

# Support for Applied Research and Analysis in Kenya and East Africa Region (SARA-KEA)

Policy Research Brief 4

October 2024

## Food environments and diet quality: Insights from urban and peri-urban Nairobi and Kisumu

Mywish K. Maredia<sup>a</sup>, Timothy Njagib<sup>b</sup>, David Tschirley<sup>a</sup>, Ayala Wineman<sup>a</sup>, Aisha Sophia Otwoma<sup>d</sup>, Nahian Bin Khaled<sup>a</sup>, Ian Fisher<sup>a</sup>, Lilian Kirimib<sup>b</sup>, Thomas Reardon<sup>a</sup>, Hillary Bii<sup>b</sup>, Michael Asiagob<sup>b</sup>, and Semeni Ngozi<sup>c</sup>

### INTRODUCTION

The nutrition transition sweeping across Sub-Saharan Africa marks a significant shift in dietary patterns, with far-reaching implications for public health. As African populations increasingly move away from traditional, minimally processed foods to those high in sugars, unhealthy fats, and salt, the prevalence of diet-related non-communicable diseases (NCDs) like obesity, diabetes, and heart disease is rising (Rousham et al., 2020; Laar et al., 2022), even as under-nutrition remains high. Driven by urbanization, economic growth, and industrialization, this shift has transformed food environments, increasing reliance on fast foods and convenience snacks over home-cooked meals (Popkin, Adair, & Ng, 2012; Glatzel et al. 2024). In Kenya, urban centers such as Nairobi and Kisumu exemplify this trend, mirroring broader global dietary changes.

Food environments—the physical, economic, and sociocultural settings that influence dietary behaviors—are increasingly recognized as critical determinants of diet quality and health outcomes (Glanz et al., 2005). Emerging research suggests that the characteristics of neighborhood food environments, such as the density of food outlets, the diversity of available foods, and pricing structures, play a critical role in shaping dietary behaviors and subsequent health outcomes (Cooksey-Stowers et al., 2017; Turner et al., 2020).

The connection between food environments and dietary patterns is particularly relevant in rapidly urbanizing areas. In this context, this study focuses on urban and peri-urban Nairobi and Kisumu, aiming to provide insights into (1) consumer food choices and their impact on diet quality, (2) neighborhood food environment characteristics, and (3) the relationship between food environments and diet quality. By examining evolving, understudied food environments in low- and middle-income settings, this paper seeks to offer actionable insights for policymakers. Interventions that enhance access to nutritious foods, especially in economically disadvantaged areas, are essential to address the dual burden of malnutrition in Kenya's urban centers.

### Key Findings

- **High Reliance on Unhealthy Out-of-Home Foods:** Out-of-home foods account for 22% of daily calories, and this value is higher for men, higher-income groups, and commuters.
- **Limited Dietary Diversity with High Consumption of Unhealthy Foods:** Diets are grain-heavy with low fruit and vegetable variety, while refined grains, high-fat dairy, and sugary foods are widely consumed, raising the risk of diet-related non-communicable disease.
- **Inequitable Food Environments:** Unhealthy foods dominate shelf space, especially in poorer and peri-urban areas. Reducing this imbalance could improve diet quality in vulnerable regions.
- **Higher Cost of Healthy Foods:** Healthy foods are more expensive per gram, particularly in peri-urban and high-poverty areas, limiting access for low-income households.
- **Influence of Food Environments on Diet Quality:** Home food environments and daily variation in food environment quality strongly impact diet quality, indicating a need for policies to enhance healthy food access across settings.

### Recommendation

- **Enhance Food Environments in Economically Challenged Areas:** Policies should expand access to healthy foods, reduce unhealthy options, and integrate these improvements into urban planning to ensure nutritious choices are available at home, work, and along commuting routes.



## DATA AND METHOD

In 2022, we conducted household surveys using multi-stage stratified sampling to obtain a representative sample of 1,507 households from urban and peri-urban Nairobi and Kisumu. This dataset includes novel features like collecting consumption data at individual level, interviewing multiple individuals per household to capture intra-household variation, and systematically recording both meals and snacks consumed at home and outside, providing a comprehensive view of dietary habits.

We used the Global Diet Quality Score (GDQS) to measure diet quality, a metric that considers nutrient adequacy and dietary risk factors for non-communicable diseases. The GDQS assigns points based on grams consumed across 25 food categories: higher consumption of healthy foods earns more points, while for unhealthy foods, points decrease with greater intake. Foods unhealthy only in excess receive points up to a threshold, then decrease with further consumption.

We collected data on food availability around participants' homes and frequently visited locations, defining each food environment as a 0.4 km radius around these areas in Nairobi and urban Kisumu, and 0.6 km radius in peri-urban Kisumu. We conducted a census of food outlets within each environment, documenting offerings by GDQS food categories. For a sample of non-prepared food outlets, we also measured shelf space by category to assess the availability of healthy versus unhealthy options.

To understand the relationship between food environment and diet quality, we use regression analysis.

## RESULTS

**Food choices and diet quality:** Our analysis of food choices and diet quality highlights several significant patterns. First, on average, 22% of daily calories come from the out-of-home food economy, with greater reliance among men, higher-income individuals, and commuters. This dependence heightens diet-related health risks, highlighting the need for healthier out-of-home options. Second, diets show limited diversity, mostly centered on grains. Dark green leafy vegetables are common, but orange-fleshed fruits and vegetables are rarely eaten. Refined grains, high-fat dairy, sweets (53.3g), and deep-fried foods (47.3g) are heavily consumed, with sugared tea adding to sugar intake. Third, the Global Diet Quality Score indicates 11% of adults are at high risk and 82% at moderate risk for diet-related NCDs. Risk varies by demographics, with wealthier non-commuters more likely at high risk. Urban residents in Nairobi and Kisumu also show higher risk profiles than those in peri-urban areas. Finally, our findings show a positive link between age and diet quality: older adults have healthier

eating habits, while younger individuals consume more unhealthy foods. These age-related patterns, along with insights into dietary diversity and out-of-home consumption, can guide targeted interventions to improve diet quality in Kenya.

**Characteristics of food environments:** The food environment data reveals several critical insights into the availability and distribution of healthy and unhealthy foods. Unhealthy foods consistently occupy more shelf space than healthy options across all types of food environments, including poorer and wealthier areas, as well as urban and peri-urban settings. In absolute terms, total shelf space for both healthy and unhealthy foods is highest in urban Nairobi, indicating greater food availability but still skewed toward unhealthy choices. Notably, shelf space for unhealthy foods is more extensive in high-poverty areas and in peri-urban settings compared to urban ones. Additionally, healthy foods are more expensive per gram than unhealthy foods, especially in peri-urban Nairobi and higher-poverty areas. Overall, the data shows variability in food environments based on quantity, shelf space, and price of healthy versus unhealthy foods. Nevertheless, consistent trends emerge: all areas prioritize shelf space for unhealthy foods over healthy ones, and healthy foods tend to cost more.

**Relationship between food environments and diet quality:** Our findings indicate a significant relationship between the quality of the home food environment and diet quality, showing that healthier home environments positively impact dietary outcomes. Additionally, we found that certain factors, such as gender, mediate this relationship, suggesting that dietary impacts from the home environment vary across demographic groups. Lastly, the analysis reveals that the quality of the food environments individuals encounter each day—based on where they spend their time—contributes to daily variations in diet quality, underscoring the influence of multiple food environments on dietary choices.

## CONCLUSION AND IMPLICATIONS

Our study emphasizes the urgent need for policies aimed at enhancing food environments, particularly in economically challenged areas. Essential actions include expanding access to healthy food options, limiting the availability of unhealthy choices, and incorporating these improvements into urban planning to boost both accessibility and affordability. Moreover, policies should ensure that nutritious food options are readily available not only at home but also along major commuting routes, workplaces, and schools, supporting healthier choices wherever people spend their time.

## REFERENCES

Cooksey-Stowers, K., M.B. Schwartz, and K.D. Brownell. 2017. "Food swamps predict obesity rates better than food deserts in the United States." *International Journal of Environmental Research and Public Health* 14(11).

Glanz, K., J.F. Sallis, B.E. Saelens, and L.D. Frank. 2005. "Healthy nutrition environments: Concepts and measures." *American Journal of Health Promotion* 19(5):330-333.

Glatzel, Katrin; Ameye, Hannah; Hülsen, Vivien; Qaim, Martin. 2024: Changing food environments in Africa's urban and peri-urban areas: Implications for diets, nutrition, and policy, ZEF Working Paper Series, No. 235, University of Bonn, Center for Development Research (ZEF), Bonn

Laar, A.K., P. Addo, R. Aryeetey, C. Agyemang, F. Zotor, G. Asiki, et al. 2022. "Perspective: Food environment research priorities for Africa: Lessons from the Africa Food Environment Research Network." *Advances in Nutrition* 13(3):739–747.

Popkin, B.M., L.S. Adair, and S.W. Ng. 2012. "Global nutrition transition and the pandemic of obesity in developing countries." *Nutrition Reviews* 70(1):3–21.

Rousham, E.K., R. Pradeilles, R. Akparibo, R. Aryeetey, K. Bash, A. Booth, S.K. Muthuri, H. Osei-Kwasi, C.M. Marr, T. Norris, and M. Holdsworth. 2020. "Dietary behaviours in the context of nutrition transition: A systematic review and meta-analyses in two African countries." *Public Health Nutrition* 23(11):1948–1964.

Turner, C., S. Kalamatianou, A. Drewnowski, B. Kulkarni, S. Kinra, and S. Kadiyala. 2020. "Food environment research in low- and middle-income countries: A systematic scoping review." *Advances in Nutrition* 11(2):387–397.

**Author affiliations:**

<sup>a</sup> Michigan State University; <sup>b</sup> Tegemeo Institute of Agricultural Policy and Development; <sup>c</sup> University of Dar-es-Salaam; <sup>d</sup> Independent consultant

\* Corresponding author: Professor, Michigan State University (Email: maredia@msu.edu)

**Acknowledgements:** Research for this study was co-sponsored by the SARA-KEA project and the Nutrition Center of USAID through the Feed the Future Innovation Lab for Food Security Policy, Capacity, and Influence (PRCI).

The SARA-KEA activity is funded through a Participating Agency Service Agreement between USAID/KEA and the U.S. Department of Agriculture, Foreign Agriculture Service, Office of Global Programs (grant #: FX22TA-10960R002). It is implemented by a Michigan State University (MSU)-led consortium that includes the Tegemeo Institute of Agricultural Policy and Development at Egerton and Purdue University. The contents are the responsibility of the study authors and do not necessarily reflect the views of USAID, USDA, or the United States Government.