Neighborhood Residential Design and Community Integration

Gwaza Mtaver; Oladele Dada Stephen
Department of Architecture,
Joseph Ayo Babaola University, Ikeji-Arakeji, Osun State, Nigeria

Abstract:- Sustainability issues are as old as human existence, though they have not occupied the front burner of human activity or been discussed until recently, in a not-too-distant past. Architects and other actors in the built environment have concentrated more on environmental sustainability, creating a vacuum and a need for this study. The study assessed residential neighbourhood designs and social sustainability by means of communal integration. The study used housing estates in Kaura district of the federal capital territory of Abuja as cases while examining the bottlenecks and leeways these estates had on communal integration. Data was collected by means of questionnaires and observation schedules, which were in turn analysed, and conclusions were deduced through the analysis. The findings revealed that, based on the cut-off point of 2.50, the respondents agreed that neighbourhood residential design had an impact on communal integration. The findings revealed that respondents tend to agree that the lack of common spaces, layout barriers, and absence of community-oriented amenities negatively affect communal integration. The findings revealed that the respondents agreed that practical design interventions and recommendations would improve communal integration. The study concluded that communal integration is not solely reliant on physical elements. Social and cultural factors emerged as significant influencers of communal integration, aligning with existing research that highlights the interplay between the built environment and social dynamics. Policies, rules, and the existing sense of neighbourhood identity were seen to play a role in either hindering or facilitating residents' sense of belonging. The study recommends that engaging residents in the design process can help ensure that design elements align with their preferences and needs. Regular feedback sessions and community workshops can enable a collective vision for communal spaces to emerge.

Keywords:- Design, Communal, Integration Neighborhood, Residential.

I. INTRODUCTION

Sustainability has emerged as a central concern in contemporary society, encompassing environmental, economic, and social aspects. While the environmental dimension of sustainability has been widely studied and addressed, the significance of social sustainability in shaping inclusive and resilient communities has gained increasing attention in recent years. Within the context of the built environment, the role of neighborhood residential design in fostering communal integration stands as a crucial factor in achieving social sustainability.

Sustainability has been a long-standing concern throughout human history, but it gained global prominence in the late 20th century as societies grappled with environmental challenges and the consequences of unchecked urbanization (Elmqvist *et al.,* 2013). The Brundtland Commission's report in 1987, commonly known as the Brundtland Report, highlighted the interdependence of environmental, economic, and social aspects, laying the foundation for the concept of sustainable development (WCED, 1987). Since then, the concept of sustainability has evolved, acknowledging the interconnectedness of human well-being and environmental health. The built environment plays a pivotal role in addressing sustainability challenges as it encompasses the physical infrastructure, urban spaces, and residential neighborhoods where people live and work (Barton, 2000). In recent years, scholars and policymakers have recognized the need to integrate social sustainability alongside environmental and economic concerns to create holistic and resilient communities (Blewitt, 2018).

Social sustainability focuses on promoting equitable, inclusive, and cohesive communities that foster a sense of belonging and well-being among their residents (Tsenkova & Hristova, 2018). Central to social sustainability is communal integration, which refers to the level of social interaction, cohesion, and interconnectedness among residents within a neighborhood (Bojago, 2022). Communal integration contributes to social capital, building trust, and cooperation among community members, thereby enhancing the community's resilience and quality of life (Cope *et al.,* 2022). The neighborhood's design and layout significantly influence the social dynamics and communal integration within it (Summan, 2019). Well-designed neighborhoods can facilitate positive social interactions, active participation in community activities, and a sense of ownership among residents (Carmona, 2010). On the other hand, poorly designed neighborhoods may create physical and social barriers that hinder communal integration and social cohesion (Aelbrecht, *et al.,* 2019).

The primary aim of this study is to assess the impact of neighborhood residential design on communal integration within housing estates located in the Kaura district of the Federal Capital Territory, Abuja. The specific objectives are therefore: To identify the design challenges and barriers that hinder communal integration within the selected housing estates, thereby inhibiting social sustainability; to propose practical design interventions and recommendations that can enhance communal integration and foster social sustainability in residential neighborhoods, based on the

findings and analysis of the study. This district has numerous housing estates that represent a significant urban setting with diverse cultural backgrounds, social structures, and urbanization patterns, making it an essential context for exploring the dynamics of communal integration and social sustainability.

To achieve this objective, the study will conduct an in-depth analysis of selected housing estates in the Kaura district, focusing on the design elements, spatial configuration, and community amenities that influence communal integration (Hartig & Kahn, 2016). By examining these factors, the study aims to identify design challenges and barriers that hinder social sustainability within these neighborhoods. Furthermore, based on the findings and analysis, the study will propose practical design interventions and recommendations to enhance communal integration and foster social sustainability in residential neighborhoods.

II.　LITERATURE REVIEW

Existing literature demonstrates the multi-faceted nature of communal integration in neighborhood residential areas. Effective design elements, spatial configuration, community amenities, social infrastructure, sense of place, and technological influences can all contribute to fostering a cohesive and connected community. However, it is important to note that the context of each neighborhood and the preferences and needs of its residents play a vital role in shaping communal integration.

Neighborhood residential design significantly influences community integration by shaping social interactions, fostering a sense of place and identity, and providing opportunities for shared activities. Well-designed neighborhoods with accessible public spaces, mixed-use developments, and a strong sense of community identity are more likely to foster social cohesion and communal integration among residents (Gärling et al., 2013). Gated communities, while offering security and shared amenities, may present challenges to broader neighborhood interaction. Understanding the relationship between neighborhood residential design and community integration is essential for creating vibrant and cohesive communities where residents feel connected and engaged (Gehl, 2011).

A. Design Elements Influencing Communal Integration
Design elements play a crucial role in shaping the social dynamics and communal integration within neighborhood residential areas. Public spaces and green areas Accessible parks, plazas, and green spaces provide gathering spots and opportunities for social interactions, encouraging residents to connect and build a sense of community (Francis, 2003). Similarly, neighborhoods with pedestrian-friendly streets, sidewalks, and connectivity promote walking and chance encounters, fostering a strong sense of community (Cho and Rodriguez,2015).

Mixed-use development through the integration of residential and commercial spaces within the neighborhood creates a vibrant environment where residents can live, work, and socializes within a compact area (Dempsey et al., 2009). Mixed-use developments that combine residential, commercial, and recreational spaces have gained popularity in urban planning. Studies suggest that such developments can enhance communal integration by creating a vibrant environment where people live, work, and socialize in close proximity (Stojanovski, 2019). The presence of shops, cafes, and community facilities within walking distance encourages residents to interact more frequently and develop a stronger sense of community (Schmitt and Hartmann, 2016). Furthermore, houses with front porches or verandas facilitate casual interactions between neighbors and promote a sense of belonging (Schmitt and Hartmann, 2016).

B. Spatial Configuration and Communal Integration
The spatial arrangement of buildings and public areas significantly impacts the social cohesion and integration within residential neighborhoods. Neighborhoods density and diversity with moderate residential densities and diverse housing options encourage a mix of age, income, and family types, fostering social interactions among different groups (Gärling et al., 2013). Furthermore, studies have shown that neighborhoods with interconnected street grids promote more social interactions than cul-de-sacs, as they facilitate movement and connectivity (Gümüş and Erdönmez. 2021). Also, the design of public spaces and private property affects residents' perceptions of safety and their willingness to interact with neighbors (Yeganeh and Kamalizadeh, 2018). Proximity of residential units can influence the likelihood of interactions, with closer neighbors often leading to stronger community ties (Carr et al., 2011).

C. Community Amenities and Communal Integration
Community amenities and shared facilities are essential for creating opportunities for communal interaction and fostering a sense of belonging. Community centers serve as hubs for social activities, events, and gatherings, bringing residents together (Litt et al., 2015). In the same vein, recreational facilities such as parks, playgrounds, and sports fields provide spaces for leisure activities, encouraging residents to come together and engage in physical and social activities (McCormack et al., 2010)
Furthermore, Neighborhoods with local retail and dining options encourage people to socialize and support local businesses, enhancing the sense of community (Sampson et al., 2012). Schools, libraries, and cultural institutions contribute to the neighborhood's identity and provide spaces for residents to come together and learn (Bonaiutoand Alves, 2012).

D. Social Infrastructure and Communal Integration
Social infrastructure refers to the support systems and services that foster community engagement and interaction. Support for community organizing and engagement initiatives, such as resident associations and neighborhood events, can enhance communal ties (Gamo and Park,2023). Involvement in decision-making processes and community planning can lead to greater communal integration and a sense of ownership among residents (Gibbs et al., 2014).

More so, Access to efficient public transportation and pedestrian-friendly infrastructure can increase residents' mobility and facilitate social connections beyond their immediate neighborhood (Dehghanmongabadi and Hoşkara, 2020). Proximity to social services and healthcare facilities can create support networks and improve the well-being of residents, contributing to communal integration (Sampson et al., 2002; Powell, 2003).

III. METHODOLOGY

A. Research Design

This study employs a mixed-methods approach to comprehensively explore the relationship between neighborhood residential design and community integration. The research design combines both quantitative and qualitative data collection and analysis methods to provide a holistic understanding of the phenomenon.

B. Data Collection

A structured survey was administered to 108 residents of 9 different neighborhood residential areas (estates). The survey will include questions about design elements, spatial layout, amenities, social interactions, and perceived community integration. Likert-scale questions and multiple-choice questions will be utilized. A stratified random sampling technique was employed to ensure representation from various types of neighborhoods (e.g., mixed-use, gated communities, traditional neighborhoods). Observations of public spaces, architectural features, and community amenities will be conducted to understand their physical characteristics and usage patterns.

Table 1: Observation checklist of

Estate	Private Gates	Pedestrian walk paths	Community Center	Mix-use Development	Social infrastructure
Olympia	X	X	X	X	X
Mosaic Garden	X	X	X	X	X
Ivory Crown	V	X	X	X	X
Golden Ville	V	X	X	X	V
NPI	V	X	X	X	V
Total Corporative	X	V	V	V	X
Laffa Yette	V	V	V	V	V
Gaduwa	V	V	V	X	X
Prince and Princess	V	x	V	X	V

Source: Research field Data

Table 1: Sample size stratification according to residential neighborhoods

Estate	Respondents	Percentage (%)
Olympia	11	10.19
Mosaic Garden	11	10.19
Ivory Crown	11	10.19
Golden Ville	11	10.19
NPI	11	10.19
Total Corporative	11	10.19
Laffa Yette	11	10.19
Gaduwa	11	10.19
Prince and Princess	20	18.52

Source: Research field Data

C. Data Analysis

Survey responses will be analyzed using descriptive statistics of means and standard deviations to answer research questions and identify trends and patterns in residents' perceptions of design elements, amenities, and community integration. A cut off point of 2.50 was used as the decision criterion for acceptance or rejecting. A mean of 2.50 and above is accepted and a below 2.50 is rejected. Qualitative data from observations will be analyzed using thematic analysis. Themes related to social interactions and neighborhood identity will be identified and interpreted to gain deeper insights into the influence of design on community integration.

IV. AREA OF THE STUDY

Kaura district, more commonly known as Games Village, is a relatively well-developed district in phase 2 of Abuja. It is located to the south west of Abuja's central business district. It is characterized as a predominantly peaceful residential neighborhood, although there are some commercial interests. Several high-quality educational establishments are sited in or near the neighborhood. There are social amenities on the district's southern boundary, close to the Lokogoma Expressway, as to the north near the border with Durumi. Available amenities include parks, gardens, restaurants, supermarkets and religious centres.

Kaura district sits adjacent to Durumi to the north, Gudu to the north east, Duboyi to the east, Galadimawa to the south and Kukwaba to the west. Umaru Musa Yaradua Expressway also known as Airport Road, links to the Nnamdi Azikiwe International Airport. Ring Road 2 connects to other outer Abuja destinations like Lokogoma and Apo. Kaura district is a sought after neighborhood. A variety of different residents call the place home such as professionals, civil servants and business men. The area benefits from good infrastructure like water, drainage and roads. It is also very well situated giving easy access to the Central Area. Accordingly the district has become increasingly popular with people looking for more affordable places to live in the capital.
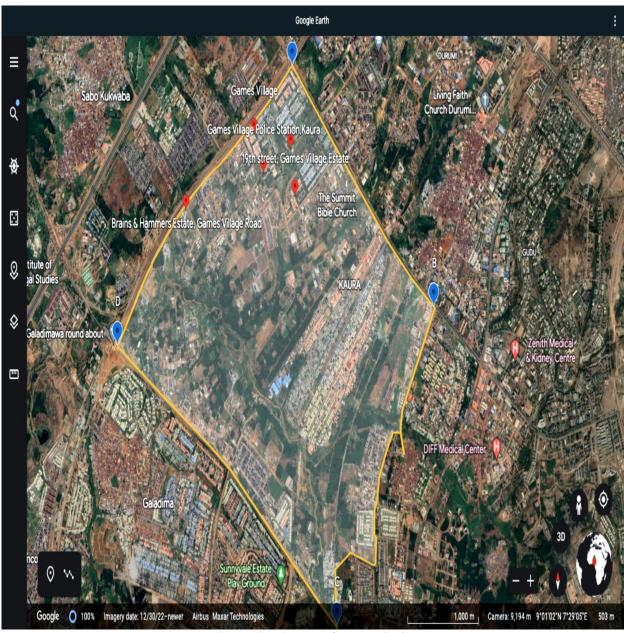

Plate 1: Google Map of Kaura District

Marked Coordinates:
A - 9 01'19"N, 7 26'50"E
B - 9 00'17"N, 7 27'55"E
C - 8 58'56"N, 7 27'10"E
D - 9 00'07"N, 7 25'29"E

V. RESULTS

The research questions stands as a guide for effective presentation of data. The responses from the questionnaire are rated on five point scale of Strongly Disagree (5), Disagree (4), Neutral (3), Agree (2) and Strongly Agree (1). Every objective is represented as a cluster and the data collected for this study was presented, analysed and interpreted as shown below:

- **Objective 1:** Assessing the impact of neighborhood residential design on communal integration in housing estates located in the Kaura district of the Federal Capital Territory Abuja.

Table 3: Mean Response of Impact of Neighborhood Residential Design on Communal Integration

S/No	Item Description	SD (5)	D (4)	N (3)	A (2)	SA (1)	$\bar{\bar{X}}$	STD
1.	The design and layout of my housing estate encourage residents to interact with each other.	42	30	12	18	6	3.78	1.27
2.	The architectural features and design elements of my housing estate promote social connections among residents.	30	42	12	17	7	3.66	1.22
3.	The common spaces or facilities within my housing estate are conducive to communal activities and interactions.	37	43	17	11	0	3.98	0.95
4.	The design aspects of my housing estate facilitate communal integration among residents.	28	25	15	20	20	3.19	1.47
5.	I am satisfied with the level of communal integration within my housing estate.	59	24	9	6	10	4.07	1.30
	Cluster Mean/ STD						**3.74**	**0.599**

$\bar{X}$ = Mean, decision: $\bar{X} > 2.50$ – Accepted.

Table 3 indicates that the mean scores of respondents for items 1 to 5 were 3.78, 3.66, 3.98, 3.19 and 4.07 with their standard deviation of 1.27, 1.22, 0.99, 1.47, and 1.30 respectively. Based on the cut-off point of 2.50, the respondents agreed that neighborhood residential design had an impact on communal integration. The data suggests that respondents generally perceive their housing estate as having design elements that encourage interaction and communal activities. Respondents seem not satisfied with the existing level of communal integration within their estate. However, there is some variability in responses,

- **Objective 2:** Identifying the design challenges and barriers that hinder communal integration within the

particularly in statements related to architectural features promoting social connections and the extent to which design aspects facilitate communal integration. The variation in responses may indicate differing perceptions among residents regarding the effectiveness of design elements in promoting communal integration. Statement 4 has a relatively lower mean and higher standard deviation, suggesting that there might be differing opinions about how design aspects contribute to communal integration

selected housing estates, thereby inhibiting social sustainability.

Table 4: Mean Response of Impact of Design Challenges and Barriers on Communal Integration

S/No	Item Description	SD (5)	D (4)	N (3)	A (2)	SA (1)	$\bar{\bar{X}}$	STD
1.	The lack of common spaces or gathering areas in my housing estate hinders communal integration.	21	12	6	47	22	2.66	1.44
2.	The physical layout of my housing estate creates barriers to social interactions among residents.	18	14	6	49	21	2.62	1.37
3.	The absence of community-oriented amenities in my housing estate inhibits communal integration.	23	15	6	43	21	2.78	1.46
4.	Social and cultural factors significantly impact communal integration within my housing estate.	15	12	7	52	22	2.50	1.31
5.	The existing policies or rules in my housing estate hinder communal integration among residents.	17	8	9	56	18	2.54	1.29
	Cluster Mean/ STD						**2.62**	**0.697**

$\bar{X}$ = Mean, decision: $\bar{X} > 2.50$ – Accepted.

Table 4 shows that the mean scores of respondents for items 1 to 5 were 2.66, 2.62, 2.78, 2.50 and 2.54 with their standard deviation of 1.44, 1.37, 1.46, 1.31, and 1.29 respectively. Based on the cut-off point of 2.50, the respondents agreed that these design challenges and barriers had an impact on communal integration. The responses to the survey questions suggest that residents perceive various factors as hindrances to communal integration within the housing estate. Respondents tend to agree that the lack of common spaces, layout barriers, and absence of community-

oriented amenities negatively affect communal integration. Although most residents indicate an agreement that social and cultural factors play a significant role in shaping communal integration, while also suggesting that existing policies or rules might hinder communal integration.

The responses highlight areas that residents perceive as barriers to communal integration, including the lack of common spaces, layout challenges, absence of amenities, social and cultural factors, and existing policies. The

housing estate management can consider addressing these concerns to enhance communal integration and residents' quality of life.

- **Objective 3:** Proposing practical design interventions and recommendations that can enhance communal

integration and foster social sustainability in residential neighborhoods, based on the findings and analysis of the study.

Table 5: Mean Response on Practical Design Interventions and Recommendations to Improve Communal Integration

S/No	Item Description	SD (5)	D (4)	N (3)	A (2)	SA (1)	$\overline{\overline{X}}$	STD
1.	The design and layout of my housing estate encourage residents to interact with each other.	18	11	5	44	30	2.47	1.42
2.	The architectural features and design elements of my housing estate promote social connections among residents.	16	12	6	50	24	2.50	1.34
3.	The common spaces or facilities within my housing estate are conducive to communal activities and interactions.	22	13	5	45	23	2.69	1.45
4.	The design aspects of my housing estate facilitate communal integration among residents.	17	12	7	52	20	2.57	1.33
5.	I am satisfied with the level of communal integration within my housing estate.	15	9	7	51	26	2.41	1.31
	Cluster Mean/ STD						**2.53**	**0.615**

$\overline{X}$ = Mean, decision: $\overline{X} > 2.50$ – Accepted.

Table 5 shows that the mean scores of respondents for items 1 to 5 were 2.66, 2.62, 2.78, 2.50 and 2.54 with their standard deviation of 1.44, 1.37, 1.46, 1.31, and 1.29 respectively. Based on the cut-off point of 2.50, the respondents agreed with practical design interventions and recommendations made will improve communal integration. The responses suggest that residents perceive varying levels of agreement regarding the influence of design elements on communal integration within the housing estate. Overall, the mean scores for each question range from 2.41 to 2.69, indicating moderate levels of agreement or neutrality in responses. The responses suggest that residents generally agree to a large extent that design elements influence communal integration.

VI. FINDINGS AND DISCUSSION

The study's findings highlight the nuanced perceptions of residents regarding the influence of design elements on communal integration within the housing estates. The varying levels of agreement or neutrality observed in the survey responses underscore the complexity of this relationship. While some residents perceive the design's potential to encourage interactions and foster a sense of community, others remain cautious or uncertain about its impact. The findings suggests that while residents recognize the potential impact of design elements on communal integration, there is no strong consensus on the extent of their influence. Concerning whether the design and layout of the housing estate encourage residents to interact with each other, the result implies that some residents believe the design promotes interaction, but others might perceive limitations in the design's ability to foster social connections. Similarly, the focus on the architectural features and design elements that promote social connections, indicates a mixed perception of the efficacy of these features in promoting communal interactions.

The suitability of common spaces or facilities for communal activities and interactions indicates a slightly more positive perception while still reflecting a varied range of opinions. Furthermore, whether the design aspects facilitate communal integration, residents perceive highly the impact of design aspects on fostering communal integration. Lastly, the research aimed to understand residents' satisfaction with the level of communal integration within the housing estate. This lower mean score indicates a less satisfied response compared to the other questions. It is noteworthy that while residents may perceive the impact of design elements on communal integration, their overall satisfaction with the current level of integration is not as high.

The findings of this study resonate with existing research that highlights the complexity of the relationship between design elements and communal integration. Cao and Kang, (2019), emphasizes that well-designed neighborhoods with accessible public spaces can encourage social interactions and community engagement. Gehl (2011) argues that urban design influences how people use public spaces and interact with their environment. These observations align with the mixed responses observed in the study, where some residents perceive the design's ability to encourage interactions while others remain neutral or skeptical about its impact. Furthermore, Du *et al.* (2023) research that acknowledges the multifaceted nature of communal integration suggests that both physical and social aspects of the built environment influence residents' interactions and sense of belonging. This idea is reflected in the study's findings, as respondents' perceptions are influenced by a combination of design elements, architectural features, and existing.

VII. SUGGESTION OF DESIGN ELEMENTS FOR IMPROVED COMMUNAL INTEGRATION IN NEIGHBORHOOD RESIDENTIAL BUILDINGS

The findings of the study underpin the intricate dynamics between design, spatial configuration, community amenities, and communal integration in neighborhood residential areas. The findings highlight the need for a holistic approach that considers both physical and social factors to create vibrant and connected communities. The study therefore suggests the following design consideration in fostering neighborhood communal interaction.

A. Central Gathering Spaces

Designate central gathering areas such as plazas, squares, or community parks that serve as focal points for residents to come together. These spaces can be equipped with seating, shade, and interactive installations to encourage spontaneous interactions and community events.

Plate 2: shows typical central gathering areas in residential neighborhood

B. Pedestrian-Friendly Streets

Design streets with pedestrian pathways, sidewalks, and bike lanes to encourage residents to walk and interact. Streets designed for people, rather than just vehicles, can create a safer and more inviting environment for social connections.

Plate 3: shows pedestrian pathways areas in residential neighborhood

C. Mixed-Use Developments

Incorporate mixed-use spaces that combine residential units with commercial establishments, such as cafes, restaurants, and local shops. This setup encourages residents to engage with their surroundings and neighbors while going about their daily routines.

Plate 4: shows mixed-use spaces in neighborhood

D. Parks and Playgrounds

Integrate small pocket parks, playgrounds, and recreational spaces strategically throughout the neighborhood. These spaces provide opportunities for families and individuals to gather, play, and connect with one another.

E. Community Gardens

Designate areas for community gardens where residents can collaborate on planting and nurturing plants. Community gardens not only promote sustainable living but also provide a platform for residents to interact and share gardening knowledge.

Plate 5: shows community gardens in neighborhood

F. Shared Facilities

Include shared facilities like clubhouses, community centers, and multipurpose rooms that can host various activities and events. These spaces can be utilized for fitness classes, workshops, meetings, and cultural celebrations that bring residents together.

G. Open Sightlines and Visual Connectivity

Plan the layout with open sightlines, where residents can see and interact with one another from their homes. Clear visibility promotes a sense of safety and encourages spontaneous interactions.

H. Street Furniture and Gathering Nodes

Install street furniture, such as benches, tables, and gathering nodes, at key points throughout the neighborhood. These nodes create opportunities for residents to rest, meet, and engage with their neighbors.

Plate 6: shows street furniture within neighborhood

VIII. CONCLUSION

This study embarked on a comprehensive exploration of the intricate relationship between neighborhood residential design and communal integration. By examining design elements, spatial configuration, and community amenities, the study aimed to shed light on the ways these factors influence the sense of community and social interactions within housing estates. Through a mixed-methods approach, encompassing quantitative surveys and qualitative interviews, a nuanced understanding emerged, revealing the complexity of this interaction.

The findings of the study underscore the importance of design elements and their impact on communal integration. Residents' perceptions of the role of design varied across different aspects. While there were indications of design features encouraging interactions and promoting social connections, there were also neutral or skeptical perspectives. This demonstrates that design alone is not a panacea; rather, its effectiveness is influenced by multifaceted factors such as cultural norms, personal preferences, and the availability of shared spaces.

The results also indicated that communal integration is not solely reliant on physical elements. Social and cultural factors emerged as significant influencers of communal integration, aligning with existing research that highlights the interplay between the built environment and social dynamics. Policies, rules, and the existing sense of neighborhood identity were seen to play a role in either hindering or facilitating residents' sense of belonging.

IX. RECOMMENDATIONS

The following recommendations are proposed to enhance the communal integration within neighborhood residential areas:

- Engaging residents in the design process can help ensure that design elements align with their preferences and needs. Regular feedback sessions and community workshops can enable a collective vision for communal spaces to emerge.
- Designing multi-use spaces that can adapt to various activities encourages diverse interactions. These spaces can cater to both formal and informal gatherings, accommodating a range of community needs.
- Implementing diverse and inclusive programming in community spaces can attract a wide range of residents, fostering cross-cultural interactions and connections.
- Utilizing technology to facilitate community engagement can bridge gaps and overcome physical barriers. Virtual community platforms can serve as extensions of physical communal spaces, facilitating interactions even when face-to-face gatherings are limited.
- Considering the cultural context of the neighborhood is vital. Design elements and amenities should resonate with the values and norms of the community to foster a sense of ownership and belonging.
- Regular maintenance, programming, and community events organized by housing estate management can help create a vibrant communal environment. These initiatives can facilitate interactions and create a cohesive neighborhood identity.
- While promoting interactions, it's important to maintain a balance between privacy and communal engagement. Design elements should provide opportunities for both solitude and socialization.

- Conducting long-term studies to assess the effectiveness of design interventions on communal integration is crucial. These studies can provide insights into how design evolves and impacts residents over time.

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