

REVIEW ARTICLE

Urban-Rural Disparities in Food Insecurity and Nutritional Health: A Narrative Review

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ABSTRACT

Food insecurity affects an estimated 2.33 billion people, with a stark disparity between rural and urban populations. This review synthesizes the distinct drivers and health outcomes of this divide, a comparison made more urgent by recent climate and economic shocks. Rural food insecurity is primarily driven by climate vulnerability and agricultural dependency, often leading to undernutrition. Conversely, urban insecurity stems from market dependency and income instability, promoting a reliance on ultra-processed foods that contributes to rising obesity. This urban-rural dichotomy creates a global triple burden of malnutrition. Addressing this requires moving beyond siloed policies toward an integrated financial and systemic approach. Mobilizing investment to strengthen food supply chains and build resilience is essential for achieving equitable access to nutritious food.

INTRODUCTION

According to the Food and Agriculture Organization of the United Nations, food insecurity occurs when not everyone has regular physical, social, and economic access to sufficient, safe, and nutritious food at all times that meets daily dietary requirements for optimal growth and healthy life. This exists on a continuum, ranging from food secure with sufficient nutritious food attainability to mild uncertainty of future food access,

following moderate situations where quality and quantity of food are compromised by reduction in consumption and severe conditions where food is completely unavailable. The determinants of food security and nutritional health are interconnected between food availability, access, utilization, and stability. They affect food consumption, alongside broader aspects of health services, environmental factors, and lifestyle behaviour, which influence nutritional intake and health status (FAO, IFAD, UNICEF, WFP and WHO, 2024).

This review aims to provide a synthesis of the prevalence, determinants, and nutritional health consequences of food insecurity within both urban and rural contexts. This comparison is particularly critical in the post-pandemic era, where economic shocks, supply chain disruptions, and climate pressures have simultaneously stressed urban market dependencies and rural agricultural stability in new, distinct ways that must be understood to create effective policy.

Prevalence of Food Insecurity

Globally, the World Health Organization reported that 2.33 billion people encountered food insecurity in 2023. As detailed in Table 1, a clear urban-rural divide exists. Worldwide, 31.9% of the rural population faced food insecurity compared to 25.5% of the urban population.

This trend is most pronounced in

developing regions. Africa shows the highest prevalence, with 60.2% of rural insecurity and 54.3% of urban levels. Similarly, in Latin America and the Caribbean, 32.2% of rural inhabitants were food insecure, compared to 26.0% in urban areas. Asian countries followed this pattern, with rural insecurity at 26.5% and urban at 21.6%.

Conversely, in more developed regions, this gap narrows or reverses. In Northern America and Oceania, urban food insecurity was slightly higher than rural rates. Europe showed the lowest overall prevalence, with near-equal rates of 8.6% in both areas, though severity differed slightly. Alarmingly, across low- and lower-middle-income countries, three-quarters of people were unable to afford a healthy diet (FAO, IFAD, UNICEF, WFP and WHO, 2024).

Determinants of Food Insecurity

Rural Determinants

In rural areas, where agricultural activity is the main food source, economic dependency, infrastructure adequacy, and climate change influence food accessibility.

Notably, economic exclusion is the major determinant of food insecurity, as evidenced by ongoing poverty and reliance on subsistence farming. In Africa, half of the population lives below the poverty line and is compromised by armed conflicts that disrupt rural food systems (Delgado et al., 2023). Poverty was also prominent in Central

Table 1: Prevalence of Food Insecurity by Urbanization and Region in 2023

Region	Rural Prevalence (Total)	Rural (Moderate / Severe)	Urban Prevalence (Total)	Urban (Moderate / Severe)	Key Trend
Global	31.9%	20.6% / 11.3%	25.5%	16.5% / 9.0%	Rural (Higher)
Africa	60.2%	37.3% / 22.9%	54.3%	34.4% / 19.9%	Rural (Higher)
Latin America & Caribbean	32.2%	21.3% / 10.9%	26.0%	18.4% / 7.6%	Rural (Higher)
Asia	26.5%	17.4% / 9.2%	21.6%	13.5% / 8.1%	Rural (Higher)
Oceania	15.3%	10.2% / 5.1%	15.8%	11.1% / 4.7%	Urban (Higher)
Northern America	8.3%	7.4% / 0.9%	11.8%	10.6% / 1.2%	Urban (Higher)
Europe	8.6%	6.4% / 2.2%	8.6%	6.8% / 1.8%	Similar

American populations that rely heavily on low-yield subsistence farming. Similarly, 89% of Romanian farms in Europe were categorized as subsistence agriculture with a low value of production, further intensifying low purchasing power for the affordability of a sufficient diet (Paștiu et al., 2023). Economic dependency on agriculture was aggravated by land degradation in 70% of poor rural Southeast Asian countries, which diminished productivity (Sundram, 2023), leading to food insecurity in 81.2% to 88% of Malaysia’s rural Indigenous households (Sulaiman et al., 2021). In the developed region, 33.9% of rural unemployment rates in Northern America had led to financial insecurities, which prioritize household commitment rather than food costs (Byker Shanks et al., 2022).

Infrastructure shortcomings such as limited arable land, insufficient implementation of agricultural technologies, and inadequate utilities or roadway networks also hinder access to nutritious food. Agricultural productivity was limited in Africa, whereby only minority of Ethiopian farmers utilized improved seed. Geographic isolation in some rural areas in Northern America was designated as food

deserts due to the far location of grocery stores, alongside a lack of dependable vehicle access to acquiring food (McCormack et al., 2021). Transportation barriers were also prominent in Asia, in which inadequate road infrastructure and lack of transport options in Malaysia had obstructed access to food items and thereby limited dietary diversity in rural communities (Sulaiman et al., 2021).

Furthermore, climate fluctuation has further jeopardized food production. Due to extreme weather events such as drought, floods, and storms, 84% of crop production was decreased in Oceania (Pickering et al., 2023), and 15% of agricultural productivity was threatened in Europe (Motta et al., 2025). Similarly, up to 31% of rural regions in Asia faced a reduction in rice yield due to vulnerability to climate change (Sundram, 2023), coupled with inadequate water sources and poor road networks, particularly in Sabah and Kelantan, Malaysia (Mahmood et al., 2022).

Urban Determinants

In urban settings, market dependency, income stability, and infrastructure challenges were the key factors of food insecurity.

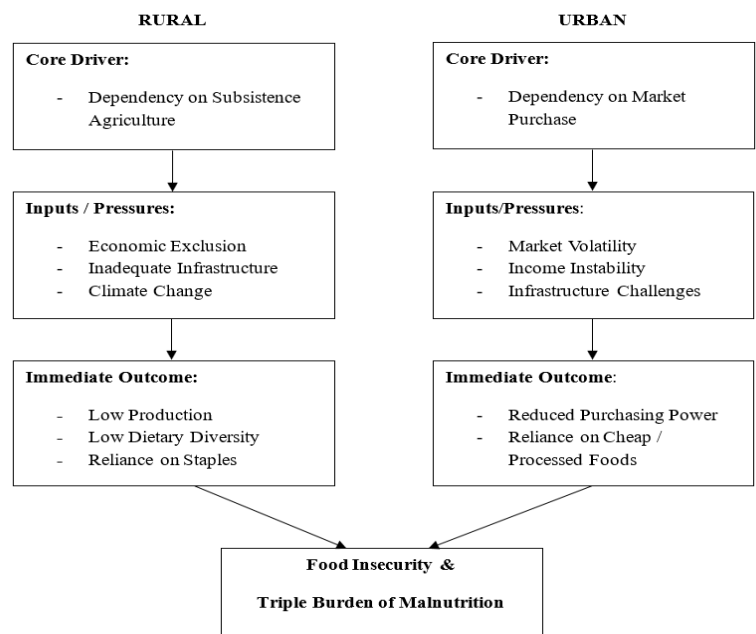


Figure 1: Conceptual Framework of Urban vs. Rural Food Insecurity Determinants

The urban communities were highly dependent on market-purchased and processed foods, which heightened the risk of price fluctuations. As seen during the COVID-19 pandemic, dependence on imported goods in many countries makes urban populations vulnerable to global supply chain disruptions. Urbanization also led to the reduction of agricultural land, thereby intensifying urban dependence on imported foods in Malaysia, which further obscured access to fresh and nutritious options. Students in the Pacific Island of Oceania were equally affected, as they were increasingly exposed to ultra-processed food as it was available in the convenience stores along the way to the school (Burkhart et al., 2025).

Income instability remains the main root of urban food insecurity, in which 70% of urban communities' expenditure is on food, making them vulnerable to rising food prices (Macalou et al., 2023). Research shows that unemployment increases the odds of food insecurity by 1.33 (95% CI: 1.19-1.48) in urban Latin American and Caribbean communities (Novoa-Sanzana et al., 2024). Decline in food access was also pronounced in Africa due to food price inflation, high unemployment rates, and increased numbers of household members to breadwinner ratios (Nenguda & Scholes, 2022). Cheaper, less nutritious foods were opted for in the majority of poor urban countries in Southeast Asia because of the need to prioritize allocation of earnings to food. Even in developed regions like Europe, there was an increased proportion of urban households that were unable to afford a proper meal with meat or vegetables in 2021 compared to 2019 (Pawlak et al., 2024). Furthermore, the restriction during the pandemic led to economic instability through the disruption of the food supply chain and reduced workforce, and this increases the risk of unavailability and unaffordability of healthy food options in a developed country like America (Kibe et al., 2023).

This is further worsened by infrastructure challenges that exacerbate food access issues, for example, systemic inequalities of housing, water, and transportation in marginalized communities. Majority of the urban poor population in Sub-Saharan Africa reside in overcrowded settlements with limited access to basic social needs, including access to nutritious food. Impoverished urban residents in Northern America were also struggling with distant access to fresh food markets that have an affordable assortment of products, resulting in increased dependence on processed foods in convenience stores. In Asia, 25% of a low-income urban neighbourhood in Kuwait were food deserts, as they lacked access to fresh food (Islam et al., 2025).

Conceptual Framework of Food Insecurity Determinants

This conceptual framework illustrates the dual pathways of food insecurity (Figure 1). The rural model is defined by a dependency on subsistence agriculture, which is undermined by climate change, poor infrastructure, and economic exclusion, ultimately leading to low production and a reliance on nutrient-poor staples. In contrast, the urban model hinges on market dependency, which is destabilized by income instability, volatile food prices, and infrastructure challenges like food deserts, resulting in reduced purchasing power and a reliance on cheap, processed foods. Despite their different origins, both the rural and urban pathways converge on the same critical outcome: food insecurity and the triple burden of malnutrition.

Influence of Food Insecurity on Dietary Pattern

As the rural population's main economic source is from agricultural activity, particularly grains, the communities heavily rely on staple foods such as rice, cereals, and maize (FAO, IFAD, UNICEF, WFP and WHO, 2020). Maize, for instance, makes up a staggering 70% of the caloric intake in Southern Africa (Cairns et al., 2021). The dependency on energy-rich

yet nutrient-poor staples, especially in Asian countries, aggravates the lack of dietary diversity in fruits, vegetables, meat, poultry, and other food groups, leading to micronutrient deficiencies (FAO, IFAD, UNICEF, WFP and WHO, 2023). Southeast Asian countries like the Philippines have 59% insufficient fruit and vegetable intake, whereas the indigenous child-hunger group in Malaysia consumes less meat and poultry (Pei et al., 2018). Merely 12.5% of children in Ethiopia met the minimum dietary diversification (Sisay et al., 2022). Traditional rural dietary patterns in developed regions also comprise fewer vegetables and meats, as observed in Romania (Paștiu et al., 2023), where 30 to 90% of children in Europe did not consume fruits and vegetables (Heinen et al., 2021).

Recently, urban populations worldwide have experienced a significant transition toward diets that are primarily composed of processed or ultra-processed foods, for example, bread, cheese, sugar, cereals, and other prepacked ready-made meals. This is particularly prominent in developed countries, where a study revealed a range of 18 to 68% of preschool children and adolescents in North America, Latin America, Oceania, and Europe consumed ultra-processed food, which is associated with an increase in energy density and sugar but a reduction in fiber (Neri et al., 2022). In Malaysia, due to time constraints in busy daily routine schedules, the population prefers to consume ultra-processed food, which accounted for 38.6% of total calories (Ali et al., 2024), and shockingly, 96.4% of urban adolescents were found to be consuming sugar-sweetened beverages on a daily basis (Salleh et al., 2021). This dietary transition is not merely preference; it is driven by the economic realities of urban life, where the convenience, low cost, and long shelf-life of ultra-processed foods are prioritized by time-poor and low-income households, often in environments lacking access to fresh alternatives.

Impact of Food Insecurity on

Nutritional Health Outcome

As a result of the unhealthy dietary pattern due to food insecurity, the triple burden of malnutrition was prominent globally across all age groups, including undernutrition (stunting and wasting), overnutrition (overweight and obesity), and micronutrient deficiencies, as well as other diet-related non-communicable diseases. In 2022, the global prevalence of stunting was 22.3% among children under five years of age (FAO, IFAD, UNICEF, WFP and WHO, 2024). Due to insufficient protein-energy nutrients and micronutrient deficiencies in zinc, iron, iodine, and vitamin A, particularly in the staple-dependent rural population, stunting prevalence (35.8%) was 1.6 times higher than in the urban population (22.4%). As shown in Table 2, this pattern of higher rural undernutrition is consistent across stunting, wasting, and anemia.

Limited dietary diversity with micronutrient deficiencies such as iron, folate, vitamin B12, and vitamin C led to anemia, common among the rural population, especially women aged 15 to 49 years old. Data in 2019 demonstrated that 29.9% of women aged 15 to 49 years old were affected by anemia worldwide (FAO, IFAD, UNICEF, WFP and WHO, 2024). In Africa, anemia was higher among the rural population (46.6%) compared to urban residents (20.1%), and being female increases the odds of anemia (Tesfaye et al., 2020). In Indonesia, anemia affected 32% of the rural population, and there was a significant association between household food insecurity and anemia among pregnant women (Mahmudiono et al., 2022).

Conversely, Table 2 also highlights that overnutrition disproportionately affects urban areas. In urban settings, the overconsumption of processed and ultra-processed food, especially sugars, fats, and carbohydrates, had elevated macronutrient calories, thereby increasing the urban children's overweight prevalence (5.4%),

higher than the rural population (3.5%). Urban children in Latin America and the Caribbean (9.1%) and Asia (5.3%) also encountered overweight problems (FAO, IFAD, UNICEF, WFP and WHO, 2023). In adults, the prevalence of obesity had increased to 15.8% in 2022 due to the rising intake of processed foods and a lack of physical activity (FAO, IFAD, UNICEF, WFP and WHO, 2024). Poverty, which triggers unhealthy diet consumption of highly dense processed food that is high in saturated fats, sugars, and sodium among low- and middle-income countries, particularly in Africa and Latin America, has resulted in the highest rate of obesity in the regions. By 2030, one in seven men and one in five women will be obese (Carvajal-Aldaz et al., 2022). In America, a population with very low food insecurity is associated with a higher likelihood of obesity (Rezaei et al., 2024). A higher prevalence of obesity (23.8%) was observed during the Northwest monsoon due to poor diet quality compared to the Southwest monsoon (18.3%) in Malaysia (Tay et al., 2023).

Non-communicable diseases, such as hypertension, diabetes, and cardiovascular diseases, are strongly associated with poor dietary habits, particularly in urban food insecurity. In Africa, one study showed low dietary diversity, low fruit consumption, and abdominal obesity were significantly

associated with hypertension, while low fruit and legume consumption were linked with diabetes (Tchuenté et al., 2024). Research in the United States revealed that individuals with very low food security have a significantly higher likelihood of cardiovascular disease and associated mortality (Chang et al., 2022).

The evidence presented highlights a critical disconnect. Rural public health interventions have historically focused on undernutrition and micronutrient deficiencies, while urban programs have targeted obesity. This review shows such a siloed approach is no longer viable. The triple burden of malnutrition means that undernutrition, overnutrition, and micronutrient deficiencies now coexist in both settings, and often within the same household or individual. This implies that public health nutrition strategies must be integrated. For example, policies that simply aim to increase caloric intake in rural areas may inadvertently worsen obesity trends if nutrient quality is ignored. Conversely, urban obesity programs that focus only on restriction may miss underlying micronutrient deficiencies. Therefore, all food security interventions, whether rural or urban, must be nutrition-sensitive, prioritizing access to nutrient-dense foods, not just calories.

Recommendation

To effectively address food insecurity and

Table 2: The Triple Burden of Malnutrition in Urban vs. Rural Contexts

Nutritional Outcome	Global Prevalence (2022)	Rural	Urban	Key Driver(s)
Undernutrition				
Stunting (Children <5)	22.3%	35.8%	22.4%	Protein-energy & micronutrient deficiency
Wasting (Children <5)	6.8%	10.5%	7.7%	Protein-energy malnutrition
Micronutrient Deficiency				
Anemia (Women 15-49)	29.9%	46.6% (Africa)	20.1% (Africa)	Iron, folate, B12 deficiency
Overnutrition				
Overweight (Children <5)	5.6%	3.5%	5.4%	Overconsumption of processed foods
Obesity (Adults)	15.8%	-	-	High intake of energy-dense foods, low activity

malnutrition, a shift from fragmented, sector-based funding to a comprehensive and integrated financing framework that incorporates both public and private domestic and international funding sources is essential. Collaboration among governments, donors, and private actors with transparency and standardized data collection is necessary to improve accountability and efficient resource allocation.

This strategy should emphasize increasing public investment, mobilizing domestic tax revenues, and leveraging official development assistance, particularly through grants and concessional loans for countries with limited access to conventional financial options. For countries with stronger financial capabilities, innovative approaches such as blended finance, green and social bonds, and private sector investments should be utilized, as these risk-reducing measures can attract private capital.

Investment policies should aim at repurposing agricultural subsidies toward nutrition-sensitive investments, but these interventions must be tailored to the distinct urban-rural challenges. For rural areas, investment must prioritize climate-resilient agriculture like drought-resistant seeds, strengthening local infrastructure such as farm-to-market roads, and promoting crop diversification to move beyond nutrient-poor staples.

For urban areas, focus should be on strengthening fresh food supply chains, supporting urban and peri-urban agriculture like community gardens, and implementing policies like zoning for fresh food markets or subsidies for healthy food to counter the dominance of food deserts. For equitable access to financial services and opportunities, special consideration should be given to underserved groups, including women, indigenous communities, farmers, and small and medium agrifood enterprises (FAO, IFAD,

UNICEF, WFP and WHO, 2024).

In addition, future research should focus on longitudinal studies to track the long-term impacts of these disparate pressures and evaluate the effectiveness of tailored urban-versus-rural policy interventions.

CONCLUSION

In conclusion, food insecurity presents a dual-faced challenge. Rural populations remain highly vulnerable to undernutrition driven by climate shocks and infrastructure gaps. Urban populations, in contrast, face a growing epidemic of obesity and non-communicable diseases driven by market instability and poor-quality, processed diets. This urban-rural divide is particularly relevant for rapidly urbanizing regions. Nations such as Malaysia is at the epicentre of this transition, simultaneously battling stunting in rural and indigenous communities while facing explosive rates of urban diabetes and obesity. This review's findings underscore that these are not separate problems but outcomes of a single, stressed global food system. By prioritizing an integrated financial and policy framework, it is possible to enhance resilience in both rural agriculture and urban supply chains, ensuring all populations can achieve reliable access to the safe, nutritious food required to end hunger and all forms of malnutrition.

CONFLICT OF INTEREST

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