Chapter 5

EVOLVING RURAL FOOD ENVIRONMENTS IN SOUTH ASIA

The Role of Processed Foods, Traditional Markets, and Marketing Influences

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KEY MESSAGES

- Food environments in South Asia are undergoing a rapid transformation, marked by the growing consumption of processed and ultra-processed foods – a trend largely driven by accelerated globalization and aggressive marketing strategies.
- Rural food environments in South Asia remain dominated by traditional, informal food outlets. Village retail shops primarily sell packaged foods and everyday household items, while open-air multivendor markets offer diverse fresh foods, including fruits, vegetables, fish, and meat, often at more affordable prices.
- Most villages have reasonable access to retail food shops, but accessing open-air markets often involves traveling longer distances, either within the village or to neighboring areas.
- Rural residents in South Asia are highly exposed to the promotion and advertising of unhealthy foods, particularly through mass media campaigns.
- Stronger policies and improved infrastructure are needed to foster healthier food environments. Key strategies include supporting local markets, regulating the promotion of unhealthy foods, and enhancing the presence of healthy food options in retail settings.

As low- and middle-income countries (LMICs) tackle the double burden of malnutrition — the simultaneous presence of undernutrition and overweight or obesity (Popkin et al. 2012; Popkin and Hawkes 2016) — food environments are receiving increased policy focus (Fanzo 2019). Food environments are the spaces in which individuals interact directly with the larger food system, and thus they significantly influence dietary habits (Turner et al. 2020). Their critical role has been emphasized in several international reports (HLPE-FSN 2018; FAO 2016), and food environment research has gained prominence in recent years in high-income countries (HICs) in response to increasing rates of overweight, obesity, and related noncommunicable diseases (NCDs) (Caspi et al. 2012; Gamba et al. 2014; Lytle and Sokol 2017). However, the number of studies on food environments in LMICs remains limited compared with those conducted in HICs.

Food environments in LMICs are viewed as more complex, with higher variability and dynamism than those in HICs. This complexity arises from rapidly changing sociocultural and economic conditions, seasonal fluctuations, and an increasing variety of food sources (Constantinides et al. 2021; Glanz 2009; Gómez and Ricketts 2013; Gupta et al. 2023). According to World Bank estimates, 64 percent of the South Asian population resides in rural areas and exhibits significant differences in food environments, dietary behaviors, and health outcomes compared with urban populations. In the following sections, we document the dynamics of rural food environments in South Asia using data from market surveys conducted in rural Bangladesh and India as part of the CGIAR Research Initiative on Transforming Agrifood Systems in South Asia (TAFSSA), as well as data from existing literature. We focus on the interplay between shifting consumption patterns, the continued presence and transformation of traditional markets, and the growing influence of food marketing. Chapter 4 of this report examines consumers' perceptions of various dimensions of their food environments and how these perceptions influence dietary patterns. This chapter complements that analysis by presenting findings from TAFSSA's comprehensive census of retail food environments and detailed survey of the sampled outlets, and then employs novel metrics to assess food availability and accessibility in these rural areas.

TRANSITIONS IN CONSUMPTION AND FOOD ENVIRONMENTS IN SOUTH ASIA

According to statistics from the Food and Agriculture Organization of the United Nations, the share of dietary energy derived from cereals, roots, and tubers declined in Asia in the past decade (2010–2022) (FAO 2024). At the same time, the average protein supply, particularly protein from animal sources, increased. However, the benefits of these dietary shifts are overshadowed by the increased consumption of processed and ultra-processed energy-dense foods. The current dietary patterns reflect this decline in traditional diets alongside a rise in the consumption of modern, Western-style diets (Pingali 2007; Park and Agarwala 2023). The intake of sugar, fat, and salt from processed foods and beverages has surged in both lower-middle-income and upper-middle-income countries in Asia, while this trend has plateaued in HICs (Baker and Friel 2014). Consumption of processed and ultra-processed foods (UPFs) is already common in South Asia (including in Bangladesh, Pakistan, Sri Lanka, and India). In a recent study, about 75 percent of the interviewed respondents in Bangladesh, Sri Lanka, and north India had consumed UPFs within the past 24 hours, while in south India and Pakistan, the proportion was about 40 percent (Bhagtani et al. 2024). The demand for these products is fueled by widespread advertising, promotional pricing, and various marketing strategies aimed at building consumer loyalty (Popkin and Ng 2022). Rural communities are affected by the surge in UPFs. As shown in India, consumption of high-carbohydrate and sugar-rich foods and drinks marketed in small packages at low prices has become pervasive in

rural communities (WHO 2023; Prakash 2015). This nutrition transition often results in increased incidence of obesity and diet-related NCDs, although undernutrition remains a primary problem in South Asia (TCI 2023; Fanzo 2019).

Globally, food environments in LMICs are experiencing rapid transformations, driven by constantly evolving sociocultural and economic factors (Gupta et al. 2023; Downs et al. 2020; Herforth and Ahmed 2015). Food systems are becoming more globalized, influenced by factors such as interconnected transnational food supply chains, urbanization, increased reliance on imports, demographic shifts, and a decline in traditional diets in favor of energy-dense, nutrient-poor foods (GLOPAN 2016). The value of packaged food in South Asia's retail markets has increased between 10- and 20-fold over the past two decades. India, for example, has witnessed a dramatic expansion in sales of UPFs, from US$0.9 billion in 2006 to $37.9 billion in 2019 (WHO 2023), and the country is now one of the world's top five markets for sugary beverages (Popkin et al. 2020).

Low prices, easy accessibility, and the long shelf life of those unhealthy foods are the main drivers of increased sales in South Asia. Food retail policies that would reduce the presence of unhealthy foods and beverages while enhancing access to healthier options at the retail level (Pineda et al. 2024) are either absent, such as in Bangladesh, or weak, as in India. The few existing policy measures, including taxation, that target unhealthy foods represent a modest yet meaningful step toward fostering healthier dietary habits in the region. For example, carbonated and sugary beverages, which are closely associated with NCDs, are subject to a "sin tax" in India, intended to discourage their consumption. These beverages are subject to the highest tax rate, at 40 percent (comprising a 28 percent Goods and Services Tax plus a 12 percent surcharge) (Government of India 2022). In another notable move, the Food Safety and Standards Authority of India imposed a ban on the sale of junk food within school premises and within a 50-meter radius of schools, aiming to curb unhealthy eating habits among children (FSSAI 2020); under the Food Safety and Standards Regulations of 2019 and the Eat Right Movement, the sale and promotion of prepackaged foods high in fat, salt, and sugar are prohibited in school canteens, mess halls, and hostel kitchens and during school events.

FOOD MARKETS IN RURAL SOUTH ASIA

The food supply and retail sector has undergone significant changes in LMICs, a shift that is strongly linked with urbanization. Large and formal retail establishments are more frequently found in or close to urban areas, whereas informal vendors and traditional outlets are more prevalent in rural regions. Large and formal vendors have yet to become a significant part of rural food environments (Kelly et al. 2014; Reardon and Hopkins 2006; Wertheim-Heck et al. 2015; Turner et al. 2020). The Indian retail market, for example, is still dominated by numerous small local grocery stores, which make up 93 percent of the food sales (USDA and GAIN 2024), although early predictions had anticipated that modern food retail would continue to develop in India over the next several decades, as in other developing countries (Reardon and Minten 2011). The growth in modern retailing can benefit overall health and the economies of LMICs but can have some drawbacks, especially for poorer households. Traditional vendors have the advantage of being inclusive of poor consumers, poor farmers, and poor traders (Narayanan 2007) and notably resilient during disruptions such as the COVID-19 pandemic (Narayanan and Saha 2021).

TAFSSA data show that rural regions of South Asia continue to be dominated by traditional informal outlets such as village local grocery stores, greengrocers, specialized shops, restaurants and tea shops, and open-air markets. Table 5.1 presents the classification and description of various types of food outlets in the region. Open-air multivendor markets are known for offering a diverse range of

TABLE 5.1 Types of food outlets and food items sold

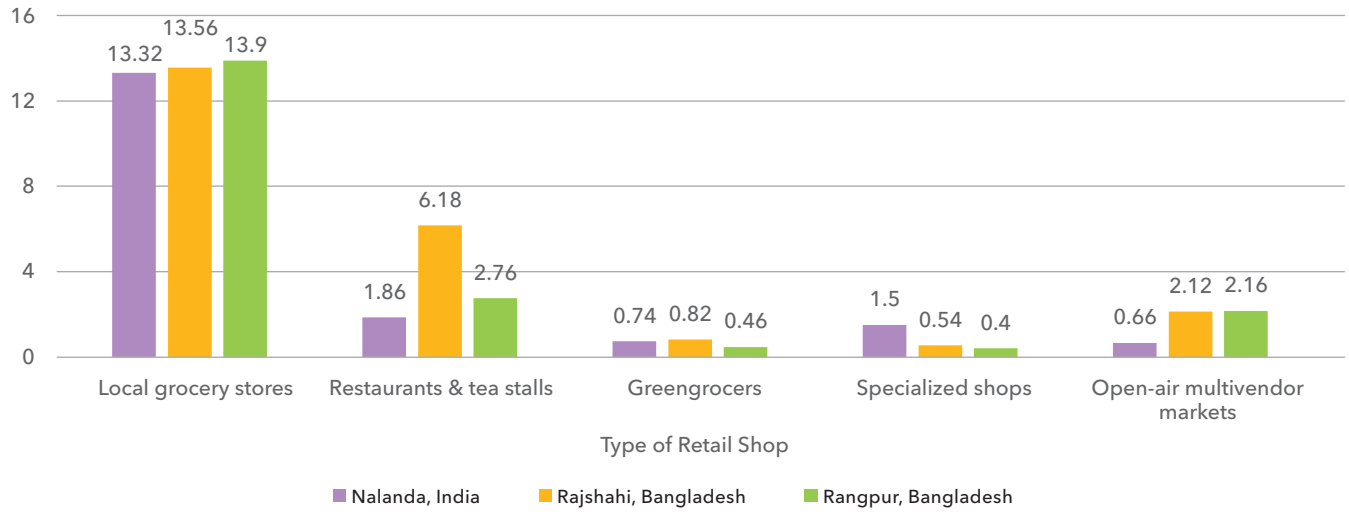
Retail shop type	Food items sold
Local grocery stores	A variety of food and nonfood items, including household staples, packaged and dry foods, and a limited selection of fresh produce
Restaurants and tea stalls	Prepared food items (usually snacks that can be quickly consumed) and tea and coffee
Greengrocers (vegetable/fruit shops)	Perishable food items, including fresh fruits, vegetables, roots, and tubers
Specialized shops	Meat, fish, or dairy products
Open-air multivendor markets	Fresh foods, such as fruits, vegetables, fish, and meat

Source: Authors' compilation.

fresh foods, such as fruits, vegetables, fish, and meat, at affordable prices. In contrast, village retail shops tend to offer a more limited selection of fresh food and prioritize selling packaged goods and everyday household items.

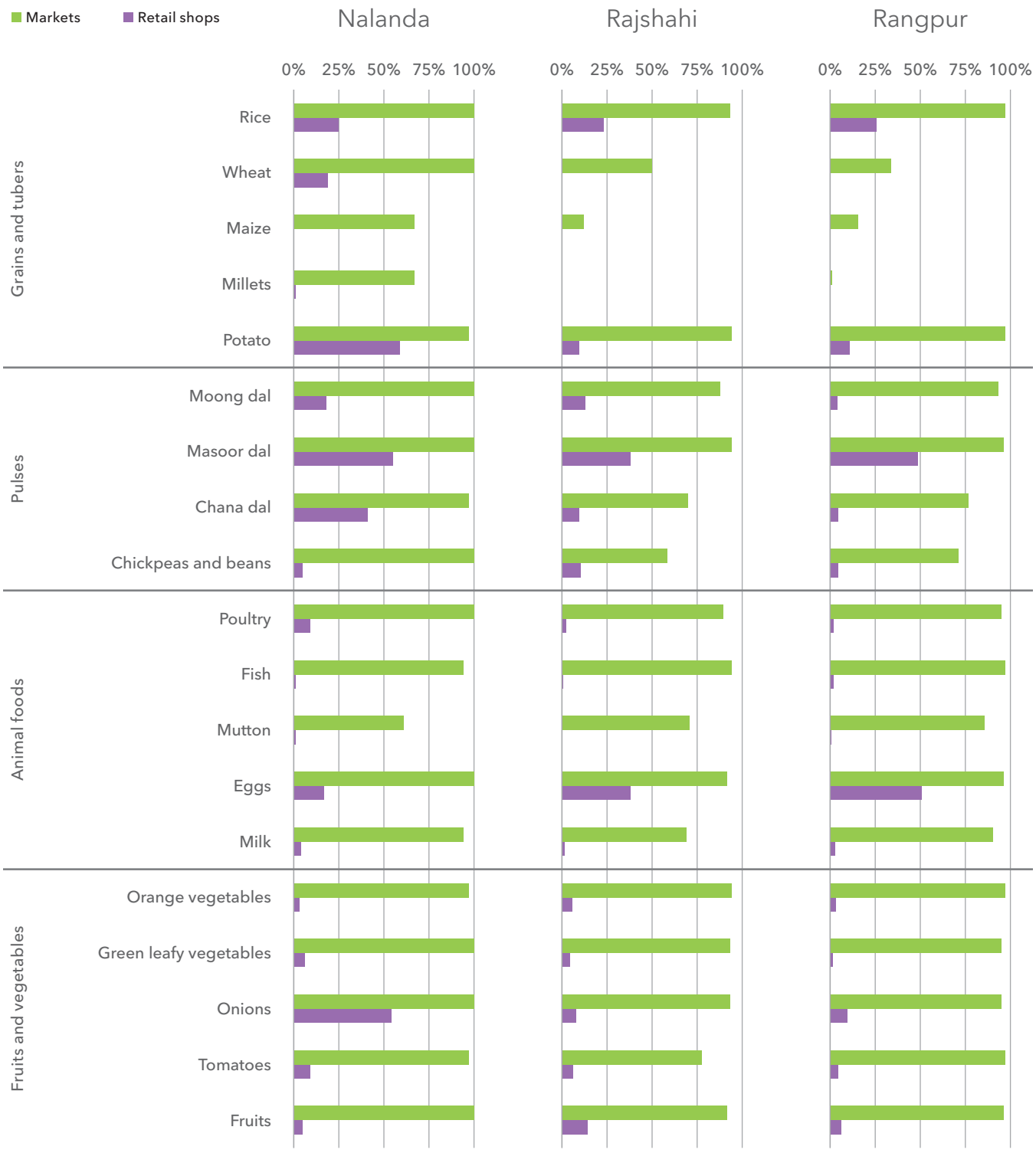
TAFSSA data were collected in Bangladesh (Rajshahi and Rangpur districts), India (Nalanda, in the northern state of Bihar), and Nepal (Banke and Surkhet districts) (Gupta et al. 2022). On average, the surveys found 19 retail food shops per village, with 8 shops serving 1,000 inhabitants on average. The Rajshahi district in Bangladesh had the highest density of food retail shops both per village and per 1,000 inhabitants. Local grocery shops, which offer both healthy and unhealthy food items, were the most common type of shop in all districts, accounting for more than two-thirds of all shops (Figure 5.1). They also made up the largest share of food retailers. Greengrocers and specialized shops that sell only healthy food items were rare, constituting less than 15 percent of the shops; there were fewer than one of these shops per village.

FIGURE 5.1 Number of shops of different types at the village level in each study district



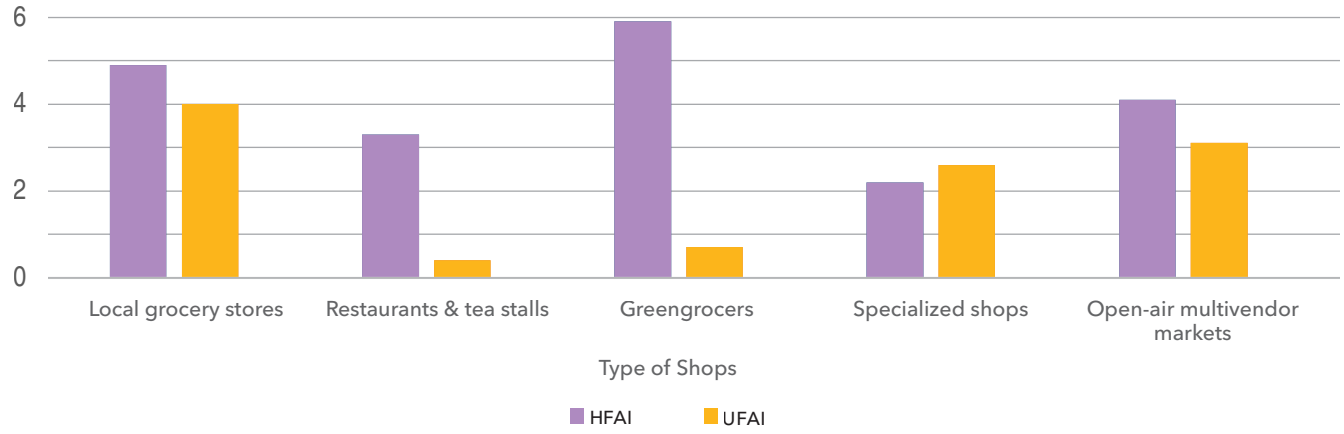
Source: Data from TAFSSA agrifood systems assessment.

FIGURE 5.2 Availability of food items in open-air markets and retail shops in Nalanda (India), Rajshahi (Bangladesh), and Rangpur (Bangladesh) districts



Source: Data from TAFSSA agrifood systems assessment.

FIGURE 5.3 Store-level healthy and unhealthy food availability indices, means across rural Bangladesh and India



Source: Data from TAFSSA agrifood systems assessment.

Note: HFIA = Health Food Availability Index; UFAI = Unhealthy Food Availability Index. See footnote 1 for explanation.

BOX 5.1 Association of food availability indices with village characteristics

Factors determining the Healthy Food Availability Index (HFAI) and Unhealthy Food Availability Index (UFAI) at the store level were assessed using a negative binomial regression model with data from the TAFSSA retail food market census. A positive and significant correlation was observed between HFAI and UFAI; hence their direction of association with the other village characteristics remains consistent in both cases. The density of retail shops has a negative association with the availability of both healthy food and unhealthy food. However, as the distance to the nearest town increases, the HFAI decreases but UFAI does not. As anticipated, the availability of both healthy and unhealthy foods was related to shop type. Large shops selling more than 50 items have greater availability of both healthy and unhealthy foods compared with small shops, but the impact of shop size is greater for healthy foods.

Source: Unpublished International Rice Research Institute research findings.

Where greengrocers were easily accessible to consumers, these shops were the primary source for healthy and perishable food items. However, prices for healthier food items were lower in open-air food markets than in these retail shops. On average, in each village in the Nalanda district, India, one multivendor market was within a 10 km radius, whereas in the Bangladesh villages surveyed, two multivendor markets were within the same radius.

Altogether, the retail food environment in the study districts was characterized by the presence of several small retailers, with more than 80 percent of these retail shops selling fewer than 50 different food items. The food landscape was mostly informal, with more than 80 percent of markets lacking a management structure and retail shops operating without a license. Retail shops were predominantly owned by men in the study locations. Most multivendor markets operated as open-air or portable units, whereas retail shops were typically housed in permanent structures. A sizable portion of markets exhibited some structural damage, in contrast to only about half of the

retail shops, which were in better physical condition. Compared with retail shops, markets tended to have better road connectivity and more amenities, such as water connections, sewage systems, waste collection areas, and toilets.

While more market vendors than retailers reported food spoilage, the percentage of products spoiled was higher in retail shops than in markets. As expected, vegetables, leafy green vegetables, and fruits had the highest spoilage rates, reported by 60 to 70 percent of vendors. This information was collected by asking vendors whether they had observed spoilage in different categories of food items and what the typical percentage of spoilage was in each category. Open drainage and garbage dumps near the shops were reported by more than 20 percent of retailers. Foods with unpleasant smells or visible signs of damage or rodents were other hygiene concerns observed in the food outlets.

AVAILABILITY AND ACCESSIBILITY OF FOOD IN RURAL SOUTH ASIA

TAFSSA data show that the availability of food items, particularly healthy foods, was greater in multivendor markets (located farther from villages) compared with retail shops (located nearby). In Indian retail shops, potatoes were the most common item available from the grains and tubers category (Figure 5.2), while in Bangladesh, rice was the most common item. In the pulse category, masoor dal was the most commonly available item in retail shops. Retail shops had a higher availability of unhealthy foods compared to multivendor markets. More than 50 percent of village retail shops sold UPFs at low prices, with biscuits and sweets the most widely available unhealthy items in the retail shops of all the districts (sold by more than 80 percent).

The Healthy Food Availability Index (HFAI) (range 0–28) and Unhealthy Food Availability Index (UFAI) (range 0–8) are used to measure the quantity and variety of these food items available at the store or market level.[1] In general, the HFAI was found to be high for multivendor markets in India and Bangladesh, with mean scores of 25 and 21, respectively. Data on the availability of unhealthy food options were not collected for open-air multivendor markets. The average HFAI score of retail shops (4.9) was at the bottom of the range, whereas the UFAI scores were much higher in relation to their potential maximum (4.0) (Figure 5.3). There was substantial evidence of variations in overall healthfulness of foods offered depending on the type of retail store, with greengrocers offering the highest quantity of healthy foods and local grocery shops providing the highest number of unhealthy foods. Greater availability of healthy foods was correlated with the greater availability of unhealthy foods, indicating that the presence of healthy options may be counterbalanced by the availability of unhealthy ones, especially in local grocery stores (Box 5.1). Food outlets such as restaurants and tea stalls sell both healthy and unhealthy food items. In restaurants, legumes and fruits were the most available items from the healthy food categories.

Factors determining the HFAI and UFAI at the store level were assessed using a negative binomial regression model with data from the TAFSSA retail food market census. A positive and significant correlation was observed between HFAI and UFAI; hence their direction of association with the other village characteristics remains consistent in both cases. The density of retail shops has a negative association with the availability of both healthy food and unhealthy food. However, as the distance to the nearest town increases, the HFAI decreases but UFAI

1 The HFAI was initially adapted and implemented by Franco et al. (2008) and was further modified in this study to align with the food categories relevant to our analysis. The HFAI measures the availability of healthy foods within stores, with a higher score indicating greater availability. The score is obtained by adding +1 for the availability of each healthy food category and an additional +1 score if more than three varieties are available within that healthy food category. The UFAI measures the availability of the unhealthy foods within stores, with a higher score indicating greater availability. This score is obtained by adding +1 for availability of each unhealthy category and an additional +1 score if more than three varieties are available within that unhealthy food category.

does not. As anticipated, the availability of both healthy and unhealthy foods was related to shop type. Large shops selling more than 50 items have greater availability of both healthy and unhealthy foods compared with small shops, but the impact of shop size is greater for healthy foods.

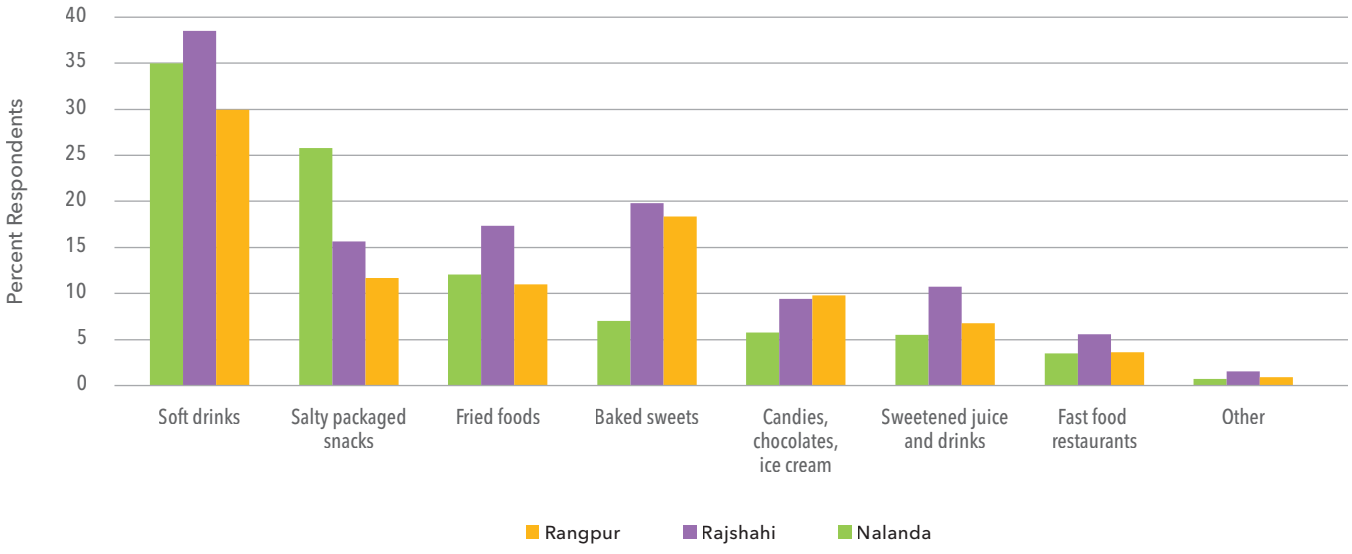
GEOGRAPHIC ACCESS TO FOOD SOURCES

In food environment research, accessibility is frequently proxied using the geographic distance consumers must travel to reach food outlets (Yenerall et al. 2017). Easy access to affordable, fresh, and high-quality food can significantly improve dietary habits (Ball et al. 2015; Rahmanian et al. 2014), and proximity to local wet (fresh food) markets has been shown to have a positive association with dietary diversity (Liu et al. 2014; Duran et al. 2016).For rural households in the Nalanda district, India, the average distance to the nearest open-air markets, where they can shop for fresh produce at affordable prices, was 4.07 km (SD = 2.18). For these households, food outlets selling both healthy and unhealthy foods, such as local grocery stores, were located much closer; on average, households in Nalanda were 300 meters from the nearest food retail shop, and only a small proportion of villages in the district had poor access (16 percent) or limited access (6 percent) to retail shops. In contrast, in Bangladesh, retail shops were located farther from the surveyed households, at an average distance of 1,000 meters, mostly on the village periphery, meaning most households had limited or poor access to village retail shops. However, open-air markets in Bangladesh were situated at shorter distances, averaging 2.95 km from dwellings, compared with 4.07 km in India.

ROLE OF MARKETING AND PROMOTION OF FOOD ITEMS

Marketing and advertisements are pivotal segments of consumers' food environments. Globally, food marketing has primarily promoted the consumption

FIGURE 5.4 Percentage who saw/heard any advertisement for different unhealthy foods or packaged drinks in the past 30 days



Source: Data from TAFSSA agrifood systems assessment.

of UPFs and sugary beverages (Carins and Rundle-Thiele 2014). While common characteristics of UPFs can contribute to overconsumption — including their convenience, intense flavors that make them highly appealing, and potentially addictive nature for some individuals — the ubiquity of mass marketing and aggressive, often child-focused marketing strategies, coupled with increased disposable income, have certainly contributed to the transformation of dietary patterns (Hebebrand and Gearhardt 2021; Filgueiras et al. 2019; Backholer et al. 2021; Popkin et al. 2012; Popkin 2004). In Asia, however, the nature and prevalence of food marketing are not well-documented.

To help address this knowledge gap, the TAFSSA surveys collected data on whether and where people encountered food advertisements. Mass media was reported to be the main source of advertisements for unhealthy food (Figure 4.4 of Chapter 4), with media advertisements for soft drinks, among all unhealthy food categories, the most commonly seen or heard in all the districts (Figure 5.4). Although very few village retailers displayed promotional messages for food items in or around their shops, those that did were primarily promoting unhealthy food brands. In addition, unhealthy foods were displayed to ensure very high visibility within village retail shops. Moreover, policies concerning food promotion and marketing were reported to be weak across South Asia (Pineda et al. 2024). All of these marketing aspects act together to expand the consumption of unhealthy foods in rural settings.

RESEARCH AND POLICY RECOMMENDATIONS

Food environments and food consumption patterns are transforming in South Asia. Rapid urbanization and aggressive marketing have expanded sales of energy-dense and sugar-rich processed foods throughout the region. To address this issue, policymakers should regulate the marketing of UPFs, particularly to children, and enforce clear front-of-package labeling so consumers can make informed food choices (see also Chapter 4). Traditional markets provide access to a wider range of fresh, healthy items but are geographically sparse and thus often inaccessible for daily use. Strengthening these markets through vendor support and promoting local food systems can help maintain diverse, affordable options, but efforts are also needed to improve rural infrastructure and to establish and manage multivendor open-air markets that can ensure efficient and continuous access to fresh, nutritious foods. In sum, policies should be put in place to increase the availability of healthy foods and simultaneously reduce the prominence and presence of unhealthy foods that contribute to disease.

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