Australian Journal of Science and Technology

ISSN Number (2208-6404)
Volume 8; Issue 4; December 2024

Original Article

# A comprehensive study of green space conditions and challenges in Urban and peripheral residential zones

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**ABSTRACT**

Green spaces are as essential as other infrastructural elements, despite being the most needed yet ignored concepts in this rapid urbanization and industrialization era. This study focuses on the current conditions of green spaces in urban and peripheral contexts and the challenges associated with green space development in these zones, particularly emphasizing informal green spaces. This study used mixed-method approaches for data collection and analysis, including key informant interviews and observation techniques. A total of 105 data were collected. Findings reveal that total household area and income range affect having green spaces and the size of green spaces. While more than half of the respondents had access to green spaces at their homes, mostly in the format of indoor plants, residents from urban and peripheral zones had different opinions about the green space issue. Limited space was identified as a common hindrance by both urban and peripheral residents. Lack of time and safety concerns for children are the main hindrances to having proper green spaces, according to urban dwellers, while peripheral dwellers mentioned limited knowledge of plant, care, and maintenance costs. Urban residents mentioned the health benefits mostly of having proper green spaces, while peripheral residents highlighted relaxation and social cohesion. The findings of this research will help to advance urban development through improved green space integration. Focusing on limited space, how urban areas can adapt to green spaces, and how peripheral zones can increase their knowledge to maintain green space, this study recommends a solution to this.

**Keywords:** Green space, informal green space, peripheral, urbanization

**Submitted:** 30-11-2024, **Accepted:** 09-12-2024, **Published:** 30-12-2024

## INTRODUCTION

Green spaces in urban environments include parks, gardens, road green spaces, urban forests, and other public areas.[1,2] As crucial elements of the urban ecosystem,[3] perform several essential functions, these areas serve a number of key purposes, such as improving the health of locals,[4] improving the quality of the environment,[5-7] supporting everyday leisure and recreation,[8,9] controlling the climate,[10] preserving biodiversity,[11,12] and safeguarding ecological balance.[13-15] The relationship between urban green spaces and human well-being primarily centers on the impact of the natural environment on overall well-being. As a scarce natural element within urban areas, green spaces play a critical role in enhancing both the physical and mental health of residents.[16]

Despite the benefits, if neglected or mismanaged, urban green space can become breeding grounds for pests and vectors of disease and engender fears of crime, posing a disservice to public health and safety.[17,18] By definition, Urban Green Space is interwoven with the urban fabric, including its built, natural, and socioeconomic elements.[19] Features of the natural environment such as topography, soils, and climatic conditions shape the conditions for vegetation growth and vegetation types.[20-22] Built environment with its buildings and infrastructure layouts and land-use regulations determine the availability of land for urban green space.[21] Rapid urbanization, population growth and urban sprawl can threaten existing green space and limit opportunities for new green space creation.[23,24] Urban sprawl has been associated with lower amounts of green space.[25]

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Green space can be roughly divided into formal and informal green space (IGS). IGS is mainly distributed in urban communities, streets, and residential areas in the form of small parks, green belts, and street trees; while formal green space is mainly distributed in urban areas or suburbs, with large areas and complete facilities, including a variety of large-scale municipal parks, scenic spots, and forest parks. At present, there is no unified definition of IGS.[26] Zhao Li regards the informal space as the extra functional space derived from the urban spatial elements. Dr. Christoph Rupprecht first proposed the concept of IGS in 2014. IGS includes any space that has been subject to intense human disturbance and is now occupied by spontaneous vegetation, which is a definite socio-ecological entity whose ownership and management rights are not clear or unified.[27] IGSs play a vital complementary role in providing environmental, social, and ecological benefits to cities in the process of urban renewal.[28] At present, low-density large-scale urban green space makes it difficult to meet the convenience needs and sharing needs of urban residents. As a new type of urban green infrastructure, accessible IGS can help cities realize the beautiful vision of co-construction, co-governance, and sharing.[29,30] Our study mainly emphasizes IGS in urban and peripheral areas. The goal of our research is to find out the existing conditions and challenges of having proper green space/greenery in urban and peripheral areas.

## METHODOLOGY

This study implements a mixed-methods approach to gain an inclusive understanding of green space conditions across diverse urban areas. Quantitative data collection tangled key informant interviews, complemented with observational methods to capture detailed insights. A representative sample was drawn from each spatial area, proportionate to its population size, to ensure demographic inclusiveness. The sample areas were divided into two key spatial zones, positioning with the study's objectives of assessing variations in green space conditions. Stratified random sampling was used to select participants, ensuring a balanced representation across different population segments.

KoBo Toolbox facilitated data collection, allowing efficient and structured data gathering in the field. Data analysis combined both quantitative and qualitative approaches to identify patterns, trends, and fundamental factors influencing green space utilization and challenges. During the study, ethical considerations—including informed consent, participant confidentiality, and unbiased data handling—were rigorously observed to maintain integrity and trustworthiness in research outcomes.

## RESULTS AND DISCUSSION

### Demographic Information

Among 105 respondents, 60.95% were female and 38.10% were male. The study area was divided into four main sections. The urban zone included Dhaka North (17.14%), Dhaka South (16.19%), Cox's Bazar Sadar (10.48%), and Savar City (0.95%). Figure 1 represents that the respondent's segregation based on two spatial zone: Urban and peripheral. Moreover, the peripheral zone was signified entirely by Savar, covering 55.24% of the area. Respondents aged 26–40, considered the youth demographic, denoted 61.90% of the study sample. Within this group, females covered 67.19%, while males made up 55%, showing a stronger representation compared to other age categories. Mostly (61.90%) responses came from 26 to 40 years age group.

### Household Composition

From the findings, it has been observed that the ownership status of respondents' current homes in comparison with their living duration. Most respondents (80.95%) reported living in rental housing, whereas only 19.05% owned their homes. A noteworthy proportion of renters (69.41%) had resided in their current housing for 1–5 years, reflecting frequent relocation patterns among this group. Inversely, 50% of homeowners had lived in the same residence for over 10 years, indicating higher residential stability. This distinction highlights distinct housing dynamics between renters and owners, with renters experiencing more mobility and homeowners indicating long-term settlement tendencies.

Among the respondents, 71.43% stated a household size of 3–5 members, while only 4.76% had more than six members. In addition, 49.52% stated that their homes span 750–1000 sq ft. A minor proportion, 4.76%, live in houses exceeding 2000 sq ft, which also inclines to accommodate

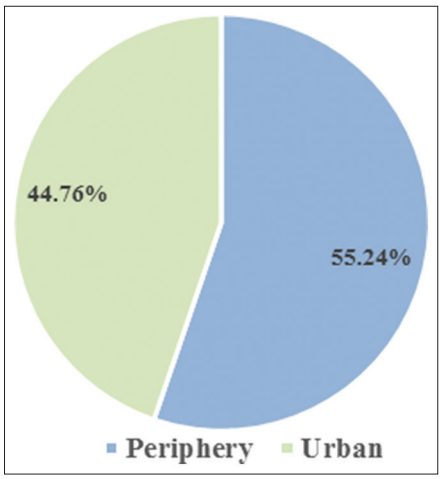


**Figure 1:** Spatial zone wise respondents category

larger households. Notably, in the peripheral zone, 24.14% of respondents reported that their homes cover <750 sq ft.

About 36.19% of respondents said that their monthly average income is more than BDT 80,000 and 31.43% of people stated that their monthly average income is BDT 40,001–60,000. Moreover, among female respondents, 59.38% do not earn for their families, while 40.63% do contribute financially. On the contrary, a much higher proportion of male respondents are income earners, with 92.5% representing that they earn for their families, and only 7.5% reporting that they do not. This recommends a remarkable gender difference in financial contributions within households, with males being more likely than females to participate in income-earning activities. Household income contributions for different genders are also understood, with 100% of earners in peripheral areas being husbands, whereas 65.96% of earners in urban areas are husbands, followed by other family members at 23.40%, brothers at 6.38%, and sisters at 4.26%.

Table 1 shows data on the monthly average income range of respondents based on the spatial distribution of respondents. In peripheral areas, 68.97% of households earn between BDT 10,001 and 20,000, while urban incomes are more diverse, with 38.3% in the same range and 36.17% earning between BDT 20,001 and 30,000. Higher-income brackets (BDT 30,001–50,000) are only present in urban areas, demonstrating a broader income distribution and a higher earning potential than in peripheral areas.

## Green Space/Greenery Coverage

Respondents' response on asking about the availability of green spaces at home, 57.14% of respondents reported having some form of green space or greenery in their homes, while a prominent portion specified that they lacked any greenery in their living spaces.

The responses regarding various types of green spaces, provided by respondents who confirmed the presence of green space in their homes solidifies the concept of IGS convenience more. Among those with green space, 77% have indoor plants, primarily on balconies or as decorative features and 45% have various forms of outdoor plants.

This study reveals that larger homes generally have more green space. In homes with a total area of 1001–1500 sq ft, 40% of green spaces fall between 151 and 400 sq ft, whereas 27.5% are under 150 sq ft. For homes sized 1501–2000 sq ft, mostly (60%) of green space falls in the 401–650 sq ft range. Smaller homes, such as those with 750–1000 sq ft, mainly have green spaces under 150 sq ft (62.5%). Homes over 2000 sq ft show the most wide-ranging green areas, with 40% having green spaces between 401 and 650 sq ft.

Respondents who lacked greenery or green spaces at home expressed several factors. Both male and female participants frequently cited limited available space (49%) and the time required for plant maintenance (29%) as the main barriers. Figure 2 denotes reasons behind not having green spaces at home, and responses provided by those who agreed earlier that they did not have green spaces at home.

Urban residents (89.36%) are slightly more likely than those in the periphery (82.76%) to feel the necessity for green spaces, with fewer urban respondents (10.64%) saying "No" compared to the periphery (17.24%). Among those who feel the need, urban residents express it more powerfully, with 50.00% feeling the necessity "Very Strongly" equated to 22.92% in the periphery, while 72.92% in the periphery feel it "Strongly" compared to 35.71% in urban areas. In the case of family members' viewpoints, 48.94% of urban respondents indicated strong support for green spaces within their families, compared to 46.55% of peripheral respondents who reported neutral feelings.

Figure 3 portrays the reasons identified by urban and peripheral respondents of not having or maintaining green spaces. Exploring the reasons behind obstacles to green spaces discovered that, beyond space and time constraints, a prominent 25% of respondents expressed concerns about the safety and security of children and pets. Furthermore, 89.52% of respondents stated their preferences for having green space

**Table 1: Spatial zone wise respondents' monthly income range**

| Income range | Periphery | Urban | Grand total |
|---|---|---|---|
| BDT 10,001–20,000 | 68.97 | 38.30 | 55.24 |
| BDT 20,001–30,000 | 10.34 | 36.17 | 21.90 |
| <BDT 10,000 | 20.69 | 12.77 | 17.14 |
| BDT 30,001–40,000 | 0.00 | 8.51 | 3.81 |
| BDT 40,001–50,000 | 0.00 | 4.26 | 1.90 |

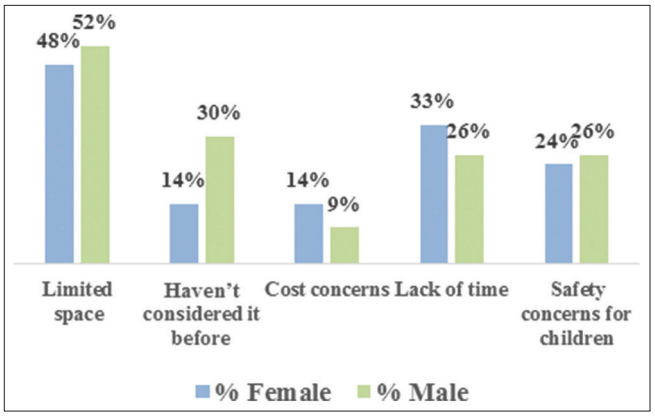


**Figure 2:** Reasons behind not having green spaces at home

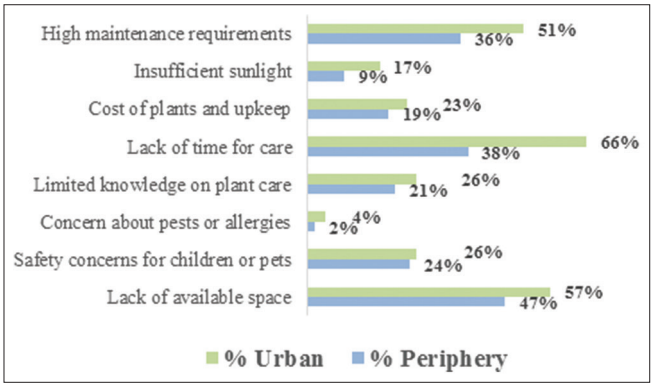


**Figure 3:** Obstacles of having or maintaining green spaces

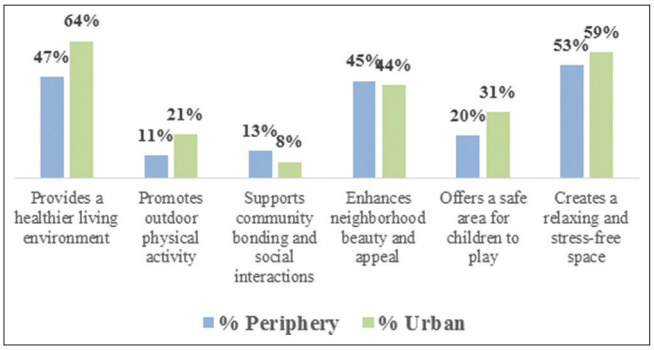


**Figure 4:** Perception on benefits of having green spaces

outside, and among those 94.83% portions are peripheral respondents.

A follow-up question asked to see differing perceptions of green spaces in periphery and urban areas. Figure 4 symbolizes responses from different spatial zones about having benefits of green spaces. In both areas, green spaces are seen as providing a healthier living environment, but urban areas place greater emphasis on this benefit (64% compared to 47% in periphery areas). While urban spaces are also viewed as offering more opportunities for physical activity (21%) and a safer area for children to play (31%), peripheral areas are considered more conducive to relaxation and stress reduction (53% compared to 59% in urban areas). Remarkably, both areas agree on the importance of enhancing neighborhood attractiveness (45% periphery, 44% urban), but peripheral spaces are seen as somewhat better for community ties (13%) compared to urban areas (8%). Overall, green spaces are valued for different reasons in each context, with urban areas highlighting health and safety, while peripheral areas focus more on tranquility and social cohesion.

## CONCLUSION

The key findings of the study are as follows:

- Availability of green space: More than half of the respondents (57.14%) had access to green spaces, most (77%) in the form of informal plantations (indoor planting). It was observed that larger homes had more green spaces, but they also mentioned a lack of space and time constraints to maintain those greeneries.
- Preferences: Respondents from urban areas (89.36%) expressed a stronger need for green spaces as they could relate it to health benefits (64%) and safety for children (31%). Peripheral respondents prioritized relaxation (53%) and social cohesion (13%), mostly in an expression of a need to have green space.
- Hindrances to green space development: Regardless of spatial zone, most of the respondents mentioned space constraints, maintenance time, and safety concerns for children and pets as obstacles to having green space. People in urban areas who could afford larger homes were still maintaining some forms of green spaces as they comparatively had fewer financial issues to take care of plants. People with limited income and smaller home space could not even think to adjust some expenses to have green space being agreed about its importance.

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