The role of physical environment in increasing place attachment among public housing’s resident of Mojosongo, Surakarta

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Abstract. Place attachment has correlated with pro-environmental attitudes and supportive of the motivation to improve the status quo in places of residence. Most studies has focused on the natural environment in rural communities, but limited to urban physical environment such as public housing. The residents in public housing also has a very distinct characteristics compared to landed housing. Therefore, in this paper explored the physical environment role in creating resident’s attachment to their public housing. Semi-structured interview were conducted to discover resident’s engagement in public/shared spaces in the neighborhood and how physical environment bring people in creating bond or ties to their public housing. Furthermore, field observations were used to explore the quality of those places. Result shows that potentials of environmental design for facilitating resident activities has a vital role in growing sense of responsibility and social interaction between residents. Routine activities as the source of attachment of place are essential to the physical environment. This willingness to engage in joint civic activities create neighborhood ties or attachment to place.

Keywords: physical environment, place attachment, public housing, community, residence

1. Introduction
The bonding between people and their important places can be defined as place attachment. Place attachment affect an emotional bond with an environment that satisfies a fundamental human need [1–3]. This affective attachment is formed through interaction within the environment, also known as “topophilia” or “love of place”[4]. Studies demonstrate that people who contributes to civic activity on behalf of one’s place of residence, form reactions to encroachment of one’s territory. Therefore, strong local identity and place attachment were factors that were correlated with pro-environmental attitudes and supportive of the motivation to preserve the status quo in places of residence [5,6]. Place as a dimension in place attachment concept, has typically been divided into two levels: social and physical attachment. All human behavior occurred in a physical place has the impact on the physical environment.

Place attachment in residential complex often transforms into feelings of community pride, which can also contribute to the formation and maintenance of a group or culture. One of the urban residential complex that have been developed these days are public housing. Public housing in Indonesia is a new urban housing for those low income families who moved from landed or horizontal housing system to vertical housing system. Living in a public housing are very different physical
environment to the newcomers resident. To determine the space functions, residents adaptability relies not only on the users, but also the physical capability of the building. Thus, the physical environment aspects are essential in examining resident’s attachment to the status quo of place residence.

Public housing residents came from low-income families and usually have an outdoor personality. They often do social activities together with fellow residents and eventually create neighborhood ties. But living in a high density urban public housing with limited space and resources has created a challenge on how to meet the demand of services for basic everyday activities within the available space. The change of place forced them to create new environment and spaces to fulfil the needs. In that case, public space in residential complex has a big role in providing social interaction to residents [7].

The public housing residents conducted in this research are from low-income communities that other previous research also has focus on too, but the residents here are temporary and have a more change-oriented place attachment. There is a possibility of mobile persons may develop and sustain attachment to several different places. In this case, rusunawa or public housing is supposed to be temporary and tenants should exit their unit when a fixed term tenancy expires. Therefore, tenants will have to adapt to the change quickly.

Socio-economic attributes of the low income residents such as age, family size and previous residences are negatively correlated with residential satisfaction (Mohit et al, 2010). However, we expected to find, on average, that Mojosongo rusunawa residents will associate a positive community attachment with their public rental housing. Mojosongo Rusunawa is a public rental housing which was built by the Surakarta City government and located in the suburban area of Surakarta. The residents here tend to be diverse (heterogeneous) because they come from different regions.

This study also examines the contributions of physical environment on resident’s attachment by analyzing the role of people’s physical involvement and emotional connections in neighborhood settings. The role of physical environment plays in the stories of individuals and social groups [8].

1.1. Physical Environment

Lately, architectural issues have been focusing not only about the building but even more to the surrounding environment. Physical environment can be seen as an important source of sensory information essential for human well-being [8]. Some person-environment configuration provide more control over the physical environment than others. Most studies on place and place attachment demonstrated that the relationship between individuals and/or group and their physical environment is a multidimensional concept [1,9] including feelings. There are four category theories that used in understanding the relationship between physical environment and human behavior. Key aspects in control theories stated that human desires control over the physical environment than others including privacy, personal space, territoriality and crowding [8]. Other research have stated that key aspects of urban designs are accessibility, vitality, diversity, legibility, and comfort. Each of these elements are in line to examine the spaces that being used by large group activities in residential building.

The physical relationship between actor and its environment can achieve cooperation that should lead to the stability of social order regarding the minimum requirements of individual. Clearly, people’s adaptation to the environment is influential in their lifestyle. Thus, when individuals could not adopt themselves with the environment, the social order will face with failure.

Also, people’s adaptation to the environment depend on their attachment. If an environment is created based on the satisfaction of its users, it can be influential in adaptability of people who live in that environment, and consequently it affectsthe stability of social order. For instance in residential environments, open spaces that host various personal and group activitiesfor the young to the elderly, are of foremost importance in increasing place attachment.

1.2. Place attachment

The definition of place attachment may vary depending on the interpretation of the attachment to the conceptual approach taken. Place attachment in architectural approach is a bond formed with a place
Engagement refers to the individual’s (emotional) desires in the location of their residence and population in it[9]. Various levels of thought, behavior and feelings are built through attachment to a place[11]. Place attachment simultaneously involves individual, social and cultural processes [9,12,13].

Measurement on place attachment have already done in multiple discipline, which include multidimensions concept about emotional and functional dimensions (Lin & Lockwood, 2014). Emotional bonding called place identity, while functional bonding called place dependence [14]. One of the important factors in the place attachment is place dependence. This was disussed before that the concept of place dependence contain a number of supporter physical environment sub-indicators for place attachment. At the personal level, prolonged residence in the same dwelling or neighborhood is a key to develop deep affection to a place. But the inability to relocate could also mean the difficulty in adjusting to changing circumstance such as neighborhood decline and relocation of job opportunities in the urban area. Meanwhile, place identity refer to symbolic meaning given by a place when individuals invested psychologically (emotional bonding). That place become their stronger identity involving feelings [15]. Place dependence show functional bonding owned by individuals with their places functional attachment). It will grow when a place provided with condition and adequate facilities to fulfill people needs. If a place can fulfill their needs to their goals, then people will become depend to that place [16].

1.3. Physical environment in Public Housing (Rusunawa)

The quality of residential environment is one of the main components of people’s overall quality of life [17]. The purpose of Public Housing (Rusunawa) is to facilitate a temporary settlement for low-income community so they can have a better quality of their own house. Rusunawa is a vertical housing which consists about several units and provide a limited spaces to social interact with each other. The development of rusunawa is expected to improve the quality of settlements. The better quality of the housing environment also expected to improve their attachment to place.

In general, attachment to the environment tends to be stronger when someone feels that other people have similar social backgrounds to them or are homogeneous [18]. Rusunawa residents who originally came from surrounding area or still within the neighborhood, there are still similarities in the social/ cultural environment; so that residents only need to adapt to live in vertical buildings only. Whereas for residents who come from different regions, more adaptation needs to be done in several ways, including the economy, because it is related to transportation to the original workplace, and so on [7]. Hence, changing place from horizontal to vertical housing forced them to make strategies on how to create social space as their attempt adjusting the changing circumstance and still protecting the existing environment. Public housing consist of dwelling unit and non-dwelling unit such as facilities and infrastructure, also shared or communal space. In rusunawa, public space called as shared space or communal space.

Following earlier research, the physical environment-related factors were added to explore different forms of human interaction and relationships associated with the urban physical environment [15] on place attachment by including interactions with the environment of rusunawa and social interactions that took place within. Perceived residential environment quality (PREQ) aspects were also used to evaluate on the basis impressions expressed by the residents [17]. The physical attributes of the setting, the activities occurred in the setting and people interactios with the setting would be carried out in the data collections.

2. Method

The research study site was conducted in Mojosongo Block A Public Rental Housing (Rusunawa) in Surakarta. It is located in the sub urban area, at Jalan Sindoro Raya, Jebres, Surakarta. The residents are tenants occupying rental units. The majority of the residents are newcomers who came from various region in Surakarta and registered to live in the public rental housing. Therefore, public
housing (Rusunawa) Mojosongo was a suitable study site for exploring whether and how newcomer residents became attached to the place.

Figure 1. Location of the research area

Qualitative approach was used in this study to capture the reality in a comprehensive way, achieving a high degree involvement of the participants. This paper adopted a qualitative approach in examining the way people attach to the spaces within the public housing, their engagement and the influence of physical environment on place attachment. The data were obtained through the observation of the physical environment of each unit, including the recording of house spaces, the spaces given within the neighborhood and their functional uses in everyday living. The observation was complemented by interviews and focus groups of residents, housing managers and the government exploring the issues and strategies practiced by them. Four units’s owner in each floor, the head of community association, and also the housing manager were chosen as the samples of the study.

The analysis was conducted by classifying the physical environment into categories based on the general spatial organization of the dwelling and by examining the characteristics of those spatial-spaces which people attached. The analysis was primarily to identify everyday spatial activities in the physical context regardless of the number of residents and the space sizes. The emergence of resident’s engagement in shared spaces became the focus of the study.

3. Result
Residents who are occupying a rental units in Mojosongo rusunawa tend to be diverse and mobile, they came from various regions in Surakarta City, with one condition that they have a Surakarta personal ID card and also from low income people. A suitable community order in the community always try to be maintained longer in accordance with the capabilities and developments that occur. The community will basically try to form a balance that can maintain a good concept and keep trying to better improvement. Based on interviews with several residents here, the bond or relationship between residents is good enough so that people get along and feel comfortable. Rarely do conflicts occur between residents. The conflict happens usually with the children but only a small fight which causes their parents feel a little comfortable.

Initially when the rusunawa was completed and inhabited by residents, the manager had provided basic rules that residents must obey regarding the use of residential units and not residential units in rusunawa. Then a community of citizens was formed, who then worked with the manager to add more regulations that were binding and must be obeyed in order to sustain life in the residential neighborhood of the flat. Examples are strict regulations regarding the payment of electricity, water, cleanliness and other infrastructure. So that citizens are involved so they have responsibility and a sense of belonging and willingness to care. The housing manager invited citizens to commit together to form a good environment first, then emphasize harmony.

Strong social relationship usually called as ’guyub’ in most kampong or rural communities. People who occupied a rental unit in public housing usually still has this guyub feeling toward each other in
the community. Joint civic activities such as community services to clean the water sewage, decorate the open space with vegetation or even decorate the street road have a big role to create the neighborhood ties in public housing.

Residents’s interactions to the environment and social interactions were used as a tool to measure one’s attachment to the place and what aspects influence it. Based on previous studies regarding meeting residents’s desires for interaction, the physical aspects in *rusunawa*’s shared spaces as follows:

![Mojosongo Rusunawa floor plan](Image)

**Figure 2.** Mojosongo *Rusunawa* floor plan

3.1. Accessibility

The public housing is in the form of a sideways block building with units lined up to the side and connected by a hallway or corridor on one. There are void between each corridor and provide an open area from the highest floor to the ground floor. This configuration will benefit residents to get a lot of open space compared to densely landed populated settlements they used to live in. However, it is a bit inconvenient for them to access and exit the building because they need to use stairs, especially for the highest floor’s units owner. But over time, they became got used to the situation. They said that going up and down the stairs made them healthy, so no one became skinny because of that, in fact, many are stout.

People living in a neighborhood also need to do activities together or interacts with other residents in public spaces. Mojosongo *Rusunawa* usually called this space as shared spaces. The hall/ lobby is easily reached for residents who have just arrived or guests entering the *rusunawa*, because it is located on the ground floor as the reception area. But when reached from the units’ residents who are from the upper floor, then the residents must first access the stairs. Interactions between residents that occurred were dominated by short to long duration, starting from one hour to half a day. The frequency of interaction occurred at least once a week. Because of its location in an easily accessible location from the floor, this space is often used by residents for interaction with guests dominated by passing
and chatting both with those who have relationships or just acquaintances. This results in stronger bonds between residents.

Another shared space is hallway or corridor. Corridor is located on each floor near the resident’s unit. So that to reach this space is very easy to do every day. Noticing the close range, there is a warung that sells vegetables and kitchen spices at the hallway of the stairs on the 2nd floor to facilitate residents. So the economic interactions were also created there.

Figure 3. Physical environment of various shared spaces in Mojosongo Rusunawa
3.2. The existence of open and green areas
The hall / lobby area has a large area and can accommodate most of the residents. It has a wide visions, even to the corridor of the residential unit located on the top floor. So that residents often sit relaxed in this area for chatting, discussing, playing and other activities. Therefore, the hall has a multifunction uses that gives residents the opportunity to be involved in every activity. Interactions that occur usually have a short to long duration.

Mojosongo's rusunawa corridor is relatively narrow, which is about 1.5 - 2 meters. With this narrow condition, not many residents use it to carry out activities and interact together because it will disrupt the flow of circulation of other residents who will pass it. So that the interactions that occur are only in the form of passing, greeting and individual activities such as sweeping and watering plants. It is difficult to present activities that are meaningful with limited corridor space.

The hall has a closed room but with wide openings of doors and windows. This closed room can accommodate around 100 people usually for formal activities together. Hall and musholla are the most closed public spaces and activities occur tend to be static and less dynamic/ flexible. Because of the closedness, so the space is limited and the intensity of uses become low with short period of time. However, in musholla, even though the intensity is moderate, the frequency of social interactions remains and occur every day.

Green open space or outdoor space becomes the most open and nuanced natural space. Here many are used by children as a playroom, besides that also residents of all ages. With all ages using this space, the intensity of use is high. The intensity of social activities that occur is seen from residents involved in activities in green open spaces such as planting crops together. Variations in usage can vary from just passing and chatting, to exercising together. Users of green open spaces vary from all ages, sexes, and so on. The dominating age is children.

The road is also open outer space. The road to the rusunawa environment is decorated with many green plants on the right and left sides that give a natural feel. In addition to walking activities, moving places from one place to another, roads in rusunawa are used to build social interactions while carrying out community service activities such as cleaning the environment and decorating roads with plants.

Corridors include semi-open spaces. The intensity of use consists of only a number of flat apartment occupants whose units are adjacent to the corridor. Based on observations, the social activities created are just greeting, chatting and relaxing but with a frequency that is more than twice a week.

3.3. Adequate Facility
Based on the collected data, most of the residents preferred to live in public housing than their previous grounded housing. Besides the economical factor, the strongest reason is the availability of a more adequate infrastructure network, although in terms of comfort it has not been sufficient to meet the needs of residents.

The residents who previously came from a high density settlement, are most likely choose to stay after given the allotted time. They prefers vertical housing provided by the government because of the ease in obtaining the infrastructure services needed as an adequate function of residential built environment. The accessibility is easier for residents to go to their workplaces, market, or even school.

Facilities that also provided in the public housing are street road and parking area. Different from their previous grounded housing, there is limited access to park their vehicle without using the limited space in the street. Thus, in pubic housing, street roadand parking area are available and built to provide the needs of residents accessibility who lived there.

As well as the electricity uses, the residents can control the power usage according to their ability to pay electricity usage fees. If they can’t afford, so they will not use electronics excessively. it is all based on the affordability of each occupants and they must also consider to be responsible. But, because of the collective payment, residents need to pay their electricity fees on time to avoid arrears which eventually forced-power cut by the company. It is unfortunate to harm the other residents,
therefore the housing manager in Mojosongo public housing to ask for resident’s cooperativeness. Compared to living in the grounded house, electricity cost in each house are charged to their own family. Electricity power and water services also provided in public housing, makes the residents fulfill their needs in everyday living.

In the aspect of shared spaces, hall / lobby has sufficient and adequate infrastructure for residents both for formal activities to receive guests or other informal activities such as relaxing. Chair and table furniture are also available with attached-TV and loudspeakers to turn on the music. Many residents often gather in this room. So that adequate facilities can provide residents the opportunity to carry out various forms of interaction.

As well as the spaces that connect corridor between the stairs which is quite large and given chairs and tables to sit and chat. In addition, this space is often used by children to play without having to go down to the ground floor. Interactions between children also vary with the frequency of daily hours.

Whereas in the corridor, only in the form of narrow roads without being allowed to decorate furniture because it will disrupt the circulation. But with limited facilities, residents can still do activities and interact with other residents even with low intensity of use and frequency of daily hours. Various forms of interaction are limited. Compared to the grounded housing, the community usually gather around in front of their house to just watch over the children or conversing with other residents, and even shopping. The varieties are a lot and not limited, but this may caused a crowding in the street which was actually a public services. Meanwhile, in Mojosongo public housing, the corridor only used by the residents and it is quite safe.

3.4. Continuity of place
Continuity refers to the place creating continuity, stability, and sustainability impressions. The place must be adaptable to the constant change in the social and cultural patterns of the communities that make use its space, through this continuous re-invention process, the place can remain suitable for the residents’ needs. In this public housing, residents said that they were already adapted to the conditions there and wanted to renew their tenant expiry. The residents who lived there for 5 to 6 years usually suggested to move out if they didn’t renew or paid the rent. People who did not pay the rent for months or people who did not obey the regulations would be forced out. However, based on the interview conducted, most of the residents would like to continue their rental period. Thus, they keep maintaing the environment to stay clean, eye pleasing and comfortable.

3.5. Frequency of activity and involvement of residents
Residents of Mojosongo Rusunawa are committed to maintaining kinship between residents. Community relations are intertwined from various routine activities carried out in a flat apartment environment, especially those that occur in shared spaces. The frequency of activity in rusunawa is divided into daily, weekly-monthly and annual hours [21].

Activities that have a frequency of daily hours are chatting, playing mobile, sitting, playing, caring for children, selling and eating, and also worshiping Muslims. Interactions that occur from this activity have a short to long duration.

Activities that have a frequency of monthly weeks are community meetings, social gathering, PKK mothers' meetings, community service, and also traditional / community events. Because of its low frequency, interactions that occur from this activity usually have a moderate to long duration.

Activities that have an annual frequency are August 17 evening recitations, commemoration of independence with competitions and decorating parks, and celebrations of major religious holidays. In this activity involved all residents of the flat apartment. Adult occupants perform voluntary work assisted by children. In the activity of decorating the road at the independence commemoration involving young people from the residents of the flat apartment themselves to make the design then when the painting was done together with other residents. Although the frequency is rare, the intensity usage and activity are high. In this activity plays a role in increasing harmony and also attachment to the place.
Shared spaces that have daily frequency are hallways/ corridors, roads, halls / lobbies, non-formal communal spaces, green open spaces (parks), and prayer rooms. Whereas the shared space which has a weekly-monthly frequency is a hall / multipurpose room.

4. Discussion
This study explored the physical environment in Rusunawa setting and its effects on place attachment. From the mapping of interactions that occur in the public spaces that have been presented, it illustrates that although the characteristics of diverse residents and experiencing changes in the physical settings of the space that were previously horizontal become vertical, residents managed to adapt by interacting with neighbours.

Based on the previous theory which states that place attachment is influenced by the length of involvement and the opportunity for a person to use space and place to carry out joint activities. These aspects are seen based on range, the frequency of dominant social interactions occurs in the hall / lobby space which is far compared to the closest shared space of the residential unit, namely the corridor / corridor. So that the distance does not have a big effect on the attachment of the place

Based on accessibility, shared spaces that accessible or easy to reach will be used more frequently by users. The main line is used to connect between residential units and access to other floors, but the interaction that occurs is only a short chat or just greeting. This is because basically, residents want privacy near their homes to rest.

Based on adequate area and facilities, wide space facilitates circulation and access in and out of space so that social interaction and the involvement of dominant residents create strong attachments. In addition, residents/ people involved in conducting activities also determine social interactions and attachments to the place.

People living in public housing have the opportunities to encounter with other residents on a daily basis within this small-sized neighborhood. This supports previous findings that attachment to the place contradict to community size, which have smaller population than urban areas to be more attached [19]

As a result from public space uses, residents will develop personal and meanings, also their attachments [20]. Social environment provide a place to fulfill their emotional and social bonding. Even though their existence is informal, public space will improve in many aspects such as social, economic and culture to low income people. Therefore, public space should be well maintained to reach the purpose so it can develop place attachment to a better environment.

5. Conclusion
From the data results shows that most of the physical environmental conditions of Rusunawa Mojosongo were already meet the resident’s expectation. Physical and functional conditions and involvement of residents provide opportunities for social interaction. That way, as the frequency of social interactions that involve residents together is often done then the emotional bond will grow as well and increase attachment to the place. in maintaining rusunawa’s environment by complying with existing regulations. Therefore, a sense of responsibility and ownership will arise. This then affects residents to continue to maintain interaction and participate in activities that take place and are carried out in shared spaces. Their willingness to engage in joint civic activities create neighborhood ties or attachment to place. However, social interaction in the shared space plays a major role in determining the attachment of the place created in Mojosongo Rusunawa. Routine activities as the source of attachment of place could be important evidence for vitality of the neighborhood physical environment. This research only focused on the spesific characteristics user of public housing which more homogenous, and limited to different sociodemographic-public housing that more diverse. Further research are needed to find in deep the impact of public housing environment and place attachment.
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