

Sustainable Urban Farming for Low-Income Housing Communities in Rusunawa Surakarta

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ABSTRACT

Urbanization and lifestyle changes, accentuated by the Covid-19 pandemic, have exacerbated the decline in Green Spaces, leading to significant environmental degradation. This study emphasizes the urgent need for a sustainable, inclusive, and equitable approach to Covid-19 recovery, prioritizing environmental sustainability and green spaces. In response, Surakarta City has developed vertical housing projects, notably Public Housing (Rusunawa), to address the diminishing Green Space. However, challenges persist, particularly for low-income communities, necessitating innovative approaches. This study explores the potential of urban farming as an effective method to develop sustainable and affordable green urban spaces in public housing in Surakarta, Indonesia. Utilizing a qualitative research design, semi-structured interviews and focus group discussions were conducted with residents of Rusunawa Surakarta and stakeholders. The findings offer practical recommendations for implementing urban farming, ensuring the creation of sustainable and affordable green spaces. The implications of this research serve as a valuable reference for government agencies, developers, and stakeholders in planning and executing effective and sustainable urban farming practices in public housing.

KEYWORDS

Green space;
Public housing;
Urban farming;
Low-income
community.

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1. Introduction

The rapid urbanization in Surakarta has led to a significant decline in Green Spaces, resulting in severe environmental degradation. This decline, exacerbated by the lifestyle changes prompted by the Covid-19 pandemic, has underscored the urgent need for sustainable solutions to address the diminishing Green Spaces. One of the top priorities in 2021 is land use planning, particularly concerning the availability of Green Spaces. According to the 2007 Spatial Planning Law, a minimum of 30% of the city's total area should be designated as Green Spaces, with 20% being Urban Green Space. In Surakarta, local regulations have reinforced this requirement, stipulating that Green Space provision should reach at least 30% of the city's area, with private RTH comprising a minimum of 10%, and Green Space at least 20%. Despite these regulations, the availability of Green Space in Surakarta is a mere 7.98% of the total city area, significantly below the targeted 20% (*Dinas Lingkungan Hidup Kota Surakarta*, 2021).

Given an annual population growth of 0.44%, available green spaces within the city are becoming increasingly scarce. In response, the Surakarta city government has developed vertical housing projects in densely populated areas, including Public Housing (*Rumah Susun Sederhana Sewa* or *Rusunawa*). These initiatives aim to enhance the urban living environment and bolster Green Space. Surakarta has 21 Public Housing units located across five subdistricts, providing a model for addressing these issues (Rosalina 2021). *Rusunawa*, a form of vertical dwelling with a rental payment system, caters to low-income communities with unique cultural settlement practices. Apart from providing green space, the primary purpose of *Rusunawa* is to offer temporary housing for those without their own homes. *Rusunawa* residents are subject to rental time limits determined by the Peraturan Daerah Kota Surakarta No.7 Tahun 2011, targeting underprivileged families within the low-income community.

The existence of *Rusunawa* has a significant impact on its residents; physical, psychological, social, and economic well-being (N. N. Rosalina, Hardiyati, and Muqoffa 2021). To enhance each resident's quality of life, community cohesion—a defining feature in this community—must be strengthened (Bahri 2009; Li, Stehlík, and Wang 2019). However, providing high-quality, healthy green spaces in densely populated urban areas poses a significant challenge (Syrbe and Chang 2018). Poor planning has resulted in suboptimal spaces, with long hallways and stairwells inadvertently turning into places where trash is carelessly dumped. The lack of balconies and private outdoor places forces tenants to use common areas to air dry their laundry, contributing to the challenges of shared living spaces. Situations with open balconies and hallways frequently turn into informal playgrounds, posing safety risks for children.

Urban farming can be an effective solution to these concerns. It can provide public housing communities with access to fresh and healthy food, create employment opportunities, and promote social cohesion (Gambua 2023). Urban farming involves growing food in urban areas through various methods, including community gardens, rooftop gardens, and vertical farms. In the context of public housing in Surakarta, Indonesia, urban farming can effectively develop green urban spaces that are sustainable and affordable. It provides residents with fresh produce while promoting social interaction and community building (Pasha, Widyaningsih, and Rijanta 2014; Jha 2022; Şenik and Uzun 2022).

This study aims to explore the potential of urban farming and its impact on urban communities through a qualitative research design. Semi-structured interviews and focus group discussions were conducted with residents and stakeholders of *Rusunawa* Surakarta. The analytical framework combined participatory and spatial analyses to gain comprehensive insights. The findings are expected to offer practical recommendations for implementing urban farming, ensuring sustainable and affordable green spaces. The research aims to serve as a valuable reference for government agencies, developers, and stakeholders in planning and executing effective and sustainable urban farming practices in public housing.

2. Method

This study employed a comprehensive qualitative research design to explore the impact of urban farming in *Rusunawa* Surakarta. Data were collected through various methods to ensure a thorough understanding of the subject matter. Semi-structured interviews were conducted with 30 residents and 10 stakeholders, including representatives from the Technical Management Unit (UPT) and local government officials, to gather detailed insights into the views on urban farming, its challenges, and potential benefits.

Additionally, focus group discussions (FGDs) were held with community members to discuss the challenges and opportunities associated with urban farming. These discussions allowed for deeper understanding through group interactions. Field observations were also carried out to document the existing conditions of the *Rusunawa* environment, focusing on green spaces and communal areas, providing contextual understanding and identifying potential sites for urban farming.

Supplementary document analysis included reviewing local government regulations, urban planning reports, and previous research studies to contextualize the findings within the broader framework of urban planning and policy. The data analysis process involved identifying patterns and themes from the interviews and FGDs through descriptive analysis. Participatory analysis was employed by involving residents in interpreting the data through follow-up discussions to ensure the findings were grounded in their lived experiences. Spatial analysis was used to assess suitable locations for urban farming within the *Rusunawa* complex, identifying optimal areas for implementing urban farming initiatives.

Ethical considerations were strictly adhered to throughout the study. Informed consent was obtained from all participants to ensure voluntary participation. Anonymity and confidentiality were ensured to protect the identities of the participants. The community was involved at all stages of the research to foster trust and collaboration. This comprehensive approach provided a thorough understanding of urban farming's potential to enhance green spaces and improve the quality of life in low-income housing communities. By integrating various qualitative methods, the study ensured a robust and holistic analysis of the data, facilitating practical and actionable recommendations.

3. Results and Discussion

Mojosongo *Rusunawa* is one of the Public Housing with a rental payment system built by the Surakarta City Government, located at Mertoudan Street RT.07/RW.09, Mojosongo, Surakarta City, Indonesia. Constructed in 2015, this housing comprises a ground floor and four additional floors, accommodating a total of 24 residential units. Each unit has dimensions of 4 square meters, equivalent to a type 24 house. The ground floor serves as a common facility area, including parking spaces, a multipurpose hall, a prayer room (musholla), shared bathrooms, a communal kitchen, and a storage room.

Mojosongo *Rusunawa* is equipped with two 2 meters wide staircases and emergency staircases on both sides of the building. It is also outfitted with a hydrant installation to address fire incidents. Clean water facilities are sourced from a deep well, with water reserves stored in a ground tank. Each unit is supplied with 450 watts of electricity and includes a living room, bedroom, bathroom, kitchen, and laundry area.

According to the Mayor's Regulation No. 15 of 2016 on the Management of Government-Owned Rental Public Housing in Surakarta City, the Technical Management Unit for Rental Housing (UPT Rumah Sewa) is a unit established to oversee the apartment complexes in Surakarta within the Department of Housing, Settlements, and Land. The management aims to ensure the availability of habitable and affordable apartments for Low-Income Communities in a healthy, safe, harmonious, and sustainable environment within an integrated housing and settlement governance system. It also ensures the disciplined, orderly, and systematic management of the apartment complexes.

As the entity responsible for managing the public housing, UPT Rumah Sewa is obligated to provide services to residents by conducting regular inspections, maintenance, and repairs on all elements and components of the apartment facilities in accordance with health and safety standards. Residents have the right to receive information and explanations regarding policies, decisions, and all matters related to the management of the apartment complexes.

3.1 Challenges in Public Housing: Safety, Livability, and Environment Quality

The investigation into public housing reveals a significant compromise in housing standards to achieve affordability. Public housing communities face considerable concerns related to maintenance, management, and issues of anti-social behavior (Samsudi 2010; Bilal, Meera, and Abdul Razak 2019; Aly et al. 2020). High-density housing presents challenges in maintaining overall livability. These challenges underscore the critical need to address and rectify shortcomings in the construction and design of low-cost housing to ensure residents' well-being. Furthermore, housing development encounters specific challenges in establishing effective joint management bodies. These bodies play a crucial role in overseeing maintenance and ensuring the overall upkeep of the housing units. The difficulty in forming and sustaining these bodies highlights the need for innovative solutions to encourage community participation, cooperation, and effective management structures. Therefore, the role of community organizations, such as *Paguyuban*, is essential in *Rusunawa*.

In the context of developing Green Spaces, it is crucial to acknowledge that efforts to provide affordable housing often result in compromises in housing standards. Inadequate design has led to suboptimal environments characterized by lengthy corridors and staircases that unintentionally become areas for indiscriminate dumping. The absence of balconies and private outdoor spaces compels residents to use communal areas for drying laundry, intensifying challenges associated with shared living spaces. Situations where open corridors and balconies are present often devolve into makeshift playgrounds, posing safety risks, particularly for children.

The scarcity of open spaces and recreational facilities, such as multipurpose halls or playgrounds, impedes community engagement and interaction. The Covid-19 pandemic has accentuated the struggles of low-income residents, particularly those with large families enduring cramped living conditions during movement control order periods. These difficulties are further complicated by social issues, including residents' comprehension of their responsibilities.

Another challenge is balancing the needs of residents with environmental preservation. This requires careful planning and management to ensure that green spaces are developed sustainably and environmentally friendly (Syrbe and Chang 2018). Promoting community participation and engagement in the development and maintenance of green spaces is also essential, yet challenging, especially considering the limited resources and time of the low-income residents.

Regarding the management of Green Spaces in *Rusunawa*, Iswan Fitradias, the Head of UPT *Rusunawa*, observed that the management remains suboptimal due to most residents being of low income. There is a tendency for reduced concern and limited active involvement in environmental issues among the residents, with a common reliance on management or sanitation and security personnel.

Based on interviews with residents, including two mothers from units 2 and 07, both admitted they rarely go down to the ground floor, preferring to stay on their respective floors. Community activities include Ramadan gatherings, PKK (Family Welfare Empowerment), communal work approximately every three months, residents' meetings if there are specific events, and exercise sessions (which have ceased due to the instructor's passing). Both residents expressed an initiative for gardening but preferred doing it in front of their units rather than in the designated ground area due to the inconvenience of going up and down the floors. They also mentioned that interactions among residents are infrequent because almost all adult residents are employed and prefer to rest in their respective units in the evenings.

One interviewee, Mrs. Suyatmi (67), suggested that if the land is to be utilized, it is better to plant useful crops such as chili or vegetables. Another interviewee, Mrs. Esia (49), proposed that the land should be used for planting greenery as a stress relief facility. Both strongly support the idea of the management initiating a Green Open Spaces development program in the *Rusunawa*. However, there is confusion about the rules regarding land use for residents. Mrs. Suyatmi stated that residents are not allowed to plant on the land, while Mrs. Esia said it is allowed. Through consultations and discussions involving both the management and residents, it has been determined that the Urban Farming concept aligns effectively with the residents' needs.

These findings suggest that urban farming can address some of the critical challenges faced by *Rusunawa* residents. By providing access to fresh produce and fostering social interaction, urban farming can enhance the community's overall well-being. The management must clarify the rules regarding land use and actively involve residents in developing and maintaining green spaces. This participatory approach will ensure the sustainability and success of urban farming initiatives in public housing communities. One of the existing conditions of the *Rusunawa* environment and the potential areas for urban farming is the laundry spot. The field observations documented in Figure 1 highlight the current use of corridors for drying laundry, indicating a need for designated green spaces. The participatory and spatial analyses provided a clear picture of suitable locations for urban farming within the *Rusunawa* complex, emphasizing the importance of accessible and communal areas for successful implementation.



Fig. 1. Dry laundry hanging in corridors of *Rusunawa* (Source: author's documentation, 2024)

3.2 Empowering Urban Communities through Urban Farming in Public Housing

Urban farming is a sustainable solution with significant potential to enhance the well-being and resilience of urban communities. This study identifies several criteria for urban farming, aligning with

key indicators that contribute to urban community improvement. The table below provides an overview of these criteria and their corresponding indicators (Rahmawati, Winarno, and Wibowo 2020; Abdurrohman, Arkasala, and Nurhidayah 2021; Clerino and Fargue-Lelièvre 2020): (see table 1.)

Table 1. Criteria for Urban Farming and Associated Needs of Public Housing Residents

Criteria	Attributes	References
Perception of green space	Enhances community perception of the importance of green spaces and raises awareness of their health and environmental benefits	Wijayanti, Pandia, and Sutarno 2019; Syrbe and Chang 2018;
Frequency of usage	Increases the frequency of green space usage as communities utilize vacant land for cultivation, producing fresh vegetables	Abdurrohman, Arkasala, and Nurhidayah 2021;
Type of activities	Involves planting and tending to crops, fostering enjoyable social activities and community building	Pasha, Widyaningsih, and Rijanta 2014; Rahmawati, Winarno, and Wibowo 2020.
Social interaction	Serves as a space for interacting with neighbors or fellow residents, sharing knowledge and experiences in cultivation	Gambua 2023; Samsudi 2010
Quality of interaction	Involves planting and tending to crops, fostering enjoyable social activities and community building	Aly et al. 2020;
Social well-being	Enhances social well-being by connecting communities with nature and their surroundings, resulting in increased happiness through successful cultivation	Jha 2022; Şenik and Uzun 2022
Community engagement	Boosts community participation in activities held in green spaces, such as seed or harvest exchanges, cultivation training, or other social events	Clerino and Fargue-Lelièvre 2020
Environmental quality impact	Enhances environmental quality and instills a sense of environmental care as residents tend to plants and improve conditions of vacant land around them	Rosalina et al. 2021.

(Source: author's elaboration, 2024)

By considering these concepts and conducting participatory engagements with *rusunawa* residents, the development of Green Space is expected to bring positive advantages to the community. Open spaces in the center of the building, front areas or paved roadways in front of the building, and in front of each resident's unit/ balcony are all appropriate locations for the development. In the meanwhile, outdoor circulation area is frequently used for parking, kid's play areas, and community events. Residents also use it to decorate the surroundings with a range of plants, both hanging and potted. In the *Rusunawa* setting, these plants provide a visually pleasant and refreshing ambiance.

Implementing green spaces can also address issues of food security and provide economic benefits. By utilizing these communal spaces for urban gardening, residents can grow their own vegetables and herbs, reducing their reliance on external food sources and lowering their grocery expenses. This practice not only fosters a sense of community and shared purpose but also promotes healthier eating habits. The cooperative nature of these gardens can lead to stronger social bonds and a more resilient community, capable of supporting each other through collaborative efforts.

These green spaces serve multiple purposes within the *Rusunawa* community. They not only enhance the aesthetic appeal of the residential complex but also contribute to improved air quality, reduced urban heat island effects, and increases biodiversity. Moreover, these areas foster social interaction among residents, providing common grounds for community gathering, relaxation, and recreational activities. The presence of green spaces has been shown to have positive impacts on mental health, reducing stress and promoting overall well-being among residents. By incorporating these elements thoughtfully into the *Rusunawa* design, planners can create a more livable, sustainable, and community-oriented environment that addresses both the physical and social needs of its inhabitants.

The idea of Green Space offers a lot of possibilities for future development in this area. This is due to the fact that the outer courtyard offers a bigger, more open space for plant cultivation. In addition, this position minimizes possible disturbance to operations within the building and makes it easier to tend to and harvest plants. Urban gardening in the courtyard will therefore have a major

positive impact on the economic health of the *Rusunawa* community as well as the resilience of the local food supply. The location suitable for urban garden is in front of Mojosongo *Rusunawa* which outdoor. (see fig 2.)



Fig. 2. Outdoor areas in front of Mojosongo *Rusunawa*

The residents have taken it upon themselves to cultivate greenery around the *Rusunawa*, attempting to bring some greenery into this cramped area. It is relevant and worthy of investigation to place a community garden in the front corridor of housing units. This location can make it easier for locals to participate in cooperative farming operations. Furthermore, placing a community garden in the front corridors of housing units holds the potential to aesthetically contribute, improve environmental quality, and create more opportunities for social interaction among residents. As a result, establishing a community garden in the front corridor area of housing units is crucial to strengthening social ties and environmental sustainability in the *Rusunawa* community.

Creating these green spaces within the *Rusunawa* not only enhances the aesthetic appeal but also promotes mental well-being by providing residents with a serene environment. Studies have shown that access to green spaces can reduce stress levels and improve overall mental health, which is community gardens can serve as educational spaces where residents can learn about sustainable farming practice, the importance of biodiversity, and the benefits of fresh, locally grown produce. This educational aspect can empower residents with knowledge and skills that can be passed down through generations, fostering a culture of sustainability and self-sufficiency within the community.



Fig. 3. Green plants in corridors area

According to the characteristics of the *Rusunawa* neighborhood, Green Spaces must address the demands of low-income communities, such as communal gardens that can provide additional income. Urban farming and gardening can have positive effects on the environment and the economy. People who live there actively take part in gardening or plant cultivation. However, there is the scarcity of land that is truly suited for food production in terms of location, size, and accessibility to resources is another obstacle to urban farming. Appropriate places have been identified using land suitability studies and land use inventories, mostly based on biophysical criteria such as:

- a. Common vegetables grown in urban gardening include lettuce, water spinach, sawi pokcoy, tomatoes, cucumbers, also peppers such as chili pepper. These crops are excellent for containers and hydroponic systems.
- b. Fruits that can be cultivated in pots or containers include strawberries, tiny oranges, or other small fruit plants. These fruit crops are ideal for vertical garden systems and rooftop gardens.
- c. Herbs & Medical Plants: Basil, mint, rosemary, and butterfly pea plants are examples of herbs that thrive in an urban agricultural setting. Spring onions and ginger also excellent for urban farming as they can be used in cooking and offer health benefits. These plants do not require much room and are simple to keep.
- d. Decorative plants: Several types of decorative plants are planted to improve the appearance of open areas. These plants are commonly used in vertical and wall gardens.
- e. Air-filtering plants
- f. Traditional medical plants: ginger, turmeric, or andrographis paniculata can be cultivated for traditional medicinal purposes.

The development and maintenance of green spaces through urban farming in *Rusunawa* can address several challenges faced by residents, from improving environmental quality to fostering social interaction and economic benefits. The successful implementation of urban farming initiatives requires the active participation and engagement of the community, supported by clear guidelines and management practices. These efforts will enhance the quality of life in low-income housing communities, contributing to sustainable urban development.

4. Conclusion

The findings of this study suggest that implementing urban farming initiatives in public housing, specifically in *Rusunawa*, Surakarta, is well-aligned with the needs and preferences of the residents. The identified criteria and attributes related to urban farming—such as perception of green space, frequency of usage, variety of activities, social interaction and well-being, community engagement, and environmental impact—indicate a positive impact on the urban community. Furthermore, the study highlights the potential of strategically placing urban farming areas, such as community gardens, in accessible locations like in front of unit corridors. This placement facilitates easy participation in communal farming activities, enhances the aesthetic quality of the environment, and promotes frequent social interactions among residents.

The findings align with previous research, affirming that shared spaces are pivotal in cultivating a sense of responsibility and social interaction among residents. Green Spaces, specifically, have been highlighted in earlier research as significantly impacting the level of interaction and communal activities among residents (Rosalina et al., 2021). The current study further supports the importance of communal spaces, emphasizing the role of urban farming as a viable solution to enhance shared spaces and contribute to sustainable community development in low-income housing.

In conclusion, the implementation of urban farming in *Rusunawa* has the potential to contribute significantly to environmental sustainability, increase local food security, and strengthen social bonds within the community. The study emphasizes the importance of considering the specific needs and characteristics of the low-income population in public housing when designing and implementing such initiatives. The findings open avenues for future research in the realm of sustainable urban development and community empowerment in low-income housing.

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