

Urban Food Systems and Nutrition

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Questions

- *What is the evidence for the risks of increasing urbanisation in low- and middle income countries for the urban poor's access to healthy and nutritious food?*
- *What opportunities are mentioned in the literature to improve the nutritional intake for the urban poor, and how will this impact food systems?*

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1. Summary

Food systems are changing and will continue to change in the near future, because of many transformative drivers, like population growth, globalisation, climate change, and pollution. The Learning Journey on Changing Food Systems examines several of these drivers, and one very important driver of change is urbanisation, particularly in developing countries. This K4D helpdesk report provides an overview of the trends of urbanisation, urban poor, urban nutrition and how these trends affect urban food markets and food systems in low- and middle-income countries. Data on health issues related to dietary changes is taken from published literature and research reports. Evidence for risks associated with increasing urbanisation on urban poverty and urban nutrition are further highlighted using country data and listed in the Appendices.

Latest figures (UN, 2016) show that the proportion of the **population living in urban areas** is now 40% in lower-middle-income countries, and 31% in low-income countries. By 2050, these countries are expected to become, on average, 57% and 48% urban, respectively. Most of all future population growth is set to take place in rapidly expanding mega-cities, in Asia, Africa and Latin America, but provincial cities will also expand dramatically. Closely linked to the urbanisation trend is the growth of the middle class, which is now the dominant class globally and predicted to grow even further (to 48% globally in 2025). The number of urban slum dwellers is now nearly a sixth of the world's population (approximately 1 billion people) and that number is estimated to double by 2030.

Urbanisation is changing the food system in such a way that an increasing part of the global population will depend on purchased food. A large part of the food will be highly processed to meet the urban demand for food diversity, including meat and dairy products. The urban food market will become more internationally-oriented with longer supply chains, and with an increasing power shift to the retail industry (e.g. supermarkets). Formal food markets will mainly focus on rising demand for food from the middle classes.

Food availability is seldom the key factor contributing to undernutrition ('hidden hunger'), which will continue to be a major challenge for the urban poor. As the urban population will continue to grow in low- and middle income countries (LMICs) the **urban poor will not necessarily benefit from food diversity and booming formal urban food markets**. Urban poor households in LMICs spend approximately 70% of their income on food, making them particularly vulnerable to food price crises and do not have the purchasing power to afford a healthy diet. They will rely on informal food markets. Central African Republic and Chad have high proportions of urban population living in slum areas, 93% and 88%, respectively (see Appendix A).

Urbanisation is an important factor in changing eating patterns and nutrition trends:

- Rural to urban migrants shift away from staples, towards sugary and more conveniently consumed purchased foods. Increased eating outside the home (e.g. street food), is found to be a risk factor for higher fat intake and lower-micronutrient levels.
- The increase of women in city employment has affected the types of food consumed for men, women and children.
- A positive aspect of urban food systems is the diversity of food available within most cities. However, diverse high dense diets, which are different from the traditional diet, together with changing physical activity levels, will later lead to greater occurrences of Non-Communicable Diseases (NCDs) such as obesity and diabetes.

- With increasing urbanisation and sedentary lifestyles in other regions, obesity is now accelerating as a primary health issue in India, China and other fast-shifting nations across Asia and Africa. In Kenya, Senegal and Ghana urban obesity is twice the level than that found in rural areas.
- Urban consumers are increasingly unaware of the processes by which their food is produced and processed. This points to the loss of 'protective factors' in the shift away from more traditional diets, pointing to loss of nutrients and dietary diversity.

Urbanisation also changes dramatically the structures of urban food markets:

- Supermarket expansion has coincided with rapid urbanisation. Supermarkets are playing an important role in urban food provision in Asia and Latin America, but also rapidly now in Africa, in both 'better-off' (Dar es Salaam, Tanzania) and poor households (Cape Town, South Africa). Due to their increasing market share, they have increased significant power in the supply chain and changing relations in the food value chain impacting on food production (e.g. securing large volumes, operating internationally, market out local small middlemen and processors, negotiating lower prices).
- 'Food deserts', areas in cities where people have no access to any food at all, are still a reality. Where food is available the quality of the food is often not good, or there are no healthy and nutritious options accessible in the market.
- The informal food sector continues to be very important, with vendors purchasing wholesale, or sometimes direct from farmers. It is a critical source of food (including processed and cooked food) and income in urban areas. The informal sector can be a problem because most of the time the quality and safety of food is not good. Food safety training for street food vendors has been shown to improve food safety and quality (e.g. Abidjan, Cote d'Ivoire).

Therefore, continued urbanisation in the current form incorporates many risks: increased risks related to poor health and undernutrition; "distancing" of food production via long-distance modern supply chains risks the growing issue of urban food waste; urban poor are especially hard hit by food price inflation and volatility, while price controls on primary products do not guarantee the stability of food prices. Inequalities in access to food not only risks instability, food riots, and an increase in violence in cities, but also reduces the economic opportunities of poor slum dwellers to increase their micro or small scale food businesses, risking unemployment. Increasing food demands of cities also create intense competition for land, as development encroaches on peri-urban agricultural land: substantial land use and land cover has occurred.

Fortunately, city councils are one of the first to recognise these risks, and have started to look for opportunities and solutions by using more **holistic approaches**. Civil servant support (e.g. Brazil, Kenya – see Appendices) is paramount to food security programme success, in spite of government changes. Devolution of power is an important contributor to **city governance improvements** in the urban food systems. Financial regulation should also be part of food system governance. Good connective infrastructure can help develop cities in terms of driving economic growth and creating more efficient links with local food producers who can tap into the growing urban food markets. Such City Region Food Systems (CRFS) need **policy interventions** to encourage short food supply chains, and enterprise can help generate networks of economically empowered actors and relationships, which lead to new business opportunities including for women (Brazil, Mexico- see Appendix B). As food supply chains are increasingly driven by retailers and large food and beverage companies that process and package for

distribution to consumers, urban policymakers must face this new reality and ensure the nutritional quality and diversity of the food is reaching urban consumers and focus on developing alternative food markets for the urban consumers.

Investment in urban infrastructure and services is fundamental to national growth prospects and social outcomes. Mega cities must deal with how to make overburdened infrastructure more efficient, while smaller cities have to plan the most effective way to implement new infrastructure to reach those most in need. There is potential strength of **strategically investing in medium-size cities** as they are more likely to generate equitable growth, including for their surrounding hinterlands, by improving or maintaining its links with rural areas as providers of food during periods of fast urbanisation growth.

Technology and innovation are increasing opportunities for improving urban food security, for example with information and computer technology (ICT) solutions to link urban demand with rural supply and formation of 'smart cities' to help with urban growth solutions. ICTs are also increasingly used to inform people about the importance of a healthy diet. Also, other technologies are important, like cold storage operations which are increasingly supporting links between farmers and traders, helping to stabilise food supply (e.g. Bangladesh, India – see Appendix C). Linking electrification efforts (e.g. solar energy) with improvements in food systems.

Rapid urbanisation means greater waste, and greater **environmental issues**: waste management is directly related to the economic, social and political status of the country. Separate collection of food waste makes treatment much more efficient: Lusaka in Zambia and Cajica in Colombia both have successful food waste programmes. However, few cities are treating food waste, and prevention policies are yet to become mainstream. Other (technological) solutions are to use sewage water from cities for vegetables and fodder crops in peri-urban areas. The Cambio Verde (or Green Exchange programme) in Brazil, allows citizens to trade recyclable materials for fresh peri-urban and rural metropolitan produce originating from family farms, or the option to buy such produce at 30% cheaper prices than in stores (see Appendix B).

Although DFID places a particular emphasis on **gender and disability**, the evidence found was not aimed to address gender or disability issues. Data on female traders was found in Colombia, Ecuador, Indonesia, and South Africa; however, the evidence included in this report was 'gender-blind.'

2. Changing food systems

In most discussions on urban food systems very little attention is given to the urbanisation factor, for example, how urban areas interact with food systems and how urban people access their daily food (Bloem & de Pee, 2017:80). The global food system is highly differentiated: there is great diversity on the level of cities and how these cities interact with regional and increasingly international food systems (in which income is a key differentiator, especially in LMICs).

It is possible to extract a series of important trends in food systems that are occurring globally hand-in-hand with the urban transition. Although in reality a wide continuum of context-dependent scenarios exist, for ease of understanding it can be useful to think in terms of two archetypes: "Food System 1.0" (the system that has been historically prevalent prior to widespread industrialisation, globalisation and urbanisation) and "Food System 2.0" (the system that is now starting to dominate across much of the globe) (see Figure 1) (FAO, 2015a).

Figure 1: Characteristics of Food System 1.0 and 2.0

Food System 1.0	Food System 2.0
Greater number of actors at all stages of the supply chain	Smaller number of actors at all stages in the supply chain (e.g. due to refrigeration)
Greater degree of local and regional production	Increased national and international food production
Greater prevalence of small-scale producers and informal actors	Formalised and consolidated retail sector (mainly national or international supermarket chains)
More subsistence food production in both urban and rural areas	Reduced reliance on urban and peri-urban production
Consumption of a smaller variety of relatively unprocessed foods - dominated by a few staples with a low percentage of meat and dairy products	Greater consumption of processed foods and meat and dairy products
Significant proportion of food wasted during the early and middle parts of the supply chain, with less wasted by consumers	Significant proportion of food is wasted at the consumption stage, being discarded even if it is still suitable for human consumption

Source: FAO, 2015a

During the transformation period between food systems 1.0 and 2.0, there is a mixed food system (HLPE, 2017). In urban areas, produce is frequently sold by traders at a limited number of wholesale or retail wet markets. Numerous grocers and specialists such as butchers purchase food wholesale to supply their small shops. The informal sector is also important, with vendors purchasing wholesale, or sometimes direct from farmers. The informal sector is a critical source of food (including processed and cooked food) and income in urban areas. For example, street vendors have been estimated to constitute 15% of all urban employment in South Africa, of which 67% sell food. Many cities operate predominantly in this manner, with the majority of food sourced locally and nationally, though they are also connected to regional neighbours and global commodity markets that are vital for ensuring constant supplies of staple food when national harvests are poor.

Supermarkets are the most common form of food retail in Food System 2.0, tending to be organised around national and international chains offering food to consumers at low prices due to efficiencies, economies of scale, and powerful bargaining position. Small food shops are still

present but account for a small percentage of sales, and tend to be more expensive. Highly processed and packaged foods have emerged as a major part of what customers expect and what the food system supplies (FAO, 2015a).

3. Trends

Until recently, urban food questions have been neglected in urban studies. The burgeoning of food-related activities in cities is now making food issues difficult to ignore. The following section explains the current trends in urbanisation and how it interacts other trends in nutrition and food markets in LMICs.

Urbanisation trends

Urbanisation is defined as the shift from a population that is dispersed across small rural settlements in which agriculture is the dominant economic activity, towards one where the population is concentrated in larger, dense urban settlements.¹ Over 3.5 billion people, 55% of the world's population, live in urban areas (UN, 2018; UN DESA, 2018). Latest figures (2016) show that the proportion of the population living in urban areas is 40% in lower-middle-income countries and 31% in low-income countries.² By 2050, these countries are expected to reach, on average, 57% and 48% urban, respectively (UN, 2014:10). The urban population of lower middle-income countries is projected to more than double in size, increasing by around one billion. Urban populations in low-income countries are projected almost to triple, increasing by over 500 million (UN Habitat, 2016:146).

Africa and Asia have yet the lowest rates of urbanisation, compared to Europe, Latin America and North America which are already highly urbanised, but the tendency is expected to continue and intensify in the future. By 2020, up to 85% of the poor in Latin America are expected to live in towns and cities, and 45% of the poor in Africa and Asia (FAO, 2015b).

Of the countries which DFID supports, India, Nigeria, Pakistan and Bangladesh have the greatest current and projected (2030) urban populations (of DFID-supported countries with available data). Just three countries - China, India, and Nigeria - are projected to add 860 million urban residents by 2050 (UN, 2018). At around 3% per year, Rwanda has the highest estimated rate of increase in percent urban population, while Malawi, Uganda, South Sudan, Ethiopia, Nepal and Eritrea are expected to have the highest rates of increase in 2030 (Tuffrey & Espeut, 2015:13).

Mega-cities vs provincial cities

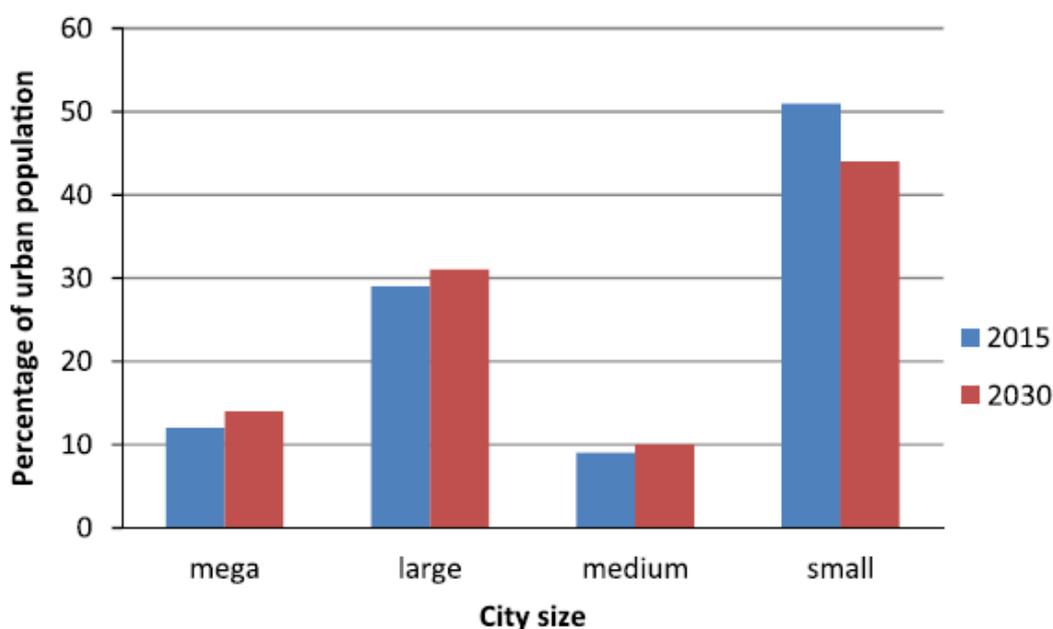
The area covered by cities could triple in size by 2030 (UN Habitat, 2016:7). Therefore, it is important to make the separation between the increase of mega-cities and the increase of provincial cities, where a lot of the urbanisation will take place. Figure 2 below shows the city size classifications:

¹ Montgomery, M.R., Stren, R., Cohen, B., & Reed, H.E. [eds]. *Cities Transformed: Demographic Change and Its Implications in the Developing World*. Panel on Urban Population Dynamics, Committee on Population. Washington, DC: National Academies Press, 2003.

² <https://data.worldbank.org/indicator/SP.URB.TOTL.IN.ZS>

Figure 2: City size classifications, and prediction of the world urban population living in each city size category

Type of city	Population size
Megacities	> 10 million
Large	1–10 million
Medium	500,000–1 million
Small	< 500,000



Source: UN, 2014; Bloem & de Pee, 2017:81

The fastest growing urban agglomerations are medium-sized cities and cities with less than 1 million inhabitants located in Asia and Africa (UN, 2014). Rapid urbanisation has been possible due to globalisation influences that allowed mega-cities in LMICs to flourish without building very productive national agricultural sectors. Structural adjustment policies and anti-urban migration policies meant governments had no means to provide adequate social protection and housing infrastructures (Bloom and de Pee, 2017). This has inevitably led to the massive growth of slums.

Urban poor

The number of urban slum dwellers is now nearly a sixth of the world's population - approximately 1 billion people - and that number could double by 2030. Most of all future population growth is set to take place in rapidly expanding mega-cities, in Asia, Africa and Latin America. The Central African Republic and Chad have high proportions of urban population living in slum areas (93% and 88%, respectively). The urban poverty gap is highest in CAR at 30%, followed by Mozambique, Zimbabwe, and Nigeria (Tuffrey & Espeut, 2015:16).

Income growth projections

In its 2030 projections, the Global Panel on Agriculture and Food Systems for Nutrition (2016:70) states that South Asia is expected to be the fastest growing region in terms of annual growth in real per capita GDP, followed by East Asia and South-East Asia.

Growth in per capita GDP in sub-Saharan Africa is positive, but relatively low compared to Asia. The lower growth in income in sub-Saharan Africa will result in a slow-down in the rise in consumption of foods that lower diet quality. However, it will also slow down increases in the consumption of foods that will improve diet quality.

Middle classes

Closely linked to the urbanisation trend is the growth of the middle class, which is now the dominant class globally. This group is predicted to reach over 4 billion (48%), out of a projected global population of 8.14 billion by 2025. This will have a huge impact on consumption and shopping habits around the world. The African Development Bank³ has identified the rapid rise of the middle class as an important trend in the region “crucial to the continent’s economic and political development”. Heterogeneity of the African middle class is emphasised using a broad definition of USD2–20 a day in purchasing power parity (PPP) terms, dividing the class into three sub-classes: (1) 60% in the ‘vulnerable middle’, at USD2–4/day, just out of poverty and with the potential to slip back; (2) the rest of the middle class is divided into the ‘lower middle’ class, with USD4–10 a day; and (3) an ‘upper middle’ class, with per capita consumption of USD10–20 a day.

On the other hand, some harbour hopes that the African middle class, especially in cities, will drive demand for higher-value agricultural products (Badiane, 2014) and demand for value-added food products from the processing sector (Reardon et al., 2013), thus creating opportunities for local entrepreneurs and feeding economic growth. Some research hopes that the African middle class, especially in cities, will drive demand for higher-value agricultural products and demand for value-added food products from the processing sector (Reardon et al., 2013), thus creating opportunities for local entrepreneurs and feeding economic growth (Tschirley et al., 2015:629). The middle class has a much bigger share of national food expenditure than its population implies: whereas it is 27% of overall population, it is 48% of food expenditure. As it is growing relative to the poor class, in the future, its consumption habits will determine the majority of the African food markets. This implies that its preferences will drive change in the African food economy (Tschirley et al., 2015:644).

Surprisingly, Tschirley and colleagues found that amount of processed foods consumed in urban areas was only slightly higher than that consumed in rural areas in East and Southern Africa - even for the poor, and certainly for the middle class (Tschirley et al., 2015:644). These results imply that productivity and employment consequences of the processing sector in Africa should become a mainstream policy issue and receive consequent research emphasis.

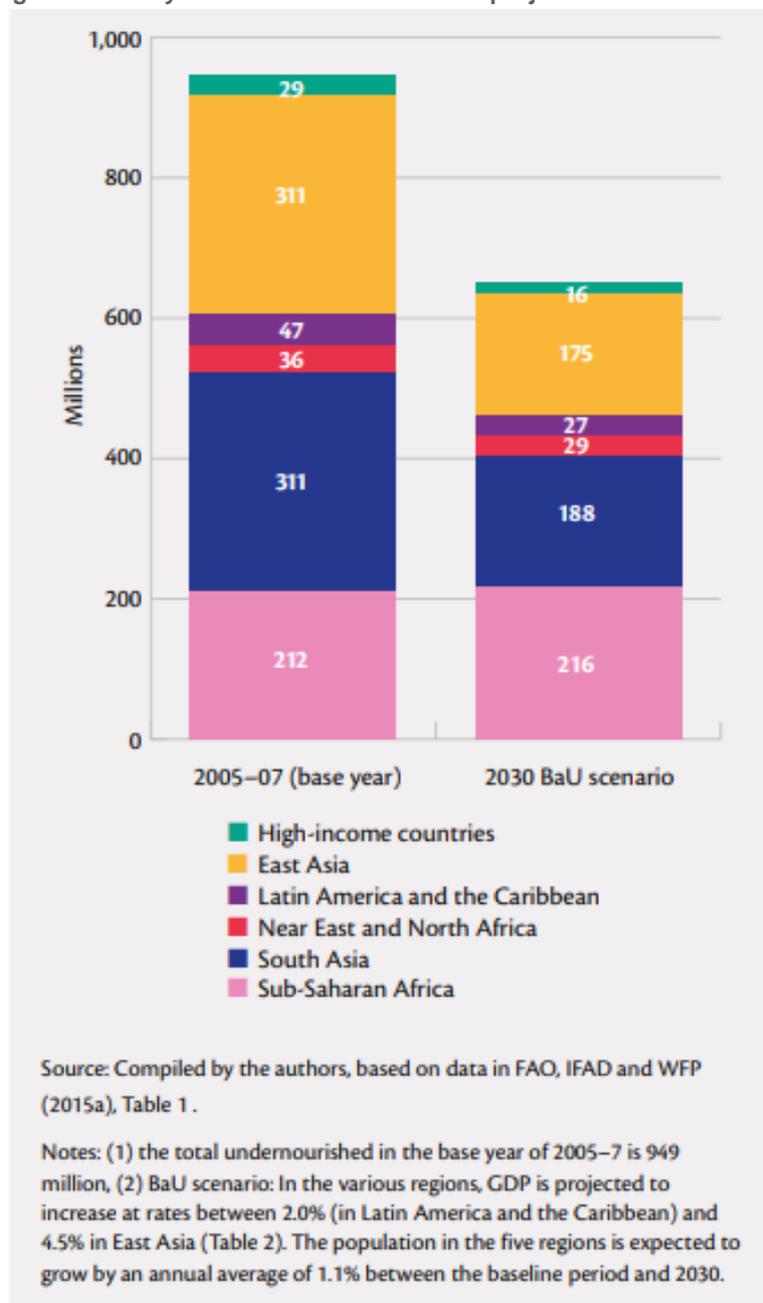
³ Ncube, M., Lufumpa, C.L., & Kayizzi-Mugerwa, S. (2011). *The Middle of the Pyramid: Dynamics of the Middle Class in Africa*. Market Brief, African Development Bank, April.

Nutrition trends

Urban nutrition trends

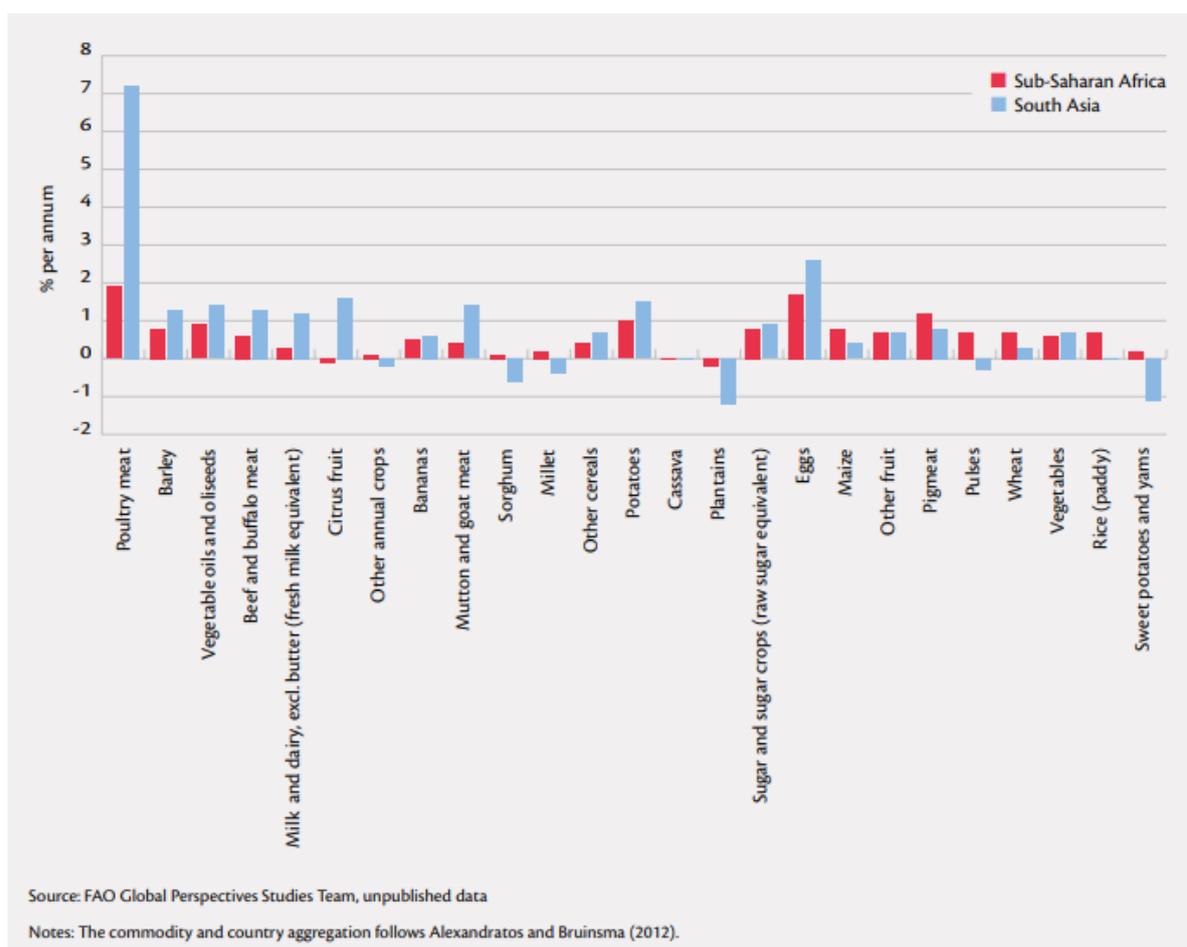
The 'nutrition transition' (i.e. is the shift in dietary consumption and energy expenditure that coincides with economic, demographic, and epidemiological changes) is well established, particularly in urban areas of LMICs, with clear differences in diets, nutrition, and health outcomes for urban residents compared to their rural counterparts. These changes are shaped by socioeconomic status, and by the food environments and broader urban environments within which people make their everyday decisions (Hawkes et al., 2017:41). Figure 3 shows that undernourishment will increase in sub-Saharan Africa countries if no intervention occurs.

Figure 3: Base year undernourishment and projections to 2030 in the Business-as-Usual (BaU) scenario



Urbanisation is increasingly put forward as a crucial determinant of changing dietary patterns. More specifically, while part of the urban population faces food insecurity, other subpopulations are hypothesised to suffer from dietary excess and obesity as a consequence of more sedentary lifestyles and the transition towards diets high in sugar, fats, and refined foods, but low in fibre (e.g. ‘double burden’ of over- and under-nutrition). *However, whether and how these patterns are linked to urbanisation remains poorly understood.* These changes are occurring at different rates in different regions and populations, but the most rapid change is taking place in the developing world. For example, sugar, salt, and particularly fat consumption from processed foods has plateaued in high-income countries, but is rapidly increasing in middle-income countries (IFPRI, 2017). The Global Panel on Agriculture and Food Systems for Nutrition (2017) concluded that, “over time, people are consuming more recommended components of high-quality diets. However, despite dietary improvements, the net result is still a prevalence of low-quality diets in most countries.” Poor-quality diets—lacking in essential nutrients and with excess of harmful components—are now estimated to be the number one risk factor in the global burden of disease. Figure 4 shows the predicted growth in per capita daily caloric intake for 2030 – animal sources products (ASF) are predicted to be a feature particularly in South Asian countries. *Continuation of current trends will not deliver the high-quality diets needed to accelerate hunger reduction or reduce the growth in obesity rates.*

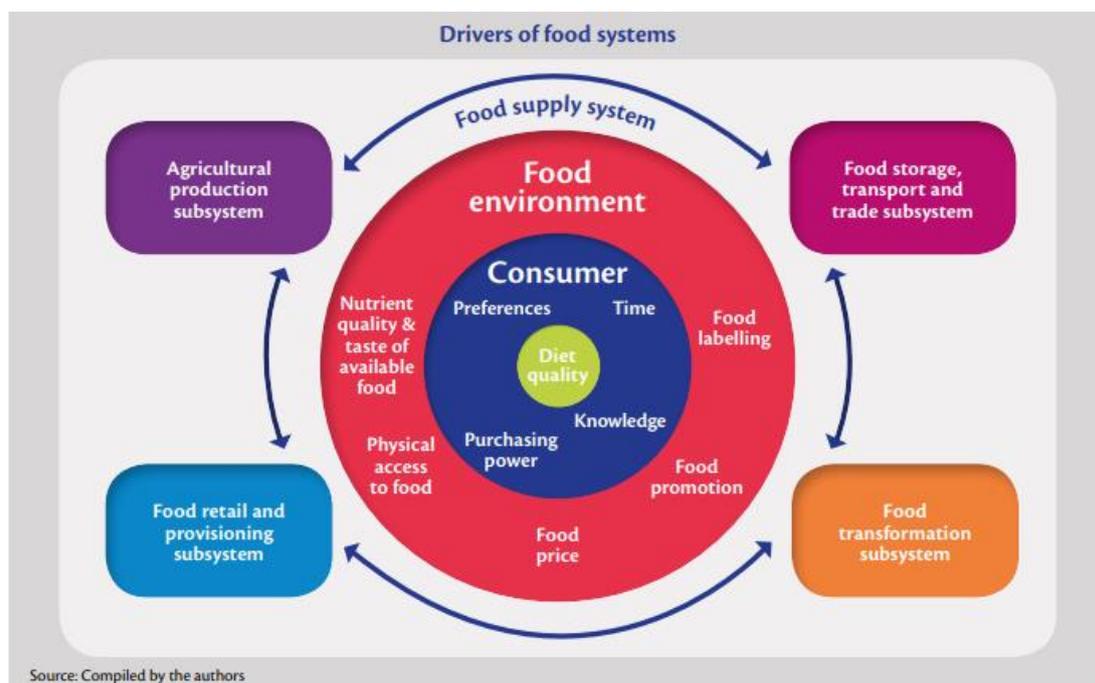
Figure 4: Growth in per capita daily caloric intake (2005/2007 – 2030): Sub-Saharan Africa and South Asia



Source: Global Panel on Agriculture and Food Systems for Nutrition, 2016:63

Figure 5 shows the complexity of the links between diet quality and food systems, going from the consumers individual preferences, time schedules, knowledge and purchase power, to the determinants of the environment where food are markets, and finally how this is linked with the broader food supply system.

Figure 5: Conceptual framework for the links between diet quality and food systems



²²Black et al. (2013) ²³Horton and Steckel (2013); IFPRI (2015a); United Nations (2016b) ²⁴Liu and Zhu (2014) ²⁵Herforth and Ahmed (2015); Hawkes et al. (2015)

Source: Global Panel on Agriculture and Food Systems for Nutrition, 2016:27

Urban health issues

A positive aspect of urban food systems is the diversity of food available within most cities (IPES-Food, 2017:7). However, diverse high dense diets, which are different from the traditional diet, together with changing physical activity levels, will later lead to higher occurrences of Non-Communicable Diseases, or NCDs. Looking to the future, undernutrition as well as micronutrient deficiencies, as well as Non-Communicable Diseases (NCDs), will continue to be a major challenge for urban poor populations in LMICs (FAO, 2015b; Hawkes et al., 2017).

If current trends continue, 127 million children under 5 years will be stunted (due to severe prolonged malnutrition) in 2025, according to World Health Organisation predictions. This will have long-term effects on individuals and societies if allowed to continue. In LMICs, children under five years living in urban areas are generally less likely to be stunted and underweight than children living in rural areas (da Silva et al., 2018:8-9). However, children with low socio-economic status still have higher risk of being stunted, compared to those with high socio-economic status. In several countries, including Ecuador and India, the rate of stunting in children living in slums is higher than in the rest of urban areas or rural areas. Analysis shows that overall stunting prevalence in LMICs decreased more rapidly among rural than for urban

children (0.78 and 0.55 pp, respectively). Poor-rich gaps are stable in middle-income countries and slightly increasing in low-income countries (da Silva et al. 2018).

At the same time, however, countries may also face the 'double burden of malnutrition', characterised by the coexistence of undernutrition along with overweight, obesity or diet-related NCDs. In Kenya, Senegal and Ghana urban obesity is twice the level found in rural areas. In both India and China the prevalence of obesity in cities is three to four times the rate in rural areas. In India, migration from rural to urban areas is also associated with an increase in obesity, particularly abdominal obesity, which drives other health risk factor changes such as insulin resistance, diabetes, high blood pressure, and dyslipidemia.⁴

Although much of Asia and Africa are, on average, well under half the US level of obesity of 35%, things are changing quickly - especially in the cities. To help counteract this in Latin America, a five-year World Bank loan (2015-20) to the Government of Argentina for 'Protecting Vulnerable People Against NCDs Project,' of USD350 million is the largest loan in the world designed to combat NCDs (mainly cardiovascular diseases, diabetes, cancers, chronic respiratory diseases, and associated risk factors) in the country.

Food market trends

Dietary changes and resulting health issues are linked to the functioning of various food markets:

Urban food markets

As the middle class grows, the share of perishable products (such as fruit, vegetables and meat) in the food economy, and their absolute level of consumption, will grow. Available evidence also points to increased consumption of fats. Therefore, this argues for 'mainstreaming' the attention to supply chains and productivity of food products 'beyond-grains' in Africa. It also argues for more public investment in development of cold chains, logistics and wholesale markets for fresh produce (Tschirley et al., 2011) as well as meat, fish and dairy. While there is some evidence of higher fruit and vegetable consumption in urban areas in sub-Saharan Africa, the differences with rural diets appear to be modest (Worku et al., 2017).

Large urban poor populations rely heavily on the informal economy for accessible, affordable food. Most eggs, meat, fish, and milk sold to the urban poor are from informal markets. With growing population of poor urban dwellers informal markets will remain important an important part of the food system. Food security policies in urban Africa face institutional, administrative, and political challenges, because of a lack of local mandate for food security under decentralisation policies. However, informal sector workers could improve food safety with training (IFPRI, 2017). Criminalisation of informal food vendors is not the solution. Street vending and informal trade are especially important sources of livelihoods and financial independence for women, who are the primary sellers of street foods and perishable goods, such as fruits and vegetables (IFPRI, 2017).

⁴ <https://www.futureagenda.org/insight/urban-obesity>

Rural-urban food trade

The need of middle classes for perishables is met in great majority by local supply (Tschirley et al., 2015:645). However, due to the rapid growth of cities, their needs usually exceed the capacity of the surrounding agricultural region.

Rapidly growing middle classes offer important potential markets for farmers and agricultural producers, so linking farmers with consumers in thriving urban areas to address regional trade will benefit all concerned. Linkage to growing urban and regional markets has provided incentives for farmers to invest in soil conservation and fertility, and productivity enhancing inputs including seeds, breeds, fertiliser, and irrigation (Vorley and Lançon, 2016:9). In Ethiopia, Mali, Senegal, Rwanda, and Kenya, the growth of domestic markets is becoming more interesting to farmers than exports of cash crops, like tea and coffee, and is driving investments in productivity (Reardon et al. 2015).

While urbanisation presents opportunities for rural producers, many - especially smallholders in less developed countries - lack the resilience, resources, knowledge and infrastructure to access new markets (IPES-Food, 2017:6). The food demands of cities also create intense competition for land, as development encroaches on peri-urban agricultural land (IPES-Food, 2017:6).

Financialisation

There is growing concern about financialisation in the food sector, in terms of price volatility, hunger and farm incomes. This refers to the increasingly important role played by financial actors, markets, and motives in decisions along agri-food supply chains. Financial actors have long been intertwined in the agriculture and food sector, but their activities have intensified and have become more complex in recent decades (Clapp et al., 2015).

Seeking financial returns, these investors are engaged across entire agricultural value chains, from production to retail. As their engagement in the sector expands, their presence has shaped and re-shaped the agri-food system from production to retail and all activities in between. With a focus on the rise of finance across entire agricultural value chains Vander Stichele (2015) shows that this trend has had a profound impact on the global food system in ways that inhibit its ability to provide adequate nutrition for all, making the case that financial regulation should be part of food system governance.

Governance and policy

The Global Food Policy Report (IFPRI, 2017:18) states that local governance will be increasingly important, as cities have a growing role to play as urban populations expand across the world – especially as poverty, food insecurity, and malnutrition become increasingly urban problems. Cities may be better poised to address these challenges nimbly than national governments.

Urban consumers have long been the drivers of agricultural policy formation, with the aim to provide cheap food to large cities (Engel & Jouanjean, 2013:19). The ‘Connecting Food Staples and Input Markets in West Africa’ report (World Bank, 2015) calls on governments in West Africa to move beyond nationally-focused food policies, and address regional trade within the ECOWAS to link farmers with consumers in the region’s thriving urban areas.

4. Opportunities and challenges

Urbanisation generates opportunities and challenges for food systems, as Table 1 shows:

Table 1: Challenges and opportunities faced by consumers arising from urbanisation

Factors affecting consumers	Opportunity for high-quality diets	Challenge to high-quality diets
Increased access to fresh foods	Fresh foods such as fruits and vegetables are good for high-quality diets	Consumption of ASF above certain levels are not consistent with high-quality diets
Greater access to commercially fortified foods	Promotes access to micronutrients for vulnerable groups who can afford fortified foods	Improper fortification or high cost of fortified foods are a risk for high-quality diets
Accessing a greater share of food from markets	A greater range of processed foods such as legumes, vegetables and fruits are available	A greater range of high-energy-dense, low-micronutrient foods are available. Consumers are more vulnerable to food price changes due to international and domestic shocks
Demand for foods that require less preparation time	Availability of good quality prepared food saves time for other activities that are important for nutrition, such as child care	Foods may be unaffordable or low in nutrient quality or unsafe
Demand for foods outside home	Availability of good quality prepared food saves time for other activities that are important for nutrition, such as child care	Foods may be unaffordable or low in nutrient quality or unsafe

Source: Global Panel on Agriculture and Food Systems for Nutrition, 2016: 74

Cities have a key role in addressing food system challenges for their own populations, for the rural producers that serve them, and for the global community. To address them, there is vital need for concerted policy action at all levels (IPES-Food, 2017:7-8).

Opportunities

Smart technologies

Smart technologies have much to offer city planners and food system actors, including options on how to produce food in cities (Maye, 2017), to the efficient management of supply chains that deliver food to cities. New vertical farms are also emerging that use natural sunlight (Kalantari et al., 2017) instead of LED lights – useful in central Asian countries. ‘Smart agriculture’ is often positioned at the global scale, supporting businesses and researchers to develop smarter food production systems through technological innovation to address food security. This includes city farming projects adopting vertical farming and other technological and design solutions.

Smart cities

The ‘smart city’ agenda is neoliberal and business led, using ICT and techno-science innovation as solutions for urban growth. The ‘urban food question’ is about how to feed cities in a just, sustainable and culturally appropriate manner when faced with looming climate change, widening inequality and worsening world hunger problems. This presents socio-cultural and politico-economic challenges that cannot be resolved by smart technology alone (Maye, 2017).

Medium-size cities

Understanding urban dynamics such as city size, urban infrastructures, and rural-urban linkages are critical for planning for adequate urban nutrition. There is potential strength of strategically investing in medium-size cities as they are more likely to generate equitable growth, including for their surrounding hinterlands. Therefore, by strengthening local foods systems and creating better enabling environments for improved urban nutrition through better sanitation infrastructures, increases access to nutritious foods by the urban poor.

Community innovation

There is a strong case for looking beyond traditional technology and growth models, with a commitment to supporting emergent agro-ecological approaches and multiple smaller-scale community innovations (for example in waste and water recycling to support food production) in peri-urban contexts (Marshall & Randhawa, 2017:30).

City Region Food Systems (CRFS) offer concrete policy and programme opportunities within which these developmental issues can be addressed and through which rural and urban areas and communities in a given city region can be directly linked (GIZ, FAO and RUAF, 2016:3). CRFS are vital to the implementation of the Agenda 2030 and the New Urban Agenda (NUA).⁵

In the context of CRFS, *policy interventions to encourage short food supply chains and enterprise can help generate networks of economically empowered actors and relationships which lead to new business opportunities*. Opportunities may include employment in the farming, marketing and processing of the food produced, as well as in small service industries developed around city region agriculture. This impact is perhaps more likely to emerge where the conditions for successful entrepreneurship are in place, including non-marginal market opportunities, governance and support systems that favour entrepreneurs, and the free flow of information through information and communications technology (FAO, 2015a).

Cross-sector involvement

Policy makers will need to ensure that food and nutrition security can be achieved by the growing urban populations, including the urban poor, for this urban growth to generate equitable economic growth (Bloem & de Pee, 2017).

Civil Society Organisations (CSOs) may need capacity building to fully understand potential to convene stakeholders and sectors in early stages of building linkages and identifying policy changes needed to strengthen city region food systems. Organisations may find it difficult initially to work across sectors. In some cases, would need funds to be available to drive engagement and implementation activities at city region level (FAO, 2015a). *Therefore, DFID could form partnerships to aid with this (Mordaunt, 2018)*.

⁵ A 'New Urban Agenda' was adopted by the UN Habitat III conference in October 2016 (Quito, Ecuador) to guide the urbanisation process over the next 20 years. This roadmap makes explicit commitments to improving food security and nutrition, strengthening food systems planning, working across urban-rural divides and coordinating food policies with energy, water, health, transport and waste (UN, 2016).

A study of food systems in India, Bangladesh and China suggested that, in the future, supply chains may be driven by buyers such as retailers and large food and beverage companies that process and package for distribution to consumers. Food and agriculture policymakers should consider this new reality much more thoughtfully to ensure the nutritional quality and diversity of food is reaching urban consumers (Global Panel of Agriculture and Food Systems for Nutrition, 2017:16-17).

There is no need for city regions to 'reinvent the wheel' when formulating food strategies. There are examples of successful knowledge sharing platforms that could be expanded elsewhere that provide the frameworks for city regions to evaluate their initiatives and share with others elsewhere (FAO, 2015a). The Milan Urban Food Policy Pact (MUFPP): International pact signed by 167 country mayors committed to working towards "sustainable food systems that are inclusive, resilient, safe and diverse" — and to encouraging others to do the same. On 6 June 2018 The Milan Pact and European project [FIT4FOOD2030](#) presented a Side Event – Sustainable Food Systems food Cities of the High Level FOOD2030 Event in Plovdiv (Bulgaria), an interactive opportunity to explore selected Research and Innovation (R&I) cases within MUFPP cities. Other examples include the [URBACT](#) sustainable food project, which brought together 10 European cities over a three-year period to exchange experiences developing sustainable food programmes. A barrier to the rollout of similar exchange networks is the absence of suitable funding. The [IUFN \(International Urban Food Network\)](#) project offers an alternative in the form of an online platform to facilitate connections between researchers, decision-makers, civil society and practitioners around sustainable city region food systems (FAO, 2015a).

Street food preparation

The street food sector offers ready-to-eat food and beverages that are prepared and/or sold by itinerant or stationary vendors, especially on streets and in other public places. Due to its low cost and convenience, street food is consumed by millions of low- and middle-income urban dwellers (Privitera & Nesci, 2015).

The street food phenomenon connects to the cultural, territorial, and ethnic, has always existed, and has a positive impact on local economies and ecosystems, because it is mostly traditional and thus made with locally sourced foods. Known examples are the kebab in Istanbul and pannelle (chickpea fritters) in Palermo (Privitera & Nesci, 2015:717), moi-moi (fried bean cake) in Nigeria, momo (stuffed dumpling) in Nepal, and cuy (guinea pig) in Peru (Moussavi et al., 2016).

It is an alternative to globalisation, an instrument of socialisation, a means to do business, and to communicate also with young people.

Street foods play a crucial role in food security for millions of low and middle-income individuals in developing countries. For example, residents of provincial towns in Nigeria and Thailand spend nearly half of their average household food budget on street foods. The street food industry can be of great benefit to women in many low-income developing countries by increasing their social and economic capital, facilitating professional and personal networks, and otherwise empowering them (Moussavi et al., 2016:88).

By innovating on the cooking space to improve cooking heat, time, or reduce the amount of oil needed, the opportunities for street vendors can widen to allow for more variety in products sold and less food waste. Foods could be prepared to-order, instead of in bulk and warmed

throughout the day. This change also has the potential to improve food safety and reduce foodborne disease transmission (Moussavi et al., 2016:98).

Refrigeration

Cold storage operations in particular are increasingly supporting links between farmers and traders, helping to stabilise food supply flows in some countries such as Bangladesh and India. Refrigeration in some homes is also allowing less frequent shopping for perishable foods such as meat and dairy. However, the development of cold storage solutions and the availability of reliable refrigeration for the majority of the population is largely lacking in sub-Saharan Africa and much of South Asia (Global Panel on Agriculture and Food Systems for Nutrition, 2017:16).

Urban waste

As urbanisation increases, more food is being produced and more food is being wasted. Particularly for cities, wasted food creates severe environmental and public health consequences. *However, it also presents opportunities to make a positive impact.* Better food waste management in urban areas represents an opportunity to cut into emissions while resolving other issues around energy, soil quality, waste management and human health. Separate collection of food waste makes treatment much more efficient. The technologies to achieve these goals are mature and deployable now (World Biogas Association, 2018). Recycling and reuse of solid waste is an economic activity through which new enterprises can be created and thus creating employment through collection and reselling recyclable materials, or working directly in the enterprises.

Compounding the food waste problem, supermarkets often implement stringent aesthetic standards for produce (Soma, 2017:437). Although it's illegal for restaurants and stores to use or sell food after the sell-before date, it's not illegal to give the expired food away. '**The Real Junk Food Project**' cafés, with a 'pay-as-you-feel' option, use such foods. Although most of them are in the UK, these projects already reached the United States, France, Germany, Australia, Nigeria, South Africa and South Korea. They operate on a grassroots level: talking to the supermarkets and businesses, go to wholesale markets, and intercept food where they can. Volunteers organise pop-up restaurants all over town, redistribute surplus food to homeless or refugee organisations, and let boxes of food fill up private flats when there's no storage space elsewhere. Every café in the network keeps precise records of the surplus food they collect, and the numbers are overwhelming: the Berlin project alone has already rescued over 6 tons of food that would have otherwise been thrown away.

Inclusive business models

Inclusive business models are increasingly used to find solutions for micro- and small scale producers, processors and entrepreneurs in the formal food systems to participate with formal business actors in food markets. Food is by far the biggest Base of the Pyramid (BoP) market sector, and corporate businesses have started to experiment to access this market mainly by looking for partnerships with local NGOs and social entrepreneurs. They make use of franchise systems and including small vendors operating in informal markets to sell their products. Although there are still many challenges related to inclusive businesses and other related initiatives on frugal innovations and pro-poor market strategies (see below, under 'Challenges'), there are opportunities to learn from this partnership development model (Quak, 2018).

Challenges

Food access and choices

The problem of food access in cities is spatial. Inhabitants of cities do not merely need enough food, but access to healthy, nutritious diets. Yet many urban neighbourhoods are poorly served by markets and stores selling foods contributing to a healthy diet - particularly less affluent neighbourhoods that hold limited commercial opportunities for retailers. Cheap, convenient, prepared items with low nutritional value - particularly those subjected to heavy marketing - tend to be ubiquitous, contributing to disproportionately high incidences of obesity and diet-related ill-health (Hawkes et al., 2017; IPES-Food, 2017:7). Urban food environments – with supermarkets, food vendors, and restaurants – facilitate access to unhealthy diets, although they can also improve access to nutritious foods for people who can afford them. For the urban poor, the most easily available and affordable diets are often unhealthy. Urban poor households in LMICs tend to spend a large part (up to 70%) of their income on food, making them particularly vulnerable to food price crises (Bloem & de Pee, 2017:82). Eating outside the home is found to be a risk factor for higher fat intake and low-micronutrient levels.

The urban poor are exposed to both acute and chronic problems of food access – often on an ongoing basis – thus impacting nutritional status negatively at all stages of the life cycle, from conception to adulthood, and also in old age. In addition to household income and spending capacity, access to retail, and particularly access to supermarkets, is critical for understanding urban food environments (Peyton et al., 2015).

Food deserts⁶

Food deserts are still a reality. The food desert literature highlights the complex, multifaceted nature of food systems (Moseley et al., 2017:38). In urban environments, a multidimensional approach toward understanding food security which combines household scale analysis with a broader understanding of structural determinants must be adopted.

Markets:

- *Formal - Supermarkets and modernisation*

The rapid rise in supermarkets in developing countries over the last several decades resulted in radical transformations of food retail systems. The literature on ‘supermarketisation’ and retail modernisation provides an alternative framing from that of the food desert literature concerning the role of supermarkets in urban food security. Supermarkets are critiqued for destabilising existing food systems rather than conceptualised as providers of diverse food selection (Peyton et al., 2015). Some academics do not see retail modernisation as a linear progression from an informal to a formal economy as accompanied by the consolidation and standardisation. Since controlling decentralised supply systems is much more complicated for fresh food, it becomes difficult for supermarkets to offer lower prices than local stores (Moseley et al., 2017). Rather than viewing the process as a simple linear progression, there could be many factors, such as

⁶ Characterised as urban neighbourhoods with high food insecurity with a mix of formal supermarkets and informal food markets—existing side by side, but nutritious food still remains limited.

the state of the existing market and trade policies, which influence the format and extent of this transformation.

Supermarkets are certainly changing the food procurement strategies of poor urban households. But they are also prompting new strategies from informal street vendors and street food sellers (Chen et al., 2016).

Data conducted by the African Food Security Network (AFSUN) reveals that supermarkets play an important role in urban food provisioning in Southern Africa, even amongst poor households. At the same time, the relationship between supermarket expansion and the informal urban food economy is extremely dynamic. Informal food traders, source many of their processed and fresh food products from supermarkets and other formal sector retailers and wholesalers. In turn, these traders sell that food to poor urban households, often in smaller quantities. Even though supermarkets are more visible and may offer cheaper food, poor households frequently rely on the informal food economy because of geographical access and other constraints including income, transportation costs and the inconsistent provision of electricity.

- *Informal markets*

The interaction between informal markets and supermarkets is highly complex and intricate. Depending on the city and place, supermarkets can purchase from informal wet markets and informal vendors can purchase foods from formal supermarkets. Supermarkets can be cheaper, as was for example found in Southern African cities, but urban poor consumers may still prefer informal markets because of location, convenience or offering goods in small quantities (Crush & Frayne, 2011; Frayne et al., 2017).

In many cases, street food has been united with junk food, but they are different products. They have become part of the daily snacks and packaged foods with uncertain nutritional value, with a consequent impact on obesity, particularly in the younger age groups (Privitera & Nesci, 2015:719).

There is also an increasing amount of literature that looks critically to the efforts of linking corporate businesses with informal sector actors, as promoted in BoP strategies or frugal innovation. The main challenge is that corporate businesses are not working to eradicate poverty and food insecurity at the BoP, but that their business strategies are mainly based on free-riding, copying, eliminating and disrupting informal food economies by neglecting important actors in the informal economies like middlemen, brokers etc., while putting most of the risks on the shoulders of the poor through their contracts and franchising approaches (Meagher, 2018; Quak, 2018).

Food safety

More food trade has both negative and positive implications for food safety: urbanisation offers greater convenience to consumers in terms of low-cost food prepared outside the home, but also creates risks around food safety (Global Panel of Agriculture and Food Systems for Nutrition, 2016:77). Food safety is an issue of growing concern in urban areas as risks can occur throughout the food supply subsystem.

In Abidjan, Cote d'Ivoire, street food safety training has improved food safety and quality. It has helped vendors manage businesses, and identified social problems (e.g. child labour). Actors were the city government, community health services and national Ministry of Health. In this

'training of trainers' technical staff are trained first, who then pass on the knowledge to vendors. Over 200 street food vendors, mostly women, from ten districts of Abidjan received training (IPES-Food, 2017:16).

Urban food policies

A growing number of city governments are confronting the food system challenges head on by developing urban food policies (IPES-Food, 2017:9). Although urban governments taking action to address food system challenges is not new, the scale and complexity of the challenges outlined above, that cut across the entire food system is new (IPES-Food, 2017:10).

Most urban food policies consist of targeted actions with specific goals, such as addressing a specific public health or environmental concern (e.g. obesity, food waste). Such actions can pave the way for - and be incorporated into - integrated food policies at a later stage and may also have benefits in other policy areas. Urban food policies are one contributing factor in broader scale food systems change. *Many problems associated with the food system are contingent on imperatives at the national and international levels, e.g. trade, economic, agriculture and public health policies, and cannot be fully addressed at the city level.*

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6. Appendices: Country case studies

Impact of urbanisation on nutrition and health

This section includes data on how diets change due to urbanisation, and the issues for poorest and most marginalised living in urban areas. Recent data on levels of poverty in a selection of urban areas is provided, where available.

APPENDIX A: Urbanisation in African countries

With sub-Saharan Africa currently in the midst of a wave of rapid urbanisation, a better understanding of how this may change diets is necessary to develop appropriate policies for agriculture, trade, and for improving health and food and nutrition security.

Upcoming DFID Strategic Directions include the cross-cadre “Africa Strategy,” therefore, the following section focusses on the effect of urbanisation in food systems from six African countries – Ethiopia, Kenya, Senegal, South Africa, Tanzania, and Zambia.

APPENDIX B: Urbanisation in Latin American countries (LAC)

Even though LAC accounts for only 8% of the world's population, its population trends are especially interesting. Data from five countries (Argentina, Brazil, Columbia, Ecuador and Mexico) is provided.

APPENDIX C: Urbanisation in Asian countries

Although they have made progress, South Asian countries have struggled to make the most of the opportunity urbanisation provides them to transform their economies to join the ranks of richer nations in both prosperity and livability, according to the World Bank.⁷ Urbanisation has been relatively slow in some countries, for various reasons. However, some of South Asia's urbanisation has been hidden, stemming from official national statistics understating the share of the region's population living in areas with urban characteristics. Evidence from four countries (India, Indonesia, Nepal, and Pakistan) is presented.

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APPENDIX A: Urbanisation in African countries

SSA urban poor 2020 estimate: 45%

Ethiopia

Urbanisation trends	<ul style="list-style-type: none"> • Currently 2nd most populous SSA country. • LOW RATE, but changing fast urban population 20.8% of total population (CIA, 2018); 4.63% annual rate of change (2015-2020 estimate). • Although poor, great economic growth of 10.8% per year (between 2003/04 and 2013/14). • 30% of population will live in cities in 2028. • Addis Ababa (population ~3 million) expanding rapidly in recent years.
Urban poor	<ul style="list-style-type: none"> • ESPECIALLY HARD HIT by food price inflation and volatility (Assefa et al., 2016:104). • HIGH unemployment of young and non-graduates. • UNPROTECTED by targeted food subsidies (e.g. means testing).
Urban nutrition	<ul style="list-style-type: none"> • HIGHER DIETARY DIVERSITY in urban areas for children (Demographic and Health Survey data). • MORE cereals (teff and wheat), animal-based products, fruits and vegetables, oils and fats, and processed foods than rural populations (Worku et al., 2017; IFPRI, 2018). • MORE awareness of food safety (e.g., potential contamination of local milk with aflatoxin (CGIAR, 2018)- but it is unclear how those emerging concerns are impacting dietary habits (e.g., potentially less milk consumption). • RELATIONSHIP CHANGE with food, including how they shop and what they buy, as well as their ideas about sanitation and freshness (CGIAR, 2018). • INCREASED out-of-home consumption: currently represents 16% of the budget of urban consumers (CGIAR, 2018).
Health issues related to dietary changes	<ul style="list-style-type: none"> • HIGH child undernutrition rates, linked to lack of diversity in diets. • RISE in overweight and obesity – due to diet changes, together with shift away from agriculture to low-activity occupations (resulting in calorie needs),
Urban trade and food supply	<ul style="list-style-type: none"> • HIGH DIETARY DIVERSITY relationship changes and weakens as access to markets improves, and purchased foods are becoming more important (CGIAR, 2018). • Transition from traditional food systems to mixed and modern food systems, particularly in peri-urban and urban settings (HLPE, 2017). • Vegetable and fruit production increasingly commercialised, particularly to meet demand on the international markets and from growing urban areas (IFPRI, 2018) - and are not directly accessible to urban poor. • Flour mills dominate urban cereal markets: 61, 64, and 64 % of teff, maize, and sorghum, respectively, sold by the mills (Assefa et al., 2016:95). Market functioning is expected to improve further with rapid urbanisation and the growth of secondary cities.
Urban food production policies	<ul style="list-style-type: none"> • GOVERNMENT LED: reliant on agricultural policy and market for production.
Changing business models and value chains	<ul style="list-style-type: none"> • INCREASE in creation of new cooperatives between 2007 and 2008, highlighting the increasing importance of modern private and cooperative retail in food retail. However, modern retail still a SMALL MARKET in Addis Ababa. • REGULAR SHOPS lead in distribution of processed foods: accounting for 41, 21, 50, and 67% of the urban distribution of edible oil, sugar, <i>shiro</i> (<i>chick pea</i>

	<p><i>flour</i>), and <i>berbere</i> (milled mixture of hot red pepper and other spices), respectively.</p> <ul style="list-style-type: none"> • CONSUMER COOPERATIVES are major outlets of controlled value chains by the government: accounting for 72% of sugar and 54% of edible oil retail distribution. • <i>BALTENA</i> (SPICE) SHOPS are relatively important for <i>shiro</i> and <i>berbere</i>: accounting for 22% and 23% of the market, respectively (Assefa et al., 2016:97).
Innovation and technology	<p>Urban consumers might benefit from more options in the food retail landscape:</p> <ul style="list-style-type: none"> • POTENTIAL opportunities for the agri-food sector to benefit from consumers' increased willingness to pay. • POTENTIAL to miss out from important technological spillovers from modern retail on local markets (Assefa et al., 2016:92).
Waste management	<ul style="list-style-type: none"> • Addis Ababa: poor solid waste management. However, there is no data on specific urban policies.
Further work: opportunities	<ul style="list-style-type: none"> • Government to move increasingly out of the distribution of food, as well as to reduce price controls in these markets (Assefa et al., 2016:104). • Practical methods and human capacity to investigate how food system innovations (supply and demand side) will influence the food basket consumed, that is, identifying the net nutritional impacts of specific innovations (IFPRI, 2018). • Gain a better understanding of how markets can cater consumers with adequate and nutritionally diverse diets - especially solving issues related to the distrust that usually exists toward food markets. • More emphasis on diversification in agricultural production. • Further understanding of producer, wholesale, and retail markets; agricultural processing; trade logistics; and the role of each of these factors in shaping food prices and consumption patterns is required in order to design appropriate policies and interventions to improve urban diets (Worku et al., 2017). • Move toward examining its indirect effects on resource use and the environment, such as embodied energy for food production, transport, packaging, cold storage, food waste, and the rest of the entire food supply chain, from farm to fork (CGIAR, 2018). • More research on waste management (CGIAR, 2018).

Kenya

Urbanisation trends	<ul style="list-style-type: none"> • Urban population: 27.0% of total population (CIA, 2018) • Rate of Urbanisation (2015-2020 estimate): 4.23% annual rate of change FAST BUT UNDER-URBANISED
Urban poor	<ul style="list-style-type: none"> • HIGH levels: 61% of population occupy slum housing. • Variable issues access to basic services such as water, sanitation, and electricity between urban areas of different population sizes (World Bank, 2016a:6): • Larger urban areas: BETTER ACCESS to finance (though less so after devolution) and LOWER LEVELS of urban poverty than smaller urban areas.
Urban nutrition	<ul style="list-style-type: none"> • HIGH food costs: ranging from 47.3% of income in Nairobi to 61.8% in Kakamega (World Bank, 2016a:70). • HIGH reliance on street food: 79% carbohydrate-based products sold by Kangemi and Dandora vendors (Moussavi et al, 2016:88). Receiving up to 1/3 of their daily energy from such foods.

Health issues related to dietary changes	<ul style="list-style-type: none"> • POOR access to services: Hospitals inaccessible for 25% of Nairobians (World Bank, 2016a:96).
Urban markets	<ul style="list-style-type: none"> • COUNTY GOVERNANCE: Transferred from local authorities, includes licensing and control of undertakings that sell food to the public (World Bank, 2016a:169).
Urban food production policies	<p>POSITIVE affect on food security: The 'Nairobi Urban Agriculture Promotion and Regulation Act (2015)' represents a major reversal in municipal attitudes to urban food production (IPES-Food, 2017:38):</p> <ul style="list-style-type: none"> • Nairobi City Council trains farmers, ensuring their access to organic waste disposal, developing marketing infrastructure and monitoring and regulating quality and hygiene standards • Boosted food security in the city, promote job creation and value chain development, protect food safety and environmental health and regulate access to land and other resources (Global Panel of Agriculture and Food Systems for Nutrition, 2017:18). • Civil servants re-assigned to Nairobi's new agriculture department, as well as some politicians, served as champions for the policy through the County Assembly.
Waste management	<p>LIMITED COUNTY GOVERNANCE:</p> <ul style="list-style-type: none"> • However, public funding of solid waste management services has not kept pace with urbanisation (World Bank, 2016a:62). • Local governments provide services primarily to central business districts, leaving residents and businesses outside this zone to contract with private operators.
Innovation and technology	<p>AGRIBUSINESS and FOOD PROCESSING sectors dominate among emerging firms (World Bank, 2016a:121).⁸</p>
Changing business models and value chains	<p>GOOD CONNECTIVE CITY INFRASTRUCTURE:</p> <ul style="list-style-type: none"> • Urban economic growth established around population centres and productive agricultural regions • Better business environment for urban firms to create more jobs, benefitting from a sufficiently large pool of better educated people who can migrate from rural areas to take these jobs. • Most urban dwellers (>86%) live near the Northern Corridor, which connects Mombasa Port through Nairobi to Malaba, with a branch line to Kisumu in the west (World Bank, 2016a:3). • Enterprises such as Sidai have been able to open up new, more efficient, product value chains (input and output) for its customers, and provide immediate access to quality items as it reduces selling food products through informal traders.
Further work: opportunities	<ul style="list-style-type: none"> • Research on health consequences of street food consumption in younger age groups. • Development and implementation of policies that direct growth towards specific polycentric centres beyond the central business district (subnational). • Analysis of business trends around current street foods in Kenya, and the relationship between vendors and consumers, to raise awareness about the ways stakeholders can improve vendors' livelihoods and consumers' nutrition, e.g. refrigeration/preservation methods and purchasing behaviours (Moussavi et al., 2016:89).

⁸ Emerging firms are, on average, half as large as existing firms and a quarter as productive, but their performance on capital investment and capacity utilisation is similar to that of their larger counterparts.

Senegal

Urbanisation trends	<ul style="list-style-type: none"> • Urban population: 47.2% of total population (CIA, 2018) AHEAD OF SSA urban poor 2020 estimate • Rate of Urbanisation (2015-2020 estimate): 3.73% annual rate of change. • INCREASING Urbanisation rate of 60% by 2030 (World Bank, 2016b).
Urban poor	<ul style="list-style-type: none"> • Dakar region: houses 50% of the urban population (World Bank, 2016b). • CHRONIC DEFICIT of urban infrastructure and POOR SERVICE DELIVERY in secondary cities (World Bank, 2016b). • HIGH poverty and food insecurity. • HIGH food costs: ‘The National Family Social Security Transfer Programme for Family Security Credit’ aims to tackle chronic poverty and make the poorest citizens more resilient to crises. However, this initiative only targets a quarter of a million people, and many Senegalese resort to internal or international migration for financial survival.⁹
Urban nutrition	<ul style="list-style-type: none"> • HIGH in crops and fish.
Health issues related to dietary changes	<ul style="list-style-type: none"> • NO nutritional food programmes. • Prevalent acute malnutrition and micronutrient deficiencies in Dakar children from primary state schools (Fiorentino et al., 2016).
Urban markets	<ul style="list-style-type: none"> • BETTER access to resources than those in rural areas.
Urban food production policies	<ul style="list-style-type: none"> • OPPORTUNITIES for policymakers to structurally transform the Senegalese economy (World Bank, 2016b): • The ‘Senegal Urbanisation Review’ recommends several priority policy changes on enhancing urban economy through targeted programmes
Waste management	<ul style="list-style-type: none"> • INADEQUATE and INEFFICIENT in Dakar (APHRC, 2017).
Innovation and technology	<p>IMPROVING FOOD ACCESS AND ECONOMIC OPPORTUNITIES:</p> <p>Dakar ‘micro-gardens’ programme:</p> <ul style="list-style-type: none"> • MULTIPLE SUPPORT: supported by city government; funded by FAO, the City of Milan and the Italian Ministry of Foreign Affairs. • Provided 4,000 families with income and healthy food and participants’ families eat more vegetables (IPES-Food, 2017:12).
Changing business models and value chains	<p>URBAN CENTRES MAIN DRIVER: mostly Dakar</p> <ul style="list-style-type: none"> • 65% of Senegal GDP produced in urban centres (55% in Dakar itself) • 80% of registered firms • >52% of created jobs • 62% of business openings (World Bank, 2016b).
Further work: opportunities	Current urban food trade and nutritional status

⁹ <http://www1.wfp.org/countries/senegal>

South Africa

Urbanisation trends	<ul style="list-style-type: none"> Urban population: 66.4% of total population (CIA, 2018). 1.97% annual rate of change (2015-2020 estimate). SET TO INCREASE: projected to reach 77.4% by 2050.¹⁰ Cape Town: 2nd second largest urban area in the country, population ~4 million, and a growth rate almost 2% higher than the national average.
Urban poor	<ul style="list-style-type: none"> RAPID INCREASE in poverty and a rising population of urban poor, due to urbanisation. INCREASED supermarket expansion ('supermarketisation') in Cape Town has coincided with rapid urbanisation and food insecurity.
Urban nutrition	<ul style="list-style-type: none"> Urbanisation, globalisation, the expansion of supermarket chains, the increased availability of processed food, the "fast food" revolution and junk food are all making it more difficult to speak of discrete dietary types (Crush et al., 2011:7).
Health issues related to dietary changes	<ul style="list-style-type: none"> RELATIVELY HIGH malnutrition rates: 12%, and higher than for urban adults (Crush et al., 2011).
Urban markets	<p>INFORMAL MARKET DRIVEN (Battersby, 2011):</p> <ul style="list-style-type: none"> Retail modernisation impacts food access for the poor. Introduction of formal food retail formats is viewed simultaneously as a driver of food accessibility and as a detriment to informal food economies established in lower income neighbourhoods (Peyton et al., 2015). Research from Cape Town show that while supermarkets have been successful in penetrating some low-income communities, they are often incompatible with the consumption strategies of the poorest households. The informal economy is significant.
Urban food production policies	<ul style="list-style-type: none"> URBAN AGRICULTURE POLICY in Cape Town facilitates economic opportunities for the poorest residents, to help feed families, and to promote social equality. MULTISECTOR INVOLVEMENT: The 'Urban Agriculture Unit' housed within the Directorate for Economic and Human Development, as well as inter-departmental working group and cooperation with NGOs. COMMITMENT made to urban agriculture in planning processes. Assistance is provided to between 50 and 60 food gardens each year, with provision of technical and business skills training (IPES-Food, 2017:15-16).
Waste management	<ul style="list-style-type: none"> According to CSIR, informal waste pickers account for approximately 0.6% of the urban population (215,000 earning a livelihood from waste) (Godfrey & Oelofse, 2017). However, waste is also largely invisible to most urban consumers and businesses.
Innovation and technology	<ul style="list-style-type: none"> OPTIONS: Low energy, safe cooking technologies, such as the WonderBag, should be promoted in order to enhance food utilisation. This was trialed in Malmesbury town in the Western Cape (SACities, 2015:6).
Changing business models and value chains	<p>HIGH DEPENDANCE ON 'INFORMAL FOODSERVICE' (cash economy of fast food, takeaways, and prepared meals) heavily used by local residents of Cape Town (Petersen et al., 2017):</p> <ul style="list-style-type: none"> Local residents on a regular basis spend up to R218 (USD17) per week on products (potentially 30% of income) from these outlets.

¹⁰ Global Health Observatory data repository – Urban health data (2018).
<http://apps.who.int/gho/data/node.main.nURBPOP?lang=en>

	<ul style="list-style-type: none"> • Enterprises make a substantial contribution towards satisfying local food demand whilst serving an important social protection and neighbourhood relationship function. • Predominated by women preparing takeaway foods and conducting street braai (BBQ). • HIGH DEPENDENCE on the immediate place of operations which includes local input suppliers and selling to a narrow pool of trade from immediate (walking scale) neighbourhoods. • SHORT supply chains, linked to FORMAL agriculture and wholesale sectors.
Further work: opportunities	<ul style="list-style-type: none"> • Dietary intakes in urban areas. • Use of innovation and technology to improve food security.

Tanzania

Urbanisation trends	<ul style="list-style-type: none"> • Urban population: 33.8% of total population (CIA, 2018). • Rate of Urbanisation: 5.22% annual rate of change (2015-2020 estimate) • Average annual urban population growth over the past two decades amounted to over 5%. As a result, nearly 1/3 of the population is now living in urban areas; country is projected to contribute more than 50 million people to the global urban increment by 2050. • The commercial capital, Dar es Salaam, currently home to > 4 million people, is expected to hit the ten million mark by 2030 and become one of the 20 largest cities in the world by mid-century (UN figures). • Goes beyond the expansion of Dar es Salaam: other cities and towns have constituted a stable two thirds of the expanding urban population in Tanzania for the past 50 years. • Substantial part of urbanisation is the result of the natural increase of the urban population and the reclassification of previously rural areas into urban areas, Tanzania is also characterised by large internal migration movements. • Overall, this swift process of urbanisation has coincided with a period of relatively rapid macro-economic growth, with an average annual GDP per capita growth rate close to 3% between 1995 and 2014 (Cockx et al., 2017:8).
Urban poor	<p>Insufficient jobs and rapid urbanisation have resulted in new forms of poverty, characterised by:</p> <ul style="list-style-type: none"> • HIGH RATES of under- and unemployment. • HIGH LEVELS of emotional, physical and sexual violence.
Urban nutrition	<p>Data from the Tanzania National Panel Survey for 2008/09 and 2012/13, which tracked out-migrating respondents, shows the dietary changes experienced by 238 rural-urban migrants to changes in food consumption of their original household members:</p> <ul style="list-style-type: none"> • The longitudinal data reveals that rural-urban migrants shift away from staples, towards sugary and more conveniently consumed foods, but do not have greater dietary diversity (Cockx et al., 2018). • These effects occur across the whole spectrum of urban locations, ranging from smaller secondary towns to large cities. • Income and price differences, and moving out of farming are important mediators through which migration affects dietary change. However, it is important to acknowledge that the absence of detailed compositional data on meals and snacks consumed away from home represents a caveat to the analysis of dietary diversity.¹¹

¹¹ A survey experiment in Tanzania (described in De Weerd et al., 2016) suggests that purchased full meals tend to be largely starch-based – “ugali” (maize porridge); rice; fried cassava and cooking bananas are most

	<ul style="list-style-type: none"> • ELEVATED levels of oils and fats and high-sugar foods. • MUCH HIGHER consumption of meals and snacks away from home. • MORE DIVERSE DIETS are revealed in summary statistics. However, <i>it is worth noting that except for the level of total food consumption, these differences between rural and urban diets are very much in line with the findings from earlier cross-sectional studies from Tanzania.</i>
Health issues related to dietary changes	<ul style="list-style-type: none"> • HIGH rates of HIV/AIDS infection. • Although a GREATER LEVEL OF ACCESS to health facilities and medicine is reported, a general concern of quality and availability in health services is raised (Levira & Todd, 2017:445). • HIGHER maternal mortality and child mortality (Levira & Todd, 2017:446).
Urban markets	<ul style="list-style-type: none"> • Important developments in large scale food production and processing, such as flour milling, edible oils, sugar and tea and coffee. • Supplies of milk products, poultry and eggs, and fruit and vegetables to urban areas from mainly rural producers are also increasing. • A number of urban supermarkets are now established, particularly in Dar es Salaam, but their contribution to food security is largely confined to the 'better-off' urban consumers. • In addition to the large companies and supermarkets, there are large numbers of small producers, transporters, traders, etc. who play a part in linking mainly rural food production to the growing urban markets, supplying open markets, itinerant traders and small shops. • Generally, POORLY DEVELOPED systems for getting produce from rural areas to the main markets. Transport is often difficult (particularly during the rainy season), distances can be considerable, vehicles are rarely specialised, and storage is generally inadequate (Wenban-Smith, 2016).
Urban food production policies	<p>GOVERNMENT-LED:</p> <ul style="list-style-type: none"> • The 'National Strategy for Growth and Poverty Reduction II (2010-2015)', 'National Development Plan, National Nutrition Strategy (2011-2016), and 'National Multi-sectoral Nutrition Action Plan (2016-2021); in a drive to improve nutrition across the country. • Policy is already shifting from the goal of supplying urban populations with food at favourable prices to a more rural focus. The aim is to improve the capacity of rural areas to meet the growing urban food demand (Wenban-Smith, 2016).
Waste management	<ul style="list-style-type: none"> • There are opportunities for Dar es Salaam to become a 'zero waste' city. A solid waste characterisation study found that despite the fact that 98% of solid waste generated per day in Dar es Salaam can be recycled or composted, only 10% is recycled, leaving 90% to be disposed in dumpsites.¹² •
Innovation and technology	<ul style="list-style-type: none"> • Initiatives such as 'Feed the Future' have invested in the people and the country, specifically focusing on products including rice and maize. • Recently, the agriculture sector has become transformed, especially among its smallholder farmers, after realising the benefits of sesame seeds.
Changing business models and value chains	<p>AGRICULTURAL FOCUS:</p> <ul style="list-style-type: none"> • Profits will begin to increase through improving agriculture strategies and creating business-minded farmers, not by farming primarily cash crops. • Rural-urban linkages benefit from a sustained programme to strengthen value chains, particularly regarding storage, processing, transport and marketing of agricultural products.

commonly mentioned – therefore, the possibility of underestimating their contribution to dietary diversity by considering them as part of only one food group cannot be excluded.

¹² <http://article.sciencepublishinggroup.com/pdf/10.11648.j.ijjepp.20140205.11.pdf>

	<ul style="list-style-type: none"> • Small-scale farmers will be able to better financially manage their farms and decrease production costs in order to increase surplus crops and earn a profit. • Financers also have the opportunity to invest in small farms.
Further work: opportunities	<ul style="list-style-type: none"> • Future policy needs to reinforce urban demands (Wenban-Smith, 2016). • The potential for market gardening in peri-urban areas could also usefully be explored.

Zambia

Urbanisation trends	<ul style="list-style-type: none"> • Urban population: 43.5% of total population (CIA, 2018). • Rate of Urbanisation: 4.23% annual rate of change (2015-2020 estimate) • The UN (2018) projects that the number of urban dwellers will increase to 58% by 2050, which translates into a five-fold increase. • Rapid pace of urbanisation in Lusaka is a reflection of a countrywide increase in urbanisation.
Urban poor	<ul style="list-style-type: none"> • Uninterrupted economic growth since 1999. • Demographic movement towards cities poses considerable socio-economic and environmental challenges. • Equally, however, urban growth represents an opportunity to drive countrywide economic development. • Copperbelt and Lusaka provinces are the most affected by urbanisation. • An unprecedented reduction (19%) in urban poverty between 2004 and 2006 has raised controversy as no clear explanations have been offered as to why poverty is shown to have fallen so dramatically within a two-year period.
Urban nutrition	<ul style="list-style-type: none"> • HIGH cereal consumption: provide almost 2/3 of the dietary energy supply; maize and starchy roots, as well as other staples (cassava in Luapula, Northern and North-Western provinces; millet and sorghum in the Northern province). However, consumption patterns are changing: rice and sweet potatoes are GAINING IMPORTANCE.¹³ • LOW micronutrient-dense foods e.g. animal products, fruits and vegetables. • INCREASED RATES of exclusive breastfeeding during early infancy. However, only 37% of children 6-23 months receive a minimum acceptable diet, which has a major impact on their growth and development.
Health issues related to dietary changes	<ul style="list-style-type: none"> • The HIV/AIDS pandemic is compounding the food insecurity situation by reducing the ability of households to earn income and to produce foods, and by increasing expenditures on health services.
Urban markets	<ul style="list-style-type: none"> • 80% of the food consumed in Lusaka is produced outside of the province, impacting costs of living for urban dwellers.¹⁴ • The informal sector is a problem, because most of the time quality and safety of food is not good. Infrastructures are also in a state of dilapidation. • The Food and Drug Act is often not enforced enough. Therefore, inspectors must monitor the enforcement of this law so that food is safe.
Urban food production policies	<ul style="list-style-type: none"> • Rapid growth may pose important and urgent policy questions, and also offers OPPORTUNITIES for usable policy research (Sladoje, 2016). • Effective policies must harness agglomeration advantages of concentrated economic activity.

¹³ http://www.fao.org/ag/agn/nutrition/Zmb_en.stm

¹⁴ 23 March 2018, Twangale Park, Lusaka – Final conference of the Food for the Cities Programme in Lusaka and Kitwe, Zambia

Waste management	<p>LOW level of collection and safe disposal.</p> <p>HIGH level of illegal players.</p> <ul style="list-style-type: none"> To ensure effective management of waste, the city council in Lusaka works in partnership with private waste management companies which service conventional and peri-urban areas in the city. Currently, the council has 16 waste management districts (WMD), and of these, 14 are manned by the private sector while the other two are under the council; these are Kamwala and the central business district. Foxdale Court, in Lusaka's Roma separates all paper, cardboard, plastic bags, plastic bottles, and food waste. The food waste is loaded into a series composting machines, mixed with sawdust, and turned on a daily basis. This food waste turns into compost within a four to six week period, and is used in the gardens around Foxdale Court.
Innovation and technology	<ul style="list-style-type: none"> Huge agricultural potential, still largely untapped. Community gardens to make land accessible to the poorest, is one innovative idea for putting food into urban planning.
Changing business models and value chains	<p>NEED FOR FARMER COOPERATIVES:</p> <ul style="list-style-type: none"> There is the need to control the middlemen in the markets. Farmers must be organised, and then the markets accordingly. Issues of processing, infrastructures have been missing for a long time in our activities. OPPORTUNITIES for partnership development of private sector with city council, i.e. to provide processing and storage facilities.¹⁸
Further work: opportunities	<ul style="list-style-type: none"> All markets will have to be renovated, as well as more built, especially in all the sub-districts of Lusaka. Other municipalities (districts and cities) need to be involved in this ambitious programme.

APPENDIX B: Urbanisation in Latin American countries

LAC urban poor 2020 estimate: 85%

Argentina

Urbanisation trends	<ul style="list-style-type: none"> VERY HIGH urban population 91.9% (CIA, 2018). Rate of Urbanisation: 1.07% annual rate of change (2015-2020 estimate). Córdoba is the second-most-populous city in Argentina by population (1,454,645). POTENTIAL rise in middle classes due to urbanisation.
Urban poor	<ul style="list-style-type: none"> Despite the president's 'zero poverty' pledge, a third of the country lives below the poverty line. A traumatic rural-urban migration has been registered for decades in the country (Regúnaga & Rodriguez, 2015:51).
Urban nutrition	<ul style="list-style-type: none"> While intake of fruits and vegetables is insufficient, WHO report that Argentina has committed to regulating sodium levels in processed foods.¹⁵ The food industry has volunteered to decrease sodium in its products by 5-15% over two years. As a result, salt intake (although still high) has decreased in all areas. Argentina is also one of the first countries to eliminate trans-fats from the domestic food industry. The Córdoba Obesity and Diet Study (CODIES) identified four dietary patterns: "Starchy-Sugar", "Prudent", "Western", and "Sugary drinks" (Pou et al., 2016:618).

¹⁵ <http://www.who.int/ncds/un-task-force/world-bank-argentina-october-2017/en/>

Health issues related to dietary changes	<ul style="list-style-type: none"> RELATIVELY HIGH obesity prevalence in Córdoba (Pou et al., 2016:619). The five-year World Bank loan (2015-20) for 'Protecting Vulnerable People Against Non-communicable Diseases Project,' of USD350 million is the largest loan in the world designed to combat NCDs (mainly cardiovascular diseases, diabetes, cancers, chronic respiratory diseases and associated risk factors).
Urban markets	<ul style="list-style-type: none"> Empirical evidence has shown that price controls on primary products do not guarantee the stability of food prices, given that in many of them (e.g. wheat), the share of the primary product in the total cost of the food item (bread, cookies) is less than 10%; that is, of little significance if the other costs increase (salaries, energy, other supplies, transport, and distribution margins). In other cases (e.g. beef), the medium-term disincentives to production resulted in notable drops in supply, which created substantial increases in domestic prices (Regúnaga & Rodríguez, 2015:ix).
Urban food production policies	<p>AGRICULTURE FOCUS:</p> <ul style="list-style-type: none"> An urban agriculture programme in Rosario aims to supplement food hand-outs, to give poor people an income, and to support land regeneration, social inclusion, and economic growth, following the economic crisis of the early 2000s that led to food insecurity and civil unrest. A partnership between the City's Social Promotion Division, Centre for Agroecological Production Studies and Pro Huerta, it provides tools, seeds and agroecology training and promotes cultivation of urban space. By 2013 there were 400 gardeners, 22 hectares of city land were under cultivation, and three businesses for processing surplus produce had been established (IPES-Food, 2017:12-13).
Innovation and technology	<ul style="list-style-type: none"> Reducing waste volumes benefits consumers, who save money on food shops, as well as the municipality, which saves money via reduced waste processing. The 'Zero Garbage Law' (2005) aims to gradually reduce solid waste going to landfill. <i>Cartonero</i> groups calculate that at least 15,000 people in Buenos Aires depend on litter picking for their livelihood. Only about one third of those collect a subsidy, of whom only around half receive the full 5,200 pesos (USD284). The other half receive 2,700 pesos (USD199) per month. To make up the shortfall, they sell their pickings privately rather than have it collected by a cooperative.
Changing business models and value chains	<ul style="list-style-type: none"> In Rosario, recent focus has included developing short marketing chains, establishing agro-industries, using horticulture to rehabilitate brownfield sites, and the creation of flagship 'garden parks' used for agriculture, recreation and sport (FAO, 2015a&b). The provincial government also supports the municipality by funding infrastructure to support family and community gardening in urban and peri-urban areas. The annual budget for urban agriculture is decided by participatory processes. The initiative has benefited around 10,000 low-income families, for many of whom agricultural sales are their main income and who earn above the poverty line.
Further work: opportunities	<ul style="list-style-type: none"> More information on dietary intake of adult population. Ideas for innovation and technology needed in food production/waste management, e.g. development of a mechanism to collect surplus food to feed those below the poverty line will create a fairer city with lower inequality levels. Need business opportunities in agro-industrial production, as well as investing in social infrastructure and support for rural communities, to limit the traumatic rural-urban migration which has been registered for decades in the country (Regúnaga & Rodríguez, 2015:51).

Brazil

Urbanisation trends	<ul style="list-style-type: none"> • HIGH urban population: 86.6% of total population (CIA, 2018). Fourth most populated country in the planet. • Rate of Urbanisation: 1.05% annual rate of change (2015-2020 estimate). • High urban growth is a result of two factors: the natural growth of urban population and rural-urban migration (Willaarts et al., 2013:5). • Formation of a significant urban middle class (Willaarts et al., 2013:4). • Brazil is (along with Mexico) one of the two countries that most increased their participation of women in the labour market over the last two decades. The two countries together account for two thirds of LAC's GDP (Willaarts et al., 2013:6).
Urban poor	<ul style="list-style-type: none"> • > 50 million Brazilians (nearly 25% of the population), live below the poverty line, and have family incomes of R\$387.07 per month (USD5.50 a day) (2017 Brazilian Institute of Geography and Statistics, IBGE).
Urban nutrition	<ul style="list-style-type: none"> • 30% MORE HIGH-CALORIE products consumed, including processed foods and sugary products, than rural citizens. • HIGHER mineral water consumption - possibly linked to two causes: the low reliability of urban waters sources and/or the increasing fashion of buying bottled water (Willaarts et al., 2013:9). • However, these changes are country-specific and the Brazilian case does not exactly replicate general trends. • Many workers now eat meals that are prepared outside the home, particularly in urban centres – meaning HIGHER food expenditure is higher, which is difficult for those living on low incomes. This poses a new challenge for the right to food: how to ensure the urban poor can eat healthy and affordable meals (Constantine, 2017:14).
Health issues related to dietary changes	<ul style="list-style-type: none"> • MORE sedentary lifestyles, but also GREATER ACCESS to a wide range of food markets and products, which often impacts food habits.
Urban markets	<ul style="list-style-type: none"> • For São Paulo, a highly urbanised megalopolis with 12 million inhabitants, the food that urban population accessed was mostly offered by the EXPANDING SUPERMARKET CHAINS in the city. • The cheapest alternative was farmers' markets or wholesale food markets, but that could mean a one-hour trip, something that can become unmanageable on a day-to-day basis (Preiss et al., 2017:7).
Urban food production policies	<p>GOVERNMENT LED:</p> <ul style="list-style-type: none"> • Belo Horizonte approach to food security and “alternative food system” (that runs in parallel to the conventional, market-led system) was one of the first integrated food security policies in the world, and the dedicated food agency within city government has survived for 23 years (IPES-Food, 2017:91). • Urban nutrition has been integrated as a priority with a municipal food security initiative (Tuffrey & Espeut, 2015:26). • Programmes are delivered in partnership with civil society and private companies, as well as other municipal departments. The city's Lagoinha food market serves as a training centre offering 40 different courses in food processing and preparation, including baking, confectionery making, and international cuisine. The programmes are co-governed by civil society organisations and the private sector. • Between them the programmes reach around 300,000 Belo Horizontinos - 12% of the population - every day (IPES-Food, 2017:22). Within six years, initiatives such as the Bolsa Família cash transfer scheme for low-income families, free meals in every public school, and support to small-scale family farming had reduced the number of people facing food insecurity from 50 million to 30 million.

Waste management	<ul style="list-style-type: none"> The City of Curitiba is implementing an innovative programme to collect solid waste directly from its citizens, enhance food and nutrition security. <p>ECONOMIC DEVELOPMENT of the city region occurs as jobs are created.</p> <ul style="list-style-type: none"> In the Cambio Verde or Green Exchange programme, citizens can trade recyclable materials for fresh produce originating from family farms from the peri-urban and rural metropolitan areas or can buy such produce at 30% cheaper prices than in stores. Local family agriculture is supported, and small farmers benefit from more stable demand for their agricultural products. Families spend less on food purchases while improving their diets and eating habits. The Cambio Verde programme and its partners ensure that solid and oil waste does not end up polluting Curitiba city.
Innovation and technology	<ul style="list-style-type: none"> Belo Horizonte: the national 'zero hunger' programme launched in 200 is the most famous City Region Food Systems (CRFS) innovation developed (Dubbeling et al., 2016:11).
Changing business models and value chains	<ul style="list-style-type: none"> The Cambio Verde programme represents for producers a constant and guaranteed volume of sale that enhances producers' income and livelihoods. The city's Environmental and Food Supply Municipal Secretariats see this programme as an efficient way of connecting different stakeholders involved in urban management and planning issues (waste disposal) with economic and social opportunities created by the food system, notably the local agricultural system (GIZ, FAO and RUAFA, 2016:19).
Further work: opportunities	<ul style="list-style-type: none"> More current data on the nutrition status of urban citizens. Further research focusing on explaining the probable causal link between demographic change and nutritional transition. Investigating as to whether growing and changing demands for agricultural products from growing urban populations can be sustained (Willaarts et al., 2013:14).

Columbia

Urbanisation trends	<ul style="list-style-type: none"> HIGH urban population: 80.8% of total population (CIA, 2018). Rate of Urbanisation: 1.22% annual rate of change (2015-2020 estimate). Contrary to all expectations, rural-urban migration has experienced a new impetus. This is due to the decline of the agricultural sector, rural poverty, concentration of ownership, violence promoted by outlaws (i.e. related to drug cartels, drug traffickers, urban and rural guerrillas, and criminal gangs), and the subsequent forced displacement mainly from rural areas and small villages into large cities (Vargas-Uricoechea & Casas-Figueroa, 2015:743).
Urban poor	<ul style="list-style-type: none"> HIGH food insecurity (IPES-Food, 2017:12). According to the 2012 Sole Registry of the Displaced Population of Social Action in Colombia, 829,625 households have been declared as internally displaced (3,625,672 people). MORE measures taken to reduce the issues that contribute to poverty, by focusing on reducing crime and conflict in the two largest cities, Bogota and Medellin (from >30% in 2003 to <20% in 2017). By targeting these areas, surrounding cities have also improved. However, results would be vastly greater if violent conflicts could also be reduced.
Urban nutrition	<ul style="list-style-type: none"> HIGH unhealthy eating habits (Vargas-Uricoechea & Casas-Figueroa, 2015:743). Changes in production and availability of food items account for most of the calories available to the population.

Health issues related to dietary changes	<ul style="list-style-type: none"> • LOW physical activity: greatly curtailed as a result of people's fear of violence and kidnapping (Vargas-Uricoechea & Casas-Figueroa, 2015:743). • RISE in undernutrition (IPES-Food, 2017:12). • RISE in obesity incidence, prevalence of prediabetes and diabetes. The prevalence of diabetes in urban areas ranges from 1%-46%, compared to 1.4%-7.9% in rural areas (Vargas-Uricoechea & Casas-Figueroa, 2015).
Urban markets	<ul style="list-style-type: none"> • The 19 MUNICIPALITIES around Bogotá city specialise in milk, vegetables, fruits and potato production. • In total, 1/3 of Bogotá's food supply comes from this metropolitan area, of which 75% is classed as rural land. Very little of this production could properly be called urban agriculture, though there are more than 300ha of open air and greenhouse vegetable gardens close to the city (FAO, 2015a). • MODERNISATION of the poultry and pork industries is a successful example of decreases in trade barriers, resulting in improved availability of animal feed, and increased total production and availability for human consumption.¹⁶
Urban food production policies	<p>GOVERNMENT LED/MULTISECTOR MANAGEMENT:</p> <p>The 'Public Policy on Food Security, Food Sovereignty and Nutrition' in Medellín aims to provide an adequate, balanced, healthy diet for all. It also supports sustainable agriculture, fair trade, gender equality and population growth due to migration.</p> <ul style="list-style-type: none"> • MULTISECTOR SUPPORT: Managed by the Food Security Unit in the Medellín government, it involves food provision and educational programmes. Its Committee is chaired by the Mayor and involves actors from city departments, NGOs, academia (it is monitored by the University of Antioquia), business and the health sector (FAO, 2016; IPES-Food, 2017:12). <p>The 'Food Gardens for Informal Settlements' in Medellín aims to improve infrastructure, social cohesion and food security, and to provide training and economic opportunities in the context of social problems and sprawling informal settlements following the civil war.</p> <ul style="list-style-type: none"> • MULTISECTOR SUPPORT: Managed by the Urban Development Agency and funded by city utility company EPM and NGO Fundación Terra Salva, it involves training on cooperative agro-ecological growing, a school garden, and bartering of surpluses with the food bank. 700 families have benefited, and the number of growing spaces has been expanded from 7 to 21 (IPES-Food, 2017:12). <p>The SACIAR Foundation¹⁷ is the first organisation in Colombia to be classified as a food bank. It manages to help feed approximately 1,400 people including children, the elderly, and pregnant and lactating women, especially in Medellín city.</p> <ul style="list-style-type: none"> • It is involved in two main interventions targeting the urban poor and food-insecure residents: (i) The REAGRO programme, which is focused on the recovery and redistribution of safe and nutritious food for human consumption, and (ii) The NUTRIAMOR® programme, which is focused on value addition for safe and nutritious food resources identified in the banana export supply chain. • For both programmes, SACIAR collects food from the food industry, farmers, supermarkets, and wholesale markets with the support of volunteers and a number of permanent employees. • This action benefits urban (and rural) vulnerable dwellers in the Medellín Metropolitan Area, and enhances their food security and nutrition.

¹⁶ Fajardo, L.F. Impact of globalization on food consumption, health and nutrition in urban areas of Colombia.

Waste management	<p>These programmes mitigate the negative environmental impact that would occur if these foods were discarded or wasted (GIZ, FAO and RUAF, 2016:18-19).</p> <p>SUCCESSFUL SEPARATE COLLECTIONS & RECYCLING:</p> <ul style="list-style-type: none"> • In Cajica city, separate food waste collections have been successfully implemented in 24 cities over a long time period, as infrastructure and investment required is minimal. • Education and involvement of residents has been identified as a key element. • It has reduced illegal dumping, raised public awareness about recycling and encouraged home growing of food (World Biogas Association, 2018:20). • The Community of Latin American and Caribbean States (CELAC) Plan for Food Security, Nutrition and Hunger Eradication includes creation of the 'Regional Alliance for Reducing Food Waste and Losses'. • Resources are processed into powder and used as supplements for young children, pregnant and breastfeeding women, and the elderly, in conditions of nutrition vulnerability.
Innovation and technology	<p>MULTISECTOR INVOLVEMENT: The private sector, civil society, and national government actors initiate many innovative food system approaches:</p> <ul style="list-style-type: none"> • In Medellin the CRFS intervention supports several new inter-institutional initiatives, including new food and nutrition security monitoring and evaluation frameworks; the creation of regional participatory governance and food planning mechanisms, tools, and partnerships emanating from the Metropolitan Area of the Aburrá Valley; linking low-income consumers more directly to small food producers through urban markets; and redesigning urban spaces to include food activities that enhance food and nutrition security through, for example, community gardens and popular canteens (Blay-Palmer et al., 2018:12). <p>However, LOCAL AND PROVINCIAL AUTHORITIES and governance systems are key to creating an enabling environment to help institutionalise these approaches.</p>
Changing business models and value chains	<ul style="list-style-type: none"> • Colombia is a growing market for value-added, processed and packaged food products. This growth is partly due to the expansion of mass grocery retailers, with their chilled and frozen storage facilities. Also, producers are set to benefit from further retail expansion beyond the largest four cities (Bogotá, Medellin, Cali and Barranquilla). • Middle-to-high-income consumers are showing a greater preference for convenience products. The prepared food market is increasingly being driven by health and wellness trends, with health consciousness on the rise, generating an increased demand for value-added and premium products that are not generally regarded as essential. At the same time, the expansion of private labels offers significant growth opportunities for the low-income consumer segment. • Robust growth in food consumption (retail sales of food and drink, excluding alcoholic drinks) is nonetheless expected in the coming years. According to Business Monitor International, between 2017 and 2021 food sales will increase by an annual growth rate of 7.4%.¹⁸

Ecuador

Urbanisation trends	<ul style="list-style-type: none"> • Urban population: 63.8% of total population (CIA, 2018)- LOWER THAN LAC Urban poor 2020 estimate • Rate of Urbanisation: 1.66% annual rate of change (2015-2020 estimate) • Migration, coupled with the high birth rate, has transformed the country.
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¹⁸ <https://www.export.gov/apex/article2?id=Colombia-Processed-Food-and-Beverages>

	<ul style="list-style-type: none"> • The United Nations Human Settlements Programme (UNHabitat) is supporting efforts to minimise urban sprawl by encouraging densification and more compact cities. • The Metropolitan District of Quito (DMQ) is the second most inhabited city in the country after Guayaquil.
Urban poor	<ul style="list-style-type: none"> • Rapid urbanisation increased the number of poor people living in urban areas. • Between 2014 and 2016, urban unemployment rose from 4.5% to 6.5%, and urban underemployment increased from 11.7% to 18.8%, according to World Bank figures. • LIMITED ACCESS to food and employment for refugees, VULNERABILITY to natural disasters and climate change, gender inequalities, and LIMITED OPPORTUNITIES for smallholder farmers.¹⁹
Urban nutrition	<ul style="list-style-type: none"> • HIGHER consumption of cookies, cakes, candies, ice cream, and French fries (Melby et al., 2017).
Health issues related to dietary changes	<ul style="list-style-type: none"> • HIGH prevalence of chronic malnutrition and micronutrient deficiencies. • INCREASING overweight and obesity levels. • HIGH hypertension in urban women (Melby et al., 2017).
Urban markets	<ul style="list-style-type: none"> • Since 2015 the CRFS project has helped people working in the Quito city region to understand the need to look beyond the DMQ boundaries to understand that their food system relies on important food supply and food processing from outside the DMQ area (Blay-Palmer et al., 2018:13). • As a result, the DMQ committed to develop a city region food policy building on its urban agriculture program and to strengthen linkages between Quito and surrounding municipalities and provinces through various institutional initiatives.
Urban food production policies	<p>GOVERNMENT-LED & MULTISECTOR INVOLVEMENT:</p> <ul style="list-style-type: none"> • In 2002, DMQ launched the 'Participatory Urban Agriculture Project' (AGRUPAR) to improve food security and create jobs in the context of economic crisis and heavy rural migration that led to high levels of poverty and food insecurity. It is inclusive of all community members, including those who would often be excluded or marginalised – older people, single mothers, abandoned children, migrants and refugees and people with disabilities. • AGRUPAR also promotes diverse diets and environmental management. The pilot programme was funded by the City, UN-Habitat, and International Development Research Centre. • The project provides seeds and training in organic agriculture and encourages successful groups to sell surpluses. • Between 2002 and 2015 it created 2,700 gardens covering 2924 hectares, and trained 19,200 people. Good additional incomes (on average USD151/month) have been generated from selling surplus (IPES-Food, 2017:13). • More than 1,000 active gardens have been established through AGRUPAR, including 140 community gardens. • Annual food crop production is estimated at 400 tonnes, with 47% of produce sold and the remainder kept for home consumption. • Participants earn at least USD55 per month from the sale of surplus produce, and make a further saving of at least USD72 per month on food purchases by consuming what they grow. • The programme has helped to diversify the diet of urban farmers and their families, and support the establishment of produce markets across the city (Global Panel of Agriculture and Food Systems for Nutrition, 2017:18).

¹⁹ <http://www1.wfp.org/operations/ec01-ecuador-country-strategic-plan-2017-2021>

Waste management	<ul style="list-style-type: none"> • Quito has also set up a Water Protection Fund (Fondo para la Protección del Agua– FONAG) as a sustainable finance mechanism that allows for improved management and long-term protection of its surrounding watersheds. • FONAG aims to strengthen research and use of adequate technology to support programmes in the fields of control and monitoring of protected areas, restoration of natural vegetation, environmental education, and outreach and agricultural projects with local communities (GIZ, FAO and RUAF, 2016:12).
Innovation and technology	<ul style="list-style-type: none"> • The 'Master Plan for Comprehensive Waste Management for Quito' aims to deal with the 2,000 tonnes of waste per day produced by the 2.5 million inhabitants for the 2016-2025 period. • It describes programmes, projects, objectives, goals, and generation indicators of the cleaning of public spaces, collection, use, treatment, and final disposal of residues; the effective organisational model; an economic financial system that guarantees the economic or self-sufficiency sustainability of the waste management system, and a new regulatory framework that contributes clarity, definition of competencies, and actors involved. • This operation has the potential of impacting on the reduction of greenhouse gasses, opening possibilities for the project to access lines of green financing in the future.
Changing business models and value chains	<ul style="list-style-type: none"> • The Quito AGRUPAR programme actively promotes local organic/ agro-ecological agricultural production in the metropolitan area for home consumption (food security and nutrition) and for sale (income generation). • Commercialisation of production from urban and rural AGRUPAR farmers farming in the district mainly takes place through bio fairs. • In addition, new markets have been established that offer rural organic/ agro-ecological producer groups from areas surrounding the district (from the Pichincha Province) the opportunity to sell their produce to Quito's population. • By working across urban and rural parishes in the Metropolitan District (AGRUPAR), as well as linking to areas outside the District (AGRUPAR and FONAG), both programmes contribute simultaneously to more integrated and sustainable territorial development of the city region, strengthened food and nutrition security, and employment and income generation (GIZ, FAO and RUAF, 2016:12).

Mexico

Urbanisation trends	<ul style="list-style-type: none"> • Urban population: 80.2% of total population (CIA, 2018). • Rate of Urbanisation: 1.59% annual rate of change (2015-2020 estimate). • Mexico City is the largest city with over 20 million inhabitants (Hungry Cities Partnership, 2017:29). • The urbanisation of the Mexico City Metropolitan Area (MCMA) has been characterised by the loss or stagnation of the population in the central city and growth in peripheral municipalities. • Of the 18,800 hectares of urbanised land added between 2005 and 2010, 88% was the result of the creation of new residential areas, including both formal and informal settlements. The remaining 12% was a result of the incorporation of rural settlements into the urban fabric.
Urban poor	<ul style="list-style-type: none"> • Mexico is (along with Brazil) one of the two countries that most increased their participation of women in the labour market over the last two decades. The two countries together account for two thirds of LAC's GDP (Willaarts et al., 2013:6).
Urban nutrition	<ul style="list-style-type: none"> • According to the Hungry Cities Partnership (2017), levels of household food insecurity (undernutrition) are lower in Mexico City than in other global cities of the South.

Health issues related to dietary changes	<ul style="list-style-type: none"> • LOW consumption of fruit and vegetables, LIMITED consumption of dietary fibre and antioxidants, and HIGHER consumption of processed and animal products, sugars, refined flour and saturated fats. Sugary drinks, whether beverages prepared from fruit or bottled soft drinks, contribute significantly to sugar consumption (Hungry Cities Partnership, 2017:39). • Tortilla, oil and sugar are among the foods most frequently consumed by all socioeconomic groups. • The biennial household income-expenditure surveys of the National Institute of Statistics and Geography (INEGI) show that diet is related to family income. • Higher-income urban households have MORE diverse and energy-dense diets.
Urban markets	<ul style="list-style-type: none"> • Mexico City faces an epidemic of over-nutrition, obesity and non-communicable diseases.
Urban food production policies	<p>AGRICULTURAL FOCUS:</p> <ul style="list-style-type: none"> • Meeting the daily food demands of Mexico City's inhabitants requires the agricultural production of Mexico's rural areas, its fishing industry, and food imports. • Food products arrive in the city from around the country in a combination of traditional and highly sophisticated modern systems of food supply and distribution. • Structural changes in recent decades have led to modifications in the systems of supply, distribution and food consumption with vertically integrated companies now controlling aspects of the food chain. • The system of supply and marketing of food products is also characterised by competition between public markets, large wholesale and retail companies, and neighbourhood convenience stores. • Supermarkets cater to different cultural habits and diets - especially to people concerned with health and product variety (Hungry Cities Partnership, 2017:29). <p>A significant focus of food distribution in Mexico City is its FOOD TERMINAL: the Central de Abasto (Supply Centre of Mexico City):</p> <ul style="list-style-type: none"> • This 327-hectare terminal is the largest of its kind in the world, with 5,000 businesses and over 300,000 visitors per day. • Food arrives at the terminal on a daily basis by truck from other states in Mexico. • The Central de Abasto buys and distributes 30% of national fruit and vegetable production and the value of the products for purchase and sale is around USD9 billion per year. • The food terminal provides approximately 70,000 jobs directly related to its activities, and represents a central hub in the extensive network of formal and informal food-related activities in Mexico City, with vendors of all scales and types purchasing wholesale supplies for sale or processing elsewhere in the city (Hungry Cities Partnership, 2017:23). • The 2009 'Law on Food Security and Nutrition for the Federal District' aims to establish priority strategic activities and guarantees the universal right to food and food security for all the inhabitants of the Federal District of Mexico City. • The law institutionalises policy by mandating the creation and implementation of the Federal District System for Food and Nutrition Security (SDFSAN) and the elaboration of the Food and Nutrition Security Programme as the planning instrument of the system. • It defines responsibilities and estimates the budgetary resources needed for the activities, actions and goals for achieving food security and adequate nutrition. • The agreement mandating the creation of the SDFSAN established the Social Development Secretariat of the Federal District, the System for the Integral

	<p>Development of the Family of the Federal District, and the Trust for the Construction and Operation of the Food Supply Centre of Mexico City.</p> <ul style="list-style-type: none"> • The SDFSAN led to the creation of a new social programme, Aliméntate in March 2015. This added to other programmes and actions to ensure the food security of the population, and includes the school breakfast and the community, public and popular soup kitchen programmes, the food pension for adults over 68 years of age (PRAAPAM), and support for single mothers. • A study of older residents in poor areas of the city in 2002 found that 51% were receiving food pensions and 36% received free milk. Less than 1% patronised community kitchens. The main impact of PRAAPAM was to increase dietary diversity among the elderly. A more recent study of the elderly found that cash transfers were significantly associated with a lower probability of being moderately to severely food insecure (Hungry Cities Partnership, 2017:44).
Waste management	<p>SEPARATE REGULAR COLLECTION:</p> <ul style="list-style-type: none"> • Major cities such as Mexico City are starting to separately and regularly collect their food waste, either on a voluntary or mandatory basis. • Mexico City has introduced a law on “altruistic food donation of Mexico City and urban food garden”. Its objective is to promote, guide, and regulate donations of food fit for human consumption and to avoid unjustified food waste. This law also sanctions those who waste or destroy food which is still fit for human consumption. • However, most cities are not collecting food waste regularly; few cities are treating food waste, and prevention policies are yet to become mainstream. • Although opportunity is enormous, barriers to implementation have also been extremely difficult for cities to overcome (World Biogas Association, 2018).
Innovation and technology	<ul style="list-style-type: none"> • Mexico City describes its nutritional and food security system as innovative because it coordinates the food and nutrition-related strategies and actions initiated by several secretariats. • The city strengthens these and promotes the efficient coordination of the different city departments’ work (De Cunto et al., 2017:28).
Changing business models and value chains	<ul style="list-style-type: none"> • CHANGING food distribution model: as wholesale markets are displaced by companies pursuing vertical integration of tasks, and shortening distribution channels. • This is the result of the DEREGULATION OF THE COMMERCIAL SECTOR through the adoption of neoliberal policies, the deregulation of foreign direct investment in the sector, and the incorporation of logistical, organisational and technological innovations to facilitate the high-volume movement of food along supply chains from producer to consumer (Hungry Cities Partnership, 2017:23).

APPENDIX C: Urbanisation in Asian countries

India

Urbanisation trends	<ul style="list-style-type: none"> • Urban population: 34.0% of total population (CIA, 2018). LOWER than South Asian urban poor 2020 estimate • Rate of Urbanisation: 2.37% annual rate of change (2015-2020 estimate) • Currently accounts for ~10% of the world’s urban population, increasing to 17% in 2030 (Tuffrey & Espeut, 2015:13). • According to the World Bank, if India continues to grow rapidly, approximately 75% of India’s population could be urbanised by 2050 (~1.2 billion out of a total population of 1.6 billion people).
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Urban poor	<ul style="list-style-type: none"> • 78% of the workforce is employed in the informal sector (excluding agriculture), which is mostly based in urban and semi-urban areas.²⁰ • Where the slum population is estimated at 65 million, nearly half of slum residents have respiratory diseases and spend more than 10% of their household income on associated treatment.²¹ • Field research by IDS has demonstrated that ~1/3 of households in some wards classified as 'urban' still depend directly on agriculture for their livelihoods (Marshall & Randhawa, 2017:23). • Only 50% of the poor inhabiting notified informal settlements access Public Distribution System (PDS) and other government schemes and programmes (Marshall & Randhawa, 2017:18). The PDS ensures availability of essential commodities such as rice, wheat, edible oils and kerosene to consumers through a network of outlets or fair price shops (FPS). These commodities are supplied at below-market prices to consumers.
Urban nutrition	<ul style="list-style-type: none"> • HIGH consumption of food grains: 80% of rice and wheat. • DECREASED production and consumption of millet: as a result of the 'green revolution'. However, as health consciousness grows in urban India, producers of organic foods are recording an encouraging spurt in the urban consumption of millets. • Socio-economic status is the most important predictor of women's nutrition status, not rural or urban residence (Dang & Meenakshi, 2017:3). • LACK of nutrition and food security: attributed to access, availability, consumption, food preference and, importantly, distribution.
Health issues related to dietary changes	<ul style="list-style-type: none"> • DECLINING undernutrition. • RISING overnutrition and obesity. • HIGHER levels cardiovascular disease and cholesterol,²² and high blood pressure in men. • In 2025, India is projected to have by far the highest number of stunted urban children aged under 5 years at nearly 45 million, followed by Nigeria, Pakistan, and Bangladesh. • Migration status has been shown to affect maternal and child nutrition outcomes (Tuffrey & Espeut, 2015:23). • Health hazards from polluted peri-urban ecosystems also extend to those who might consume produce grown on peri-urban smallholdings, including those who purchase from urban markets, e.g. heavy metals (largely from peri-urban industries) have been found in produce from peri-urban areas, linked to both aerial contamination and uptake through soil contaminated with industrial wastewater (Marshall & Randhawa, 2017:24-5).
Urban markets	<ul style="list-style-type: none"> • People from un-notified areas in urban and peri-urban areas have to buy their food from the open market at competitive prices and cannot access subsidised food available through the PDS (Marshall & Randhawa, 2017:18). • HIGH proportion of fresh perishable produce is grown in peri-urban areas adjacent to the urban core. • Crops are produced largely by smallholder farmers, and marketed through informal channels (Marshall & Randhawa, 2017:23).

²⁰ Charms, J. (2012). "The Informal Economy Worldwide: Trends and Characteristics."

<http://journals.sagepub.com/doi/pdf/10.1177/097380101200600202>

²¹ Agarwal, S. (2011). "The State of Urban Health in India: Comparing the Poorest Quartile to the Rest of the Urban Population in Selected States and Cities," *Environment and Urbanisation*, 23, 13–28.

²² Allender, et al., "Level of Urbanisation and Noncommunicable Disease Risk Factors in Tamil Nadu, India"; K. S. Reddy, "Primordial Prevention of Coronary Heart Disease in India: Challenges and Opportunities," *Preventive Medicine* 29, no. 6 (1999): S119–S123.

Urban food production policies	<p>GOVERNMENT LED:</p> <ul style="list-style-type: none"> The 'Vegetable Initiative for Urban Clusters' was launched in 2011–2012 under the Rashtriya Krishi Vikas Yojana (RKVY) or National Agricultural Development Scheme. It aimed at fulfilling the supply of vegetables in urban clusters from the nearby villages and peri-urban areas, while looking at a number of constraints such as access to markets and food safety concerns. It was implemented in one city in each of 30 states of India (Marshall & Randhawa, 2017:26). However, it is no longer in operation.
Waste management	<ul style="list-style-type: none"> For the first time, there is a major emphasis on composting in the newly revised Solid Waste Management Rules 2016 (Marshall & Randhawa, 2017:28). It has been recommended that local bodies phase out the use of chemical fertilisers in two years and use compost in all parks and gardens maintained by local bodies and wherever possible in other places under their jurisdiction. <p>The Ministry of Agriculture has also been advised that it should propagate the utilisation of compost on farmland.</p>
Changing business models and value chains	<p>MORE PRIVATE SECTOR INVOLVEMENT: due to lack of public sector lacked funds:</p> <ul style="list-style-type: none"> A major overhaul of the administrative and legislative frameworks of the government, resulted in the drafting of an urban reforms mandate. This marked the beginning of a new regime of regulation in the Indian urban sector that cleared the ground for vigorous implementation of state-sponsored neoliberal programmes in 60 cities and towns across the country in subsequent years (Marshall & Randhawa, 2017:9).
Further work: opportunities	<ul style="list-style-type: none"> Peri-urban areas are key frontiers for sustainable urbanisation and food security – <i>innovation and technology could be used here.</i> Urban policy and planning must support these fragile peri-urban ecosystems and their marginalised residents (Marshall & Randhawa, 2017:7). The 'Vegetable Initiative for Urban Clusters', which focused on increasing production and access to markets for some peri-urban farmers, could be usefully reinstated and developed. With climate change, water will be a scarce commodity for agriculture in India. Since millets are rain-fed crops, reviving millets-based biodiverse farming can contribute to meet the future food demands.²³

Indonesia

Urbanisation trends	<ul style="list-style-type: none"> Indonesia is undergoing a historic transformation from a rural to an urban economy Urban population 55.3% of total population (CIA, 2018). Rate of Urbanisation: 2.27% annual rate of change (2015-2020 estimate). However, World Bank data shows that the country's cities are GROWING FASTER THAN IN OTHER ASIAN COUNTRIES: 4.1% per year. By 2025 – in less than 10 years – Indonesia can expect to have 68% of its population living in cities.
Urban poor	<ul style="list-style-type: none"> Research utilising social indicators from the 2012 Demographic Health Survey of Indonesia as a means to examine differences between city size found that poor residents in medium-size cities are more likely to have a refrigerator than those in small and large-size cities and mega-cities.

²³ <https://www.eatingcity.org/wp-content/uploads/2015/02/Eating-City-conference-canton-Siddhartha.pdf>

	<ul style="list-style-type: none"> • Most low-income Indonesians cannot afford to buy in bulk, and are unable to store much food as many have small fridges and in some cases, no fridge at all (Soma, 2017:437).
Urban nutrition	<ul style="list-style-type: none"> • LOWER percentage of children with nutrient intakes below the Indonesian recommended daily allowance (RDA) than in rural areas. • Older children were more at risk for not meeting the Indonesian RDA for many nutrients. • HIGHER intake of macronutrients and micronutrients in urban children. • However, according to the South East Asian Nutrition Survey (SEANUTS), while undernutrition is still a major public health problem, the prevalence of overnutrition is increasing.
Health issues related to dietary changes	<ul style="list-style-type: none"> • HIGH prevalence of stunting in children under 5 years of age: 25.2% (compared to 39.2% in rural areas).
Urban markets	<ul style="list-style-type: none"> • Food security in Indonesia was always a function of trade and trade regimes. This is still the case. • Distribution prices are set in line with current market prices, and distribution is through the private sector and public channels.
Urban food production policies	<ul style="list-style-type: none"> • The “Sustainable Reserve Food Garden” urban agriculture policy, which started in 2010, involves women in the family as the main actor to use the home yard optimally, i.e. to cultivate vegetable and potential fruits and/or poultry and small ruminant raising.
Waste management	<ul style="list-style-type: none"> • Bogor city waste CRISIS: High consumer demand for food diversity and prevalence of ‘modern’ food packaging catalysed the (Soma, 2017:441).
Innovation and technology	<ul style="list-style-type: none"> • A new initiative called the ‘Better Buying Lab’ a partnership of major companies with food service operations in the US and UK such as Google, Sainsbury’s and Hilton Worldwide, attempts to develop strategies that combine research from marketing, consumer, and behavioural economics to enable consumers to buy and eat more sustainable foods. • Implementing a similar initiative in Indonesia, in partnership with the Ministry of Environment and Forestry, other relevant government ministries, private companies, and CSOs, could be useful to aid consumers to make sustainable food choices.
Changing business models and value chains	<ul style="list-style-type: none"> • COUNTRYWIDE INCREASE IN SUPERMARKETS: by 67% between 1999 and 2009 (75% of the supermarkets owned by multinational corporations). • This “distancing” of food production via long-distance modern supply chains is connected to the growing issue of urban food waste (Soma, 2017:433).
Further work: opportunities	<ul style="list-style-type: none"> • More in-depth analyses of the differences between city sizes may provide better insights on how to improve urban infrastructures for nutrition (Bloem & de Pee, 2017:86). • Specific research should also be dedicated toward looking at healthy and sustainable diets, as well as alternative plant-based foods that are healthier and more sustainable. • Policy makers need to find ways to capitalise on the more equitable growth seen in medium-size cities for the benefit of both urban development and nutrition in all cities such as building partnerships to enhance public services and infrastructures (Bloem & de Pee, 2017:87).

Nepal

Urbanisation trends	<ul style="list-style-type: none"> • LOW but rapid level of urbanisation: 19.7% of total population (CIA, 2018). • Rate of Urbanisation 3.15% annual rate of change (2015-2020 estimate). • Rapid pace is likely to remain so in future (2017 Nepal National Report, Ministry of Urban Development).
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Urban poor	<ul style="list-style-type: none"> • HIGH rate, however population distribution across urban areas remains uneven. • Among all the urban centres, Kathmandu Valley (KV) is the hub of the country's urbanisation. • With a population >1 million, Kathmandu city had the highest density of 19,726 persons per sq km in 2011. • Manufacturing employment per square km is above 600 in the Kathmandu city area, the highest in the country, which in turn has attracted people to change their occupations from farming to manufacturing (Ishtiaque et al., 2017:11).
Urban nutrition	<ul style="list-style-type: none"> • HIGH influx of internally displaced people to KV due to the decade-long civil unrest that began in the mid-1990s. More than 500,000 people believed to have been displaced during the insurgency period (Ishtiaque et al., 2017:12). • While triggering the socio-political crisis, the conflict disrupted local economic activities by frequent strikes, closures of businesses, extortion, and threats. • Remote rural citizens mostly migrate for economic reasons (i.e., better livelihood opportunities) and educational purpose. However, rural push factors play a dominant role in urban in-migration too (Ishtiaque et al., 2017:11).
Health issues related to dietary changes	<ul style="list-style-type: none"> • CHANGING from agricultural staple based foods, to modern processed foods with HIGHER total energy, total fat, and sugar. • Nutrition transition already advanced in urban areas. • Changes are triggered by income and urbanisation. • A cross-sectional survey conducted among 309 mothers across 15 health facilities and found that consumption of commercially produced snack food products was high at 74.1% of children 6–23 months (Pries et al., 2016).
Urban markets	<ul style="list-style-type: none"> • HIGH prevalence of overweight/obesity and diet related non-communicable diseases are increasing. • LOWER child stunting: 27%, compared to 42% for rural children (Nepal Demographic and Health Survey).
Urban food production policies	<ul style="list-style-type: none"> • The trade liberalisation has made processed foods, edible oil and sugar easily available at supermarkets and fast food outlets (Subedi et al., 2017). • The increasing number of middle-class families in the KV is demanding new modern facilities such as modern grocery stores and restaurants in the suburbs (Ishtiaque et al., 2017:12).
Waste management	<p>GOVERNMENT-LED:</p> <ul style="list-style-type: none"> • Multi-Sectoral Nutrition Plan (MSNP) 2012-2017: various bottlenecks affected effective implementation of MSNP at central, district and community level. • The current existing land use policy (or constitutional provision) does not allow the government to impose any kind of restriction on the use of private property (Ishtiaque et al., 2017:12). • MSNP II (2018-2022): targets women, children and adolescent girls in the country.
Innovation and technology	<ul style="list-style-type: none"> • Foodmandu, the Kathmandu-based start-up, started its services in 2010. It became the first and only company to enter the food delivery market. It started with only ten restaurants and 15 employees, and used a cash on delivery model to generate trust from customers. Measured steps towards growth were taken, investing more on logistics and quality service instead of marketing.

Changing business models and value chains	<ul style="list-style-type: none"> • Organic waste has the highest share.²⁴ • if not managed properly, creates serious health and environmental hazards. • It could be managed efficiently by composting at household and local government level.
Further work needed	<ul style="list-style-type: none"> • The Nepalese economic structure has also changed: away from agricultural food supply system towards modern processing based food supply system. • Nepali people are now eating out more often and prefer non-Nepali food when they do. Opening a restaurant or a cafe is therefore seen as a good business opportunity for entrepreneurs to explore.
Further work: opportunities	<ul style="list-style-type: none"> • The metropolitan valley of KV has experienced a significant transformation of its landscapes in the last four decades resulting in substantial land use and land cover (LULC) change; however, no major systematic analysis of the urbanisation trend and LULC has been conducted on this valley since 2000 (Ishtiaque et al., 2017:1). • Further study is recommended to identify whether urban versus rural, rich versus poor and educated versus uneducated families are experiencing transition in a similar way. • It is particularly urgent to examine the impacts of the conversion of agricultural land to the built environment, socio-ecological significance of disappearing open space, fragmentation of habitats and important biological corridors, changes in urban food and diet system, rising urban divide, increasing pollution levels, and most importantly, the governance of urban growth (or the lack thereof) (Ishtiaque et al., 2017:13).

Pakistan

Urbanisation trends	<ul style="list-style-type: none"> • Urban population: 36.7% of total population (CIA, 2018). • Rate of Urbanisation: 2.53% annual rate of change (2015-2020 estimate). FASTEST PACE IN SOUTH ASIA • The United Nations Population Division estimates that, by 2025, nearly half the country's population will live in urban areas. • Lahore population: currently ~7 million, will exceed 10 million by 2025. • Karachi population: currently 13 million, will be 19 million by 2025.
Urban poor	<ul style="list-style-type: none"> • People are moving from the countryside to urban areas in droves, and for various reasons: <ul style="list-style-type: none"> ○ migration from rural areas. ○ natural population growth, and ○ war and conflict - with troubling consequences for stability and security. • Precious urban real estate has been seized by profit-minded oligarchs and industrialists. This deprives people of the space and land needed to build homes. • The most devastating effects, including poor living standards, food scarcity, unhygienic neighbourhood and bad health conditions, are due to increase in poverty in urban areas.
Urban nutrition	<ul style="list-style-type: none"> • As incomes swell, more women enter the workforce, thereby leaving them with less time and inclination to fulfil the traditional role of cooking for the family. • HIGH demand for diversified food of high quality, including fruits, vegetable and livestock products.

²⁴ Maskey, B., & Singh, M. (2017). Household Waste Generating Factors and Composition Study for Effective Management in Gorkha Municipality of Nepal. DOI: 10.5539/jsd.v10n6p169

	<ul style="list-style-type: none"> • However, per capita consumption of high value products like beef, chicken, fish, milk, vegetables and fruits is almost 6-10 times LOWER than in developed countries. • Diets DEFICIENT in essential micronutrients (40-80%) including iron, calcium, and vitamin-A (MNFSR, 2018:4).
Health issues related to dietary changes	<ul style="list-style-type: none"> • Limited research on urban health issues has attributed for scanty data regarding big cities. • Many health problems and fatal diseases are the hallmark of poverty dominant spots in big cities primarily due to unsafe housing and poor sanitation. • Large cities in Pakistan have rarely been screened for poor areas of where public health risks are high and expected prevalence of asthma, malaria, dengue and other water-borne or air-borne disease is high.
Urban markets	<ul style="list-style-type: none"> • A considerable share of vegetables and fodder crops are produced in peri-urban areas by using sewerage water (MNFSR, 2018:16). • A key challenge for the livestock sector is the culling of dry animals and calves under per-urban dairy farming systems (MNFSR, 2018:11). • Urban consumers are often unaware of the processes by which their food is produced, pointing to the loss of 'protective factors' in the shift from more traditional diets to those that are emerging today, pointing to loss of nutrients and dietary diversity, including microbial diversity (MNFSR, 2018:16). • Food franchises are booming across Pakistan's big cities. Cultural attitudes are changing, helping make it the fastest-growing retail market.
Urban food production policies	<ul style="list-style-type: none"> • Along with Bangladesh and Nepal, Pakistan is a member of the global Scaling Up Nutrition (SUN) movement, and various networks associated with SUN designed to improve nutrition. • Pakistan's provinces have taken steps to improve their food and nutrition situation following devolution of power beginning in 2010.
Waste management	<ul style="list-style-type: none"> • Use of IT is necessary for sharing technological as well as improved consumption knowledge with rural and urban communities (MNFSR, 2018:20). • Pakistan has a flourishing yet underappreciated IT sector, and urban growth can strengthen this sector - which has urban roots. • However, at the same time, the economy will suffer with a potentially large and young urban work force, especially if it can't be productive because it does not have access to water and energy and schooling necessary to keep it healthy and educated.
Innovation and technology	<ul style="list-style-type: none"> • In the Punjab capital city of Lahore, state-of-the art facilities, including compost and wastewater treatment plants, provided by PAMCO (Government of Punjab-Pakistan).
Changing business models and value chains	<p>One example of modernisation: Lahore Meat Processing Complex:</p> <ul style="list-style-type: none"> • Halal and traceable, and therefore, more complex value chain linking producers and consumers. • Compliance of standards at all tiers of value chain. • State-of-the-art processing facilities by PAMCO for supply to local and export markets.
Further work: opportunities	<ul style="list-style-type: none"> • The private sector can get involved by providing capital, technological know-how, and perhaps even builders to ensure that more homes are built in the cities. • In-depth research has not yet been conducted on urbanisation and health effects. • Health-related awareness programmes and research should be conducted to address cultural, economic and social dynamics of urban health.

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Key websites

- FAO - Food for the Cities Programme:
<https://www.youtube.com/watch?v=1rnA3LhWLB&index=5&list=PLzp5NgJ2-dK48bLMAsDIwiDCFLH7xZkuR>
- Future Agenda: <https://www.futureagenda.org/insight/urban-obesity>
- Belo Horizonte, Brazil – Zero Hunger Programme:
http://www.fao.org/ag/agp/greenercities/en/ggclac/belo_horizonte.html
- Cajica city, Columbia – Household waste management:
<https://emrojapan.com/case/detail/17>
- MUFPP: Open research needs and most interesting innovation (Food in Cities, 2016):
<http://www.milanurbanfoodpolicypact.org/wp-content/uploads/2018/06/study.pdf>

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