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Urban Farming Towards Enhancing Food Security in Highly Urbanized Cities in the Philippines, A Community Sustainability Response

Eunice Mareth Q. Areola[1]*, Anthony Galit Dacones[2]

[1]UST Angelicum College
[2]Trinity University of Asia, New Manila, Quezon City
Author E-mail: eunice.areola@ustangelicum.edu.ph

A B S T R A C T

Using comparative data, this study looked at small and medium-scale farming in highly urbanized cities in the Philippines, including community gardens, rooftop farms, and backyard gardens, excluding rural-like or peri-urban farming practices that focus on food production. It highlights the effects on food insecurity, daily spending, and environmental sustainability at the household level without performing life-cycle analysis of agricultural systems. The short-term and local effects of urban farming that looks into the selected cities' social and economic difficulties, and the area's sustainability were highlighted in this study.

Keywords: *Urban Faming, Environmental Sustainability, Urban Food Security, City Living.*

INTRODUCTION

Urban farming has become one of the most influential concepts in the attempt to solve some of the most pressing environmental urban sustainability problems, such as socioeconomic inequality. Food insecurity in cities in the Philippines, high cost of living, and rapid urbanization are some of the issues that have been on the rise due to the increase in population. Urban farming is a viable enhancing option for food production, which involves reducing utilization dependence on scarce agricultural commodities and urban products from distant food production areas. Given this, cities must incorporate urban agriculture into their planning frameworks to improve food security and enhance community resilience.

Cities in the largest and most populous capital region has problems arising from urbanization. Vast agricultural areas initially dominated the land use structure in the area. However, cities have become highly urbanized, and most agricultural land has been converted into residential,

commercial, or industrial use (Puma et al., 2015). This has left residents dependent on imported foods, making them susceptible to supply chain interruptions, economic shocks, and natural disasters. These vulnerabilities are compounded by the fact that the Philippines is prone to effects of calamities such as typhoons, agricultural and sector floods, and food supply chains (Food and Agriculture Organization, 2015).

Urban farming supported by the local governments help mitigate these pressures by emphasizing community resilience. Programs on rooftop gardens, backyard farming, and community gardens were meant to increase food production at the household level, resulting in lower household expenditure, and ultimately supporting the sustainability of the highly urbanized cities. (Cruz et al., 2019). Despite some attempts, more research needs to be done on the overall impact of urban farming in key cities of the country, especially regarding the economic, environmental, and social aspects. This study aims to fill this research gap by examining the multiple effects of urban agriculture on the food economics direction of urbanized cities.

Urban farming has become one of the most effective strategies in the fight against food insecurity, environmental challenges, and economic inequality in the urban environment. By analyzing the existing literature and research on urban farming, emphasizing food security, economic resilience, environmental sustainability, and social inclusion, this study was able to consolidate the findings to develop a framework that will cover this the research.

Food insecurity is a big issue in highly populated urban centers, one that is shaped by food accessibility and affordability problems. According to Frayne et al. (2014), urban agriculture directly enhances food security because individuals can grow their food and thus are not fully dependent on outside food sources. This is especially so in cities where the food supply is largely imported, and the food supply chain is vulnerable to disruptions caused by natural disasters, as Puma et al. (2015) point out. In Southeast Asia, people have turned to urban farming to increase stability in food supply, drastically enhancing the ability of the people to provide for their food needs. The urban farming initiatives in cities have allowed households to obtain fresh, affordable, and nutritious food through rooftops, backyards, and community lots. This is consistent with Grewal and Grewal's (2012) arguments that localized food production in urban regions reduces food security.

Likewise, real-life examples from across the globe exists to strengthen this argument, such as the urban farming model response by Cuba to food trade deficit (Altieri embargo et al., 1999). The 1990s highlight practices on urban farming that had been adopted in Philippine cities in the best way possible given that the area has changed from being an agricultural area to a residential and business zone in the recent decades. Urban farming has numerous advantages for households and communities, including financial advantage. According to Vitiello and Wolf-Powers (2014), one of the benefits of urban agriculture is that it helps families meet their food needs without having to spend a lot of money on produce from the market. In low-income areas, people have turned to urban farming to reduce the cost of food and thereby divert their money for spending on their other needs.

Beyond the household costs, urban farming also creates income-generating opportunities. According to Kim (2016), small-scale urban farming enterprises, like selling excess farm products, create employment opportunities for the needy, women, and the unemployed. This is because it empowers people socially and economically, and it is in harmony with the

concepts of sustainable urban development that is found in the United Nations SDG direction. However, the profitability of urban farming depends on several factors, such as the availability of resources, access to markets, and policy incentives. In developed cities like Berlin, Opitz et al. (2016) stated that urban faming initiatives help to test sustainability and economic integration with the rest of the city's economic system.

Guerrero (2009) explains that urban farming also helps conserve the natural environment through efficient regenration in urban ecological areas. Further, Deelstra and Girardet (2000) state that local food production is a form of food security since it reduces food's time to travel from the farm to the table. Because most of the food supplies in highly urbanized areas are imported, the transportation system that supplies the food to the city causes greenhouse gas emission that compounds the usual city problems. Urban agriculture improves the environment's biodiversity by providing green spaces, which act as habitats for pollinators, and other controlling organisms. Water is generated to provide vital services such as temperature combating control and urban cleaning of any island heat effect.

The promotion of circular economies and Drechsel's use of organic wastes (2015) highlight the role of composting urban wastes for use in farming. This practice supports the cities' sustainability goals by minimizing waste generation and encouraging its proper disposal. Urban farming as a social practice boosts social relations, collective actions, and resource sharing. Tornaghi (2017) pointed out that urban agriculture projects are normally community-based, and through such projects, people develop a sense of interaction, enhance their skills, provide an avenue of belonging, and promote shared ownership. Community gardens have also emerged as farming tools that help individuals and societies by allowing them to produce their own food. This is in line with food security, which is the right of peoples and nations to autonomous and resilient food systems (La Via Campesina, 2007). By implementing urban farming, residents can produce their food, thus reducing dependence on other food procurement systems.

The social impacts of urban farming are also felt through education and capacity building. Most of the programs in cities also include training on improved farming techniques, proper nutrition and waste management, effectively boosting the productivity of the participants. These educational components not only enhance the literature on agricultural practices but also enhance awareness on literature about the environment and its care. Urban farming knowledge has numerous advantages in addressing key city challenges urban agriculture plays a significant role in improving food access and quality. Economic impacts, such as costs, savings and income generation, are also addressed in some ways by urban farming initiatives.

This study underscores that the environmental advantages of urban farming such as the reduction of carbon footprint and the promotion of urban biodiversity are more directly felt through participation down the line. This study supports the current global initiatives that encourages the use of food systems produced within the urban environment to reduce the concerns on stability in food supply brough about by urbanization. Lastly, the social and community aspects of urban farming, including social inclusion, empowerment, and education, show how urban areas can be transformed into sustainable and resilient communities when given the right impetus.

METHODOLOGY

This research identified the numerous benefits of urban farming that will address concerns on food insecurity, sustainability, and other

socioeconomic difficulties. Specifically, the study explored the effects of urban farming on the ability of the urban dwellers to obtain affordable and nutritious food through local area production. Similarly, it assessed the economic benefits of urban farming to households in the form of reduction of expenses and environmental gains such as reduction of greenhouse gas emissions, creation of urban green spaces, and increase in urban biodiversity. Finally, this study endeavored to examine the social effects of urban farming and its role in enhancing community cohesion, resistance, and group empowerment.

This research makes a theoretical contribution to the academic, policy, and community discourse on urban farming with empirical evidence from a fast-growing Southeast Asian city. Although the use of urban farming has been widely analyzed in developed cities like New York, London, and Tokyo (Grewal & Grewal, 2012; Opitz et well al., explored. 2016), its usage analysis in Southeast has not provided the analysis of the prospects of urban agriculture in a developing country.

Using the Sustainable Livelihood Framework, this paper assessed the main factors that affect people's livelihoods, and typical relationship between them, used in both planning new development activities and assessing the contribution to sustainability made by existing activities. It identified how urban farming affects households' resilience, improved their access to assets and enhanced their social networks. The framework provided a grounding on the congruence and conformity of obtaining food with the needs of the environment, the objectives of the economy, and the value of urban agriculture. Social aspects of livelihood systems and ecological modernization have been used to understand the connection between urban farming and sustainable development. It asserts that technological and institutional changes can make urban systems more sustainable and equitable. Urban farming is an example of this transformation, as it integrates agricultural activities into the urban environment and structures. The study also embraced the principles of food sovereignty, which include the community's right to determine its food systems. This perspective underlines the importance of empowering people to provide for their food needs, promoting individual freedom, and reducing reliance on market systems. This research work looked on the interdependence of food security, economic resilience, environmental sustainability, and social inclusion. At the same time, it also highlighted the effects of lowering carbon footprints and increasing the biodiversity in the urban areas. The framework amplified how success in urban farming can generate urban income, promote farming and enhances community involvement initiatives in city communities.

The study employed a consecutive parallel mixed-method design incorporating quantitative and qualitative research approaches. The triangulation of data from qualitative and quantitative research designs provided a better understanding of the effects of urban farming on food insecurity, economic stability, and environmental and social sustainability in the urbanized areas. The quantitative part involves the descriptive research designed to collect data on food insecurity, cost savings, and environmental gain from urban farming. Quantitative data were collected by administering questionnaires to the participants, and the data were analyzed using descriptive and inferential statistics to identify trends, similarities, and differences.

Complementing the study is the phenomenological approach used that focused on looking at the perception of urban farmers. In qualitative design, semi-structured interviews and focus group discussions were employed to understand the social and psychological effects of urban farming on people's lives, community cohesion, and well-being. This research design was deemed suitable

to incorporate both qualitative and quantitative approaches and thus able to capture the value of urban farming.

This study is limited to city residents who are engaged in urban farming. The target population comprised of individuals from different socioeconomic status who cultivate crops in small and medium-scale farms, including backyard gardens, community farms, and rooftop farms. The sample size calculated by using Slovin's formula yielded a study from the response of 1,424 respondents.

In order to make the sampling more representative of different levels of income and different types of urban farming, stratified random sampling was employed. The population was divided into three strata, i.e. backyard farmers, community gardeners and rooftop farmers. The respondents are the urban farmers who live in cities and meet the criteria that included involvement in urban farming schemes in the last three years, involvement in farming on a small or medium-scale farm instead of large-scale commercial farming, and those who agreed to be interviewed or complete the given questionnaires, surveys, or become part of the focus group discussions. The exclusion criteria are residents who farm in rural or peri-urban areas and large-scale commercial farmers. The respondents are of different demographic characteristics, such as age, gender, income level, and type of urban farming practice.

RESULTS AND DISCUSSION

Quantitative data were analyzed using statistical techniques: Descriptive statistics provided averages, totals, percentages, and standard deviations that analyzed demographic characteristics and opinions of the respondents on the effects of urban farming. T-tests was conducted to know the difference between means of certain variables, such as income level. To determine the differences in the levels of urban farming impacts among the three farming strata, Analysis of Variance (ANOVA) was used. For the correlation analysis, The Pearson's correlation was used to establish the relationship between food security and monthly savings. Finally, multiple regression was used to explain the role of urban farming in food insecurity and household spending. The qualitative data were analyzed thematically. The interviews and focus group discussion transcripts were coded to identify patterns and themes. This ensured that the qualitative data collected were accurate and consistent with the quantitative data and observations.

The study revealed a no significant difference in the propensity of urban dwellers to pursue urban farming in a city to city comparison. However, age and income level are distinct reasons for differences in decisions to pursue urban farming. Such difference was not seen on the basis of gender and type or urban farming practice. A positive result was obtained on the perception about urban farming's effect on food security, environmental sustainability and community cohesion, proving that there are more advantages than known disadvantage in pursuing this practice of food supply creation.

CONCLUSION

Food security and the increasing economic burdens of city residents caused by urbanization, climate change, and dependence on imported foods are addressed, though in small scale, through urban farming. Urban food security can be addressed by a more efficient household food production. While some may argue on the efficiency of maintaining highly valued city resources for a small scale backyard food production initiative, it should be noted that urban farming still supports the environmental needs in cities, and the social benefits derived from community involvement. Ultimately, urban farming still allows for the enhancement of the economic gains of households, particularly in

minimizing food costs, and establishes the manner by which urban farming is able to promote food security as realized by urban residents when there is a shortage or increase in food costs. Further, the effect of urban farming on the environment in terms of carbon footprint and biodiversity, and how it enhances the cities' food security, social inclusion, and community resilience remain to be stronger reasons for urban area dwellers to continue to advocate and practice urban farming.

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