

# Integrating Urban Agriculture into Neighborhood Planning for Sustainable Development: People's Perceptions of the Potentials of the Al-Bastanah in Al-Za'faraniya, Iraq

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## Abstract

Urban agriculture has emerged as a global movement in recent decades, addressing multifarious challenges posed by rapid urbanization. This research explores the potential of urban agriculture in the Al-Bastanah neighborhood of Al-Za'faraniya, Baghdad, through a comprehensive case study. It investigates how urban agriculture can be seamlessly integrated into the neighborhood planning process, paving the way for a sustainable and resilient urban future for Baghdad and cities alike.

It employs a literature survey to ascertain the global significance of urban agriculture, its role in sustainable development, and its potential to revitalize neighborhoods. It also employs case studies from global cities to generate insights into urban agriculture's adaptability, potentials, and constraints. The study is focused on a case study of Al-Bastanah neighborhood.

The study reveals that urban agriculture can be a catalyst for sustainable neighborhood planning in Baghdad, addressing challenges such as food security, unemployment, and urban heat islands. It identifies potential areas for urban agriculture in Al-Bastanah, considering the neighborhood's socio-cultural and environmental characteristics. It also recommends strategies for integrating urban agriculture into neighborhood planning, involving stakeholders from diverse sectors. Overall, the research underscores the potential of urban agriculture to transform urban landscapes into sustainable and resilient habitats, promoting food security, economic opportunities, community engagement, and ecological health. It calls for the integration of urban agriculture into neighborhood planning, ensuring a holistic and inclusive approach to sustainable urban development.

**Keywords:** Urban agriculture, Sustainable neighborhood planning, Food security, Urban agriculture, Community engagement

## Introduction

In recent decades, cities worldwide have been grappling with the challenges of rapid urbanization, dwindling green spaces, and the increasing need for food security. As urban centers expand, there is a pressing demand to reconcile development needs with sustainability goals. Within this context, urban agriculture emerges not just as a means of food production but as a transformative tool for urban planning and sustainable neighborhood development.

Baghdad, a city with a rich history that spans millennia, is no stranger to these challenges. Urban expansion, coupled with socio-political issues, has significantly impacted the city's urban fabric. Neighborhoods like Al-Bastanah in Al-Za'faraniya have seen transformative changes over the years, with potential areas for introducing sustainable practices through urban agriculture.

Integration of urban agriculture into neighborhood planning can be a catalyst for rejuvenating urban spaces, promoting local economies, and fostering community engagement. It can also bridge the gap between construction and green initiatives, offering a balance between built environments and ecological systems. Such an approach aligns well with the ethos of journals like "Urban Planning and Construction," which seek innovative solutions to modern urban challenges.

This research delves into the potential of urban agriculture in the Al-Bastanah neighborhood of Al-Za'faraniya, Baghdad. Through a comprehensive case study, it explores how urban agriculture can be seamlessly integrated into the neighborhood planning process, paving the way for a sustainable and resilient urban future for Baghdad and cities alike.

Its aim is to examine the integration of urban agriculture into the neighborhood planning of Al-Bastanah in Al-Za'faraniya, Baghdad, and evaluate its potential to foster sustainable developments in urban environments. Its objectives are:

1. To assess the current state of urban agriculture in Al-Bastanah and identify potential areas for development.
2. To propose strategies for effectively integrating urban agriculture into the neighborhood planning process, enhancing both environmental sustainability and community engagement.

## Theoretical Basis

### Urban Agriculture and its Global Significance

Urban agriculture, in recent years, has transcended from being a mere localized activity to a global movement addressing multifarious challenges posed by rapid urbanization. According to the United Nations, over 55% of the world's population currently resides in urban areas, a proportion projected to surge to 68% by 2050. This shift towards urban living propels the need for sustainable food systems in cities, placing urban agriculture at the forefront of sustainable urban development (United Nations, 2018)

At its core, urban agriculture is not only about food production. Yes, it provides an opportunity for cities to become more self-reliant in terms of food, but its implications are profound and manifold. One of the most direct environmental benefits of urban agriculture is its potential to ameliorate the urban heat island effect, where urban regions experience higher temperatures than their rural surroundings. Vegetative cover from urban gardens can provide shading, reduce the number of heat-absorbing surfaces, and through transpiration, can cool the surrounding air (Akbari et al., 2001). Furthermore, by localizing food production, urban agriculture can significantly reduce food miles, thereby cutting down the carbon footprint associated with transporting food from distant rural farms to urban consumers (Edwards-Jones et al., 2008).

Socio-economically, urban agriculture fosters community engagement and can be a beacon for social cohesion in urban areas. Gardens become platforms where citizens can connect, share knowledge, and foster a sense of community. Moreover, urban agriculture can potentially generate employment opportunities, especially for marginalized urban populations. For instance, in regions of sub-Saharan Africa, urban farming is providing livelihoods to urban

dwellers, predominantly women, who are engaged in food production for both home consumption and local markets (Akoto-Danso et al., 2019).

Furthermore, the aesthetic and recreational dimensions of urban gardens can't be understated. They not only provide urban dwellers with direct access to green space, promoting mental well-being, but also have the potential to enrich the biodiversity of the city, attracting a variety of fauna and enhancing ecological corridors (Goddard et al., 2010).

In conclusion, urban agriculture's global significance is anchored in its ability to address diverse urban challenges, from environmental sustainability to social cohesion and economic resilience. As cities continue to grow, integrating agriculture within the urban fabric will become not just beneficial, but imperative.

### **Urban Agriculture and Sustainable Development**

In the evolving discourse on sustainable urban development, urban agriculture has emerged as more than a mere trend; it is an integral solution catering to the multidimensional challenges of burgeoning urban populations. The United Nations' Sustainable Development Goals (SDGs), especially Goal 11 which emphasizes sustainable cities and communities, and Goal 2 which promotes zero hunger, underscore the significance of integrating agriculture into urban design (United Nations, 2015).

Localizing food systems is paramount in an age of global supply chains that often emphasize quantity over quality. Urban agriculture addresses this by bringing food production closer to consumers, ensuring fresher produce and reducing dependencies on extensive logistics that might be susceptible to disruptions. This localization substantially reduces the carbon footprint related to food transportation, contributing to decreased greenhouse gas emissions—a pressing concern given the role of transportation in global emissions (Garnett, 2011).

Economically, urban agriculture opens up avenues for entrepreneurship and employment. City dwellers, especially those in marginalized communities, can find opportunities in both cultivating produce and the ancillary industries it spawns, such as processing, marketing, and distribution. Such initiatives have not only shown potential in terms of livelihood but also in fostering community resilience. The FAO has noted the multifunctional role of urban agriculture in providing food, generating employment, recycling urban wastes, and creating greenbelts (Urban and Peri-Urban Agriculture Sourcebook, 2022).

Beyond the tangible benefits, urban agriculture holds the promise of revitalizing urban ecosystems. In stark concrete jungles, urban farms and gardens serve as essential pockets of biodiversity, attracting a variety of fauna, enhancing pollination, and fostering a biophilic connection among urban residents (Goddard et al., 2010). Moreover, green spaces, through the mechanism of evapotranspiration, contribute positively to the urban microclimate, acting as cool zones and mitigating the urban heat island effect, a growing concern in many expanding cities (Akbari, Pomerantz and Taha, 2001).

In essence, urban agriculture's role in sustainable development is multifaceted and deeply interwoven with the urban fabric. As cities grapple with challenges of the 21st century, from climate change to economic disparities, urban agriculture presents a holistic approach to address these intricacies, reflecting a paradigm shift in how we envision urban futures.

### **Neighborhood Planning and Urban Agriculture**

Neighborhoods, often considered the heartbeat of cities, play a vital role in shaping the socio-cultural and economic life of urban environments. The intimate scale of neighborhoods presents an opportune platform for integrating urban agriculture as a cornerstone for sustainable development. This grassroots approach can offer insights into nuanced urban challenges and cater to them effectively, reflecting the maxim "think globally, act locally."

Several scholars and urban planners recognize the transformative power of urban agriculture in rejuvenating neighborhoods. Drechsel & Dongus (2010) highlight how urban agriculture can revitalize vacant or derelict lands, converting them into vibrant community spaces and thereby ameliorating the urban landscape. These transformed spaces not only

improve the aesthetic appeal but also increase property values, fostering a sense of pride and belonging among residents.

Community engagement is another notable benefit derived from the infusion of urban agriculture at the neighborhood level. Saldivar-Tanaka & Krasny (2004) observe that community gardens and local farming initiatives foster community cohesion by offering shared spaces for collaborative work and cultural expression. They act as hubs for knowledge exchange, skill development, and the reinforcement of communal ties.

From an economic standpoint, neighborhood-focused urban agriculture initiatives can significantly stimulate local economies. By promoting locally grown produce, neighborhoods can reduce their dependency on external supply chains, leading to the creation of local jobs in cultivation, processing, and distribution. Oberholtzer, Dimitri and Pressman (2014) show that urban agriculture in the form of community gardens and small-scale farms can serve as incubators for local entrepreneurship, adding vibrancy to local economies.

Incorporating urban agriculture within neighborhood planning, thus, is not a mere addendum but a holistic strategy that addresses ecological, social, and economic dimensions. As cities continue to grapple with the multifarious challenges of the 21st century, neighborhood-centric urban agriculture could very well serve as a beacon for sustainable and inclusive urban transformation.

### **Review of Literature**

Recent studies in urban agriculture and land use have provided multifaceted insights into the dynamics of urban environments and their sustainable development. Russell, Li and Wang (2023) explore the spatial disparities in urban agriculture access, highlighting its significance for food security, mental health, and community integration, and advocating for the transformation of vacant urban spaces into productive areas. Haldar et al. (2023) focus on peri-urban and rural areas, examining the relationship between Land Use/Land Cover (LULC) changes and environmental factors using remote sensing and GIS to underscore the complexity of these dynamics. Miralles-Garcia (2023) reviews the critical role of peri-urban areas in sustainable city development, emphasizing their vulnerability to urban expansion and the need for integrating agricultural systems into urban planning. Van der Gaast, Jansma, and Wertheim-Heck (2023) discuss the significance of cities in developing sustainable food systems and the potential of urban spaces for citizen-led initiatives.

Lastly, Sonet et al. and Kuusaana et al. (2022) analyze the socio-economic implications of urbanization on agricultural land, particularly in Bolgatanga, Ghana. Kanosvambira and Tevera (2022) discuss the importance of land tenure security in urban community gardens and its impact on urban agriculture's efficiency and viability. Fricano and Davis (2020) investigate the growth and regulatory challenges of urban agriculture in the Southern United States, highlighting the role of policy in its development. In contrast, Nowysz (2021) provides a historical and contemporary perspective on urban agriculture, noting its evolution and integration into residential areas for sustainable urban development. Similarly, Sonet et al. (2021) highlight the importance of public participation in urban development, focusing on the design of public parks in Malaysia. Toboso-Chavero et al. (2019) evaluate the environmental benefits and challenges of using rooftops for food production, energy generation, and water harvesting. Anderson et al. (2019) delve into the role of urban community gardens in providing ecosystem services and serving as social spaces. De Zeeuw, Van Veenhuizen, and Dubbeling (2011) emphasize urban agriculture's impact on food security, poverty alleviation, and environmental management in developing countries. Undenibaly, these studies underscore the evolving and complex relationship between urban development, sustainability, and community involvement.

Together, these studies present a rich tapestry of research in urban agriculture and land use dynamics, highlighting the evolving relationship between urban development and sustainability. They show the importance of equitable access, socio-economic considerations, and innovative solutions in shaping sustainable urban future. Table 1 provides a concise summary of them, and an overview of the insights in to urban agriculture and land use.

**Table 1:** summary of each study

Source: Author

| Source (Author, Year)                          | Summary  |
|--|--|
| Russell, Li, and Wang, 2023                    | Examines spatial disparities in urban agriculture access, highlighting its role in food security, mental health, and community integration.                      |
| Haldar et al., 2023                            | Explores the relationship between Land Use/Land Cover changes and environmental factors in peri-urban and rural areas.   |
| Miralles-Garcia, 2023                          | Discusses the importance of peri-urban areas in sustainable city development and their integration into urban planning.  |
| van der Gaast, Jansma, and Wertheim-Heck, 2023 | Discusses the importance of cities in developing sustainable food systems and citizen-led initiatives.   |
| Kuusaana et al., 2022                          | Analyzes the impact of urbanization on agricultural land, addressing socio-economic implications of land use changes.  |
| Kanosvamaha and Tevera, 2022                   | Explores the importance of land tenure security in urban community gardens and its impact on urban agriculture.  |
| Fricano and Davis, 2020                        | Investigates urban agriculture's growth and regulatory challenges in the Southern United States.   |
| Nowysz, 2021                                   | Traverses the historical and contemporary roles of urban agriculture, examining its evolution and impact.  |
| Sonet et al., 2021                             | Focuses on public participation in designing public parks in Malaysia, highlighting the significance of public involvement in urban development.                 |
| Toboso-Chavero et al., 2019                    | Focuses on rooftop utilization for food production, energy generation, and water harvesting, evaluating environmental benefits.                                  |
| Anderson et al., 2019                          | Examines urban community gardens' role in providing ecosystem services and serving as social spaces.   |
| De Zeeuw, Van Veenhuizen, and Dubbeling, 2011  | Provides a review of urban agriculture's role in addressing challenges in developing countries, emphasizing its impact on food security and poverty alleviation. |

### Precedents: Urban Agriculture in Global Cities

Across the globe, cities with varied historical backgrounds, socio-economic dynamics, and urban challenges have turned to urban agriculture as a multifaceted solution. Not only does urban agriculture serve as an innovative response to food security issues, but it also addresses a myriad of other urban challenges, including economic downturns, vacant land management, and community development. By analyzing case studies from cities like Detroit and Havana, a comprehensive understanding of urban agriculture's adaptability, potentials, and constraints can be established.

**Detroit, USA:** Once an industrial powerhouse, Detroit faced significant economic and social challenges following the decline of the automotive industry. A rise in vacant plots and increased unemployment characterized the urban landscape. However, these abandoned spaces presented an opportunity. According to Steenkamp et al. (2021), Detroit has witnessed a resurgence through urban agriculture, with over 1,400 community gardens revitalizing neighborhoods, providing fresh produce, and fostering community engagement. Additionally, these initiatives have presented avenues for entrepreneurship and local job creation.

**Havana, Cuba:** The case of Havana stands out due to its swift embrace of urban agriculture following the economic crisis of the early 1990s, catalyzed by the dissolution of the Soviet Union. Facing severe food shortages, Havana's urban farming movement was not just a choice but a necessity. Altieri et al. (1999) note that within a few years, the city transformed vacant lots into 'organopónicos' or organic gardens, producing a significant portion of its vegetables. This not only bolstered food security but also fostered a culture of self-reliance, resilience, and sustainability.

These two cities, while distinct in their trajectories and challenges, demonstrate the adaptability of urban agriculture in providing context-specific solutions. While Detroit's journey underscores the role of urban agriculture in post-industrial urban rejuvenation, Havana's story illuminates its potential in crisis mitigation and resilience-building. Both cases, therefore, serve as testaments to urban agriculture's versatility and its promising role in shaping future urban landscapes.

### **The Issue:**

#### **Urban Agriculture in Baghdad and its Potential**

Baghdad, as the capital city of Iraq, boasts a rich history of agricultural innovation and urbanization. While urban agriculture has not been extensively documented within the city, it's essential to note the latent potential it offers in light of the numerous urban challenges Baghdad currently faces. This is particularly significant considering the socio-economic transformations and environmental pressures the city has been grappling with.

The urban challenges in Baghdad are multifold. Studies by (Nadhir Al-Ansari & Sven Knutsson (2011) highlight the increasing demand for potable water and food security concerns due to population growth and environmental constraints. This, coupled with the effects of climate change and the evident urban heat island phenomenon Alavipanah et al. (2015), underlines the urgent need for sustainable solutions. Urban agriculture offers a multifaceted approach to addressing these problems, as it can reduce the urban heat island effect, contribute to local food production, and potentially conserve water through innovative farming practices. Unemployment, especially among the youth, is another concern in Baghdad. emphasizes that urban agriculture could be a viable strategy for employment generation. By incorporating urban farms and green spaces, not only can fresh produce be cultivated, but local communities can also engage in entrepreneurial endeavors.

Furthermore, neighborhoods such as Al-Bastanah present an intriguing backdrop for urban agriculture given its socio-cultural fabric and environmental characteristics. These neighborhoods are repositories of traditional knowledge, which when combined with modern agricultural practices, can create sustainable urban farming systems.

In essence, while the literature on urban agriculture in Baghdad remains sparse, the city's unique socio-cultural and environmental context combined with its pressing urban challenges indicate a promising potential for urban agriculture as a sustainable development tool.

#### **Urban Agriculture in Sustainable Urban Design: Principles and Indicators**

Urban agriculture, as an emerging field in urban planning and design, offers both tangible and intangible benefits. It's essential to integrate this approach holistically, keeping in mind both its design principles and the indicators that measure its impact.

#### **Design Principles**

- Multifunctional Land Use: Spaces should serve dual purposes, like parks offering edible landscapes or rooftops that insulate and produce food (Bohn & Viljoen, 2012).
- Integrated Water Management: Strategies such as rainwater harvesting and greywater recycling are crucial (Mahmoud et al., 2021).
- Biodiversity Enhancement: Promoting diverse plant species encourages healthier ecosystems (Goddard, Dougill and Benton, 2010).
- Community Engagement: Spaces must foster community participation and ownership. (Saldivar-Tanaka & Krasny, 2004)
- Resource Cycling: Strategies for local composting and organic waste recycling are vital. (Kwartnik-Pruc & Droj, 2023)
- Energy Efficiency: Combining clean energy solutions, like solar panels, with agriculture setups. (Twidell & Weir, 2015)
- Connectivity: Agricultural spaces should be integrated and accessible within urban fabric. (Frumkin, 2002)

## Impact Indicators

- **Productivity and Food Security:** Quantity and quality of urban produce are primary indicators of food security. (Orsini et al., 2013)
- **Environmental Impact:** Indicators include reduced carbon footprints, biodiversity enhancements, microclimate improvements, and efficient organic waste recycling. (Hallett et al., 2016)
- **Socio-economic Impacts:** Assessing the socio-economic contributions like job creation and local economic boosts. (Zezza & Tasciotti, 2010)
- **Land Use and Spatial Integration:** Evaluating how urban agriculture blends with the urban fabric and contributes to green infrastructure. (De Zeeuw, Van Veenhuizen and Dubbeling, 2011)

These principles and indicators, when harmoniously implemented, can transform traditional neighborhoods into sustainable urban habitats, ensuring a balance between agricultural production, ecological health, and community well-being. (table 2)

**Table 2:** Urban Agriculture in Sustainable Urban Design: Principles and Indicators

Source: Author

| Component         | Principle/Indicator              | Description  |
|-------------------|----------------------------------|--|
| Design Principles | Multifunctional Land Use         | Spaces should serve multiple purposes, e.g., parks with edible landscapes    |
|                   | Integrated Water Management      | Strategies like rainwater harvesting and greywater recycling                 |
|                   | Biodiversity Enhancement         | Encourage diverse plant species selection                                    |
|                   | Community Engagement             | Design spaces that encourage community participation                         |
|                   | Resource Cycling                 | Strategies for local organic waste composting                                |
|                   | Energy Efficiency                | Integrate clean energy solutions with agricultural areas                     |
|                   | Connectivity                     | Emphasize connecting agricultural spaces to residential and commercial areas |
| Impact Indicators | Productivity and Food Security   | Quantity and quality of urban agricultural produce                           |
|                   | Environmental Impact             | Indicators such as reducing carbon footprint and promoting biodiversity      |
|                   | Socio-economic Impacts           | Assess socio-economic contributions like job creation                        |
|                   | Land Use and Spatial Integration | Assess how urban agriculture integrates with urban fabric                    |

## Research Methodology

This study aims to rejuvenate an existing residential neighborhood, integrating the principles of urban sustainability and urban agriculture. Derived from an extensive literature survey, methodology draws upon key design principles and impact indicators which will be employed in two major phases: assessment and redesign.

### Assessment of the Existing Neighborhood

- **Preliminary Evaluation:** Using Land Use and Spatial Integration as an impact indicator, an in-depth site analysis will be conducted. The current state of the neighborhood's urban agricultural integration will be gauged.
- **Community Engagement:** The principle of Community Engagement will drive stakeholder meetings, ensuring residents' voices are heard and incorporated.
- **Resource Identification:** We'll assess current practices of resource cycling and energy efficiency in the neighborhood, identifying areas of improvement.
- **Environmental Evaluation:** We'll employ the Environmental Impact indicator to assess biodiversity, carbon footprint reductions, and more.

### Al-Bustanah: Overview

Al-Bustanah District is a residential neighborhood located in the southwestern part of Baghdad, Iraq. The district was built in the 1950s and is home to approximately 20,000 residents. Al-Bustanah is located on the banks of the Tigris River and has a beautiful natural setting. However, the district suffers from a lack of basic services, such as sewage and electricity networks, as well as poor infrastructure, such as unpaved roads and a lack of health care facilities (Fig. 1).

Al-Bustanah District is a neglected area with the potential to be a vibrant and thriving community. The district has a number of advantages, including its beautiful natural setting, its proximity to the city center, and its proximity to the Tigris River. However, the district also faces a number of challenges, including a lack of basic services, poor infrastructure, and high unemployment.



**Fig. 1:** Al-Bustanah District

Source: Google map

### Rapid Assessment of the Study Area Al-Bustanah

The table shows the results of a Likert scale survey to assess the design of a proposed urban agriculture project. The survey asked respondents to rate their agreement with a series of statements about the project's design elements. The responses were then converted to a scale from 1 (Strongly Disagree) to 5 (Strongly Agree) Table 3.

**Table 3:** Rapid Assessment Form for the Study Area Al-Bustanah

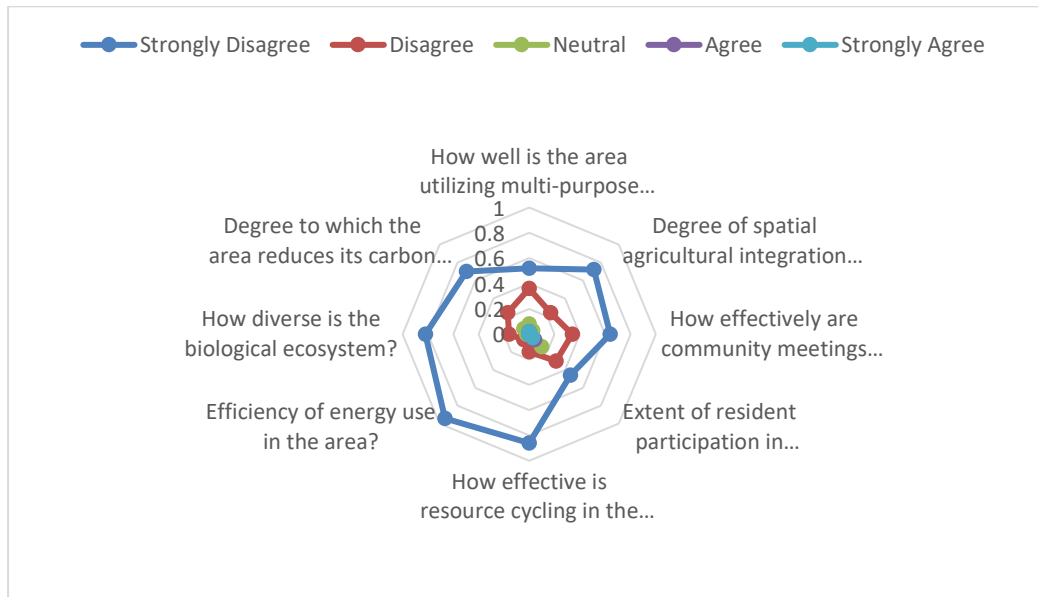
Source: Author

| Main Element           | Question or Variable                  | Likert Scale (1: Strongly Disagree, 5: Strongly Agree) |          |         |       |                | Average Rating | Interpretation                               |
|------------------------|---------------------------------------|--|----------|---------|-------|----------------|----------------|--|
|                        |                                       | Strongly Disagree                                      | Disagree | Neutral | Agree | Strongly Agree |                |  |
| Preliminary Evaluation | How well is the area utilizing multi- | 0.52   | 0.36     | 0.08    | 0.02  | 0.02           | 3.69           | Respondents agree that the area is utilizing |



|                          |  |      |      |      |      |      |      |   |
|--------------------------|--|------|------|------|------|------|------|---|
|                          | purpose land use?  |      |      |      |      |      |      | multi-purpose land use and has a high degree of spatial agricultural integration.   |
|                          | Degree of spatial agricultural integration in the area?    | 0.72 | 0.24 | 0.04 | 0    | 0    |      |   |
| Community Engagement     | How effectively are community meetings organized?          | 0.64 | 0.34 | 0.02 | 0    | 0    | 3.32 | Respondents agree that community meetings are organized effectively and that there is some resident participation in agricultural projects. |
|                          | Extent of resident participation in agricultural projects? | 0.46 | 0.3  | 0.14 | 0.06 | 0.04 |      |   |
| Resource Identification  | How effective is resource cycling in the area?             | 0.86 | 0.14 | 0    | 0    | 0    | 4.5  | Respondents strongly agree that the area has effective resource cycling and efficient energy use.   |
|                          | Efficiency of energy use in the area?                      | 0.94 | 0.06 | 0    | 0    | 0    |      |   |
| Environmental Evaluation | How diverse is the biological ecosystem?                   | 0.82 | 0.16 | 0.02 | 0    | 0    | 4.29 | Respondents strongly agree that the area has a diverse biological ecosystem and is reducing its carbon footprint.                           |
|                          | Degree to which the area reduces its carbon footprint?     | 0.7  | 0.24 | 0.06 | 0    | 0    |      |   |

Overall, the average ratings for all the design elements are above 3, indicating that respondents have a positive view of the design. However, there are some areas where the design could be improved. For example, the level of community engagement is relatively low, and there is room for improvement in the extent of resident participation in agricultural projects (Fig. 2).



**Fig. 2:** Rapid Assessment Form for the Study Area  
Source: Author

### Redesign of the Neighborhood

- **Multifunctional Design:** Grounded in the Multifunctional Land Use principle, spaces will be repurposed for multiple functions.
- **Sustainable Water Management Systems:** The Integrated Water Management principle will guide water-related design decisions.
- **Biodiversity Enhancement:** Design choices will reflect the Biodiversity Enhancement principle, emphasizing varied plant species.
- **Community Involvement:** Spaces will be designed to foster Community Engagement and Socio-economic Impacts, like job creation through urban agriculture.
- **Energy and Resource Efficiency:** Drawing from Resource Cycling and Energy Efficiency principles, renewable energy sources and waste recycling practices will be central.
- **Connectivity:** The Connectivity principle will shape the redesign, linking agricultural areas with other zones.
- **Review and Evaluation:** Using the Productivity and Food Security indicator, the success of the redesign will be periodically assessed.

By infusing the design principles and impact indicators from the literature survey into the methodology, a comprehensive and research-driven approach to neighborhood rejuvenation is ensured.

### Rapid Assessment Form for the New Neighborhood Design Al-Bastanah

The redesign of the residential area of Al-Bastanah into a model for urban agriculture stemmed from an evaluation of the area's existing conditions (As assessed in the previous paragraph), utilizing modern methods like solar energy. The concept juxtaposes the organic layout of the surrounding agricultural zones with the geometric urban fabric of the district. This fusion aims to reduce energy and water consumption via solar solutions and mitigate environmental impacts through smart, sustainable building operations. Incorporating urban agriculture, responding to global health awareness and the need for green urban spaces, leverages available open spaces in this densely populated area. The design promotes resource efficiency and climate-resilient solutions, creating a harmonious interaction between the inhabitants and their geographical and social environment in Iraq.

The table shows the results of a five-point Likert scale survey to assess the design of a proposed urban agriculture project to Al-Bastanah. The survey asked respondents to rate their agreement with a series of statements about the project's design elements. The responses were then converted to a scale from 1 (Strongly Disagree) to 5 (Strongly Agree) Table 4.

**Table 4:** Rapid Assessment Form for the New Neighborhood Design Al-Bastanah

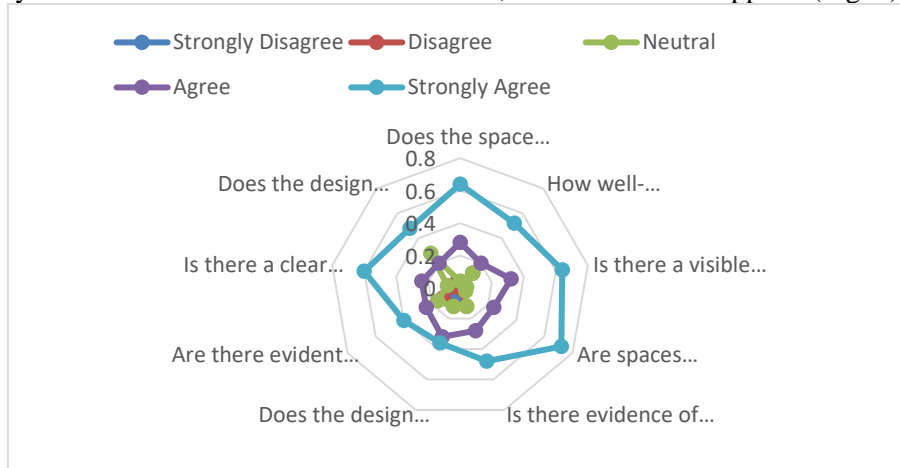
Source: Author

| Design Element                       | Question or Variable   | Likert Scale (1: Strongly Disagree, 5: Strongly Agree) |          |         |       |                | Average Rating | Interpretation  |
|--------------------------------------|--|--|----------|---------|-------|----------------|----------------|---|
|                                      |  | Strongly Disagree                                      | Disagree | Neutral | Agree | Strongly Agree |                |   |
| Multifunctional Design               | Does the space effectively serve multiple functions?                           | 0  | 0.04     | 0.04    | 0.28  | 0.64           | 4.64           | Strongly agree that the space effectively serves multiple functions.                            |
| Sustainable Water Management Systems | How well-integrated are the sustainable water management practices?            | 0.04   | 0.12     | 0.12    | 0.2   | 0.52           | 4.52           | Agree that the sustainable water management practices are well-integrated.                      |
| Biodiversity Enhancement             | Is there a visible effort to enhance plant species diversity in the design?    | 0  | 0        | 0.04    | 0.32  | 0.64           | 4.64           | Strongly agree that there is a visible effort to enhance plant species diversity in the design. |
| Community Involvement                | Are spaces designed to actively foster community engagement?                   | 0  | 0        | 0.04    | 0.24  | 0.72           | 4.72           | Strongly agree that the spaces are designed to actively foster community engagement.            |
|                                      | Is there evidence of socio-economic benefits like job creation in the design?  | 0  | 0.12     | 0.12    | 0.28  | 0.48           | 4.48           | Agree that there is evidence of socio-economic benefits like job creation in the design.        |
| Energy and Resource Efficiency       | Does the design integrate renewable energy solutions effectively?              | 0.08   | 0.12     | 0.12    | 0.32  | 0.36           | 4.2            | Agree that design integrates renewable energy solutions effectively.                            |
|                                      | Are there evident strategies for local composting and organic waste recycling? | 0.08   | 0.12     | 0.16    | 0.24  | 0.4            | 4.6            | Agree that there are evident strategies for local composting and organic waste recycling.       |

|                       |   |      |      |      |      |      |      |   |
|-----------------------|---|------|------|------|------|------|------|---|
| Connectivity          | Is there a clear emphasis on connecting agricultural spaces with other areas? | 0.04 | 0.04 | 0.08 | 0.24 | 0.6  | 4.6  | agree that there is a clear emphasis on connecting agricultural spaces with other areas.                  |
| Review and Evaluation | Does the design seem capable of producing quality urban agricultural produce? | 0    | 0.04 | 0.28 | 0.2  | 0.48 | 4.64 | Respondents strongly agree that the design seems capable of producing quality urban agricultural produce. |

Overall, the average ratings for all design elements are above 4, indicating that respondents have a very positive view of the design (Fig. 3).

Following design illustrates how to address the study area in accordance with the previously mentioned indicators in the table above, which have been applied (Fig. 4).



**Fig. 3:** Rapid Assessment Form for the New Neighborhood Design  
Source: Author



**Fig. 4:** New Neighborhood Design Al-Bastanah  
Source: Author

## Findings

The results of the two Rapid Assessment Forms indicate that both the Rapid Assessment Form for the Study Area and the Rapid Assessment Form for the New Neighborhood Design show positive results.

The Rapid Assessment Form for the Study Area shows that the area is utilizing multi-purpose land use and has a high degree of spatial agricultural integration. The area also has effective resource cycling and efficient energy use, and it is reducing its carbon footprint. However, there is room for improvement in the level of community engagement and the extent of resident participation in agricultural projects.

The Rapid Assessment Form for the New Neighborhood Design shows that the design effectively serves multiple functions, has well-integrated sustainable water management practices, and enhances plant species diversity. The spaces are designed to actively foster community engagement, and there is evidence of socio-economic benefits like job creation in the design. The design integrates renewable energy solutions effectively, and there are evident strategies for local composting and organic waste recycling. There is also a clear emphasis on connecting agricultural spaces with other areas, and the design seems capable of producing quality urban agricultural produce.

Overall, both the Rapid Assessment Form for the Study Area and the Rapid Assessment Form for the New Neighborhood Design show positive results. However, there is room for improvement in both areas, particularly in the level of community engagement and the extent of resident participation in agricultural projects.

## Conclusions

Overall, the results of the rapid assessment forms indicate that both the study area and the new neighborhood design have the potential to be successful urban agriculture projects. However, there is room for improvement in both areas, particularly in terms of community engagement and resident participation in agricultural projects.

The following are the key conclusions that can be drawn from the above:

- The study area and the new neighborhood design have the potential to be successful urban agriculture projects.
- There is room for improvement in both areas, particularly in terms of community engagement and resident participation in agricultural projects.
- The following recommendations can help improve the success of these projects:
  - Increase community engagement and resident participation in agricultural projects.
  - Develop a plan to promote environmental education and awareness in the community.
  - Develop a monitoring and evaluation plan for the project.
  - Make the design publicly available so that it can be replicated in other communities.
  - Seek funding and support from government agencies and private foundations.

By following these recommendations, designers can ensure the success of these projects and their benefits to the entire community.

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