Social Interaction Dynamics among Residents of Public Spaces in Low-Cost Housing in Yogyakarta

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Social interaction is important for maintaining social kinship among residents and achieving common objectives in the housing environment. Neighborhood infrastructure, particularly streets and communal facilities, provides essential public spaces where residents can interact as well as engage in social activities. Therefore, this study aimed to use housing observation and mapping methods to examine location and assess the availability of environmental infrastructure as well as social facilities. The analysis also identified social interaction activities occurring on neighborhood streets and in housing social facilities, analyzed the role in shaping social interactions, and obtained relevant assumptions. The results showed that neighborhood streets and social facilities (open spaces, playgrounds, and community halls) played a significant role in facilitating social interactions among residents. Social interaction was necessary for promoting togetherness and social cohesion among housing residents. However, architectural arrangements were still needed to increase the flexibility of existing space use and bridge the gap in the availability of social facilities in low-cost housing.

Keywords: Housing, Environmental Infrastructure, Social Facilities, Social Cohesion

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1. Introduction

The availability of environmental infrastructure and social facilities is a significant issue in the development of low-cost housing. This problem is caused by residents' limited financial capacity to obtain homes with complete and adequate environmental infrastructure and social facilities, as well as the mismatch between residents' needs and the architecture of low-cost housing. The urgency of this research stems from the limited environmental infrastructure and social facilities in low-cost housing, especially for low-income communities (MBR). This article focuses on the role of environmental infrastructure and social facilities in housing as spaces and places where residents can engage in social interaction activities. Social interaction is important for maintaining unity and togetherness among residents to achieve common goals in their residential environment. The purpose of this research is to explore the availability and roles of environmental infrastructure and social facilities in low-cost housing, and their use as places to foster community among residents. The expected results of this research are to address the problem of the availability of environmental infrastructure and social facilities in low-cost housing, and to examine their significant role in residents' social activities.

Under Law Number 1 of 2011 on Housing and Residential Areas, housing developers are required to transfer infrastructure to the local government upon project completion. However, this study shows a major concern, namely the inadequacy of Minimum Service Standards (MSS), particularly in relation to environmental infrastructure and social facilities in low-cost housing.

As a result, residents, who are generally low-income, have difficulty in meeting social activity needs due to limited spaces for interaction and communal engagement.

This study offers a novel contribution by bridging the gap between the availability of environmental infrastructure and social facilities and the social interaction activities of residents, which constitute essential capital for building social cohesion. Given the inadequacy of infrastructure and facilities that support collective activities, this study shows the importance of associating housing provisions with the social needs of residents.

2. Literature Review and Problem Formulation

Housing development, particularly low-cost housing, affects individuals with limited economic capacity, both socially and economically, including those living in surrounding housing complexes. Social facilities promote and support relationships among residents [1] and have important psychological benefits, particularly by reducing perceived social class differences [2]. In addition, these facilities that are used effectively serve the daily needs of residents [3]. An environment equipped with adequate infrastructure actively meets the living needs of residents and creates a comfortable housing environment [4][5][6]. In this context, good social interaction plays a role in creating a good community [7]. This interaction can be improved through social facilities integrated with perceptions of residents [8], as well as through improving attachment to place, which affects the health of the neighborhood [9]. Consequently, poor environmental quality in housing contributes to poor health [10] and reduces social cohesion among residents [11]. Concerning the relationship between the availability of environmental infrastructure and social facilities and the role in shaping social interactions, a study conducted by Adewunmi showed that limited access to social facilities formed service gaps for residents [12]. The evaluation by Kim Hamers described that residents of cluster-type housing interacted more frequently and developed stronger connections compared to those in other housing settings [13]. Similarly, place attachment among residents is mainly shaped by the social bonds formed through activities in public facilities [14]. Miroslava Vujadinovic examined the relationships and behavior of residents in environmental facilities [15]. Studies by Riyantinti [16] and Agustian [17] showed the importance of adequate social facilities. However, as the overall satisfaction with these facilities shows good service quality, not all residents reported being fully satisfied [18].

Social facilities are a major factor influencing the comfort of residents during social interactions, serving as an essential component of the housing environment [19]. Beyond physical communal spaces, access to social media is also an effective factor in meeting social needs and shaping patterns of social relationships [20]. The availability of public facilities can influence housing selections of residents [21], while a conducive environment [22] and a favorable microclimate [23] further support social well-being. Neighborhood parks also promote social interaction and contribute to a higher quality of life [24]. In general, a well-designed housing environment is characterized by community engagement, social support, and place attachment [25].

Building on the discussion above, Siregar developed a matrix to assess the quality of social interactions in housing neighborhood infrastructure. This framework considers major components such as actors, temporal aspects, activity types, activity intensity, and location layout (behavior setting) [26]. As community interaction patterns are generally associative, conflict among residents remains inevitable [27].

The problem addressed in this article arises from the frequently insufficient MSS for environmental infrastructure and social facilities in low-cost housing. As a result, residents who are typically low-income face challenges in fulfilling personal social needs due to a shortage of communal spaces for activities with other residents.

3. Method

This study used a qualitative method, with a minimal portion of quantitative data. The stages in the analysis were conducted in the Yogyakarta region, selected for its unique social conditions, as the community comprised individuals from diverse origins, which promoted dynamic social interactions. Stage 1 focused on mapping environmental infrastructure and social facilities in housing. Using a qualitative method, data were collected through direct observation and recording of infrastructure and facility elements. Moreover, information was documented through site plan drawings and photographs. The data on the availability of environmental infrastructure and social facilities were described qualitatively as well as descriptively, supported by documentary evidence showing the conditions. The output of this stage included site plan drawings and photographic documentation, created using CAD and Excel. Stage 2 mapped the use of environmental infrastructure and social housing facilities. Using a qualitative method, data collection included photographic documentation, checklists, and interviews. The resulting data were analyzed descriptively and qualitatively, producing a detailed account of social interaction activities among residents. Stage 3 included analyzing both environmental infrastructure and social facilities data, alongside social interaction activities among residents. The output was a descriptive explanation of the social interaction activities in the mapped infrastructure and facilities from stages 1 and 2. Stage 4 synthesized the results from previous stages, presenting assumptions and providing recommendations to improve public as well as social facilities, to promote social cohesion among residents.

4. Results And Discussion

Identification of Environmental Infrastructure and Social Facilities

Stage 1 was conducted to map out environmental infrastructure and social facilities in housing developments. This study was conducted in 20 housing sites in Yogyakarta, as shown in Table 1. The selection of housing sites considered the low-income population, which was often located outside urban areas due to lower land costs, and the total number of houses was approximately 350.

Table 1. Location Number and Housing Name

No	Housing	No	Housing
1	New Griya Asri Sendangsari	11	Griya Kembang Putih
2	Green Harmony	12	Bumi Tirtonirmolo Indah 1
3	Bangunjiwo Grahayasa Blok Timur	13	Tirta Bangunjiwo Sejahtera
4	Ndalem Guwosari	14	Bangun Jiwa Sejahtera
5	Ndalem Triwidadi	15	Karangjati Indah II
6	Cluster Triwidadi	16	Griya Taman Mas
7	Karangjati Indah I	17	Bangunjiwo Grahayasa Blok Barat
8	Puri Nirwana	18	Arsy Residence
9	Griya Sribitan Asri	19	Mrisi Indah, Tirtonirmolo, Kasihan
10	Bangun Griya Sentosa	20	Bumi Tirtonirmolo Indah 2

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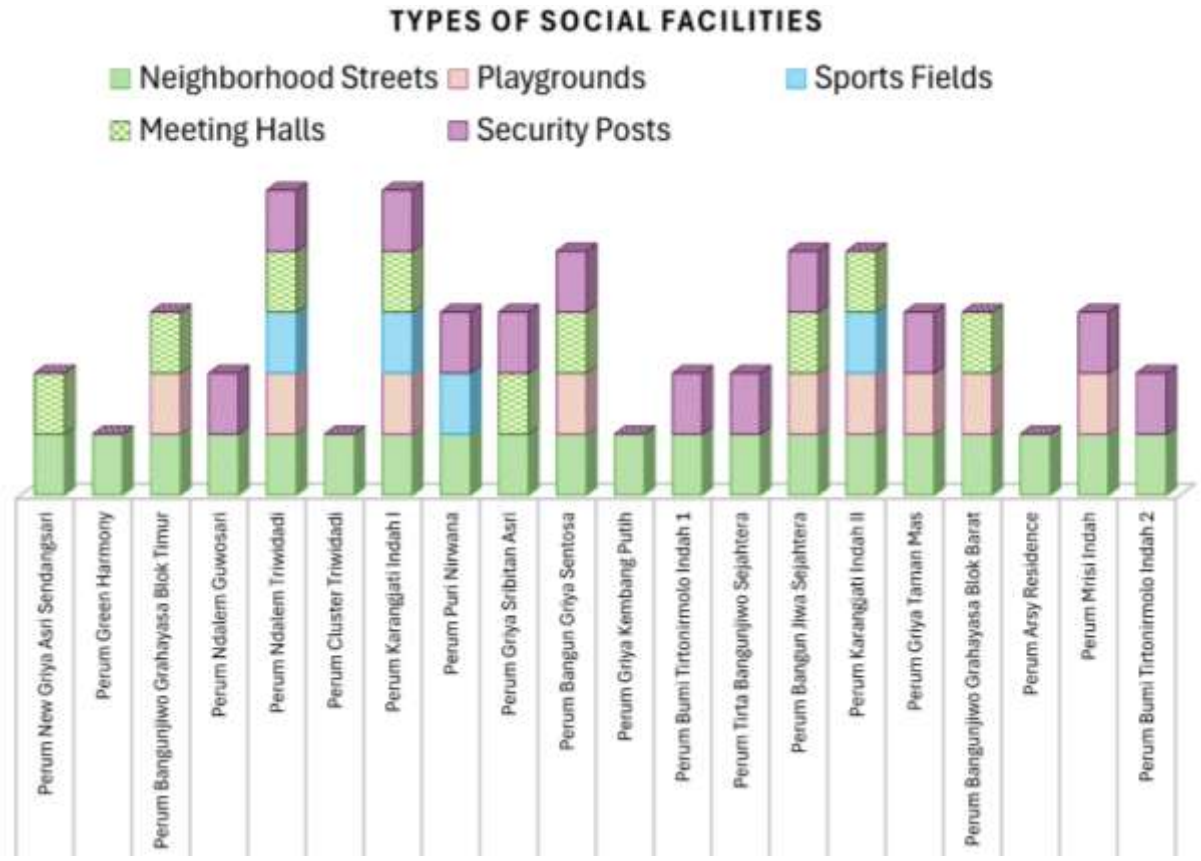


Fig. 1. Availability of Environmental Infrastructure and Social Facilities in Housing Complexes

The following presented the results of identifying the availability of environmental infrastructure and social facilities used for resident interaction activities in the 20 housing complexes, as shown in Figures 1, 2, and 3.



Fig. 2. Community Hall and Field

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Fig. 3. Neighborhood Streets and Playgrounds

Identification of Social Interaction Activities

In stage 2, the mapping of environmental infrastructure and social facilities in the housing complex was conducted. The results of this analysis were shown in Figures 4, 5, and 6.



Fig. 4. Social Interaction in Public Spaces and Community Halls



Fig. 5. Mutual Cooperation (*Gotong Royong*) and Social Interaction on Neighborhood

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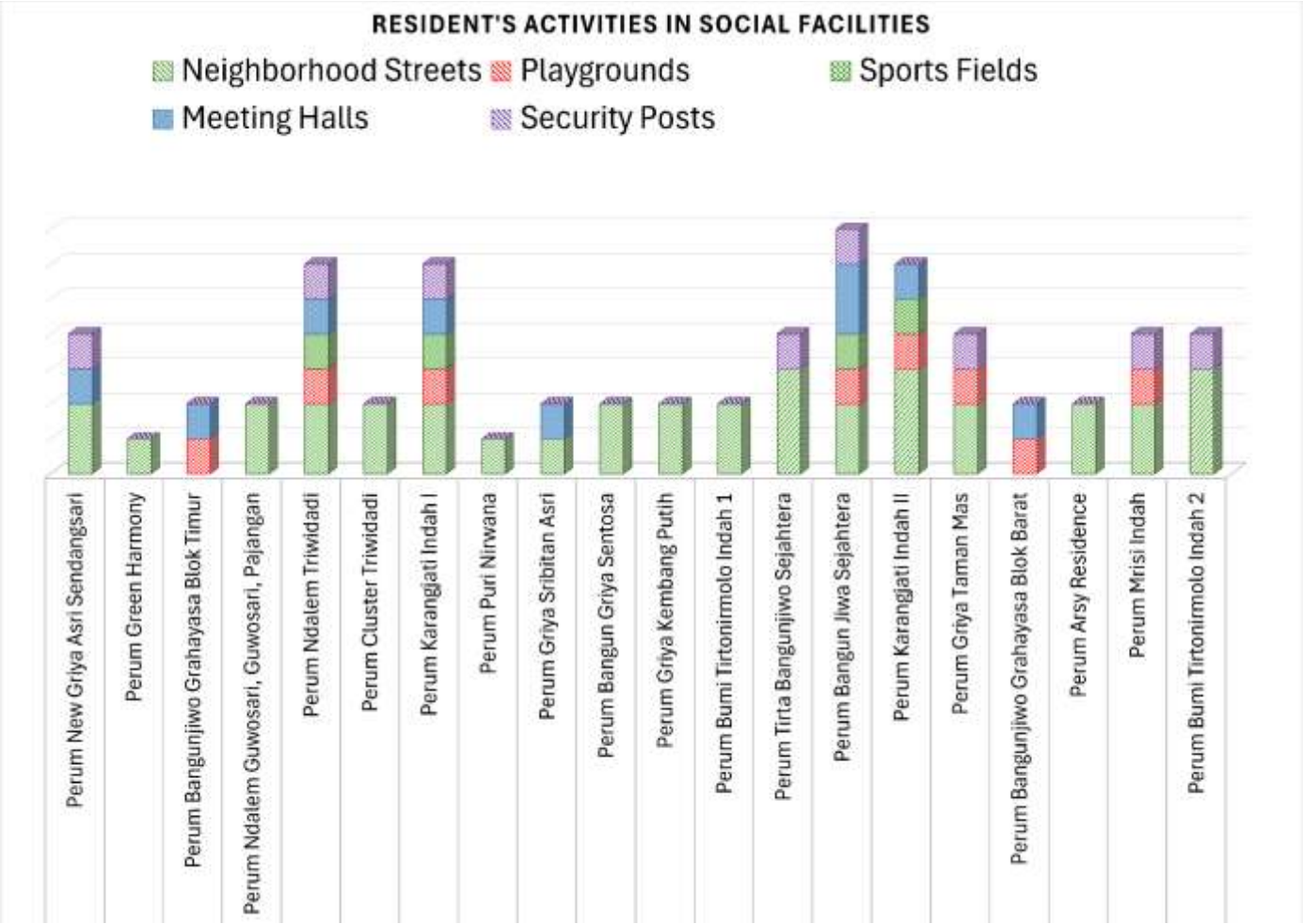


Fig. 6. Resident Activities on Neighborhood Streets and Social Facilities in the Housing Complex

Resident activities on neighborhood streets and social facilities are shown in Table 2, as follows:

Table 2. Resident Activities on Neighborhood Streets and Social Facilities in the Housing Complex

Location Number	Activity	Location Number	Activity
1	Interactions occurred on neighborhood streets at various times and in different forms, including residents engaging with mobile vegetable vendors in the morning and evenings, participation in community service activities, and children playing in the afternoons. The community hall in this housing complex functioned as a meeting place, a Family Welfare Movement / Neighborhood Associations (PKK/RT) social gathering, a Posyandu (Integrated Health Post) for toddlers, and a playground for children.	11	Interaction between residents and mobile vegetable vendors in the morning and afternoon on the neighborhood street. Community service activities and children playing in the afternoon.
2	Children were riding bicycles in the afternoons, particularly on Saturday and Sunday mornings.	12	Interaction between residents and mobile vegetable vendors, as well as vendors on the neighborhood street.

Location Number	Activity	Location Number	Activity
			Residents were discussing on the neighborhood street. Children were riding bicycling and residents were discussing in front of the guard post.
3	Interactions between residents and mobile vegetable vendors on the neighborhood streets. The community hall was used for meetings by women every other week of the month.	13	Interaction between residents and mobile vegetable vendors around 10:00 a.m. on the neighborhood street. Sports field in RT 08, as well as a playground for children. RT 06 was used for badminton and various sports activities. RT 06 had a small garden in a public space near the sports field, maintained by residents. The community hall was used for meetings by women in the first week of each month, specifically for RT 06. There was a Posyandu (Integrated Health Post) event every 14th, attended by residents from three RTs: RT 06, RT 08, and RT 09. RT 06 operated a daily patrol post, while RT 08 operated on Tuesdays, Thursdays, and Saturdays. There were no guards, but a patrol post was used at night.
4	Interactions between residents and mobile vegetable vendors in the morning, evenings, during community service activities, and in the afternoons when children played on the neighborhood streets.	14	Residents interacted with a mobile vegetable vendor around 10:00 a.m. on the neighborhood street. The space served as a playground for children. There was no sports field, but there was a sign indicating the designated sports area.
5	Interaction between residents and mobile vegetable vendors in the housing complex in the morning on the neighborhood street. Other vendors came in the afternoon. Community service activities. Children played in the afternoon, but not often. The garden of the housing complex was neglected. Regular community meetings and preparations for Independence Day celebrations are held at the Community Hall. Regular nightly community patrols were conducted in shifts.	15	Residents interacted with mobile vegetable vendors in the morning and afternoon on neighborhood streets, participated in community service activities on neighborhood streets and fields, and conducted night patrols. Children played in the afternoons, but not often. The available field was used by neighborhood associations (RT) 12 and 13. Well-maintained plants covered the neighborhood streets. The community hall served as a meeting place, a PKK/RT social gathering spot, a

Location Number	Activity	Location Number	Activity
			Posyandu (Integrated Health Post) for toddlers, and a gathering area before neighborhood patrols. This housing complex did not have a guard post, but residents assembled for nightly patrols from 10:00 p.m. to 1:00 a.m. in shifts.
6	Interaction between residents and mobile vegetable vendors in the morning, and with vendors in the afternoon on the neighborhood street. Community service activities were visible on the neighborhood street and in open spaces.	16	Residents integrated with the mobile vegetable vendor and other vendors on neighborhood streets. Competitions were held every August 17th on neighborhood streets. The sports field served as a parking lot for residents whose homes were close to the field. The guard post was used only at night.
7	Resident interaction with the mobile vegetable vendors in the morning on the neighborhood street and with the garbage collector who collected trash used by residents. A basketball court was often used by teenagers and children in the afternoon and sometimes in the morning. A playground for children was often used in the afternoon. There was a green open area with a basketball court, playground, and a community meeting hall. The green open area was used as a play area. Meetings between residents, social gatherings by women, and housing management meetings were held at the community hall. There were several guard posts in the housing complex, but not all were in use. Only the area near the community hall was frequently used for community interaction.	17	Every afternoon, the sports field was used for volleyball when it was not raining. The community hall was used for PKK meetings on the first Sunday of each month, youth meetings, and meetings conducted by men.
8	Residents water plants along the street around 9:00-10:00 a.m.	18	Interaction between residents and mobile vegetable vendors on a neighborhood street. Children riding bicycles on the neighborhood street.
9	Every afternoon, when not raining, the sports field was used for volleyball. The community hall was used for PKK (Family Welfare Movement) meetings	19	Mrisi Indah, Tirtonirmolo, interaction between Kasihan Housing residents, particularly women, and mobile vegetable vendors on the

Location Number	Activity	Location Number	Activity
	on the first Sunday of each month and for youth and men's meetings.		neighborhood street. Residents were chatting in front of their homes.
10	Residents interacted when a mobile vegetable vendor came along the neighborhood street. Interactions with garbage collectors in the morning. Children played in the afternoon. There was no dedicated community hall, allowing residents to use the mosque as a substitute for community meetings and other deliberative activities. There was a security post staffed by three security guards on a rotating basis.	20	Interaction between residents, mobile vegetable vendors, and mobile vendors on the neighborhood street. Residents were dialoguing on the street. Children were cycling, and residents were talking in front of the security post.

Analysis of Social Interaction Activities in Environmental Infrastructure and Social Facilities

In stage 3, data analysis focused on environmental infrastructure, social facilities, and social interaction activities among residents. The observations in Table 2, row 3, showed that the neighborhood streets across the 28 housing complexes studied functioned as linear public spaces. These streets supported resident circulation and also accommodated a variety of other activities. The linear and open pattern effectively extended the yards of the residents, serving as a space for domestic activities. Residents perceived neighborhood streets as dynamic public spaces, shaped by the interplay of private activities. The informal character of these streets showed the ecological role as non-green open space, a social function as a space for daily interaction among residents, and an economic purpose as a venue for hawkers, respectively. These functions strengthened the role of neighborhood streets in housing complexes as complex, interactive, and multi-role activity spaces. Neighborhood streets served as physiological (movement paths), ecological (vegetation paths and non-green open spaces), and socio-cultural spaces where social activities and interactions were formed.

In this study, neighborhood streets in 28 locations were relevant as activity settings, offering a variety of visual elements, textures, and spatial conditions that shaped perceptions of residents. A comprehensive understanding of the physical conditions and dynamics of social interactions on housing neighborhood streets was an important basis for understanding the role of streets in promoting social cohesion among residents. Visual elements that shaped the character of these streets included vegetation, street lighting, street surface materials (asphalt, paving blocks, and concrete), and the appearance of buildings. Moreover, visual elements were aesthetic and also supported social functions, even spatial orientation.

This study showed that housing neighborhood streets served as circulation infrastructure for residents, daily social spaces, hosting various activities and social interactions. Neighborhood streets, parks, and play areas in housing complexes acted as activity zones that formed a network of spaces continually used for socializing, public activities, and recreation for residents. In the 28 housing complexes studied, residents also viewed these streets as socio-spatial entities connecting the physical environment with social processes in daily lives. Following the discussion, daily activities of residents on neighborhood streets were often simple but recurring, including chatting, relaxing on the sidewalk in front of the homes, shopping with hawkers, as well as drying and watering plants. This range of activities improved social openness among residents, particularly those not mentioned.

The daily activities mentioned earlier promoted social interactions among residents, transforming neighborhood streets into spaces for play, conversation, rest, and informal economic activity. The range of activities as vibrant hub that supported both social engagement and economic transactions. The manifest and latent functions of neighborhood streets were shaped by the overlapping roles of circulation, social interaction, and the informal economy. Furthermore, accessibility and the spatial proximity of streets to the homes of residents also affected the strength of social interactions on neighborhood streets. Low-cost housing environments created high visibility among neighbors, enabled strong social oversight, and facilitated spontaneous interactions. These communications included greetings and small talk, as well as communal activities on the streets and in housing social facilities.

According to residents, local cultural values provided a normative framework that guided behavior on neighborhood streets and in social facilities. In low-cost housing, these spaces were perceived as cultural spaces that reflected shared values and collective identity, where daily social activities contributed to the formation and reinforcement of local social values. Streets also functioned as informal play spaces for children, referring to areas in the housing complex that were not originally planned as playgrounds but are routinely used for play. In this context, play spaces, casual gathering areas, and hawker activities are closely related to everyday practices of residents in activating the surroundings through spontaneous activity, mobility, as well as social interaction. From the perspective of children, these informal street spaces are often more appealing than formal, enclosed, and highly regulated play spaces. Similarly, residents, particularly housewives, tended to engage in social interactions with one another during the presence of hawkers on neighborhood streets, as shown in Table 3.

Table 3. Analysis of Social Cohesion of Residents

Variable	Activity Indicators	Resident Response
Kinship	Meeting and chatting on neighborhood streets, sharing family stories, and seeking advice.	Residents agreed that activities should be conducted almost daily at irregular times (depending on the situation/weather) and with varying intensity.
	Shopping activities when passing by hawkers were followed by spontaneous conversations among residents.	Residents agreed that neighborhood streets should be a flexible space for spontaneous gatherings that adapt to local conditions.
Cooperation	Community service activities such as cleaning parks, fields, and neighborhood streets.	Residents agreed to comply with neighborhood agreements regarding the use of shared facilities.
	Independence Day competitions on neighborhood streets, fields, and playgrounds.	Residents agreed that neighborhood streets should coordinate with one another due to limited gathering facilities. According to residents, neighborhood streets should serve more than just circulation routes.
Trust	The practice of mutually monitoring the use of neighborhood facilities.	Residents agreed that mutual trust should increase.
	The practice of discussing environmental problems in community halls (*rembug warga*).	Residents agreed that individuals should promote unity with minimal conflict.

The analysis showed that residents had a strong preference for neighborhood streets and social facilities connected to personal daily lives. The results also confirmed that daily activities could brighten gray spaces, such as streets and social facilities with limited quality, into playgrounds and arenas for dynamic social interaction. In these spaces, residents were able to define the rules of the game, regulate the intensity of interactions, and negotiate space with other users, forming more significant spatial as well as social relations that improve social cohesion. Another important characteristic discussed during this study was flexibility and spontaneity. The limited availability of formal social facilities created opportunities for creative, adaptive, and contextual social interaction activities, allowing residents to make use of existing spaces in diverse ways and distort boundaries between individuals. This flexibility allowed residents to initiate activities when opportunities arise, such as during free time, in the presence of peers, and under favorable weather conditions.

Latent activities, such as children playing and community interactions on neighborhood streets, are generally spontaneous and unstructured, arising from daily interactions in the available space. In the context of low-income housing, neighborhood streets functioned as mobility infrastructure for residents and also as extensions of domestic space where children play, sit, run around, wait for friends, and even engage in communal games. As a result, these streets were a daily play space that was close to home, easily accessible, and socially supervised by residents. This role was further reinforced by the slower pace of life of residents, low traffic intensity, and openness to outdoor activities. Perceptions of residents comprised both visual elements, including street texture, tree shapes, and street attributes, as well as physical experiences comprising playing, spontaneous conversations with neighbors, and interactions with hawkers. These elements shape social interactions and promote unity, increasing community social cohesion. Therefore, activities on neighborhood streets and housing social facilities extended beyond recreation, the events were complex spatial-social processes. The spaces provided adaptable physical settings, surrounding objects offered opportunities for exploration, and perceptions of residents connected all components into meaningful social activity spaces.

5. Conclusion

In conclusion, this study showed that the social cohesion of housing residents was built through the ability to unite and engage in communal activities. The ability was formed by various factors, including the cohesiveness of residents, which arose from the creation of linear bonds that connected one resident to another (neighbors). This comprised housing residents and external parties, consisting of vegetable sellers as well as hawkers. In general, the formation of social cohesion consisted of four main components, which were as follows. (1) Social interaction of residents on the neighborhood streets, as well as available social facilities, and (2) linear relationships of motivation and the same perception. Other components included (3) unity as well as togetherness felt due to the existence of individual needs in collective life in the housing, and (4) emotional attachment of residents in the context of the low-cost housing environment, respectively. A sense of solidarity was expressed through mutual dependence among individuals. The form of interaction, as a manifestation of mutual dependence, formed social cohesion. This was evident from the natural formation of community bonds in daily activities on neighborhood streets, community halls, open spaces, as well as playgrounds, and to a lesser extent at guard posts. The development of social cohesion among residents was also supported by community awareness, shared values, and a sense of belonging, as well as shared challenges and opportunities, grounded in mutual trust. This promoted collaboration among low-cost housing entities, promoting social cohesion in limited, modest public spaces.

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