Urban food security: Examining the unique challenges and opportunities associated with ensuring food security in urban areas.

ABSTRACT

Purpose: Food security is a significant concern in urban areas (UAs). With the rapid increase in urbanization, addressing this issue has become increasingly important. Despite interventions to tackle food security issues, the world has achieved varying degrees of success in eradicating hunger, and food security in cities is critical. This study examined the unique challenges and opportunities associated with ensuring food security in urban areas.

Method: The study reviewed empirical literature and relevant reports in the last five years (2018-2023).

Results: This study identified several challenges in securing food security in urban regions, including rising food prices, limited water and land access for farming, and poor infrastructure and food supply systems. There are also opportunities to improve the situation, such as improving access to markets, investing in agricultural production, promoting urban agriculture, expanding and stocking food banks, and government food intervention programs to ensure socioeconomic parity in urban areas.

Conclusions: Urban areas' food security opportunities and difficulties are complex and interconnected. However, by addressing the myriad challenges associated with ensuring food security and taking advantage of opportunities, it is possible to create more sustainable, food-secured urban cities. This will make it possible to guarantee that everyone in urban areas has access to the food that they need to live healthy and fulfilling lives.

Keywords: Food Security, Urban Areas, Economic Inequalities, Food Insecurity, Opportunities, Challenges

1. INTRODUCTION

1.1 Background

Humans depend on food for nutritional nourishment, which provides them with the energy to perform daily functions [1]. Theoretically, Abraham Maslow argued that food (as part of physiological needs) is an essential requirement of humankind [2], [3], and is therefore necessary to human existence and progress. Food security occurs when individuals have appropriate access to food that satisfies their nutritional needs and desires to maintain a healthy lifestyle at the physical and financial levels [4]. Food security hinges on four fundamental dimensions: 1) availability of food, whether domestically produced or imported; 2) accessibility, that is, a situation where food reaches every aspect of the population via any viable means; 3) utilization, which is the ability of individuals to have or use adequate or desirable quality and quantity of food; and 4) sustainability/stability, which is the ability of the population or the state to adapt to adverse events that affect the food chain system [5], [6]. Therefore, food security exists at four levels: national (food availability), household (food accessibility), individual (food utilization), and time factors that affect all other levels (food sustainability) [6]. Aside from food being a basic human need, food security has been a primary global concern because of its interconnectedness with many sectors of the economy, notably health, technological, political, environmental, socioeconomic, and demographic disparities [7], [8].

Global and national food security has recently become a significant concern due to rising food insecurity. Food insecurity arises whenever economic and physical access to sufficient, safe, and nutritious food becomes unreliable [9], [10]. The projection indicates that approximately 9.9% of the global population will experience undernourishment in 2020, and this figure is anticipated to rise in the future [11]. In recent times, the global food security situation has been exacerbated by the COVID-19 pandemic [12]. In particular, the pandemic led to several factors that made access to food more challenging for people, including supply chain disruption, economic disruption, and a decline in agricultural production amid the high demand for food supply. The World Health Organization indicates that food insecurity is a significant cause of undernutrition, which is a major cause of death and disease and can have a disturbing impact on people's health and well-being. Given that food insecurity can be detrimental to socioeconomic development and national security, stakeholders and governments have realized the need to prioritize food security concerns.

Food security has become an issue of prime concern to nations because of the rapid increase in urban population [7], [13]. A notable population-related problem is rapid overpopulation in urban

cities, primarily due to increased urbanization [14] and migration [15], leading to scarcity of food resources in defined demographic urban regions, which may eventually result in food insecurity in these cities [16]. Urbanization and the steadily rising annual emigration to urban areas have contributed to the urban population's global growth [17]. The global urban population increased by 1.84% per year between 2015 and 2020, and was estimated to increase by 1.63 percent between 2020 and 2025 and 1.44% between 2025 and 2030 [12]. In 2016, more than half of the world's population, around 54%, resided in urban areas, and it is predicted that this percentage will reach 60% by 2030. During the same period, the proportion of rural inhabitants is expected to decline from 45% to 40% [18]. By 2050, 68% of the world's population is expected to reside in urban cities. [19], this implies that almost two out of every three people will be living in urban areas. Most of this population expansion is anticipated in low-income developing nations, which often experience more severe food security problems than wealthy nations [19]. Slum dwellers comprise 32.7% of the world's urban population, and over half live below the poverty line, mostly in developing countries such as Angola, Bolivia, and Malawi [20]. Neo-Malthusianism theorists have argued that overpopulation leads to shortages in limited resources (such as food) and have highlighted how a population's growth can lead to sinful behaviour, probable famines, wars, and pandemics, usually in the poorest sections of a people.

Typically, urban areas are perceived to have fewer issues with food insecurity, given the availability of numerous eateries, restaurants, and fast-food chains, which are easily accessible throughout urban settlements. However, food availability only ensures that some have access to a secure, varied, healthy, and affordable diet. Inequalities in socioeconomic position [16], race, immigration status [17], habitat, and other factors [18] are especially prevalent in urban regions. In urban areas, a variety of unique issues characterize food insecurity. For instance, it is believed that the substantial share of informal labour causing the unplanned rise of slums with inadequate amenities for essential health and hygiene is a significant challenge in guaranteeing food security within urban regions [21]. As more individuals migrate to urban centers, the agricultural labor force diminishes, and there is a reduction in available arable land in or near these cities. Instead, such land is rapidly converted for residential and commercial purposes. This decline in agricultural capacity can result in a limited food supply, potentially leading to an increase in food prices [22]. The combination of dense population and increasing demand adds extra pressure on food supply networks, resulting in higher food prices [23]. Inadequate infrastructure, such as

poorly developed roads linking rural farming communities to urban areas and the costs associated with transportation to markets, can also influence food prices. Therefore, it is important to consider food prices and supply when dealing with food security issues in urban areas.

These issues have devastating effects on malnutrition and undernourishment in urban dwellers. In 2020, approximately 8.9% of urban dwellers were malnourished, and approximately 17.6% experienced stunted growth as a result of inadequate food consumption [24]. The World Health Organization (WHO) estimated that 2020, 6.9 million people died from hunger or undernutrition in 2020. This necessitates immediate intervention. Consequently, deliberate efforts have been made to ensure food security in urban areas. In general, numerous international and local pledges have been made, dating back to the first United Nations declaration in 1943, which aimed for the ambitious goal of achieving zero hunger [26]. This dedication has been reiterated multiple times in global forums, particularly through the Sustainable Development Goals (SDGs) and the specific target of SDG2, which aims to eradicate hunger by 2030. Additionally, the Food Systems Summit in 2021 also highlighted this commitment [27]. At the national level, countries have implemented policies such as subsidies for the importation of food to support the national food deficit, the provision of free fertilizer, and subsidies for farmers to promote agriculture.

Despite these interventions, the world can only boast of varying degrees of achievement in eradicating hunger (alongside hunger and various malnutrition-related issues) [24]. The issue of food security is limited to urban areas. As per the World Bank, urban food security encompasses several significant challenges, such as price volatility, the influence of specific stakeholders, migration from rural to urban areas, inadequate urban waste management, conflict, drought, and outbreaks of locusts [25]. Nevertheless, despite the presence of these challenges, there are potential opportunities that, if effectively harnessed, can enhance food security in urban regions. The United Nations suggests that leveraging food systems to improve accessibility, affordability, and the consumption of nutritious meals by the urban poor is vital for sustaining food security in urban settings [26].

However, urban dwellers, especially those belonging to economically disadvantaged groups like those residing in slums, encounter distinctive obstacles concerning food accessibility, quality, and safety, which heighten the risk of food insecurity and ultimately malnutrition. As urbanization continues to surge, particularly in developing nations, the overpopulation of urban

areas will exacerbate the issue of food insecurity. Furthermore, numerous studies have highlighted the disproportionate impact of the COVID-19 pandemic and its economic ramifications on urban populations, especially on the previously non-poor who are now experiencing significant income losses. Therefore, it is essential to prioritize research efforts on urban populations, particularly the most marginalized and vulnerable groups like urban slum dwellers, to ensure the security and sustainability of a well-functioning food, water, and nutrition system for the expanding metropolitan populace. To achieve this, key challenges must be identified and addressed to facilitate food security in urban areas while utilizing unique opportunities to strengthen food security.

As a result, the primary objective of this research is to investigate the distinct challenges and prospects related to achieving food security in urban settings. The study's outcomes are anticipated to pinpoint specific obstacles and opportunities that can offer valuable guidance to policymakers, implementers, and other stakeholders in urban centers, enabling them to develop and implement targeted interventions to enhance and support food security in urban areas.

1.2 Literature Review

1.2.1 Neo-Malthusianism Theory

Neo-Malthusianism argues that population growth is a major threat to the environment and human well-being[27]. This hypothesis is based on Thomas Malthus's work, which argued that population growth would soon outpace food production, resulting in widespread famine in the 18th century and poverty[28].

Neo-Malthusians argue that the world's population is growing too rapidly, and that this is putting strain on the environment and resources (food, water, and energy) [27]. Proponents argue that population growth leads to environmental degradation such as deforestation and pollution. In the context of this study, as the population continues to increase in urban areas, food security issues have become a threat. These threats often come with it unique challenges which ought to be overcome to sustain food security.

1.2.2 Social exclusion theory

The social exclusion theory was first proposed by sociologists Peter Townsend and Gordon Marshall in the 1970s. The key argument of social exclusion theory is that people who are

socially excluded are not just poor, but also marginalized and discriminated against[29]. This means that they are not able to participate fully in society, and they often deny the resources and opportunities available to others.

The social exclusion theory provides a framework for understanding the challenges of food security in light of social and economic factors [30]. It argues that food insecurity is not just about having enough food but also about having access to food that is safe, nutritious, and affordable. The social exclusion theory highlights how social and economic factors can make it more difficult to produce, distribute, and access food. The theory acknowledges that poverty (such as unemployed urban dwellers), marginalization (such as slum urban dwellers), discrimination, and lack of opportunity can be major problems for food security, especially in this study's setting of urban food security [30].

1.3 Concept of Food Security

The concept of food security originated mainly from a national security perspective, focusing on agricultural production and the goal of achieving national self-sufficiency [31]. This viewpoint holds that the main reason for food insecurity and the danger to national security objectives is a tainted food supply. Consequently, under this paradigm, the major tools for assessing food security were developed from macroeconomic assessments of a nation's food supply. [35]. The idea of food security is built on intricate, multiscale spatiotemporal processes that consider a variety of human and environmental factors. [36]. Based on this concept, food security must be implemented in four key areas. These include Food: Availability, Accessibility, Utilization, and Stability, as shown in Figure 1.

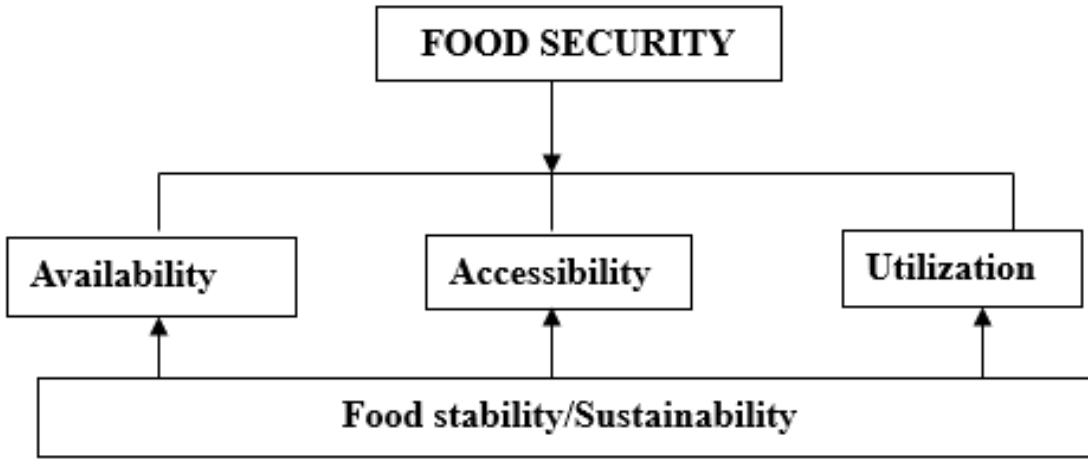

Fig. 1. Food security Dimensions framework

Food availability: Food availability is the quantity of food readily available in a nation or region. [32]. Food availability is crucial because it guarantees that there is sufficient food to fulfill everyone's requirements. However, this dimension alone cannot provide food security [38]. To satisfy nutritional demands, food must also be available, reasonably priced, and used. Food availability refers to what is available either locally or at home. This is seldom considered at the individual level. As mentioned earlier, a household can attain food and nutrition security even when the broader region or country might not. This complexity makes it difficult to differentiate between different levels of food availability [33].

Food accessibility: Accessibility is the situation where the resources and/or means to access food needed for a balanced, nutritious diet are in place [34]. There are two key components to access to food, they are physical accessibility and financial accessibility. The presence of resources, such as financial means (to buy food), mobility (to physically access food), and knowledge, plays a critical role in determining accessibility (to make decisions about obtaining food) [35]. This highlights that a household's capacity to produce food is just one aspect of ensuring sufficient access to food; households must also be able to reach the market and purchase food there. Therefore, even when a household can grow food, its ability to make money is crucial to gaining access to food and nutrition. [36].

Food utilization: The process by which the human body absorbs nutrients from the food it consumes is known as food utilization [36]. The socioeconomic aspects of food comprise the utilization component, which also includes knowledge, habits, and decision-making about what to buy, how to prepare it, who in the household consumes it when, and how fairly food is distributed, all of which are significantly influenced by culture and educational attainment [21].

Stability: Food stability is always the capacity of a population to access food, even during times of shock or stress [31]. This includes access to a variety of foods that meet dietary needs and preferences. Food stability is important because it helps protect people from the negative consequences of food insecurity[34]. Factors such as climate change, economic shocks, and political instability affect food stability. These factors can disrupt food production, distribution,

and accessibility. Therefore, in order to attain food security, it is essential to ensure the availability of appropriate food, maintain stable access to that food, and ensure its steady utilization [36].

1.4 Food Security Issues in Urban Areas

The worldwide change in population demographics is one of the biggest issues of the twenty-first century, which is why the food and nutrition communities prioritize its study. This demographic change is what causes the ongoing urbanization trend in global development, as shown in Figure 2. Urbanization refers to the proportion of a country's population residing in urban areas, leading to a decline in the proportion of people living in rural areas [19]. This trend is primarily driven by net rural-to-urban migration, a decrease in rural populations, and an increase in urban populations, leading to the emergence of megacities.

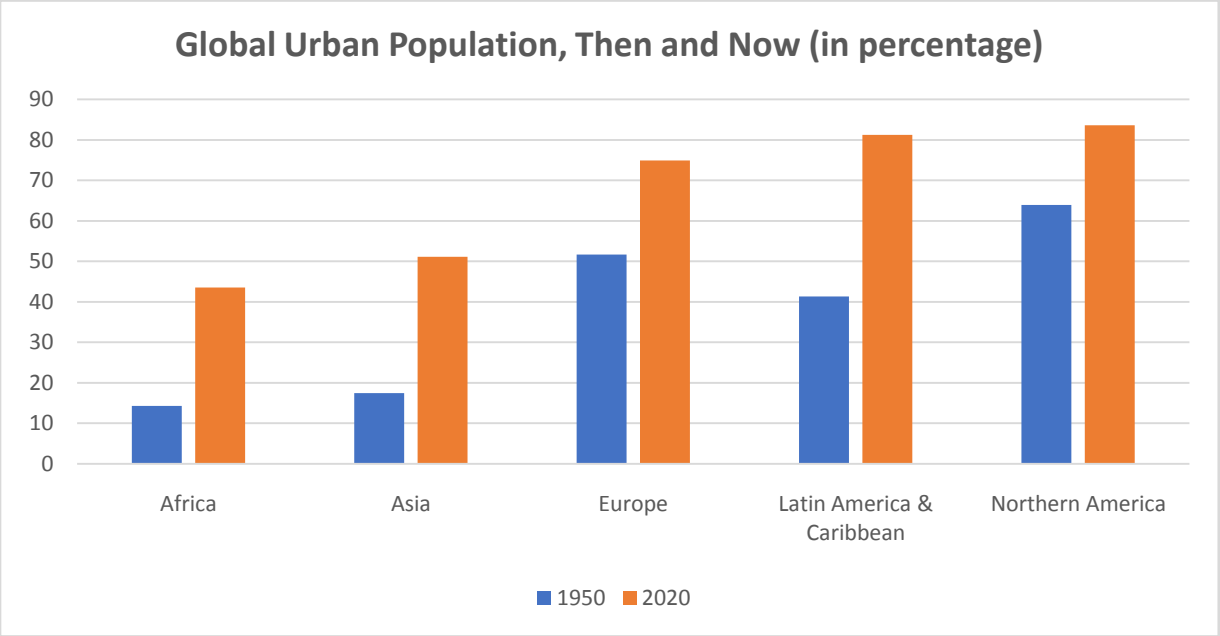

Fig. 2 Percentage of Global urban population in 1950 and 2020, showing a current shift of increased urbanization (data source: U.N population division).

Economic expansion and higher living standards are closely related to urbanization. The least urbanized nations frequently rank among the poorest [37]. Hence, urbanization brings about various advantages, including opportunities for economic prosperity, the development of centralized infrastructure, governance, politics, education, social services, and healthcare

facilities. However, urbanization has also led to several problems, including urban poverty, health, food insecurity, and socioeconomic inequities [25], [38]– [40]

The escalating growth of urban populations corresponds to an increasing demand for essential resources like food, energy, and water, leading to the acceleration of deforestation in tropical rainforests, as well as land degradation and desertification. Moreover, this surge in demand is responsible for a rise in greenhouse gas concentrations in the atmosphere, consequently contributing to the ongoing issue of climate change [23]. Consequently, cities find themselves confronted with a precarious and uncertain environment, making them highly susceptible to the impacts of global environmental changes. This situation exposes urban centers to significant risks and vulnerabilities, signifying the profound and dramatic effects of human activities on the surrounding ecosystem. Furthermore, urbanization renders cities more prone to a broad range of risks, encompassing both human-induced and natural disasters such as floods, droughts, and pollution [24].

The inherent aspects of urban life render the urban poor more susceptible to food insecurity [41], [42]. Deep disparities caused by variations in socioeconomic categories, ethnicity, migration status, place of residence, city size, and various other factors are particularly pronounced in urban regions. Contrary to popular beliefs, poor slum residents in India have nutritional statuses comparable to rural people, dispelling the stereotype that urban dwellers are often better off than those in rural areas [43].

1.5 Factors Influencing Food Insecurity in Urban Settings

Urban lifestyles and conditions possess distinct attributes that present challenges in achieving food security and accessing a nutritious diet. According to the World Bank, the majority of urban residents rely on low-paying, precarious occupations, and a sizeable proportion of urban residents are at risk of food insecurity. As a result, many low-income urban families depend on sporadic, low-paying jobs in the unorganized sector [21]. This makes it difficult for them to afford sufficient food, especially healthy foods. Moreover, healthy foods are often more expensive than unhealthy foods. This makes it difficult for poor urban households to maintain a healthy diet. Lack of access to social support, such as food stamps or cash transfers, is also a driver of food insecurity in urban areas[23]. This makes it difficult for urban dwellers, particularly the poor, to cope with food security.

However, the consequences of these challenges are severe. People who grow up in food-insecure households are more likely to be malnourished and have poorer health outcomes. Food-insecure adults are more likely to be overweight or obese and have chronic diseases.

However, several issues must be addressed to overcome these challenges. The World Food Programme has suggested investing in social protection programs that can help provide poor urban households with the resources they need to afford food. By promoting urban agriculture, urban households could access fresh and healthy food[44]. Moreover, raising awareness of the importance of a healthy diet can help poor urban households to make healthier choices. Addressing these challenges can help ensure that all urban residents have access to the nourishment they require to lead wholesome and fruitful lives.

2. METHODOLOGY

This research study reviewed recent (2018 to 2023) research studies and reports published online in the last five years. These existing studies largely focused on the key theme "challenges and opportunities for ensuring food security in urban areas". Owing to the paucity of studies in one specific geographic region or country, this research sourced studies from China, Indonesia, Ethiopia, Italy, and the USA. This was done to gather a considerable amount of evidence or data for subsequent discussion.

3. RESULTS

3.1 Empirical Review

The excessive rate of urbanization makes it more important than ever before to take decisive action to address these issues, and urban areas face significant challenges when it comes to ensuring that their populations have access to sufficient food supplies. Addressing several substantial challenges is essential to ensure the sustainability and safety of urban food systems in the long run, while also capitalizing on the unique opportunities present to promote food security. The following paragraphs highlight the conclusions drawn from relevant publications and academic articles on the difficulties and possibilities of providing food security in urban settings:

One study evaluated potential threats to China's food supply due to rapid urbanization and proposed solutions to address these issues [42]. The research revealed threats to food production stability, including issues like insufficient agricultural water, a decrease in the caliber of

agricultural labor, and a decline in both the quantity and quality of cultivated land. These factors have collectively led to a reduction in the overall amount of cultivated land. The study found that changes in dietary habits and trends in the demand for grain at the national level are factors that contribute to food waste and insecurity.

According to the findings of this study, China's food security can be improved by implementing relevant engineering practices that can serve as a foundation for food production. These practices include management of quantity, quality, and environmental protection. Additionally, the study proposed that China's food security could be improved through measures of increased food production and efficient food consumption. In addition, backyard platforms, science, technology, agricultural research, education, services, and policy inputs will contribute to the reduction of crop production gaps in urban China, which will help address the issue of food security in these areas.

[12].

Another research examined the state of food security in Indonesia following the COVID-19 pandemic and discovered both challenges and opportunities. Many people believe that maintaining food security in Indonesia will be a difficult task due to the country's substantial reliance on rice, long history of agricultural struggles, proactive regulations, and inadequate levels of education. Furthermore, new opportunities have arisen to enhance food security. These opportunities include a shift towards local potential, an increase in social capital, and a reduction in food waste. An additional study was conducted to assess the extent of food insecurity within urban food systems. A random sample of 506 households from the cities of Dessie and Combolcha, located in the middle of Ethiopia's northern region, was selected for inclusion in this mixed research design. According to the findings of this study, 33.1% of the people who participated in the survey were at risk of hunger. It was discovered that the administration of the food system was inefficient, food supply chains were erratic, and socioeconomic and gender disparities existed. All of these factors contributed to a higher level of food insecurity. Nonetheless, both formal and informal food systems possess distinct characteristics, and when appropriately integrated, they can offer significant benefits for food security. This indicates the necessity to shift the focus of food security efforts in urban areas towards supporting social security programs, including initiatives such as urban housing, job stability, urban agriculture, and comprehensive food safety net programs. These programs collectively fall under the

umbrella of social security and can play a crucial role in promoting food security in urban settings.

According to a report published by the World Bank on urban food security issues and solutions, urbanization is a significant contributor to food insecurity, and those who are poor are disproportionately affected by it, as per a report released by the World Bank, which delves into matters and solutions concerning urban food security [16]. Individuals living in urban poverty face a higher likelihood of encountering food insecurity compared to those who are not economically disadvantaged. Moreover, they are also more susceptible to the impacts of adverse events like economic recessions and climate change when compared to individuals who are not part of the urban poor population. According to research, some of the challenges that arise when attempting to maintain food security in urban settings include a lack of adequate infrastructure, decreased access to land and water, and rising food prices. Opportunities, on the other hand, improve market accessibility while encouraging investments in the realm of farming activities and the expansion of urban agriculture.

[36] The Food and Agriculture Organization of the United Nations published a report that investigated the possibility of urban food security in the future, with particular emphasis on the threats and possibilities posed by climate change. According to the findings of this study, the production and distribution of food in urban areas are made more difficult by the specific threats posed to urban food security due to climate change. Furthermore, the study revealed several actions that can be undertaken to reduce the adverse effects of climate change on food security in urban areas. These actions include investing in food systems that are resilient to climate change and enhancing urban design to accommodate sustainable food production and distribution.

A different research study explored the potential of urban and peri-urban agriculture (UPA) as a means to guarantee food security and mitigate the adverse impacts of climate change in urban regions [47]. They used a scalable GIS-based method in the city of Venice on the mainland to identify and quantify regions accessible for agriculture. These regions include flat rooftops and ground-level sites (Italy). Following this step, potential horticulture yield production was calculated by considering the value of typical UPA produces as well as typical Italian consumption. It is anticipated that the establishment of new UPA regions will lead to the

implementation of climate change adaptation and mitigation strategies, such as sequestration and reduction of CO_2. Despite the fact that the city is quite dense, [47] designated UPA and regions as having the capability to grow enough vegetables for urban people and to promote climate change mitigation and adaptation if they were transformed into agricultural spaces (such as rooftops and ground-level areas).

In 2022, the Food and Agriculture Organization of the United Nations conducted research in the United States of America, which unveiled the growing significance of urban areas in the global food system. According to this report, by 2050, 80% of the world's population will live in cities, which are also responsible for 70% of the total amount of food consumed. Research has also shown that it is difficult to achieve food security in urban settings because of a number of factors, such as the high cost of food, lack of availability of fresh, wholesome food, and food insecurity [48].

Research conducted by the Urban Institute in 2021 indicates that urban areas in the United States are experiencing an increase in the prevalence of food insecurity. According to the findings of a survey, the percentage of people living in urban areas who were uncertain about their access to food increased by 15 percent between 2018 and 2020. The survey also found that the number of urban children living in fear of not having enough food to eat has increased at a rate that is faster than that of adults [49].

In 2020, the National Academies of Sciences, Engineering, and Medicine published research highlighting various strategies to enhance food safety in urban areas. Among these approaches is urban agriculture, which has been shown to augment the accessibility of fresh, nutrient-rich foods in metropolitan regions. Additionally, public-private partnerships may help address issues related to food security in cities by combining the resources of both sectors.

4. DISCUSSION

This study aimed to investigate the unusual difficulties and possibilities related to providing food security in metropolitan regions. The review's conclusion shows that there are possibilities and difficulties in guaranteeing security in metropolitan settings. Increasing food costs are a major

threat to food safety in cities. People in metropolitan regions have a harder time to afford healthful meals because of the steady rise in food prices in recent years. The World Bank data suggest that about 821 million people do not have enough to eat, the bulk of these individuals reside in cities**,** and poverty is one of the many determinants. This phenomenon is often evident in low-income countries where the unemployment rate is high, with high population growth causing a high demand for scarce food supplies [21], [41]. Another challenge for food safety in urban areas is the limited availability of land and water. In many cities, there is insufficient land available for agricultural production and the available water is often polluted or contaminated. Industrialization and estate development in urban areas have taken over arable lands, which were originally meant for farming[23], thereby causing a reduction in agricultural production amidst a high increase in food demand given the population increase. Moreover, the review indicated that increased industrialization, population, and transport motors have increased the release of harmful gases that significantly impact climate change. Climate change is a global contributor to food insecurity, and urban cities are significant contributors to climate change factors (such as CO_2 from industries and transport motors)[29]. Poor infrastructure is also a challenge to food security in urban areas. Many cities lack the infrastructure needed to store, transport, and distribute food efficiently; thus, food supply systems are poor in urban areas. These challenges are interwoven with many complex factors, including political and government policy mismatch and poor prioritization, if not poor policy implementation, which do not adequately plan and implement policies to counter these food security shortfalls in urban areas.

Despite these challenges, there are also opportunities to increase access to food in urban areas. One opportunity is to improve access to markets. By making it easier for people in urban areas to buy food, it will be possible to reduce the cost of food and make it more affordable for everyone[25]. This can be achieved by implementing measures such as skill training and development that will ensure employment, thus reducing poverty and increasing food access. Another opportunity is to invest in agricultural production[45]. By investing in urban agriculture, it will be possible to produce more food in cities, which will help reduce food costs and improve food security. Food banks and buffer stocks can provide food to people who struggle to afford it. They are important resources for people experiencing food insecurity, and they can help guarantee that individuals have access to food. Government programs such as food stamps and school lunch programs can aid in guaranteeing people's access to food. Government programs

can also help supplement low-income families' income and provide food to children in schools [40]. Finally, it is important to promote urban agriculture. Urban agriculture can help improve food security by providing people access to fresh, healthy foods [33], [46]. It can also help reduce pollution, improve the environment, and accelerate the fight against climate change.

5. CONCLUSION

There are many obstacles to ensuring food availability in urban regions; however, there are also opportunities to guarantee food security in metropolitan communities. Urban food security presents both possibilities and challenges, which are intricately intertwined. Notably, economic inequality is inherently enforced in metropolitan areas, making it particularly challenging for the disadvantaged to obtain and buy food. Food security is a problem in metropolitan settings that is worsened by fluctuating food prices and uncertain inflation. However, by addressing the myriad challenges associated with ensuring food security and taking advantage of opportunities, it is possible to create more sustainable, food-secured urban cities.

5.1 Research implication

For practice, based on the research findings, the government should invest in urban agriculture and promote policies that support sustainable food production in cities. Non-profits and community organizations should work to broaden access to wholesome meals in urban areas, especially in low-income and marginalized communities. Individuals can support urban food security by buying local food, composting scraps, and reducing food waste. In addition, rural migrants or those from urban areas should ensure that they have adequate and reliable sources of income (such as employment) in urban cities before migrating to urban areas to facilitate their ability to cope with the cash economy in urban cities.

Policy: Based on the findings of this study, a comprehensive approach is needed to ensure urban food security. This approach should address challenges and opportunities at multiple levels, from the individual to the city. At the individual level, policies should focus on providing social safety nets to help people afford food. At the city level, policies should focus on improving access to markets, investing in agricultural production, and promoting urban agriculture. Another policy implication is the need for more research on urban food security. This research should focus on understanding the challenges and opportunities faced by different cities, as well as the

effectiveness of different policy interventions. By understanding these factors, policymakers can develop effective policies to ensure urban food security.

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