Abstract
Rusunawa was built to anticipate the needs of low-income residents for affordable urban homes. This study identifies its diversity and designed function and evaluates the existing utilization of public spaces in Rusunawa. Furthermore, it identifies the underlying reasons for them. Structured observation is applied through person-centered mapping, with a combination of structured and unstructured interviews. Public spaces in Rusunawa can be categorized into eight locations (corridor, main stair, emergency stair, common room, building entrance, parking area, open space, and mosque), where activities of five types are identified to take place (private, social, trading, supporting, and worshiping activities). Similar backgrounds in landed houses have created a strong emotional bond among occupants and obscured the boundaries of spaces.

Keywords: public space; diversity; utilization; Rusunawa

1. Introduction
1.1 Background
Comfortable, healthy and affordable city residence is an important issue in every developing country, particularly in urban areas. Here, high-rise buildings are the common solution, including the problematic consequences. According to the Statistics Bureau of Indonesia (BPS), the Indonesian housing backlog in 2010 was 13.6 million units, reaching more than 15 million in 2014–2015. This condition is predicted to worsen because of the growth of new households by an average of 800,000 units per year. The Indonesian government targeted construction of 1,000 new tower flats in 2009–2014, including 1 million residences per year starting from 2015.

Indonesia has three common types of apartments/flats, i.e. simple flats (Rusunawa), medium flats (apartments), and luxury apartments (condominiums). Based on ownership status, two types are identifiable: simple rented flats (Rusunawa) and simple owned flats called Rusunami. By the end of 2014, the authority for settlements reported that 270 new twin blocks of Rusunawa and 222 flats were built (82.2%).

Rusunawa are characterized by an informal organization, constructed by residents to accommodate their mutual social interactions. The managers share responsibilities with individual and local government representatives dealing with the rental system, housing units, and facilities (garden and elements, worshipping house, sport space, playground, parking areas, elevator, main stairs, emergency stairs, corridors, and management offices), including standard infrastructure such as electricity, gas, plumbing, telecommunication, and common spaces (communal, commercial and multifunctional rooms). Government regulation of flats recommends certain spaces as shared sections, integrated within buildings for collective utilization, communal rooms or areas for movement such as elevators, corridors, and stairs. Spaces include shared assets located on the grounds such as sporting fields, traffic areas, and pedestrian areas.

Rusunawa are subsidized rental unit houses rented with priority to people with low incomes: maximum 2 million IDR/month ($200) income or in accordance with provisions stipulated by the Indonesian Ministry of Housing. Rusunawa are constructed within highly populated cities with more than 400 people/ha, with a high rate of urbanization or with urban slum areas. Rusunawa of four types exist, with a floor area of 18–36 m², which is the capacity from two adults or up to two adults plus two children. Flat users require 9 m² per person per room, but considering rents and the number of occupants, the occupancy area in Rusunawa is actually limited to 7.2 m² for each.
A preliminary study of Rusunawa Mariso examined it as a pilot project of low-income housing in urban areas with a lack of standard facilities and infrastructure described in the regulations, such as a lack of facilities for gardens, sports, or playground spaces. In some cases, the utilization of facilities and public spaces have deviated both positively and negatively. Being multipurpose, unclear territorial borders of spaces have led to inappropriate utilizations. Therefore, it is urgent to elucidate the reasons underlying the circumstances (Fig. 2.). This study was conducted to identify existing public space diversity including evaluation of their various utilization backgrounds in Rusunawa Mariso, Makassar.

1.2 Literature Review

Residential areas are classifiable into private, semipublic and public spaces. The classifications are comparable to various terms in other studies\(^{10-12}\). Private space is defined as a personal property or space with no disruption or intrusion, whereas semipublic is defined as a secondary part of residential areas, used restrictedly by inhabitants, but not to be owned, such as communal rooms, corridors, and vertical access. Public spaces, which have a wider area, are accessible anytime for a certain period, but they cannot be acquired.

Public spaces include open and closed public spaces. Open public spaces, as defined by Hakim\(^{13}\), are shared spaces outside buildings such as parking areas, building entrances, or open spaces. Closed public spaces are located inside buildings, including communal spaces and connecting units such as corridors and main stairs. In another study, the terms of open and closed public spaces are identical, respectively, to public and semipublic spaces as explained through their functional samples\(^{11}\). Other reports define private, semipublic, and public spaces as primary, secondary, and public territories\(^{12}\).

Carr states that public spaces can be interpreted as collectively owned spaces, areas for community functional activities and ritual bonds, either for daily routines or celebrations\(^{14,15}\). As a fundamental necessity for flat occupants, public spaces can be located within or among building block units, usually serving as communal spaces and developing community life, enabled as binder spaces for social interactions among building and community units. In the function of binding communities, public spaces become places to perform private or group activities, to communicate, and to arouse occupant passions to produce a vibrant community\(^{16}\), enabling mutual interaction of residents, and thereby improving their quality of life\(^{17,18}\).

Public spaces are also frequently regarded as contested spaces: places where opposition, confrontation, resistance, and subversion can be played out over ‘the right to a space’\(^{14}\) and might trigger spatial conflict among occupants. The conflict of space utilization derives from individual needs for activities that demand numerous specific spaces from intimate to social and public spaces as explained by Hall\(^{19}\). Numerous studies have confirmed that social economic backgrounds determine activities in public spaces\(^{20-22}\), classified by age, gender, profession, source factors of different intentions on social activities, and interaction\(^{21}\). Age groups are important for human behavior development, determining tendencies of interaction and behaviors. Prabowo divides this category into nine groups based on behaviors in communities, from prenatal to late adulthood\(^{23}\). Snow\(^{24}\) reports that the larger the percentage of one age group, the more they can be expected to be involved in community activities where social economic backgrounds determine the utilization of public spaces. They might degrade environment quality.

Degradation results from insufficient facilities for occupancy purposes\(^{25}\), a tendency to use public space for personal activities, and expansion of private spaces\(^{26}\). Problems typically arise where socio-economic characteristics of occupants are important issues, as confirmed by Jacobs\(^{18}\) offering solutions by recognition of public space in terms of diverse social values and the ability to encourage occupants to interact in positive ways. New spaces are regarded as
parts of previous environments where functions and activities follow. Prayitno reports\textsuperscript{27} that corridors and small halls are regarded as shared spaces and pocket open spaces in traditional \textit{kampung}, or villages\textsuperscript{1}. The corridor concept is redefined not merely as a 'go' space, but also as 'do, sit, and incidence space'\textsuperscript{28}. Therefore, this study specifically addressed the issues above through public space diversity and utilization.

2. Study Method

This study was conducted through observations and structured and unstructured interviews. Observers were recruited to reveal actual phenomena related to social environments, synergic interaction, types of interaction, and locations and times of each activity. The population, both male and female, was divided into three age groups: children, teenagers, and adults. A person-centered map (PCM) is designed to show
details of activities throughout a day. It involves 24 people (4 to each group), taken from a population of 942 as selected samples of similar social economic background. The duration of each PCM is four days, conducted during various days from June 6–16, 2013 from 5 am to 9 pm. In addition to the PCM method, activities were also recorded by 12 sets of CCTV surveillance cameras, installed on a housing unit of PCM.

Interviews involve one respondent in each housing unit as a community representative. Structured interviews are prepared in question sets applied to each respondent, whereas unstructured interviews are taken freely, as noted on the reverse side of the question sets as additional information.

3. Result and Discussion
3.1 Rusunawa Characteristic

Rusunawa Mariso, shown in Fig. 1., is located in the southern suburbs of Makassar city, Indonesia, about 5 km from the city center. Among other districts, the Mariso region is the second greatest in terms of population: 31,057 people live in an area of 182 ha, including the slum area of 32.40 ha occupied by 11,091 people (30%).

It was constructed for slum-dwellers in 2005–2006 and has been occupied since 2007 in anticipation of dense population and slum area problems, dominated by day laborers, fishery workers, and local occupants. The flats consist of six blocks, with each block formed in a single corridor within double line blocks where two buildings face one another, as presented in Fig. 2. Including the ground floor, the five floors in each building have 48 housing units of 24 m$^2$ each, constituting 288 units. On each floor, 102 m$^2$ are reserved as public spaces with standard facilities of corridors, main stairs, emergency stairs, and a communal room. The ground floor is designed for parking areas and the building entrance.

Other public spaces within this 9000 m$^2$ site are a mosque, waste bin areas, open spaces, and Posyandu. The latter, operated once a month, is not restricted to Rusunawa occupants, but is intended also for the community of the Mariso district. In 2013, official occupants of Mariso Rusunawa were 942 people, distributed into housing units of 1–9 occupants each, where, for various reasons, 10 housing units (3.47%) were not occupied at the time of the survey.

Regarding the three age groups, they include 485 males and 457 females, comprising 236 (25%) children (< 12 years), 121 (13%) teenagers (12–19 years), and 585 (62%) adults (> 20 years) as portrayed in Fig. 3. Based on employment status, they are divided into five groups:
- employees (working with private companies, civil servants, security, etc. on a fixed monthly salary) are 115 people;
- self-employed people (entrepreneurs, traders and merchants, drivers, craft workers, salespeople, etc.) are 70 people;
- day laborers (becak drivers, construction workers, etc. with no fixed income) are 220 people;
- unemployed people (no income, including housewives, children, retirees, etc.) are 306 people; and
- others (students/college students, volunteers, etc.) are 231 people.

3.2 Public Space Diversity and Utilization

Eight locations with a total area of 7,306 m$^2$ are designated for public space at the Rusunawa site, as shown in Table 1. Spaces are initially designed as semipublic spaces, for the occupants only. However, after being occupied and integrated into the surrounding community, the function of public spaces in Rusunawa changed, with later categorization into semipublic and public spaces. About 6% of public space functions as semipublic, attached on each floor block starting from the second floor, i.e. corridor, corridor connector, main stair, emergency stair and communal room. The remaining 94% become accessible for everyone, with areas serving as public spaces such as building entrances, parking areas, mosques, and open spaces. Functions of other facilities, i.e. posyandu and waste bins, remain unchanged because of their set functions. They are used by everyone in the community at designated times.

The main functions of semipublic spaces are explained next. Corridors provide access to housing units. They are 1 m wide and 27.8 m long, located on both sides of each level starting from the second floor, creating 55% of total semipublic space. Both corridors are attached by a corridor connector to support access of the main stairs. The second largest semipublic
Table 1. Public Space Diversity & Utilization

| No. | Diversity          | Utilization                                      | Activity Category | Qty. | Total area-m² |
|-----|--------------------|--------------------------------------------------|-------------------|------|---------------|
| 1   | Corridor           | Horizontal circulation                           | Public            | 8    | 223.00        |
|     |                    | Trading (incl. vertical ways)                    |                   |      |               |
|     |                    | Conversation                                     | Semi-public       |      |               |
|     |                    | Kids playing                                     |                   |      |               |
|     |                    | Sitting/laying down (on chairs, bale-bale or temporary benches) |       |      |               |
|     |                    | Cooking                                          |                  |      |               |
|     |                    | Keeping private belongings (clothes drying, flower planting, household utensils, furniture and storage for unused possessions) |          |      |               |
|     |                    | Pet nurturing                                    | Private           |      |               |
|     |                    | Partitions among neighbors                       |                   |      |               |
|     |                    | Similar to corridor                              | 4                 | 54.00|               |
| 2   | Main Stair         | Vertical circulation                             | Semi-public       | 4    | 60.00         |
| 3   | Emergency Stair    | Vertical circulation                             | Semi-public       | 4    | 22.00         |
|     |                    | Sporadic or scheduled activities                 |                   |      |               |
|     |                    | Hand crafting                                    | Semi-public       | 4    | 46.00         |
|     |                    | Storage of private belongings (cupboards, benches, bale-bale, chairs, bicycles, waste bins, etc.) | Private | 4 | 46.00 |
| 4   | Communal Room      | Circulation                                      | Public            | 1    | 42.00         |
|     |                    | Temporary trading space                          |                   |      |               |
|     |                    | Parking                                          |                   |      |               |
| 5   | Building Entrance  | Parking                                          | Public            | 1    | 21.00         |
|     |                    | Horizontally moving                              |                   |      |               |
|     |                    | Parking                                          | Public            | 2    | 370.00        |
|     |                    | Trading                                          |                   |      |               |
|     |                    | Playing                                          |                   |      |               |
|     |                    | Vehicle repairs                                  | Semi-public       | 2    | 370.00        |
|     |                    | Storage of private belongings (benches, chairs, household items) | Private | 2 | 370.00 |
|     |                    | Placing pet cages                                |                   |      |               |
|     |                    | Multi-activity spaces (sitting/lying down, cooking, drying clothes) |          |      |               |
| 6   | Parking Area       | Horizontal movement                              | Public            | 1    | 4,800.00      |
|     |                    | Various community events                         |                   |      |               |
|     |                    | Playgrounds                                       | Semi-public       | 1    | 1,260.00      |
|     |                    | Parking                                          |                   |      |               |
|     |                    | Exercise                                          |                   |      |               |
|     |                    | Sitting                                           | Private           |      |               |
|     |                    | Clothes drying                                   |                   |      |               |
| 7   | Open Space         | Worshipping                                       | Public            | 1    | 408.00        |
|     |                    | Trading                                          |                   |      |               |
|     |                    | Communication                                    |                   |      |               |
|     |                    | Parking                                          | Semi-public       | 1    | 1,260.00      |
|     |                    | Playing                                          |                   |      |               |
| 8   | Mosque (Building)  | Worshipping                                       | Public            | 1    | 30.00         |
|     |                    | Trading                                          |                   |      |               |
|     |                    | Communication                                    |                   |      |               |
|     |                    | Parking                                          | Semi-public       | 1    | 1,260.00      |
|     |                    | Playing                                          |                   |      |               |
| 9   | Posyandu           | Integrated health care services (immunization, child weighing, milk and food distribution) | Public | 1 | 30.00 |
| 10  | Waste Bin          | Garbage, waste bin                               | Semi-public       | 1    | 14.00         |

space is the main stairs (15%), which provide vertical access, located in the center of the building: 3.6 m x 4.2 m wide. Additional communal spaces are 3.2 m x 3.6 m located on every border level, designed to accommodate interactions among occupants. On both ends of the building are emergency stairs with a 0.8 m wide connection to each floor with the ground, used daily as normal stairs exclusively for unit houses near the ends of corridors. The building entrance on the ground floor is about 63 m², connected to a parking area of 370 m². As the largest public space, open spaces intended for various activities, not only for occupants, but also for the nearby community, have functioned as a personal bonding space since the beginning of Rusunawa construction. Similarly, the mosque (main building and yard) serves a similar function but is specific to religious activities.

Herein, we report 31 categories of activity in the public spaces. Activities are then grouped into six main groups: private, social, trading, support, religion, and moving activities. Private activities are performed inside housing units personally to fulfill personal and family needs, such as cooking or meal preparation, eating, lying down or sleeping, drying and hanging clothes, reading or writing, sitting quietly or chatting while caring for children. Social activities performed by occupants in public spaces such as corridors or communal rooms include standing silently or while talking, playing, gathering, or cleaning. Economic activities performed to support family incomes include food selling, buying and selling goods for daily needs, plant or pet rearing and nurturing, and other activities intended to earn money. Supporting activities include sports and exercise, throwing out garbage, maintenance of private vehicles (bicycle, tricycle, motorcycle, car or cart). Religious activities related to faith performed in mosques or in private spaces include worshiping, religious sermons, reading, teaching or learning the Quran (Islamic holy book), etc. Moving activities represent all moving activities from one point to another to conduct various activities of occupants, including entering and exit of housing units.

Fig.4 presents results of PCM in public spaces, depicting moving activities as dominant by 56%, followed by social activities 21%, almost comparable to private activities by 18%. Other group activities are performed occasionally by less than 5%, including the most rarely performed religious activities. Private activities in public spaces based on various reasons, mainly because of the limited area of a housing unit, forcing occupants to perform private activities outside of a housing unit, such as cooking, food preparation, or sleeping. For drying purposes, each unit has a private balcony (0.8 m wide by 1.5 m long), but their position is not designed properly. Therefore, almost all occupants do clothes hanging or drying activities in the corridor because clothes are often stolen.
Local community members feel a strong mutual bond, working and helping each other. A tendency exists to perform private activities in public while doing other social activities such as chatting and socializing within the neighborhood. As part of behavior and emotional bonding, occupants want to learn about their neighbors, including their personal life. This condition prevails because most occupants come from a similar social background. Most work in informal sectors and mutually share activities, enjoying activities conducted out of the house, such as sitting and chatting (30), (24). The phenomenon above, verified by various personal staff, functioned as sitting or sleeping spots on almost every floor of the building blocks, located on corridors, in front of the main stair, housing unit, or parking area. These additional possessions are typically small benches, **bale-bale**, chair, fixed benches, etc. (Fig.5.).

By age group, occupants who use public facilities the most were the child–female group (23%), followed by adult–male (21%), and adult–female (20%). The next in rank is teenager–male (18%), then teenager–female (11%), and children–male (8%) (Fig.6.). In terms of the gender category, activities in public spaces are dominated by females (57%). Based on activity and job category, the most common activities in public spaces are private activity, performed respectively by employees and self-employed people, sharing 34% and 32%. Results show that only about 1% of religious activities are carried out in public spaces.

Most customs in landed houses persist after moving into vertical houses, including communal activities, sitting, chatting, playing, or simply dining out. In some cases, private activities are also performed collectively without hesitation as daily habits since childhood. These private activities are comparable to social activities, reflecting the homogeneity of occupants, where differences of social economic backgrounds were not significantly wide. Fig.7. presents observations related to traced objects: activity frequencies of children were about 32%, teenagers were 28%, and adults were 40%. Among available public facilities, some were not used optimally (i.e. common rooms), although some others were functional and likely to exceed their original function. Regardless of their narrow size, the most enjoyed spaces are corridors used by 77% for many activities such as moving activities, private, social, and trading activities (Fig.8.).

Corridors are easily accessible, making them strategically important for use in many activities and for use as private spaces by placing personal homemade seats, **bale-bale** or plant pots, permanently along the corridors. Here, trading also occurs, such as through small shops, temporary or permanent by some occupants. Emergency stairs are used as regular stairs and are available for use any time, although broken steps and their position at the end of corridors make them accessible to only about 2% of occupants. Similarly to the mosque, its all-day availability contrasts against its 1% utilization. It is regarded as a holy space for worshiping and is located distant from housing units. Common spaces prepared for occupants for outdoor interactions and relaxation areas are regarded as impractical because of the limited viewing area: about two-thirds of the wall has no viewing access ever.
Along with its function as private residence, public housing should also function as a medium of collective or social activities. In Rusunawa, more space for private facilities is necessary, such as drying areas, balconies and other comfortable spaces for play and socializing. Within the strong tolerance based on emotional closeness, the improvement is expected to minimize the acquisition of public spaces for private activities and prevent any potential conflicts among occupants. Harmony of living quality and comfortable living will continue to exist by the involvement of occupants' empowerment to undertake the management of facilities, utilization, and maintenance.

4. Conclusions

Initially public spaces in Rusunawa are categorized as semi-private consist of corridors, main stairs, emergency stairs, communal rooms, parking areas, building entrances, open spaces, mosque and posyandu. Later, the last four spaces become available for everyone in the community, with no restriction of occupants. Activities in public spaces are dominated by private activities, social activities, and trading, while functions of the mosque and posyandu remain unchanged. Corridors are the most favored spaces, becoming 'activity based' spaces and accommodating activities of almost all kinds. The least used spaces were common rooms because of improper placement and limited views.

Some standard facilities were not available, forcing occupants to abuse utilization of the existing public spaces, noticed by placement of personal belongings and private activities mostly in corridors and ground floor areas. Spaces' flexibility of utilization had been promoted, but the excessive sense of belonging in public spaces reflects a competition and negative acquisition manner among occupants, potentially sacrificing the comfort and accessibility of others.

In terms of social aspects, similarity in social economic backgrounds can foster a strong sense of kinship within communities, eliminating time and space boundaries in their daily interactions. People bond in kinship, sharing behaviors and tolerance mainly based on their similar backgrounds of living in landed houses with preferences for informal lifestyles. They enjoy performing private activities together and on certain occasions intervening in public spaces for personal interest with neighborhood affirmation. A community-based approach is necessary to identify and solve any elevated problems while improving the quality of life through employment of existing potential and skills.

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Notes
1 Kampong means small village (term commonly used in Malaysia and Indonesia), a unique feature of urban areas.
2 Posyandu is a national program to support health care service for children under five years old.
3 Becak, a traditional rented tricycle, is used in Indonesia and other Asian countries.

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