns of urbanization, its associated impacts on agrifood systems and the risks and opportunities for access to affordable healthy diets.

The drivers, patterns and dynamics of urbanization differ per country. Historically, urbanization went hand in hand with structural transformation – the shift from a largely agrarian economy to a more diversified economy with diverse employment opportunities. This process also entails economic growth. Although urbanization is still often accompanied by structural transformation, nowadays, in some countries, urbanization occurs without structural transformation and with limited economic growth, affecting poverty levels and, indirectly, urban and rural access to and affordability of healthy diets. Furthermore, regions and countries urbanize differently in terms of spatial patterns. In some places, already large cities are growing, creating multimillion metropolises, while in other places urban growth is more dispersed. These patterns can also affect the access of rural agrifood system actors to urban food markets.

Approaches to defining which areas are urban and which are rural differ between countries, based on population size and density, and on functionality or areas. To compare patterns across countries, the Degree of Urbanization definition developed by the Joint Research Centre is followed in *The State of Food Security and Nutrition in the World 2023* (FAO *et al.*, 2023) and in this background paper. To operationalize the rural–urban continuum in *The State of Food Security and Nutrition in the World 2023*, the Rural–Urban Catchment Area, as developed by Cattaneo *et al.* (2021), is used.

Urbanization affects agrifood systems across the rural–urban continuum, as it changes where food is demanded and affects dietary and consumption preferences. Consumption patterns of urban dwellers differ from their rural counterparts. This can partly be attributed to the higher average incomes in cities, but also to different employment profiles (notably of women) and changes in lifestyles in urban areas. People in cities of all income groups are more likely to eat out of their homes. They also consume more processed foods, including highly processed foods, however, the consumption of processed foods is increasing in rural areas as well.

These changes in consumption patterns in turn affect food supply chains. The midstream, retail and trade sectors are growing and diversifying in urbanizing countries, which implies increased off-farm employment opportunities. At the same time, production incentives change due to the rising demand for perishables and dairy products. These incentives affect farmers who are well-connected to growing city centres. Their access to food markets and services, including financial services and input suppliers, often increases.

Although urbanization has the potential to contribute to improved access to affordable healthy diets in cities due to, *inter alia*, economies of scale and improved infrastructure, there are also risks, mostly for the urban poor. The urban poor often face limited access to affordable healthy diets, whereas their access to affordable unhealthy foods is high. Low-income groups in urban areas are at particular risk of food insecurity under a scenario of continued economic inequality and rising and volatile food prices.

Urbanization can also pose both opportunities as challenges to rural communities. For the rural poor who are employed in agrifood systems, especially those living far from urban areas, it is

hard to profit from the opportunities that come with urbanization. Additionally, land use changes for rural dwellers close to cities and rural outmigration of the most healthy and young can decrease rural livelihood opportunities and, thus, decrease their access to healthy diets. But urbanization also brings off-farm employment opportunities along the longer and more complex food supply chains. Additionally, producers who are well-connected to urban markets and to the services and inputs available, can profit from the changing and increasing urban demand.

References

- Abadi, N., Techane, A., Tesfay, G., Maxwell, D. & Vaitla, B.** 2018. *The impact of remittances on household food security: a micro perspective from Tigray, Ethiopia*. 40th edition. Vol. 2018. WIDER Working Paper 2018/40. UNU-WIDER (United Nations University). <https://doi.org/10.35188/UNU-WIDER/2018/482-7>
- Abu-Salia, R., Osumanu, I.K. & Ahmed, A.** 2015. Coping with the challenges of urbanization in low income areas: an analysis of the livelihood systems of slum dwellers of the Wa municipality, Ghana. *Current Urban Studies*, 3(2): 105–118. <https://doi.org/10.4236/cus.2015.32010>
- Adams, H.** 2016. Why populations persist: mobility, place attachment and climate change. *Population and Environment*, 37(4): 429–448. <https://doi.org/10.1007/s11111-015-0246-3>
- Adger, W.N., Arnell, N.W., Black, R., Dercon, S., Geddes, A. & Thomas, D.S.G.** 2015. Focus on environmental risks and migration: causes and consequences. *Environmental Research Letters*, 10(6): 060201. <https://doi.org/10.1088/1748-9326/10/6/060201>
- Afifi, T.** 2011. Economic or environmental migration? The push factors in Niger. *International Migration*, 49(s1): e95–e124. <https://doi.org/10.1111/j.1468-2435.2010.00644.x>
- Agergaard, J., Tacoli, C., Steel, G. & Ørtenblad, S.B.** 2019. Revisiting rural–urban transformations and small town development in sub-Saharan Africa. *The European Journal of Development Research*, 31(1): 2–11. <https://doi.org/10.1057/s41287-018-0182-z>
- Akkoyunlu, Ş.** 2015. The potential of rural–urban linkages for sustainable development and trade. *International Journal of Sustainable Development & World Policy*, 4(2): 20–40. <https://doi.org/10.18488/journal.26/2015.4.2/26.2.20.40>
- Allen, T., Heinrigs, P. & Heo, I.** 2018. *Agriculture, food and jobs in West Africa*. West African Papers. Paris, OECD (Organisation for Economic Co-operation and Development). <https://doi.org/10.1787/dc152bc0-en>
- Ameye, H.** 2020. *The economics of malnutrition*. PHD thesis. Leuven, Belgium, KU Leuven.
- Asfaw, A.** 2008. Does supermarket purchase affect the dietary practices of households? Some empirical evidence from Guatemala. *Development Policy Review*, 26(2): 227–243. <https://doi.org/10.1111/j.1467-7679.2008.00407.x>
- Asfaw, A.** 2011. Does consumption of processed foods explain disparities in the body weight of individuals? The case of Guatemala. *Health Economics*, 20(2): 184–195. <https://doi.org/10.1002/hec.1579>
- Babatunde, R.O.** 2018. *Impact of remittances on food security and nutrition of migrants household: evidence from Nigeria*. 2018 Conference, 28 July–2 August 2018, Vancouver, Canada, International Association of Agricultural Economists. 276986. International Association of Agricultural Economists. <https://ideas.repec.org/p/ags/iaae18/276986.html>
- Badiane, O. & Makombe, T., eds.** 2015. *Beyond a middle income Africa: transforming African economies for sustained growth with rising employment and incomes*. ReSAKSS Annual Trends and Outlook Report 2014. Washington, DC, IFPRI. <http://dx.doi.org/10.2499/9780896298927>
- Bailey, C., Jensen, L. & Ransom, E.** 2014. *Rural America in a globalizing world: problems and prospects for the 2010s*. Morgantown, USA, West Virginia University Press. <http://wvupressonline.com/node/538>
- Baker, P., Machado, P., Santos, T., Sievert, K., Backholer, K., Hadjidakou, M., Russell, C. et al.** 2020. Ultra-processed foods and the nutrition transition: global, regional and national trends, food systems transformations and political economy drivers. *Obesity Reviews: An Official Journal of the International Association for the Study of Obesity*, 21(12): e13126. <https://doi.org/10.1111/obr.13126>

- Barrett, C.B., Reardon, T., Swinnen, J. & Zilberman, D.** 2022. Agri-food value chain revolutions in low- and middle-income countries. *Journal of Economic Literature*, 60(4): 1316–1377. <https://doi.org/10.1257/jel.20201539>
- Basu, S., Stuckler, D., McKee, M. & Galea, G.** 2013. Nutritional determinants of worldwide diabetes: an econometric study of food markets and diabetes prevalence in 173 countries – Corrigendum. *Public Health Nutrition*, 16(1): 189–189. <https://doi.org/10.1017/S1368980012003758>
- Battersby, J.** 2017. Food system transformation in the absence of food system planning: the case of supermarket and shopping mall retail expansion in Cape Town, South Africa. *Built Environment*, 43(3): 417–430. <https://doi.org/10.2148/benv.43.3.417>
- Battersby, J. & Crush, J.** 2014. Africa’s urban food deserts. *Urban Forum*, 25(2): 143–151. <https://doi.org/10.1007/s12132-014-9225-5>
- Battersby, J. & Watson, V.** 2019. *Urban food systems governance and poverty in African cities*. London, Routledge.
- Beaulac, J., Kristjansson, E. & Cummins, S.** 2009. A systematic review of food deserts, 1966-2007. *Preventing Chronic Disease*, 6(3): A105. www.ncbi.nlm.nih.gov/pmc/articles/PMC2722409/
- van Berkum, S., Achterbosch, T. & Linderhof, V.** 2017. *Dynamics of food systems in sub-Saharan Africa. Implications for consumption patterns and farmers’ position in food supply chains*. Wageningen, Netherlands (Kingdom of the), Wageningen Economic Research. <https://doi.org/10.18174/417176>
- Bisht, I.S., Rana, J.C. & Pal Ahlawat, S.** 2020. The future of smallholder farming in India: some sustainability considerations. *Sustainability*, 12(9): 3751. <https://doi.org/10.3390/su12093751>
- Blay-Palmer, A., Santini, G., Dubbeling, M., Renting, H., Taguchi, M. & Giordano, T.** 2018. Validating the city region food system approach: enacting inclusive, transformational city region food systems. *Sustainability*, 10: 1680. <https://doi.org/10.3390/su10051680>
- Bren d’Amour, C., Pandey, B., Reba, M., Ahmad, S., Creutzig, F. & Seto, K.C.** 2020. Urbanization, processed foods, and eating out in India. *Global Food Security*, 25: 100361. <https://doi.org/10.1016/j.gfs.2020.100361>
- Bren d’Amour, C., Reitsma, F., Baiocchi, G., Barthel, S., Güneralp, B., Erb, K.-H., Haberl, H., Creutzig, F. & Seto, K.C.** 2017. Future urban land expansion and implications for global croplands. *Proceedings of the National Academy of Sciences*, 114(34): 8939–8944. <https://doi.org/10.1073/pnas.1606036114>
- de Bruin, S., Denerink, J., Randhawa, P., Wade, I., Biemans, H. & Siderius, C.** 2022. *Urbanizing food systems: exploring opportunities for rural transformation*. Papers of the 2021 Rural Development Report. Rome, IFAD.
- de Bruin, S., Dengerink, J. & van Vliet, J.** 2021. Urbanisation as driver of food system transformation and opportunities for rural livelihoods. *Food Security*, 13(4): 781–798. <https://doi.org/10.1007/s12571-021-01182-8>
- Casari, S., Di Paola, M., Banci, E., Diallo, S., Scarallo, L., Renzo, S., Gori, A. et al.** 2022. Changing dietary habits: the impact of urbanization and rising socio-economic status in families from Burkina Faso in sub-Saharan Africa. *Nutrients*, 14(9): 1782. <https://doi.org/10.3390/nu14091782>
- Castañeda, A., Doan, D., Newhouse, D., Nguyen, M.C., Uematsu, H. & Azevedo, J.P.** 2016. *Who are the poor in the developing world?*. Policy Research Working Paper 1813–9450. Washington, DC, The World Bank.

- Castells-Quintana, D. & Wenban-Smith, H.** 2020. Population dynamics, urbanisation without growth, and the rise of megacities. *The Journal of Development Studies*, 56(9): 1663–1682. <https://doi.org/10.1080/00220388.2019.1702160>
- Cattaneo, A., Adukia, A., Brown, D.L., Christiaensen, L., Evans, D.K., Haakenstad, A., McMenomy, T. et al.** 2022. Economic and social development along the urban–rural continuum: new opportunities to inform policy. *World Development*, 157: 105941. <https://doi.org/10.1016/j.worlddev.2022.105941>
- Cattaneo, A., Nelson, A. & McMenomy, T.** 2021. Global mapping of urban–rural catchment areas reveals unequal access to services. *Proceedings of the National Academy of Sciences*, 118(2): e2011990118. <https://doi.org/10.1073/pnas.2011990118>
- Chaves, W.A., Wilkie, D.S., Monroe, M.C. & Sieving, K.E.** 2017. Market access and wild meat consumption in the central Amazon, Brazil. *Biological Conservation*, 212: 240–248. <https://doi.org/10.1016/j.biocon.2017.06.013>
- Chen, M., Zhang, H., Liu, W. & Zhang, W.** 2014. The global pattern of urbanization and economic growth: evidence from the last three decades. *PLOS ONE*, 9(8): e103799. <https://doi.org/10.1371/journal.pone.0103799>
- Choithani, C.** 2020. Gendered livelihoods: migrating men, left-behind women and household food security in India. *Gender, Place & Culture*, 27(10): 1373–1394. <https://doi.org/10.1080/0966369X.2019.1681366>
- Chooi, Y.C., Ding, C. & Magkos, F.** 2019. The epidemiology of obesity. *Metabolism*, 92: 6–10. <https://doi.org/10.1016/j.metabol.2018.09.005>
- Christiaensen, L., De Weerd, J. & Todo, Y.** 2013. Urbanization and poverty reduction: the role of rural diversification and secondary towns. *Agricultural Economics*, 44(4–5): 435–447. <https://doi.org/10.1111/agec.12028>
- Christiaensen, L. & Martin, W.** 2018. Agriculture, structural transformation and poverty reduction: eight new insights. *World Development*, 109: 413–416. <https://doi.org/10.1016/j.worlddev.2018.05.027>
- Christiaensen, L. & Todo, Y.** 2014. Poverty reduction during the rural–urban transformation – The role of the missing middle. *World Development*, 63: 43–58. <https://doi.org/10.1016/j.worlddev.2013.10.002>
- Cities Alliance & AfDB (African Development Bank).** 2022. *The dynamics of systems of secondary cities in Africa: urbanisation, migration and development*. Brussels and Abidjan. www.citiesalliance.org/resources/publications/book/dynamics-systems-secondary-cities-africa
- Cockx, L. & De Weerd, J.** 2016. *From Corn to Popcorn? Urbanization and food consumption in sub-Saharan Africa: evidence from rural-urban migrants in Tanzania*. Conference presentation at the 5th International Conference of the African Association of Agricultural Economists, 23–26 September, Addis Ababa 249270. African Association of Agricultural Economists (AAAE).
- Crush, J. & Frayne, B.** 2011. Supermarket expansion and the informal food economy in southern African cities: implications for urban food security. *Journal of Southern African Studies*, 37(4): 781–807. <https://doi.org/10.1080/03057070.2011.617532>
- Crush, J., Nickanor, N. & Kazembe, L.** 2019. Informal food deserts and household food insecurity in Windhoek, Namibia. *Sustainability*, 11(1): 37. <https://doi.org/10.3390/su11010037>
- Crush, J. & Young, G.** 2019. Resituating Africa’s urban informal food sector. *Urban Forum*, 30(4): 377–384. <https://doi.org/10.1007/s12132-019-09374-4>
- Da Silva, J.G. & Fan, S.** 2017. Smallholders and urbanization: strengthening rural–urban linkages to end hunger and malnutrition. In: *2017 Global Food Policy Report*. pp. 14–23. Washington, DC. https://doi.org/10.2499/9780896292529_02

- Dakora, E.A.N.** 2012. Exploring the fourth wave of supermarket evolution: concepts of value and complexity in Africa. *International Journal of Managing Value and Supply Chains*, 3(3): 25–37. <https://doi.org/10.5121/ijmvsc.2012.3303>
- Darrouzet-Nardi, A.F. & Masters, W.A.** 2017. Nutrition Smoothing: Can Proximity to Towns and Cities Protect Rural Children against Seasonal Variation in Agroclimatic Conditions at Birth? *Plos One*, 12(1): e0168759. <https://doi.org/10.1371/journal.pone.0168759>
- Davis, B., Mane, E., Gurbuzer, L.Y., Caivano, G., Piedrahita, N., Schneider, K., Azhar, N. et al.** 2023. *Estimating global and country-level employment in agrifood systems*. FAO Statistics Working Paper Series, No. 23-34. Rome, FAO. <https://doi.org/10.4060/cc4337en>
- Davis, J.C. & Henderson, J.V.** 2003. Evidence on the political economy of the urbanization process. *Journal of Urban Economics*, 53(1): 98–125. [https://doi.org/10.1016/S0094-1190\(02\)00504-1](https://doi.org/10.1016/S0094-1190(02)00504-1)
- Debonne, N., van Vliet, J., Ramkat, R., Snelder, D. & Verburg, P.** 2021. Farm scale as a driver of agricultural development in the Kenyan Rift Valley. *Agricultural Systems*, 186: 102943. <https://doi.org/10.1016/j.agsy.2020.102943>
- Diao, X., Dorosh, P.A., Kedir Jemal, M., Kennedy, A. & Thurlow, J.** 2019. Employment and livelihoods: connecting Africa’s rural and urban areas for rural revitalization. In: *2019 Global food policy report*. pp. 36–43. Washington, DC, IFPRI. https://doi.org/10.2499/9780896293502_04
- Dijkstra, L., Florczyk, A.J., Freire, S., Kemper, T., Melchiorri, M., Pesaresi, M. & Schiavina, M.** 2021. Applying the Degree of Urbanisation to the globe: a new harmonised definition reveals a different picture of global urbanisation. *Journal of Urban Economics*, 125: 103312. <https://doi.org/10.1016/j.jue.2020.103312>
- Djurfeldt, A.A.** 2015. Urbanization and linkages to smallholder farming in sub-Saharan Africa: implications for food security. *Global Food Security*, 4: 1–7. <https://doi.org/10.1016/j.gfs.2014.08.002>
- Dolislager, M.J.** 2017. *Food consumption patterns in light of rising incomes, urbanization and food retail modernization*. East Lansing, USA, Michigan State University. <https://doi.org/10.25335/M58N4M>
- Dolislager, M.J., Holleman, C., Liverpool-Tasie, L.S.O. & Reardon, T.** 2023. *Analysis of food demand and supply across the rural–urban continuum for selected countries in Africa – Background paper for The State of Food Security and Nutrition in the World 2023*. FAO Agricultural Development Economics Working Paper 23-09. Rome, FAO.
- Dolislager, M.J., Liverpool-Tasie, L.S.O., Mason, N.M., Reardon, T. & Tschirley, D.** 2022. Consumption of healthy and unhealthy foods by the African poor: evidence from Nigeria, Tanzania, and Uganda. *Agricultural Economics*, 53(6): 870–894. <https://doi.org/10.1111/agec.12738>
- Dolislager, M.J., Reardon, T., Arslan, A., Fox, L., Liverpool-Tasie, L.S.O., Sauer, C. & Tschirley, D.L.** 2021. Youth and adult agrifood system employment in developing regions: rural (peri-urban to hinterland) vs. urban. *The Journal of Development Studies*, 57(4): 571–593. <https://doi.org/10.1080/00220388.2020.1808198>
- Dorosh, P. & Thurlow, J.** 2013. Agriculture and small towns in Africa. *Agricultural Economics*, 44(4–5): 449–459. <https://doi.org/10.1111/agec.12027>
- Dorosh, P., Wang, H.G., You, L. & Schmidt, E.** 2012. Road connectivity, population, and crop production in sub-Saharan Africa. *Agricultural Economics*, 43(1): 89–103. <https://doi.org/10.1111/j.1574-0862.2011.00567.x>
- Duda, I., Fasse, A. & Grote, U.** 2018. Drivers of rural-urban migration and impact on food security in rural Tanzania. *Food Security*, 10(4): 785–798. <https://doi.org/10.1007/s12571-018-0788-1>

- Dupont, V.** 2005. Peri-urban dynamics: population, habitat and environment on the peripheries of large Indian metropolises – An Introduction. In: *Peri-urban dynamics: population, habitat and environment on the peripheries of large Indian metropolises. A review of concepts and general issues*. CSH occasional paper No. 14. New Delhi, Centre de Sciences Humaines.
- ESCWA (United Nations Economic and Social Commission for Western Asia).** 2020. Peri-urban areas. In: *United Nations Economic and Social Commission for Western Asia*. [Cited 9 May 2023]. <https://archive.unescwa.org/peri-urban-areas>
- European Commission.** 2018. GHSL - Global Human Settlement Layer. In: *European Commission*. [Cited 9 May 2023]. <https://ghsl.jrc.ec.europa.eu>
- European Commission.** 2020a. The classes of the Degree of urbanisation. In: *European Commission | GHSL - Global Human Settlement Layer*. [Cited 9 May 2023]. <https://ghsl.jrc.ec.europa.eu/degurbaDefinitions.php>
- European Commission.** 2020b. The degree of urbanisation, a new global definition of cities, urban and rural areas. In: *European Commission | GHSL - Global Human Settlement Layer*. [Cited 9 May 2023]. <https://ghsl.jrc.ec.europa.eu/degurba.php>
- EUROSTAT (Statistical Office of the European Union).** 2000. *Glossary on demographic statistics, 2000 edition*. Luxembourg, European Commission.
- FAO.** 2017. *The State of Food and Agriculture 2017. Leveraging food systems for inclusive rural transformation*. Rome. www.fao.org/3/I7658e/I7658e.pdf
- FAO.** 2021. Global Urban Rural Catchment Areas (URCA) Grid - 2021. In: *FAO Hand-in-Hand*. [Cited 4 August 2023]. <https://data.apps.fao.org/?share=g-3c88219e20d55c7ce70c8b3b0459001a&lang=en>
- FAO.** 2022. *The State of World Fisheries and Aquaculture 2022. Towards Blue Transformation*. Rome. <https://doi.org/10.4060/cc0461en>
- FAO.** 2023. *The status of women in agrifood systems*. Rome. <https://doi.org/10.4060/cc5343en>
- FAO, IFAD, UNICEF, WFP & WHO.** 2020. *The State of Food Security and Nutrition in the World 2020. Transforming food systems for affordable healthy diets*. Rome, FAO. <https://doi.org/10.4060/ca9692en>
- FAO, IFAD, UNICEF, WFP & WHO.** 2021. *The State of Food Security and Nutrition in the World 2021. Transforming food systems for food security, improved nutrition and affordable healthy diets for all*. Rome, FAO. <https://doi.org/10.4060/cb4474en>
- FAO, IFAD, UNICEF, WFP & WHO.** 2023. *The State of Food Security and Nutrition in the World 2023. Urbanization, agrifood systems transformation and healthy diets across the rural–urban continuum*. Rome, FAO. <https://doi.org/10.4060/cc3017en>
- FAO & WHO.** 2019. *Sustainable healthy diets – Guiding principles*. Rome. www.fao.org/3/ca6640en/ca6640en.pdf
- Faye, N.F., Fall, T., Reardon, T., Theriault, V., Ngom, Y., Barry, M.B. & Sy, M.R.** 2023. Consumption of fruits and vegetables by types and sources across urban and rural Senegal. *Journal of Agribusiness in Developing and Emerging Economies*, (forthcoming). <https://doi.org/10.1108/JADEE-05-2022-0090>
- Forster, T. & Mattheisen, E.** 2016. Territorial food systems: protecting the rural and localizing human rights accountability. In: *Right to Food and Nutrition Watch. Keeping seeds in people's hands*. pp. 38–44. Watch Consortium. www.brot-fuer-die-welt.de/fileadmin/mediapool/2_Downloads/Right_to_food_and_nutrition_Watch_2016_ENG_WEB.pdf
- Gandhi, V.P. & Zhou, Z.** 2014. Food demand and the food security challenge with rapid economic growth in the emerging economies of India and China. *Food Research International*, 63: 108–124. <https://doi.org/10.1016/j.foodres.2014.03.015>

- Gebru, M., Remans, R., Brouwer, I., Baye, K., Melesse, M.B., Covic, N., Habtamu, F. et al.** 2018. *Food systems for healthier diets in Ethiopia: toward a research agenda*. 0 edition. IFPRI Discussion Paper 1720. Washington, DC, IFPRI. <https://doi.org/10.2499/1032568455>
- Gibson, J., Datt, G., Murgai, R. & Ravallion, M.** 2017. For India's rural poor, growing towns matter more than growing cities. *World Development*, 98: 413–429. <https://doi.org/10.1016/j.worlddev.2017.05.014>
- GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit), FAO & RUAF Foundation.** 2017. *City region food systems and food waste management. Linking urban and rural areas for sustainable and resilient development*. Rome, FAO. www.fao.org/3/a-i6233e.pdf
- GLOPAN.** 2017. *Urban diets and nutrition: Trends, challenges and opportunities for policy action*. Policy Brief No. 9. London. <https://www.glopan.org/sites/default/files/Downloads/GlobalPanelUrbanizationPolicyBrief.pdf>
- Golub, S.** 2012. Government policies, smuggling, and the informal sector. In: *The informal sector in francophone Africa*. pp. 195–218. Chapter 9. Washington, DC.
- Hawkes, C.** 2008. Dietary Implications of supermarket development: a global perspective. *Development Policy Review*, 26(6): 657–692. <https://doi.org/10.1111/j.1467-7679.2008.00428.x>
- Hawkes, C., Harris, J. & Gillespie, S.** 2017. Changing diets: urbanization and the nutrition transition. In: *2017 Global Food Policy Report*. pp. 34–41. Washington, DC, International Food Policy Research Institute (IFPRI). https://doi.org/10.2499/9780896292529_04
- Headey, D., Bezemer, D. & Hazell, P.B.** 2010. Agricultural employment trends in Asia and Africa: too fast or too slow? *The World Bank Research Observer*, 25(1): 57–89. <https://doi.org/10.1093/wbro/lkp028>
- Headey, D., Stifel, D., You, L. & Guo, Z.** 2018. Remoteness, urbanization, and child nutrition in sub-Saharan Africa. *Agricultural Economics*, 49(6): 765–775. <https://doi.org/10.1111/agec.12458>
- Henderson, J.V.** 2010. Cities and development. *Journal of Regional Science*, 50(1): 515–540. <https://doi.org/10.1111/j.1467-9787.2009.00636.x>
- Hillbom, E.** 2011. Farm intensification and milk market expansion in Meru, Tanzania. *African Studies Review*, 54(1): 145–165. www.jstor.org/stable/41304754
- Hirvonen, K. & Hoddinott, J.** 2014. *Agricultural production and children's diets: evidence from rural Ethiopia*. Washington, DC, IFPRI. www.ifpri.org/publication/agricultural-production-and-children%E2%80%99s-diets-evidence-rural-ethiopia
- HLPE.** 2017. *Nutrition and food systems*. A report by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security. Rome. www.fao.org/3/i7846e/i7846e.pdf
- HLPE (High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security).** 2020. *Food security and nutrition: building a global narrative towards 2030*. A report by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security. Rome. www.fao.org/3/ca9731en/ca9731en.pdf
- Hoddinott, J., Headey, D.D. & Dereje, M.** 2014. *Cows, missing milk markets and nutrition in rural Ethiopia*. Washington, DC, IFPRI. www.ifpri.org/publication/cows-missing-milk-markets-and-nutrition-rural-ethiopia
- van Huijstee, J., van Bommel, B., Bouwman, A. & van Rijn, F.** 2018. *Towards an urban preview: modelling future urban growth with 2UP*. The Hague, Netherlands (Kingdom of the), PBL Netherlands Environmental Assessment Agency. www.pbl.nl/en/publications/towards-an-urban-preview

- IFAD.** 2016a. *IFAD Strategic Framework 2016–2025. Enabling inclusive and sustainable rural transformation.* Rome. www.ifad.org/en/web/knowledge/-/ifad-strategic-framework-2016-20251
- IFAD.** 2016b. *Rural Development Report 2016. Fostering inclusive rural transformation.* Rome. www.ifad.org/en/web/knowledge/-/rural-development-report-2016-fostering-inclusive-rural-transformation
- Imai, K.S., Gaiha, R. & Garbero, A.** 2018. *Poverty reduction during the rural–urban transformation: rural development is still more important than urbanisation.* Vol. 39. IFAD Research Series 22. Rome, IFAD. <https://linkinghub.elsevier.com/retrieve/pii/S0161893817301059>
- Jayne, T.S., Chamberlin, J. & Benfica, R.** 2018. Africa’s unfolding economic transformation. *The Journal of Development Studies*, 54(5): 777–787. <https://doi.org/10.1080/00220388.2018.1430774>
- Jayne, T.S., Chamberlin, J., Traub, L., Sitko, N., Muyanga, M., Yeboah, F.K., Anseeuw, W. et al.** 2016. Africa’s changing farm size distribution patterns: the rise of medium-scale farms. *Agricultural Economics*, 47(S1): 197–214. <https://doi.org/10.1111/agec.12308>
- Jayne, T.S., Mather, D. & Mghenyi, E.** 2010. Principal challenges confronting smallholder agriculture in sub-Saharan Africa. *World Development*, 38(10): 1384–1398. <https://doi.org/10.1016/j.worlddev.2010.06.002>
- Jedwab, R. & Vollrath, D.** 2015. Urbanization without growth in historical perspective. *Explorations in Economic History*, 58: 1–21. <https://doi.org/10.1016/j.eeh.2015.09.002>
- Kelly, M., Seubsman, S., Banwell, C., Dixon, J. & Sleight, A.** 2015. Traditional, modern or mixed? Perspectives on social, economic, and health impacts of evolving food retail in Thailand. *Agriculture and Human Values*, 32(3): 445–460. <https://doi.org/10.1007/s10460-014-9561-z>
- Kelly, S. & Ilie, E.T.** 2021. *Engaging with small and medium agrifood enterprises to guide policy making: a qualitative research methodological guide.* Rome, FAO. <https://doi.org/10.4060/cb4179en>
- Kinnunen, P., Guillaume, J.H.A., Taka, M., D’Odorico, P., Siebert, S., Puma, M.J., Jalava, M. & Kumm, M.** 2020. Local food crop production can fulfil demand for less than one-third of the population. *Nature Food*, 1(4): 229–237. <https://doi.org/10.1038/s43016-020-0060-7>
- Klassen, S. & Murphy, S.** 2020. Equity as both a means and an end: Lessons for resilient food systems from COVID-19. *World Development*, 136: 105104. <https://doi.org/10.1016/j.worlddev.2020.105104>
- Kriewald, S., Pradhan, P., Costa, L., Ros, A.G.C. & Kropp, J.P.** 2019. Hungry cities: how local food self-sufficiency relates to climate change, diets, and urbanisation. *Environmental Research Letters*, 14(9): 094007. <https://doi.org/10.1088/1748-9326/ab2d56>
- Kuusaana, E.D. & Eledi, J.A.** 2015. As the city grows, where do the farmers go? Understanding peri-urbanization and food systems in Ghana - Evidence from the Tamale Metropolis. *Urban Forum*, 26(4): 443–465. <https://doi.org/10.1007/s12132-015-9260-x>
- Lasisi, M., Popoola, A., Adediji, A., Adedeji, O. & Babalola, K.** 2017. City expansion and agricultural land loss within the peri-urban area of Osun State, Nigeria. *Ghana Journal of Geography*, 9(3): 132–163. <https://doi.org/10.4314/gjg.v9i3>
- Ligtvoet, W., Bouwman, A., Knopp, J., de Bruin, S., Nabielek, K., Huizing, H., Janse, J. et al.** 2018. *The geography of future water challenges.* The Hague, PBL Netherlands Environmental Assessment Agency. www.pbl.nl/en/publications/the-geography-of-future-water-challenges

- Liverpool-Tasie, L.S.O., Reardon, T. & Belton, B.** 2021. “Essential non-essentials”: COVID-19 policy missteps in Nigeria rooted in persistent myths about African food supply chains. *Applied Economic Perspectives and Policy*, 43(1): 205–224. <https://doi.org/10.1002/aepp.13139>
- Love, H. & Loh, T.H.** 2020. The ‘rural-urban divide’ furthers myths about race and poverty—concealing effective policy solutions. In: *Brookings*. [Cited 24 May 2023]. www.brookings.edu/blog/the-avenue/2020/12/08/the-rural-urban-divide-furthers-myths-about-race-and-poverty-concealing-effective-policy-solutions
- Lowder, S.K., Skoet, J. & Raney, T.** 2016. The number, size, and distribution of farms, smallholder farms, and family farms worldwide. *World Development*, 87: 16–29. <https://doi.org/10.1016/j.worlddev.2015.10.041>
- Machado-Rodrigues, A.M., Coelho-E-Silva, M.J., Mota, J., Padez, C., Martins, R.A., Cumming, S.P., Riddoch, C. & Malina, R.M.** 2014. Urban-rural contrasts in fitness, physical activity, and sedentary behaviour in adolescents. *Health Promotion International*, 29(1): 118–129. <https://doi.org/10.1093/heapro/das054>
- Maharjan, A., Bauer, S. & Knerr, B.** 2012. Do rural women who stay behind benefit from male out-migration? A case study in the hills of Nepal. *Gender, Technology and Development*, 16(1): 95–123. <https://doi.org/10.1177/097185241101600105>
- Masters, W.A., Djurfeldt, A.A., De Haan, C., Hazell, P., Jayne, T., Jirström, M. & Reardon, T.** 2013. Urbanization and farm size in Asia and Africa: implications for food security and agricultural research. *Global Food Security*, 2(3): 156–165. <https://doi.org/10.1016/j.gfs.2013.07.002>
- Miller, V., Yusuf, S., Chow, C.K., Dehghan, M., Corsi, D.J., Lock, K., Popkin, B. et al.** 2016. Availability, affordability, and consumption of fruits and vegetables in 18 countries across income levels: findings from the Prospective Urban Rural Epidemiology (PURE) study. *The Lancet Global Health*, 4(10): e695–e703. [https://doi.org/10.1016/S2214-109X\(16\)30186-3](https://doi.org/10.1016/S2214-109X(16)30186-3)
- Minten, B., Reardon, T. & Chen, K.Z.** 2017. Agricultural value chains: how cities reshape food systems. In: *Global Food Policy Report 2017*. 0 edition, pp. 42–49. Washington, DC, IFPRI. https://doi.org/10.2499/9780896292529_04
- Monteiro, C.A., Moubarac, J.-C., Cannon, G., Ng, S.W. & Popkin, B.** 2013. Ultra-processed products are becoming dominant in the global food system. *Obesity Reviews: An Official Journal of the International Association for the Study of Obesity*, 14: 21–28. <https://doi.org/10.1111/obr.12107>
- Mortreux, C., de Campos, R.S. & Adger, W.N.** 2018. Mobility, displacement and migration, and their interactions with vulnerability and adaptation to environmental risks. In: *Routledge Handbook of Environmental Displacement and Migration*. pp. 29–41. London, Routledge.
- Mottaleb, K.A. & Mishra, A.K.** 2023. Income, urbanisation and consumption of processed foods: Implications for nutrition and health policies for India. *Journal of International Development*, 35(5): 688–715. <https://doi.org/10.1002/jid.3686>
- Mueller, V., Sheriff, G., Dou, X. & Gray, C.** 2020. Temporary migration and climate variation in eastern Africa. *World Development*, 126: 104704. <https://doi.org/10.1016/j.worlddev.2019.104704>
- Mulligan, G.F., Partridge, M.D. & Carruthers, J.I.** 2012. Central place theory and its reemergence in regional science. *The Annals of Regional Science*, 48(2): 405–431. <https://doi.org/10.1007/s00168-011-0496-7>
- Mulmi, P., Block, S.A., Shively, G.E. & Masters, W.A.** 2016. Climatic conditions and child height: sex-specific vulnerability and the protective effects of sanitation and food markets in Nepal. *Economics and Human Biology*, 23: 63–75. <https://doi.org/10.1016/j.ehb.2016.07.002>

- Muyanga, M., Aromolaran, A., Jayne, T., Liverpool-Tasie, L.S.O., Awokuse, T. & Adelaja, A.** 2019. *Changing farm structure and agricultural commercialisation in Nigeria*. Working Paper 26. APRA (Agricultural Policy Research in Africa).
- Neumann, K. & Hermans, F.** 2017. What drives human migration in Sahelian countries? A meta-analysis. *Population, Space and Place*, 23(1): e1962. <https://doi.org/10.1002/psp.1962>
- Neven, D., Odera, M.M., Reardon, T. & Wang, H.** 2009. Kenyan supermarkets, emerging middle-class horticultural farmers, and employment impacts on the rural poor. *World Development*, 37(11): 1802–1811. <https://doi.org/10.1016/j.worlddev.2008.08.026>
- Nickanor, N., Kazembe, L.N., Crush, J. & Wagner, J.** 2021. Revisiting the African supermarket revolution: the case of Windhoek, Namibia. *Development Southern Africa*, 38(2): 230–247. <https://doi.org/10.1080/0376835X.2020.1819774>
- Nuthalapati, C.S.R., Sutradhar, R., Reardon, T. & Qaim, M.** 2020. Supermarket procurement and farmgate prices in India. *World Development*, 134: 105034. <https://doi.org/10.1016/j.worlddev.2020.105034>
- OECD & FAO.** 2022. *OECD-FAO Agricultural Outlook 2022-2031*. Paris, OECD Publishing. <https://doi.org/10.1787/f1b0b29c-en>
- OECD & SWAC (Sahel and West Africa Club).** 2020. *Africa's Urbanisation Dynamics 2020. Africapolis, mapping a new urban geography*. Paris. <https://doi.org/10.1787/b6bccb81-en>
- Penning-Rowsell, E.C., Sultana, P. & Thompson, P.M.** 2013. The 'last resort'? Population movement in response to climate-related hazards in Bangladesh. *Environmental Science & Policy*, 27: S44–S59. <https://doi.org/10.1016/j.envsci.2012.03.009>
- Pingali, P.** 2007. Westernization of Asian diets and the transformation of food systems: implications for research and policy. *Food Policy*, 32(3): 281–298. <https://doi.org/10.1016/j.foodpol.2006.08.001>
- Pingali, P., Aiyar, A., Abraham, M. & Rahman, A.** 2019a. The way forward: food systems for enabling rural prosperity and nutrition security. In: P. Pingali, A. Aiyar, M. Abraham & A. Rahman, eds. *Transforming Food Systems for a Rising India*. pp. 277–311. Palgrave Studies in Agricultural Economics and Food Policy. Cham, Switzerland, Springer International Publishing. https://doi.org/10.1007/978-3-030-14409-8_11
- Pingali, P., Aiyar, A., Abraham, M. & Rahman, A.** 2019b. Diet diversity and the declining importance of staple grains. In: P. Pingali, A. Aiyar, M. Abraham & A. Rahman, eds. *Transforming Food Systems for a Rising India*. pp. 73–91. Palgrave Studies in Agricultural Economics and Food Policy. Palgrave Macmillan. https://doi.org/10.1007/978-3-030-14409-8_4
- Popkin, B.M. & Nielsen, S.J.** 2003. The sweetening of the world's diet. *Obesity Research*, 11(11): 1325–1332. <https://doi.org/10.1038/oby.2003.179>
- Popkin, B.M. & Reardon, T.** 2018. Obesity and the food system transformation in Latin America. *Obesity Reviews*, 19(8): 1028–1064. <https://doi.org/10.1111/obr.12694>
- Porter, G.** 2005. From periodic markets to supermarkets: what hope for equitable and sustainable food markets in Africa? *Journal of Sustainable Development*, 2(2): 2–8.
- Pradhan, P., Kriewald, S., Costa, L., Rybski, D., Benton, T.G., Fischer, G. & Kropp, J.P.** 2020. Urban food systems: How regionalization can contribute to climate change mitigation. *Environmental Science & Technology*, 54(17): 10551–10560. <https://doi.org/10.1021/acs.est.0c02739>
- Qaim, M.** 2017. Globalisation of agrifood systems and sustainable nutrition. *The Proceedings of the Nutrition Society*, 76(1): 12–21. <https://doi.org/10.1017/S0029665116000598>
- Radwan, T.M., Blackburn, G.A., Whyatt, J.D. & Atkinson, P.M.** 2019. Dramatic loss of agricultural land due to urban expansion threatens food security in the Nile Delta, Egypt. *Remote Sensing*, 11(3): 332. <https://doi.org/10.3390/rs11030332>

- Rao, N.D., Min, J., DeFries, R., Ghosh-Jerath, S., Valin, H. & Fanzo, J.** 2018. Healthy, affordable and climate-friendly diets in India. *Global Environmental Change*, 49: 154–165. <https://doi.org/10.1016/j.gloenvcha.2018.02.013>
- Rao, N.D., Sauer, P., Gidden, M. & Riahi, K.** 2019. Income inequality projections for the Shared Socioeconomic Pathways (SSPs). *Futures*, 105: 27–39. <https://doi.org/10.1016/J.FUTURES.2018.07.001>
- Reardon, T.** 2015. The hidden middle: the quiet revolution in the midstream of agrifood value chains in developing countries. *Oxford Review of Economic Policy*, 31(1): 45–63. www.jstor.org/stable/43664670
- Reardon, T., Awokuse, T., Haggblade, S., Kapuya, T., Liverpool-Tasie, L.S.O., Meyer, F., Minten, B. et al.** 2019a. The quiet revolution and emerging modern revolution in agri-food processing in sub-Saharan Africa. In: AGRA, ed. *Africa Agriculture Status Report 2019. The hidden middle: a quiet revolution in the private sector driving agricultural transformation*. pp. 29–53. Nairobi, AGRA. <https://agra.org/wp-content/uploads/2019/09/AASR2019-The-Hidden-Middleweb.pdf>
- Reardon, T., Echeverria, R., Berdegué, J., Minten, B., Liverpool-Tasie, L.S.O., Tschirley, D. & Zilberman, D.** 2019b. Rapid transformation of food systems in developing regions: highlighting the role of agricultural research & innovations. *Agricultural Systems*, 172: 47–59. <https://doi.org/10.1016/j.agsy.2018.01.022>
- Reardon, T. & Minten, B.** 2011. Surprised by supermarkets: diffusion of modern food retail in India. *Journal of Agribusiness in Developing and Emerging Economies*, 1(2): 134–161. <https://doi.org/10.1108/204408311111167155>
- Reardon, T. & Timmer, C.P.** 2014. Five inter-linked transformations in the Asian agrifood economy: food security implications. *Global Food Security*, 3(2): 108–117. <https://doi.org/10.1016/j.gfs.2014.02.001>
- Reardon, T., Tschirley, D., Liverpool-Tasie, L.S.O., Awokuse, T., Fanzo, J., Minten, B., Vos, R. et al.** 2021. The processed food revolution in African food systems and the double burden of malnutrition. *Global Food Security*, 28: 100466. <https://doi.org/10.1016/j.gfs.2020.100466>
- Reardon, T., Tschirley, D., Minten, B., Haggblade, S., Liverpool-Tasie, L.S.O., Dolislager, M.J., Snyder, J. & Ijumba, C.** 2015. Chapter 4: Transformation of African agrifood systems in the new era of rapid urbanization and the emergence of a middle class. In: O. Badiane & T. Makombe, eds. *Beyond a middle income Africa: Transforming African economies for sustained growth with rising employment and incomes*. pp. 1–16. ReSAKSS Annual Trends and Outlook Report 2014. Washington, DC, IFPRI. www.ifpri.org/publication/transformation-african-agrifood-systems-new-era-rapid-urbanization-and-emergence-middle
- Reardon, T., Tschirley, D.L., Snyder, J., Hu, C. & White, S.** 2014. *Urbanization, diet change, and transformation of food supply chains in Asia*. East Lansing, USA, Michigan State University.
- Regassa, N. & Stoecker, B.J.** 2012. Household food insecurity and hunger among households in Sidama district, southern Ethiopia. *Public Health Nutrition*, 15(7): 1276–1283. <https://doi.org/10.1017/S1368980011003119>
- Regmi, A. & Dyck, J.** 2001. Effects of urbanization on global food demand. In: A. Regmi, ed. *Changing structure of global food consumption and trade*. pp. 23–30. Agriculture and Trade Report. WRS-01-1. Washington, DC, USDA (United States Department of Agriculture).
- Regmi, A. & Gehlhar, M.** 2005. *New directions in global food markets*. Agricultural Information Bulletin No. (AIB-794). Washington, DC, USDA.

- Robinson, E. & Yoshida, N.** 2016. *Improving the nutritional quality of food markets through the informal sector: lessons from case studies in other sectors*. IDS Evidence Report, 171. Brighton, UK, IDS (Institute of Development Studies). <https://opendocs.ids.ac.uk/opendocs/handle/20.500.12413/8959>
- Rondhi, M., Pratiwi, P.A., Handini, V.T., Sunartomo, A.F. & Budiman, S.A.** 2018. Agricultural land conversion, land economic value, and sustainable agriculture: a case study in East Java, Indonesia. *Land*, 7(4): 148. <https://doi.org/10.3390/land7040148>
- Satterthwaite, D., McGranahan, G. & Tacoli, C.** 2010. Urbanization and its implications for food and farming. *Philosophical Transactions of the Royal Society B: Biological Sciences*, 365(1554): 2809–2820. <https://doi.org/10.1098/rstb.2010.0136>
- Sauer, C.M., Reardon, T., Tschirley, D., Liverpool-Tasie, L.S.O., Awokuse, T., Alphonse, R., Ndyetabula, D. & Waized, B.** 2021. Consumption of processed food & food away from home in big cities, small towns, and rural areas of Tanzania. *Agricultural Economics*, 52(5): 749–770. <https://doi.org/10.1111/agec.12652>
- Scheffran, J., Marmer, E. & Sow, P.** 2012. Migration as a contribution to resilience and innovation in climate adaptation: social networks and co-development in Northwest Africa. *Applied Geography*, 33: 119–127. <https://doi.org/10.1016/j.apgeog.2011.10.002>
- ScienceDirect.** 2023. Out-migration. In: *ScienceDirect Topics*. [Cited 9 May 2023]. www.sciencedirect.com/topics/social-sciences/out-migration
- Selod, H. & Shilpi, F.** 2021. Rural-urban migration in developing countries: lessons from the literature. *Regional Science and Urban Economics*, 91: 103713. <https://doi.org/10.1016/j.regsciurbeco.2021.103713>
- Sharma, A.** 2016. Urban proximity and spatial pattern of land use and development in rural India. *The Journal of Development Studies*, 52(11): 1593–1611. <https://doi.org/10.1080/00220388.2016.1166207>
- Sibhatu, K.T. & Qaim, M.** 2017. Rural food security, subsistence agriculture, and seasonality. *PLOS ONE*, 12(10): e0186406. <https://doi.org/10.1371/journal.pone.0186406>
- Sitko, N.J. & Jayne, T.S.** 2014. Structural transformation or elite land capture? The growth of “emergent” farmers in Zambia. *Food Policy*, 48: 194–202. <https://doi.org/10.1016/j.foodpol.2014.05.006>
- Skinner, C.** 2018. Contributing yet excluded? Informal food retail in African cities. In: J. Battersby & V. Watson, eds. *Urban food systems governance and poverty in African cities*. pp. 104–115. Earthscan for Routledge.
- Smith, L.C., Ruel, M.T. & Ndiaye, A.** 2004. *Why is child malnutrition lower in urban than rural areas?* FCND discussion papers 176 176. IFPRI. <https://ideas.repec.org/p/fpr/fcnddp/176.html>
- Sohel, Md.S., Hossain, B., Sarker, Md.N.I., Horaira, G.A., Sifullah, Md.K. & Rahman, Md.A.** 2022. Impacts of COVID-19 induced food insecurity among informal migrants: insight from Dhaka, Bangladesh. *Journal of Public Affairs*, 22(S1): e2770. <https://doi.org/10.1002/pa.2770>
- Srinivasan, C.S., Zanello, G. & Shankar, B.** 2013. Rural-urban disparities in child nutrition in Bangladesh and Nepal. *BMC Public Health*, 13(1): 581. <https://doi.org/10.1186/1471-2458-13-581>
- Stats SA (Statistics South Africa).** 2019. *Towards measuring the extent of food security in South Africa: an examination of hunger and food adequacy*. Pretoria. www.statssa.gov.za/publications/03-00-14/03-00-142017.pdf
- Sun, Q., Li, X. & Rahut, D.B.** 2021. Gender differences in nutritional intake among rural-urban migrants in China. *International Journal of Environmental Research and Public Health*, 18(18): 9821. <https://doi.org/10.3390/ijerph18189821>

- Swain, B.B. & Teufel, N.** 2017. The impact of urbanisation on crop–livestock farming system: a comparative case study of India and Bangladesh. *Journal of Social and Economic Development*, 19(1): 161–180. <https://doi.org/10.1007/s40847-017-0038-y>
- Tacoli, C., McGranahan, G. & Satterthwaite, D.** 2015. *Urbanisation, rural–urban migration and urban poverty*. IIED Working Paper. London, IIED (International Institute for Environment and Development). <https://www.iied.org/sites/default/files/pdfs/migrate/10725IIED.pdf>
- Tadesse, T.** 2012. *The contribution of town functions to the development of rural areas: empirical analyses for Ethiopia*. Wageningen, Netherlands (Kingdom of the), Wageningen School of Social Sciences. <https://edepot.wur.nl/202596>
- Tawodzera, G.** 2011. Vulnerability in crisis: urban household food insecurity in Epworth, Harare, Zimbabwe. *Food Security*, 3(4): 503–520. <https://doi.org/10.1007/s12571-011-0152-1>
- Tefft, J., Jonasova, M., Adjao, R. & Morgan, A.** 2018. *Food systems for an urbanizing world*. Rome, World Bank and FAO. www.fao.org/3/i8346en/i8346en.pdf
- Tegegne, A.D. & Penker, M.** 2016. Determinants of rural out-migration in Ethiopia: who stays and who goes? *Demographic Research*, 35(34): 1011–1044. <https://doi.org/10.4054/DemRes.2016.35.34>
- Tessier, S., Traissac, P., Maire, B., Bricas, N., Eymard-Duvernay, S., El Ati, J. & Delpuech, F.** 2008. Regular users of supermarkets in Greater Tunis have a slightly improved diet quality. *The Journal of Nutrition*, 138(4): 768–774. <https://doi.org/10.1093/jn/138.4.768>
- Theriault, V., Vroegindewey, R., Assima, A. & Keita, N.** 2018. Retailing of processed dairy and grain products in Mali: evidence from a city retail outlet inventory. *Urban Science*, 2(1): 24. <https://doi.org/10.3390/urbansci2010024>
- Tibesigwa, B. & Visser, M.** 2016. Assessing gender inequality in food security among small-holder farm households in urban and rural South Africa. *World Development*, 88: 33–49. <https://doi.org/10.1016/j.worlddev.2016.07.008>
- Townsend, R., Benfica, R.M., Prasann, A. & Lee, M.** 2017. *Future of food: shaping the food system to deliver jobs*. Washington, DC, World Bank. <http://hdl.handle.net/10986/26506>
- Tschirley, D., Haggblade, S. & Reardon, T., eds.** 2014. *Africa's emerging food system transformation – Eastern and Southern Africa*. East Lansing, USA, GCFSI (Global Center for Food Systems Innovation). <https://gcfsi.isp.msu.edu/files/7214/6229/3434/w1.pdf>
- Tschirley, D., Reardon, T., Dolislager, M. & Snyder, J.** 2015a. The rise of a middle class in East and Southern Africa: implications for food system transformation. *Journal of International Development*, 27(5): 628–646. <https://doi.org/10.1002/jid.3107>
- Tschirley, D.L., Snyder, J., Dolislager, M., Reardon, T., Haggblade, S., Goeb, J., Traub, L., Ejubi, F. & Meyer, F.** 2015b. Africa's unfolding diet transformation: implications for agrifood system employment. *Journal of Agribusiness in Developing and Emerging Economies*, 5(2): 102–136. <https://doi.org/10.1108/JADEE-01-2015-0003>
- Turok, I. & McGranahan, G.** 2013. Urbanization and economic growth: the arguments and evidence for Africa and Asia. *Environment and Urbanization*, 25(2): 465–482. <https://doi.org/10.1177/0956247813490908>
- UN DESA.** 2022a. World Population Prospects 2022. In: *United Nations*. [Cited 9 May 2023]. <https://population.un.org/wpp>
- UN DESA.** 2022b. Methodology of the United Nations Population Estimates and Projections. In: *World Population Prospects 2022*. [Cited 18 May 2023]. <https://population.un.org/wpp/Methodology>
- UNHCR.** 2019. *Global Trends – Forced displacement in 2018*. Geneva, Switzerland. www.unhcr.org/media/unhcr-global-trends-2018
- UNHCR.** 2020. *Global Trends – Forced displacement in 2019*. Geneva, Switzerland. www.unhcr.org/media/unhcr-global-trends-2019

- United Nations.** 2022. UN Statistical Commission 2022 - Progress on implementation of the global urban and rural definitions. In: *Share Your Green Design*. [Cited 9 May 2023]. www.shareyourgreendesign.com/events/un-statistical-commission-2022-progress-on-implementation-of-the-global-urban-and-rural-definitions
- Van, V.T.S., Sales, Z.G., Gordoncillo, N.P., Advincula-Lopez, L., Sescon, J.T. & Miro, E.D.** 2021. Multilevel determinants of childhood undernutrition among low-income urban and rural households in the Philippines. *Department of Economics, Ateneo de Manila University, Working Paper Series*. <https://ideas.repec.org/p/agy/dpaper/202101.html>
- Vilar-Compte, M., Burrola-Méndez, S., Lozano-Marrufo, A., Ferré-Eguiluz, I., Flores, D., Gaitán-Rossi, P., Teruel, G. & Pérez-Escamilla, R.** 2021. Urban poverty and nutrition challenges associated with accessibility to a healthy diet: a global systematic literature review. *International Journal for Equity in Health*, 20(1): 40. <https://doi.org/10.1186/s12939-020-01330-0>
- van Vliet, J.** 2019. Direct and indirect loss of natural area from urban expansion. *Nature Sustainability*, 2(8): 755–763. <https://doi.org/10.1038/s41893-019-0340-0>
- Vogliano, C., Raneri, J.E., Maelaua, J., Coad, J., Wham, C. & Burlingame, B.** 2021. Assessing diet quality of indigenous food systems in three geographically distinct Solomon Islands Sites (Melanesia, Pacific Islands). *Nutrients*, 13(1): 30. <https://doi.org/10.3390/nu13010030>
- Vorley, B. & Lançon, F.** 2016a. *Food consumption, urbanisation and rural transformation: the trade dimensions*. Working Paper. London, IIED. <https://agritrop.cirad.fr/583130/1/10767IIED.pdf>
- Vorley, B. & Lançon, F.** 2016b. *Trade winds: is free trade in food bad news for rural areas during rapid urbanisation?* IIED Briefing Papers. London, IIED. www.iied.org/17337iied
- Wagner, J., Hinton, L., McCordic, C., Owuor, S., Capron, G. & Arellano, S.G.** 2019. Do urban food deserts exist in the Global South? An analysis of Nairobi and Mexico City. *Sustainability*, 11(7): 1963. <https://doi.org/10.3390/su11071963>
- Wanyama, R., Gödecke, T., Chege, C.G.K. & Qaim, M.** 2019. How important are supermarkets for the diets of the urban poor in Africa? *Food Security*, 11(6): 1339–1353. <https://doi.org/10.1007/s12571-019-00974-3>
- Webb, P. & Block, S.** 2012. Support for agriculture during economic transformation: impacts on poverty and undernutrition. *Proceedings of the National Academy of Sciences*, 109(31): 12309–12314. <https://doi.org/10.1073/pnas.0913334108>
- van Wesenbeeck, C.** 2018. *Disentangling urban and rural food security in West Africa*. Vol. 15. West African Papers, No. 15. Paris, OECD Publishing. <https://doi.org/10.1787/e0c75266-en>
- Wilkinson, J. & Rocha, R.** 2009. *Agro-industry trends, patterns and development impacts*. Wallingford, UK, CABI Books. <https://doi.org/10.1079/9781845935764.0046>
- WTO (World Trade Organization).** 2023. *WTO list of net food-importing developing countries for the purposes of the Marrakesh ministerial decision on measures concerning the possible negative effects of the reform programme on least-developed and net food-importing developing countries (the decision)*. G/AG/5/Rev.12. Geneva, Switzerland. <https://docs.wto.org/dol2fe/Pages/SS/directdoc.aspx?filename=q:/G/AG/5R12.pdf&Open=True>
- Xu, F., Crush, J. & Zhong, T.** 2023. Pathways to food insecurity: migration, hukou and COVID-19 in Nanjing, China. *Population, Space and Place*, 29(1): e2640. <https://doi.org/10.1002/psp.2640>
- Yeboah, F.K. & Jayne, T.S.** 2018. Africa's evolving employment trends. *The Journal of Development Studies*, 54(5): 803–832. <https://doi.org/10.1080/00220388.2018.1430767>

Zhou, Y. & Staatz, J. 2016. Projected demand and supply for various foods in West Africa: Implications for investments and food policy. *Food Policy*, 61: 198–212. <https://doi.org/10.1016/j.foodpol.2016.04.002>

Ziem Bonye, S., Yenglier Yiridomoh, G. & Derbile, E.K. 2021. Urban expansion and agricultural land use change in Ghana: implications for peri-urban farmer household food security in Wa Municipality. *International Journal of Urban Sustainable Development*, 13(2): 383–399. <https://doi.org/10.1080/19463138.2021.1915790>

Ziraba, A.K., Fotso, J.C. & Ochako, R. 2009. Overweight and obesity in urban Africa: A problem of the rich or the poor? *BMC Public Health*, 9(1): 465. <https://doi.org/10.1186/1471-2458-9-465>

Zou, Y., Zhang, R., Zhou, B., Huang, L., Chen, J., Gu, F., Zhang, H., Fang, Y. & Ding, G. 2015. A comparison study on the prevalence of obesity and its associated factors among city, township and rural area adults in China. *BMJ Open*, 5(7): e008417. <https://doi.org/10.1136/bmjopen-2015-008417>

Annex 1. Keywords

Urbanization/urbanisation *and* food system
Urbanization/urbanisation *and* agrifood system
Urbanization/urbanisation *and* agricultural production
Urbanization/urbanisation *and* agricultural intensification
Urbanization/urbanisation *and* land use
Urbanization/urbanisation *and* food value chains
Urbanization/urbanisation *and* food supply
Urbanization/urbanisation *and* off-farm employment
Urbanization/urbanisation *and* food consumption
Urbanization/urbanisation *and* diversifying diets
Urbanization/urbanisation *and* food security
Urbanization/urbanisation *and* healthy diets
Urbanization/urbanisation *and* food prices
Urbanization/urbanisation *and* food cost
Urbanization/urbanisation *and* food affordability
Urbanization/urbanisation *and* food accessibility
Urbanization/urbanisation *and* food assistance
Urbanization/urbanisation *and* food import
Urbanization/urbanisation *and* nutritious food
Urbanization/urbanisation *and* food loss
Urbanization/urbanisation *and* food waste
Urbanization/urbanisation *and* consumer food preferences
Urbanization/urbanisation *and* food market access
Urbanization/urbanisation *and* food environments
Urbanization/urbanisation *and* diets
Urbanization/urbanisation *and* food demand
Urbanization/urbanisation *and* processed foods
Urbanization/urbanisation *and* eating out
Urbanization/urbanisation *and* fast food
Urbanization/urbanisation *and* food service sector
Urbanization/urbanisation *and* farmer income
Urbanization/urbanisation *and* farm size
Urbanization/urbanisation *and* food value chains
Urbanization/urbanisation *and* food processing
Urbanization/urbanisation *and* food distribution
Urbanization/urbanisation *and* food trade
Urbanization/urbanisation *and* food markets
Urbanization/urbanisation *and* food deserts
Urbanization/urbanisation *and* food swamps
Urbanization/urbanisation *and* food marketing
Urbanization/urbanisation *and* food systems *and* natural capital
Urbanization/urbanisation *and* food systems *and* industrialisation
Urbanization/urbanisation *and* food systems *and* technology
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