Urban Food Environments in Low- and Middle-Income Countries

Today more people are living in cities than ever before and this number will continue to grow, particularly in low- and middle-income countries (LMICs). In urban areas in LMICs, rates of overweight, obesity and diet-related non-communicable diseases (NCDs) are increasing. At the same time, undernutrition persists, particularly among those on low incomes. Where people acquire their food and factors such as availability, affordability and convenience all influence what people eat in urban areas (i.e. urban food environments) and are essential to people's diets, nutrition and health. At the same time, the influence of urbanisation and increasingly complex food systems pose unique challenges and opportunities to ensure that urban food environments provide people with nutritious and safe foods. This factsheet defines and explains the concept of the food environment and its relevance in fighting malnutrition in urban areas in LMICs.

How is the food environment defined?

Understandings of the food environment have developed significantly over the years. While it was once understood to be the space in which people acquire their food, today's definition acknowledges that every person's food environment is different. A distinction is made between external and personal food environments, with interactions between components resulting in a unique food environment for every individual (Figure 1) (1–3). In this definition, the food environment is also considered an integral part of the wider food system, forming the link between on the one hand food supply chains, comprised of production, storage, transformation and transportation, and on the other, a household's or individual's acquisition and consumption – in turn related to health and nutrition outcomes (2). Hence, the components of the food environment have a direct effect on people's diets and nutrition (1,4).

The external food environment

With current global food **availability** it is theoretically possible for everyone to consume enough energy, but not necessarily a healthy diet[1] (5). Worldwide, the availability of some essential nutritious components is too low. Only 66% of the globally needed fruits and 42% of nuts and seeds are available. This inhibits many people to consume a healthy diet (1). A case study in São Paulo, Brazil demonstrated that with a low density of food retail points, and thus limited availability, regular consumption of fruits and vegetables was particularly low

1. *Based on GAIN's definition of nutritious foods (67) a healthy diet is defined as the consumption of a balanced variety of nutritious foods that provide beneficial nutrients (e.g. vitamins, major and trace minerals, essential amino acids, essential fatty acids, dietary fibre) with minimal potentially harmful elements (e.g. anti-nutrients, quantities of saturated fats and sugars).*

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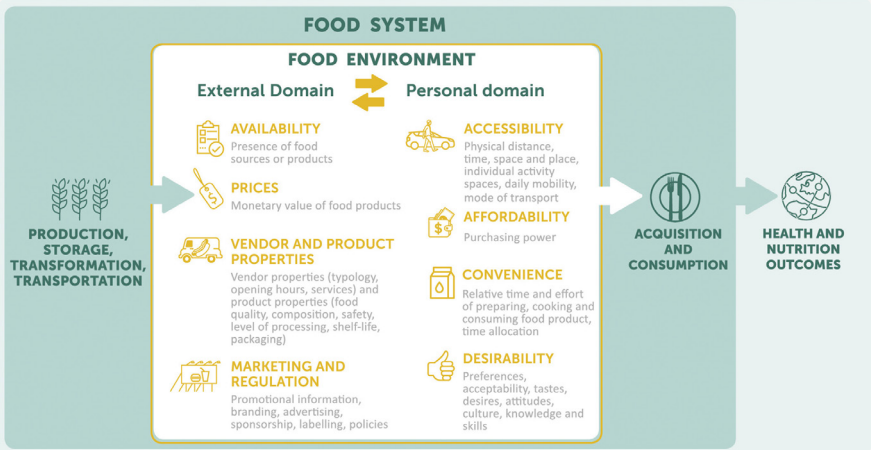

Figure 1: Food environment conceptualisation. Source: (3)

among low-income families. A high density of food retail points on the other hand positively influenced regular fruit and vegetable consumption (6). Wide availability of unhealthy food products can lead to unhealthy diets becoming increasingly common. The same case study showed that greater availability and variety of sugar-sweetened beverages (SSBs) led to an increase in regular SSB consumption (6).

The **price** of food is also crucial, and for many households is too high to purchase a healthy diet. In South Africa, a healthy diet is on average 69% more expensive than an unhealthy diet (7). The cost of a healthy and sustainable diet as proposed by the EAT-*Lancet* Commission (8) exceeded the total income of 57% of the population in sub-Saharan Africa and 38% of the population in South Asia (9). In some countries, such as Mozambique, Ethiopia, Nigeria and Kenya, the minimum cost of a daily adequate nutrient intake costs as much or even more than the average daily food expenditure of a household (Figure 2) (10). The price of a healthy diet is thus often a major barrier for low-income households. Seasonality and taxes are some of the many factors that influence food prices. In Burkina Faso, the price of vegetables was 29% higher during the lean season than during the post-harvest season (11).

Vending and product properties are likely to influence purchasing behaviour and hence alter consumption of foods. An example from urban Kenya showed that adults regularly visiting supermarkets consumed a higher share of energy from highly processed foods and had an increased likelihood (+ 20 percentage points) of being overweight or obese (12,13). While the studies suggest that supermarkets have contributed negatively to healthy diets and nutrition in adults, the same research project found positive nutrition effects channelled through improvements in dietary diversity in children (14). The lack of effective health and safety regulations for the production, processing and retailing of foods, especially in the informal sector, can pose an immense threat to public health. Vegetables sold in Ghana's urban markets contained unsafe levels of faecal coliform contamination, while unsafe concentrations of heavy metals were found on samples of fresh produce in open markets in Kinshasa and Johannesburg (15,16). Contamination like this can cause food-borne diseases (FBDs), with symptoms such as diarrhoea, stomach cramps and vomiting, that are particularly dangerous for children below five years old (17). Annually, FBDs in developing countries result in 410,000 deaths (1).

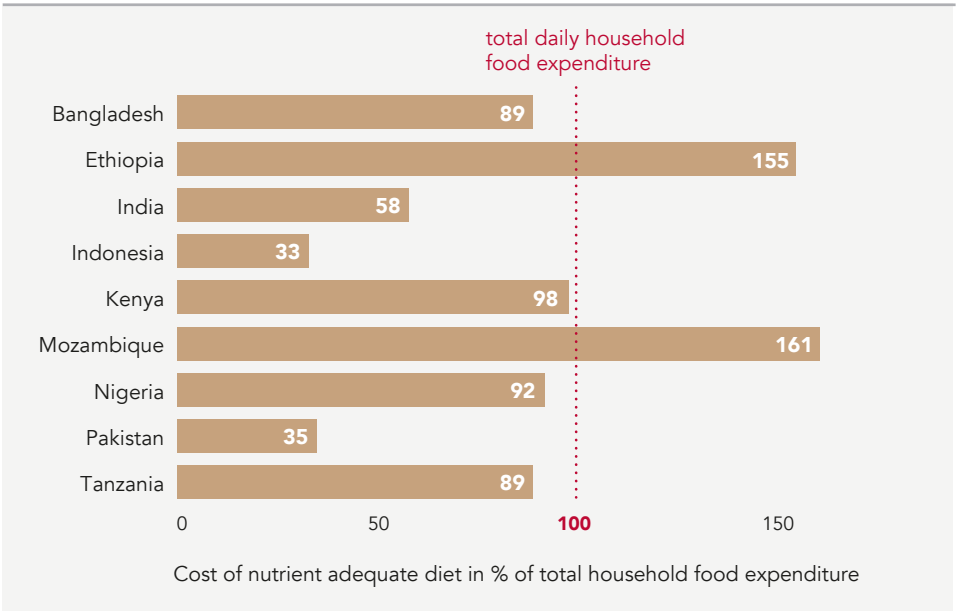

Figure 2. The minimum daily cost of a nutrient-adequate diet as a percentage of the average daily food and beverage expenditure of a household (2011). Selection based on available data for GAIN countries, modified from (10).

Marketing influences the preferences and food choices of both children and adults, with impacts on diets and health (4,18). SSB advertising in the public space is common in urban areas, particularly around points with high density of population or traffic, where schools are often located (19). Marketing that exposes children to unhealthy foods is common around schools. Evidence suggests that this exposure leads to a general increase in children's requests for food and makes them more vulnerable to overweight (19,20). In Guatemala, racks and shelves promoting child-oriented snacks were more common in stores closer to schools (21). In Ulaanbaatar, Mongolia, and Manila, the Philippines, the density of food advertising within 250 metres from schools was twice as high compared to areas within 500 metres from schools (19). The vast majority of advertisements – 85% in Ulaanbaatar and Manila and 75% in Mexico – focused on unhealthy foods and drinks, such as SSBs, snacks and candy (19,20).

Regulation exists in various types, such as fiscal policies like a SSB tax[2], and all sorts of regulations around marketing, advertising, packaging and labelling (2). Food labelling that provides nutrition information on packaged foods is used in a variety of ways, ranging from providing information to consumers to actively trying to influence their decisions (22). A meta-analysis combining nine studies on food labelling conducted in high-income countries found that two thirds of the consumers read nutrition labels and of those reading the labels 18% select healthier food items (23). Regulations to enhance the consumption of healthier diets while decreasing the consumption of unhealthy food products may be particularly effective when used in combination. In 2016, Chile combined food labelling, marketing and school food sales policies. This reduced the availability of drinks high in sugar within schools from 90% to 15% and resulted in a 24% decrease in purchases of these beverages. The effects observed were greater than those driven by stand-alone policies in other Latin-American countries. The exact extent to which this decrease can be attributed to these policy interventions needs to be further investigated (24).

2. *See GAIN's Factsheet 'Sugar-Sweetened Beverage Consumption and Taxation'*

The personal food environment

Accessibility is linked with availability as food can only be accessible if it is available. However, accessibility differs strongly between individuals, depending on the available modes of transport, distance, regular mobility patterns and time (3). With low availability of fresh fruits and vegetables in low-income urban neighbourhoods (25), accessibility to healthy diets is limited. One reason is that most low-income households do not have access to their own modes of transport (26,27). Walking or having to use (public) transport to buy foods is time consuming and having to pay for transport can place a burden on the household budget (26). Besides access to healthy foods, access to safe drinking water remains a major public health concern especially for urban households on low incomes in LMICs (28). While in the last two decades, rural areas have been catching up in terms of access to safe drinking water, urban access has stagnated and sometimes even declined. In urban areas in Kenya and Tanzania the share of total population with access to safe drinking water decreased by 5.0% and 7.5% between 2002 and 2015, respectively (29).

Affordability depends on the individual's or household's purchasing power. Lower income households spend a relatively higher share of their total budget on food. Both data from 2004, on the urban population, and 2010, on both urban and rural populations (Figure 3), show that those living on low incomes in urban areas spend at least half and up to two thirds of their total budget on food. With increasing income, this share decreases (10,30). A study in urban Nepal showed that those with the lowest and irregular incomes are estimated to spend as much as 80-90% of their total income on food. This decreases to

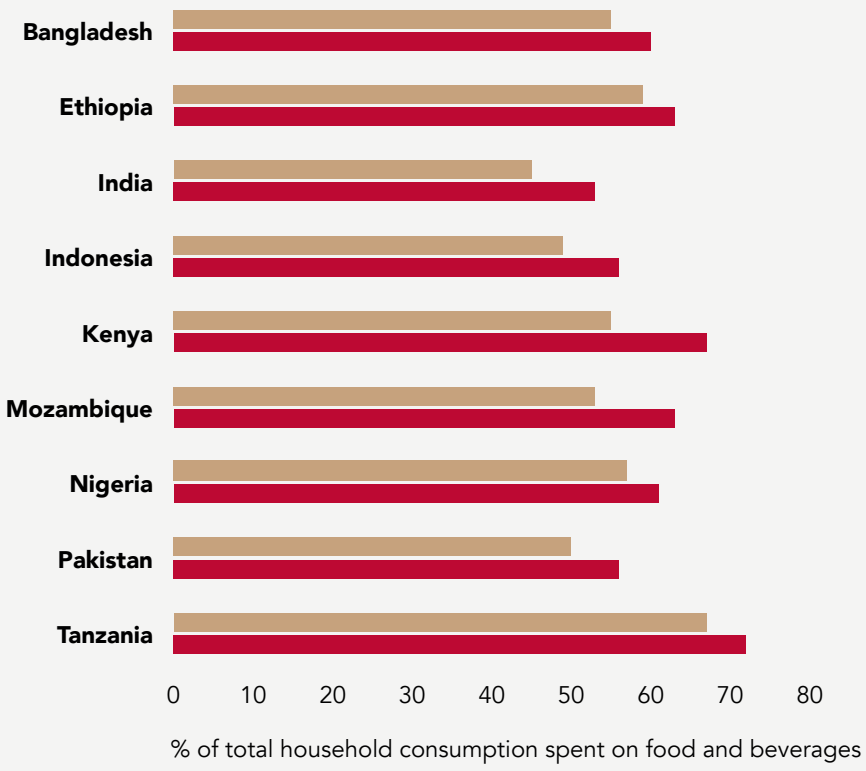

Figure 3: Proportion of household consumption spent on food and beverages[3] (2010). Selection based on available data for GAIN countries, modified from (10)

3. *For all countries included in Figure 3, between 40-85% of the population falls into the < USD 2.97/day category (68). Therefore, it is common that more than half of the total population spends at least half of their total household budget on food and beverages.*

50-60% for those on low but stable incomes (31). Seasonal price changes are another influence on affordability. In Dinajpur, Bangladesh, household food expenditure did not change between the dry and monsoon season, but dietary diversity decreased, as certain foods were not accessible or affordable anymore (32). A similar trend was seen in Ouagadougou, Burkina Faso, where price rises in the lean season meant that many products were only affordable to the richest households (11).

Convenience encompasses the time and effort spent preparing, cooking and consuming foods, but also vendor or product properties affecting how convenience is perceived. Besides better affordability and availability, one third of all people frequenting supermarkets in three urban areas in Kenya pointed to the convenience of shopping, including a one-stop shopping opportunity, as an important factor for choosing to go to a supermarket (33). For urban workers, time is often critical. Being away from home for most of the day limits time available for food preparation and drives the desire for quick and easy to prepare meals, or for consumption out of the home (34,35). Observations from women working full-time in Guatemala suggest that time constraints often lead to changes in food purchasing behaviour (buying more and a higher variety of foods), less time spent on preparing foods for children and family and an increased reliance on take-away foods (36).

The **desirability** for certain foods and diets stems from personal preferences, tastes, attitudes and cultures. Marketing often plays a major role in making food desirable and children are particularly vulnerable to its influence. During or shortly after children are exposed to advertising of unhealthy foods and beverages, their food intake increases and they find unhealthy foods more desirable, increasing the risk for child obesity (20,37,38). Fast food chains try to make fast food desirable by accommodating for local taste. For example, a global fast-food chain in Malaysia adjusted their recipe of fried chicken to offer a spicier version of the standard menu (34). Besides the taste, foods can also become desirable because they are associated with a certain lifestyle that people seek. While elderly rarely go to fast food outlets in Idaban, Nigeria, youth and younger adults are found to commonly visit the fast-food outlet as they perceive them to be elegant, trendy and sophisticated (35).

The role of women in LMIC food environments

Gender roles and responsibilities have a strong influence on personal food environments. Many tasks that relate to a household's food procurement and consumption, such as meal planning, preparation of food and food shopping, are primarily women's responsibilities in many cultures (39–41). As a result of these responsibilities, women are frequently those who decide on the household's diets and spend a relatively larger portion of their income on basic household necessities, including food (42,43). In other cultures, however, men may control most of the income and/or play a large role in purchasing food. Women's income and their position in processes of decision making within the household relative to men is therefore an important factor influencing the affordability of food. In cultures where women face barriers to movement, either due to social norms or limited availability of safe transport options, they may face lower food accessibility. Food-related household activities consume a significant amount of

time and effort. In urban areas, time is often constrained, meaning that food convenience can be highly relevant for consumption choices; due to women's dual burden of paid work and 'care' work within the home/community, convenience may be even more important to them (5).

At the same time the food environment also provides a livelihood for many women, as many work as informal market vendors and street food retailers (42). In a survey of over 1,000 respondents selling street food in Maputo, Mozambique, for example, 76% were female (44). Similar figures can be seen in Kisumu, Kenya, and Kitwe, Zambia, where respectively 70% and 58% of the food retailers were women (45). This aligns with the general trend, that in 90% of sub-Saharan African countries and 89% of the South Asian countries, women are more often working informal jobs than men (46). Informal retail is an important livelihood strategy for women, but it does make them particularly vulnerable to risks inherent to the informal sector, such as a lack of protection and a secure income. At the same time, it gives them a major role as suppliers in the external food environment, influencing components such as availability and vendor properties. Women are also involved in sectors other than retail—including food production (in both urban and rural areas) and processing.

Food environments in urban areas in LMICs

Over 97% of low-income urban households rely on purchased foods, which makes healthy food environments essential for good nutrition (47). While people in urban areas tend to consume a wider range of food items than rural dwellers, leading to higher dietary diversity, unfortunately the consumption of unhealthy foods tends to be higher (2,4). Furthermore, a strong exposure to a variety of marketing methods can influence urban people's perception of a healthy diet (48). Wide variations are seen in food safety and food quality, as a result of limited regulations and infrastructure. Cold chains for instance do not always exist or function well (48).

Food availability in urban areas in LMICs is relatively high, with a wide variety of retail points from which consumers can choose, including street food vendors offering cheap ready-to-eat foods. However, accessibility and the type of food consumed depends on individual circumstances (2,4). As more people work away from home and in urban homes space to prepare food is often small and not always well-equipped, limiting the ability and time to prepare food at home (48). With strong dependence on purchased food and limited availability for home-cooking, retail points are essential for urban food consumption.

Formal retail

Supermarkets are the most common type of formal retail outlet and generally perceived to be modern. They are rapidly increasing their presence in LMICs (49). In Indonesia for example, the total market share of supermarkets tripled between 1999 and 2004 to well over 30% (50). In India the growth rate of sales of modern-private retail between 2002/03 to 2009/10 was 49% a year on average (51). Although starting slightly later, a similar trend of supermarket expansion is seen in African countries (52). In 2002, the South African supermarket chain Shoprite had 77 stores in 13 African countries (43,45). By 2012, this was 168 stores in 18 countries and in 2019 they had close to 3,000 stores across Africa (43,45,53,54). Supermarket construction is often favoured by (local) gov-

ernments who tend to prefer modern retail over traditional and informal markets (45,55,56). Growth rates of supermarkets in various countries underline this, with an average growth often well over 20% in five years (Figure 4).

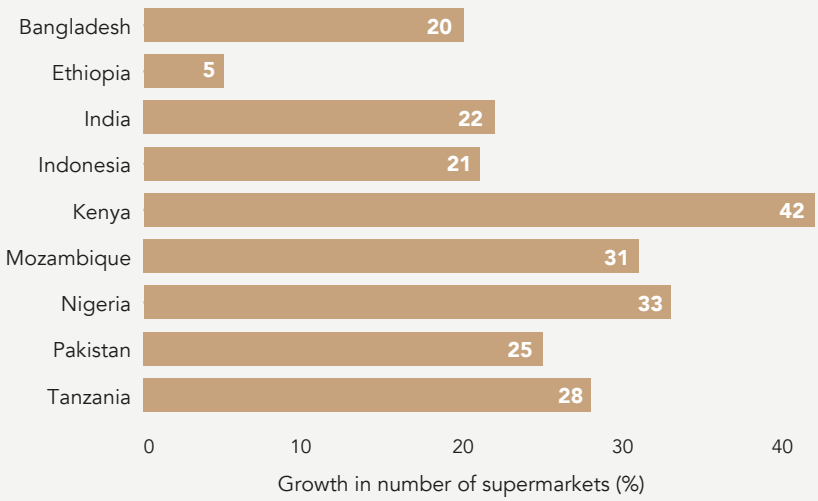

Figure 4. Growth in number of supermarkets between 2012 and 2017 (%). Selection based on available data for GAIN countries, modified from (10)

Studies in Southern Africa have shown that consumers of all income groups make purchases at supermarkets, although low-income households do so infrequently. Most low-income households only go to supermarkets on a monthly basis to buy bulk products such as cereal staples (43,49). While some products can be cheaper and increase food security (57), this is often only the case because they are sold in bulk (58), which limits the accessibility of many low-income households as they cannot afford to regularly spend large amounts of money (45,49). In addition, supermarkets are often primarily located in higher income areas, reducing the accessibility for those on low incomes (56). For example, in Nairobi, the high-income areas had up to 86 more supermarkets per 1,000 inhabitants compared to the low-income areas (56). When located in low-income areas, the products offered are often limited to highly processed, low-nutrient foods which negatively influence the availability, accessibility and convenience of healthy diets (43,45).

Informal retail

There are various types of informal retailers, such as food vending stands, mobile vendors, tuck shops, home-based operators and market stalls (43,49). Informal retail does continue to be an important source of food in LMICs, even with the growing presence of formal retail (43).

Those on low incomes are particularly dependant on informal retail for their daily groceries. In low-income neighbourhoods in Southern Africa 59% of the households go shopping at informal retail points on a weekly basis, and 32% even on a daily basis (43). Almost half of the low-income, food insecure households in Nairobi reported buying the majority of their food from kiosks, whereas this was the case for only 17% of the food secure households (56). Consumers in Thailand visit informal wet markets two to three times a week. Low-income groups and the elderly are particularly frequent visitors (59). Fresh fruits and

vegetables, cereals, roots and tubers, but also animal proteins are commonly purchased from informal outlets (60). Reasons for shopping at informal retailers ranges from perceived freshness and lower prices compared to formal retail, the possibility to buy on credit, and small purchasing units, which increases the affordability of foods (45,49,56,61,62). Furthermore, the proximity of informal retail outlets to people's houses and flexible opening hours support accessibility and convenience (45,56).

Informal retail tends to face few regulations regarding environmental or social conditions, food quality or safety. This can cause food spoilage and food safety risks. When governments do try to put public regulations in place for informal retail, cooperation from the informal sector is not always optimal (58). Even if retailers were subject to, and in compliance with, such regulations, their efforts would likely go unrecognised. Therefore, incentive or capacity to do so is generally lacking. For example, an attempt by the municipal authorities in Windhoek, Namibia, to improve the food vendors' operating environment by constructing open markets where operators had to pay a fee in exchange for services was not well received. Vendors felt there was unfair competition, as others would continue to sell in the market surroundings and make use of the services offered (61). In some other cases informal retail has been removed or threatened with removal, as they lack the right permits and do not pay taxes (45,56).

Street foods

In LMICs, street food from informal vendors is a popular means of food consumption. It is a cheap and convenient source of food, especially for those that do not have access to good cooking facilities or cold storage at home (63). A systematic review including 23 studies from nine countries found that in LMICs, predominantly in sub-Saharan Africa, intake of street foods can contribute up to 50% of daily food intake for adults, and up to 40% of daily food intake for children (64). It also contributes significantly to protein intake, with up to 50% of daily recommended intake coming from street foods (4). At the same time, street foods often contain high levels of salt, sugar and saturated trans-fats and hence do not necessarily contribute to a healthy diet (4,63). Furthermore, labelling on street foods is often missing, making it impossible for consumers to access information on the nutritional value of the products they consume (63).

Food safety issues are also common with street food due to lack of knowledge of hygiene but also due to missing access to good facilities to store or prepare food, as well as inadequate water and sanitation infrastructure. This can result in unhygienic environments and increase the risk for FBDs (45,63). Training on food safety and hygiene practices for street food vendors can help to improve food safety (63). For example, in India the Clean Street Food Hub Initiative (CSFHI) was set up to help street food vendors to comply with basic hygiene and sanitary requirements (65). In Pakistan, the Punjab Food Authority works on ensuring the safety and quality of all food items and products. Trained officials raise awareness and enforce food safety standards, resulting in greater compliance with food safety standards, higher rates of food businesses being licensed and more transparent communication to the public on food safety issues (66).

Concluding remarks

Urban food environments play an essential role in many people's daily food choices, and therefore strongly influence nutrition and health. With growing rates of overweight and obesity and NCDs in urban areas in LMICs, healthy food environments carry major potential to have a positive impact on nutrition and public health. As demonstrated by this factsheet, there are many opportunities for city governments to make policy interventions to improve food environments, such as better food safety, reducing children's exposure to marketing of unhealthy foods, and making healthy foods more available and affordable. To gain further insight into the most effective and efficient policy measures, more research on food environments, particularly in LMICs, is needed (3–5,63). This will help to better understand the effects of both the personal and external food environment components, support policy makers in the design of future policy and contribute to increased consumption of safe and nutritious diets and hence better nutrition and health.

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