A Pattern of Social Interaction of the High–Rise Public-Housing of Jatinegara Barat in Jakarta, Indonesia
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Abstract: The rapid urbanization of Greater Jakarta has resulted in the existence of slum areas. Some of them were inhabited along the riverside and were purged by the Governments in order to prevent a flood. Residents of the settlements were then relocated to the high-rise low-cost public housing named Rusunawa Jatinegara Barat. Literature and previous studies have stated that high-rise settlements pose problems for its residents, and social interaction was one of them. Physical factor also plays an essential role in this problem. For example, the social interaction of upper-floor residents might be different compared to that of lower-floor residents. This research aims to study changes after relocation and the pattern difference of social interaction between upper- and lower-residents. The research will be done through quantitative analysis using Wilcoxon test to show the significant changes after relocation and later a Chi-square test in order to see whether there were any significant differences in terms of social interaction between the upper-floor and lower-floor residents. From this study, first, it was discovered that in the case of Rusunawa Jatinegara Barat, the frequency of visiting neighbors was the most significant change after the relocation. Second, there were several significant pattern differences in social interaction between upper- and lower-floor residents including the frequency of having interaction, the location of where residents spend their free time and have social interaction, and perception of the number of friends.

Keywords: Housing relocation, Social interaction, High-Rise housing, Public housing

1. Introduction

Rapid urbanization in Greater Jakarta has resulted in the existence of squatters inhabiting slum areas spread that have out in the city (Andrea, 2015). The existence of these squatters, which mostly live in the riverside area of Ciliwung River, which is one of the largest river systems in Indonesia and is considered one of the most polluted rivers in the world. This creates an impact in the form of floods which are a critical issue that the government tries to mitigate. While Jakarta does have an adequate riverbank to accommodate this volume of floodwaters, the area was damaged because squatters inhabited it. In order to mitigate flood and at the same time improve the squatters’ living conditions, the government executed a river normalization project, which required the relocation of the squatters into a public housing project called Rusunawa Jatinegara Barat. Rusunawa stands for “Rumah Susun Sewa,” which translates as low-cost public housing and Jatinegara Barat was the location where the Rusunawa built.

During the time of this study, Rusunawa Jatinegara Barat was the only Rusunawa classified as a high-rise that was intended to accommodate the relocation of residents from Kampung Pulo, an area of slum settlements alongside the Ciliwung River. The residents were then relocated to Rusunawa in August 2015 after the building finished two years before.
It consists of two blocks, with a total of 518 housing units. This Rusunawa was classified as a homogeneous Rusunawa, which means that all of the residents came from the same previous dwelling location. However, while high-rise housing was a practical solution, it also gave rise to another problem. Based on previous studies, relocating residents into an entirely new environment may cause some social issues and changes to their levels of social interaction. Especially, if they were relocated from the landed/terrace housing to a vertical one such as a high-rise apartment, might affect how the residents interact with each other. For example, upper-floor residents might have a lower quality of social interaction compared to lower-floor residents. This study was done in order to give recommendations to the government and the managers of Rusunawa Jatinegara Barat regarding this issue, as the trend to continue building high-rise Rusunawa continues. This study will not only study the levels of social interaction in general but will also focus on the differences of social interaction patterns between residents who live in the higher floors versus those who live in the lower floors.

Figure 1. Location of the Rusunawa (Green line indicate the old location of the relocated residents; Red indicate the location of the Rusunawa)
Source: Google map (2019)

Kampung Pulo was one of the locations that frequently experienced flood because it was located alongside the riverbank of Ciliwung River. It was consisting of houses lined up against each other with only a small gap between them as an alley that can only fit the motorcycle-like vehicle. Before relocated to the Rusunawa, most of the residents were opening some kind of stalls or shops in front of their house selling anything that they could sell; starting from simple sweets and snacks, proper food and drink, or daily necessities. While the majority of the customers were among themselves, from a social standpoint of view, it was a focal point or center of their social interaction. Almost every day, the residents in Kampung Pulo passes through that alley and met other residents who stand by at their shop or those who were stopping there. Even though most of them were spending time inside their house or on the front porch\(^{(1)}\), they still managed to have
a little conversation with some residents who were passing by or hanging out together in the alley or the other residents’ stall. The proximity between houses and the abundance of stalls made the social interaction for the residents in Kampung Pulo very lively.

After the relocation, a new structure of the neighborhood community (will be referred to as "RT" which translated into "Rukun Tetangga" in Indonesia) was created. In Rusunawa Jatinegara Barat, the community was divided into eight different RT, four for each block, divided by floor number (third and fourth-floor residents considered as one RT, same applied to fifth to eight-floor, ninth to twelfth-floor, and thirteenth to sixteenth-floor residents). The leader of each RT was assigned based on the decision of each respective community forum (which tend to choose individuals with the most experience in an organization). In the process of relocation, residents have no control over which unit they will get. The unit assignment for this Rusunawa (and also for most of the other Rusunawa) was utterly random by using a lottery system. The lottery was divided into two parts — first, the lottery for the fifth floor and above for general residents. Second, the lottery for the third and fourth floor for the elderly, but only limited to those who are considered as compensation recipients (owner of the destroyed house back in Kampung Pulo). If the elderly is part of a household (for example, the parents of compensation recipient who lived together), the entire family will be assigned to the fifth floor and above. Each of those RT has one respective leader who reports directly to the manager of the Rusunawa. Sometimes, based on the statement from the leaders and managers, they were rarely sat together to solve a problem. The managers often make decisions or regulations by themselves and only involve the leaders as an emissary to spread their words to the residents, and the leaders were given the authority to make a decision or regulation regarding what happened in the Rusunawa without having to consult the managers. However, as the leaders themselves were not familiar with living in a high-rise, some of their decision were not effective or caused further problems for the residents.

2. Previous Studies

In the study done by Kapoor et al. (2004), commuting cost became one of the factors that were analyzed. In their simulation, the relocated slum residents suffered from increased commuting costs. Allonso (1964) and Mills (1967) also stated that commuting cost is an essential factor that defines residential choices. However, in this case, the relocated residents were
relocated relatively near their original dwelling in Kampung Pulo, and based on the reports by the Governments and preliminary survey for this study, the commuting cost did not become an issue for them. On the other hand, their social quality was decreasing because of the difficulties to adapt to the new housing environment, which might suffer from the affliction, loss, and homesickness (Fried, 1963). This theory was proven right in this case, as in the preliminary survey for this study, most residents were still complaining about their new housing environment after one year of occupation. The concept of high-rise housing, which forced them to use the elevator frequently, tight corridor space, limited open space was very contrary to the situation of their old dwelling. As a result, most residents stated that they rarely visit their neighbors and have less interaction compared to before. High-rise housing with its high density often related to the residents' having social issues such as their relationship within the community (Zito, 1974; Tognoli, 1987), relationship with their neighbors (Michelson, 1977) and loneliness especially among low-income class (Jephcott, 1971). Pell (2012) in his study, stressed some essential factors of social interaction after relocated. Engagement, inclusion, zones of action, are affecting neighborhood social interaction.

![Floor plan of Rusunawa Jatinegara Barat](source: Van, H., & Hardi, J (2017) (modified))

There have been many studies regarding both the relationship between high-rises and social interactions, and some studies specifically addressing social interaction in Rusunawa Jatinegara Barat. For example, the importance of social interaction in high-rises was explained well in the study by Michelson (1977). He states that high-rise housing affected many aspects of the lives of its dwellers, one of which was the relationship between neighbors. Also, one of the parameters of the success of the high-rise was the relationship that the residents had with their neighbors (Williamson, 1981). Mitchell (1971) also managed to relate the significance of the physical factor of housing—in this case, the high-rise factor—with several consequences, including social
interaction. When discussing the physical factor, public space in high-rise housing also plays a vital role as a medium for the residents to interact with each other, as explained in the study by Garling and Golledge (1989)\textsuperscript{13}, which states that public spaces in high-rise settlements were vital because they enable residents to have social interaction between them. In other words, they claim that those places become interactional spaces and "social arenas." Public spaces—especially outdoor spaces—also function as space extensions and are considered to be a part of the home itself (Dillman and Dillman, 1987)\textsuperscript{14}. Continuing from that, the important thing about public space is not whether it was big or spacious, but that it should be familiar to the residents (Burgess et al., 1988)\textsuperscript{15}. Other studies are concerned more directly with the difference between upper- and lower-floor residents. Fanning (1967)\textsuperscript{16} conducted a study about families who live in flats or high-rise housing, and one of the results was that different strains among the residents have direct relationships with the floor level on which they lived. Ultimately, one of the studies by Mitchell (1971)\textsuperscript{12} found that residents from the upper floors have different levels of social interaction compared with those who live on the lower floors.

Several studies also used the variable of social interaction in order to study the high-rise housing (Rusunawa) in the case of Jatinegara Barat. Silalahi (2018)\textsuperscript{17} conducted a study about the relocation project of residents from slum areas to the Rusunawa. In her study, social interaction was compromised because the residents had lost their close neighbors, and they had not yet built enough trust and solidarity towards their new neighbors. However, her study did not relate directly to the physical factor of the Rusunawa. Another study done by Van et al. (2017)\textsuperscript{18} mentions that residents' social interaction was affected directly by the physical factor of Rusunawa. In his study, he states that before they were relocated, the residents were utilizing alleys as places of interaction, but that activity was never found in the corridors in the Rusunawa. Another similar study by Ridwana et al (2018)\textsuperscript{19} also mentions that social problems often appear in the high-rise settlements related to the issue of the behavior of the residents. They experience difficulties in terms of interacting with each other, mainly because of the different environment and limited public space in the new settlement.

Even though both two studies by Van et al (2017)\textsuperscript{18} and Ridwana et al (2018)\textsuperscript{19} mentioned before were focused on the utilization of space and its relationship with residents' social interaction, neither took floor-level as one of its variables. Based on the literature study of the differences between upper- and lower-floor residents in general aspects, this study aims to focus on the differences of social interaction patterns between those residents of Rusunawa Jatinegara Barat.

This study was mainly based on the previous study by Pell (2012)\textsuperscript{10} which similarly study about the social interaction changes after relocation, and Mitchell (1971)\textsuperscript{12}, and Fanning (1967)\textsuperscript{16} in which both states that upper-floor residents have different social interactions compared to the lower-floor residents which indicate that floor level might affect the social interaction patterns of the residents. Although there are many studies regarding social interaction in the high-rise housing, in author knowledge, there are only few similar studies that can be found in developing countries especially in Indonesia. In addition to that, author hasn’t found any studies that analyze both differences between before and after relocation and pattern differences between upper- and lower-floor residents at the same time.

The objective of this study was to identify the most significant changes of the residents’ social interaction after relocation and to see the differences between upper- and lower-floor residents regarding that matters. From there, the question that was formulated in order to answer the
objective was the following: "How were the changes of residents' social interaction after relocation?" and "Was there any pattern difference in social interaction between upper- and lower-residents?"

3. Methodology

In this research, quantitative methods (in the form of a questionnaire survey) and qualitative methods (such as on-site observations and in-depth interviews of both key persons and residents) were applied to one public-housing project in Jakarta, Indonesia.

The Rusunawa chosen for this research was located in Jatinegara Barat, East Jakarta, Indonesia. This Rusunawa consists of sixteen floors, with fourteen floors used as dwelling units and the first two floors used for administrative purposes, such as management offices, as well as public spaces and community rooms for the residents. This Rusunawa was divided into two blocks or towers, with total of 518 housing units, and two elevators in the lobby of each block. The area of each dwelling unit is 30 meters\(^2\), which consists of two bedrooms, a bathroom, a living room, and a kitchen. The preliminary survey of this study was taken place in 2017 around February and the first field survey was done in in the August of the same year, two years after the residents start occupying this Rusunawa, while the second one was done in 2018 around February. This study were meant to assess the changes of the activity of social interaction between residents after relocation in a short-term manner following the previous studies (Van et al, 2017\(^{18}\); Silalahi, 2018\(^{17}\); Ridwana et al, 2018\(^{20}\). In addition to that, based on Preiser (2001)\(^{19}\), post-occupancy evaluation were usually carried out six to twelve months after occupancy. As for the on-site observation, it was done in two different time. First was done in September 2017, and the second was done in February 2018. This was done to see the difference after the Rusunawa managers prohibit the existence of food stalls in the public space.

| Table 1. Time of field survey |
|-----------------------------|
| **Period**                  | **Location** | **Methods** | **Surveyor** |
| **Preliminary Survey**      | Rusunawa     | General interview with some neighborhood leaders | Author |
| (February 2017)             | Jatinegara Barat |             |             |
| **First Survey**            | Rusunawa     | Questionnaire and in-depth interview, and on-site observation on the outdoor public space | Author |
| (August 2017)               | Jatinegara Barat |             |             |
| **Second Survey**           | Rusunawa     | On-site observation on the outdoor public space | Author |
| (February 2018)             | Jatinegara Barat |             |             |

Each unit has the same monthly rental price of Rp300,000\(^{4}\), which was around USD 21 during the time of this study. The facilities that were provided in this Rusunawa were a 24-hour CCTV on the ground and 2nd floor, cleaning service, motorcycle parking area, public spaces, educational facilities for children, and medical facilities. As can be seen in Figure 3, each floor was equipped with elevator lobby that also used regularly by the residents to held weekly gatherings.
This study began from the existing discussions about high-rise public housing and from preliminary surveys which indicating that social interaction became a problem that needed to be addressed. Besides that, understanding some background of the residents was developed to help in terms of analyzing the practical problem before constructing a suitable questionnaire through which to investigate it. Quantitative data will be gathered using questionnaire surveys that addressed to the residents of the Rusunawa Jatinegara Barat, as they were experiencing involuntary relocation from their original dwelling to the new high-rise public housing which might have some effects on their social situation (Pell, 2012; Mitchell, 1971; Fanning, 1967). They were then answered the questionnaire in Likert-scale type manners.

The analysis of this study will be divided into two steps. The first one is to use Wilcoxon analysis to see what the most significant changes in social interaction after the relocation is. Second is to use Chi-square to further analyze the pattern difference on those variables between upper- and lower-residents. In order to compare between upper- and lower-floor residents, this research will use stratified sampling, which involves classifying the target population into separate group or strata and then picking random samples from each of those stratum (Henry, 1990). The population was divided into two strata of "upper-floor" and "lower-floor" in order to see whether or not they have different patterns of social interaction. The "lower-floor" stratum is composed of those who live from third to eighth floors (six total floors), and the "upper-floor" stratum is composed of those who live from ninth to sixteenth floors (eight total floors). Based on the stratified random sampling, the ratio of the sample should be around 57.1% for the "upper-floor" stratum and 42.9% for the "lower-floor" stratum, from the total population of 518 households. The reasons why they were divided into two groups of eight floors or lower and nine floors or higher was based on the building type as explained on Regulation No. 28, 2002 about buildings which classified building by their height (low-rise: one to four stories, mid-rise: five to eight stories, high-rise: more than eight stories). Therefore, this research is trying to define the pattern between those who live on a floor that considered as ‘mid-rise' and those who live on a floor that considered as ‘high-rise.'
Table 2. Number of samples collected based on the classification

| Category     | Floors               | Samples | % of the total |
|--------------|----------------------|---------|----------------|
| Lower floor  | From 3rd to 8th floor| 49      | 48.0%          |
| Upper floor  | From 9th to 16th floor| 53      | 52.0%          |
| Total        |                      | 102     | 100.00%        |

By using the Slovin equation from the total household number of 518, the minimum number of samples should be around 83 respondents for a confidence level of 95%. The number of samples was based on the number of households in order to avoid questioning residents in the same dwelling unit, as the goal of this research is to define patterns of social interaction in broader terms based on respondents from different units. However, during the observation, this research managed to gather data from 102 respondents, and even though the ratio differs from the initial target, the final ratio still comes near the proportion that it should be. The sample's proportion ended up being composed of 52.0% of the total samples (53 respondents) from the "upper-floor" stratum and 48.0% of the total samples (49 respondents) from the "lower-floor" stratum.

After the residents were relocated to the Rusunawa, the neighborhood leaders were tasked by the Rusunawa managers to held weekly discussion among the neighborhood members to share their thoughts and complaints in order to adapt to the new environment. Therefore, during preliminary survey in February 2017, two neighborhood leaders were interviewed as a key persons in order to gain understanding of the general situation after relocation.

After the questionnaire survey was done in August 2017, total of six neighborhood leaders were interviewed in a focused group discussion. Through this discussion, some additional information were gathered through this discussion to further support the findings in the questionnaire survey.

In general, the first part of this study will explain the different situations before and after relocation, and the second part of this study will explain the different situations of upper- and lower- residents.

4. Social Interaction Changes after Relocation

In this non-parametric analysis, this study only compares the social interaction activity of the residents before and after relocated to the Rusunawa. By using Wilcoxon analysis, the statistical evidence of which activity that was having the most significant changes could be shown.

The respondents were asked questions about eight different variables, where each variable consists of two values, ‘before relocation’ and ‘after relocation’. The first two variables were the place of spending free time and interaction by asking respondents where they spend their free time and place of interaction in Rusunawa. Response categories were as follows: (1) Outdoor (all areas within the ground and second floor); (2) Indoor, (inside and around dwelling-units from third-floor through sixteen-floor). The next three variables were the frequency of visiting neighbors in the same and different floors and frequency of having a conversation in face-to-face interaction by asking respondents how often they do that kind of activities average in a monthly basis in Rusunawa. Response categories were as follows: (1) Very rare (once a month or never); (2) Rare, (few times a month); (3) Occasionally (once a week); (4) Often (two to three times a
week); (5) Very often (more than three times a week). The next two variables were a perception of their quality of relation with old and new neighbors. Response categories were as follows: (1) Poor; (2) Fair; (3) Good; (4) Very good; (5) Excellent. The last variable was a perception of the number of friends. Response categories were as follows: (1) Very little; (2) Little; (3) Moderate; (4) Lots; (5) Very lots.

Table 3. List of Wilcoxon Analysis between two variables

| Variables (Before-After) | Z value | p-value |
|--------------------------|---------|---------|
| Frequency of visiting neighbors (on the different floor) | -8.353 | 0.000** |
| Frequency of visiting neighbors (on the same floor) | -6.607 | 0.000** |
| Frequency of having interaction in general | -4.003 | 0.000** |
| Relationship with old neighbors | -3.843 | 0.000** |
| Perception of the number of friends | -3.062 | 0.002** |
| Place of spending free time | -2.219 | 0.027* |
| Duration of interaction | -1.707 | 0.088 |
| Place of having interaction | -1.206 | 0.228 |

*) significance at 95% **) significance at 99%

Source: Author’s analysis using SPSS based on questioner survey (2017) (the same applies hereafter)

As can be seen in Table 2, the most significant changes of residents’ social interaction were the frequency of visiting neighbors, especially on the different floor ($Z=-8.353$, $p=0.000$), while the least significant changes were the place of having interaction ($Z=-1.206$, $p=0.228$). The following sub-chapters will discuss some of the interesting findings.

4.1. Changes in the frequency of visiting neighbors

In Table 2, by looking at the Z value, there is a vast difference between the frequency of visiting neighbors before and after relocation (in the different floor) compare to other variables. It followed by the same variables of visiting neighbors but on the same floor.

Figure 5. Changes of frequency of visiting neighbors before and after relocation ($n=102$, $Z=-6.607$, $p=0.000$ for A.SAME, $Z=-8.353$, $p=0.000$ for A.DIFF).
In the study by Gifford (2007), one of the consequences of living in high-rise was less visiting and helping between neighbors. In Rusunawa, respondents were rarely visiting their neighbors compared to before relocation, and only a few of them were having an increase in the frequency.

Each respondents were asked about their frequency of visiting neighbors before relocation (BEFORE), after relocation in the same floor (A.SAME), and after relocation but in the different floors (A.DIFF). As for the results which can be seen in figure 5, the activity of visiting neighbors are highly decreased after the respondents been relocated to the Rusunawa. The frequency were way more decreasing between neighbors that lived in the different floors.

This mainly happened because of several reasons. Based on the response from some of the respondents, they do not feel close enough to their new neighbors on the same floor, and most of their close neighbors were either lived on a different floor, or in a different tower. The neighborhood leaders also said that the residents were not familiar enough with the situation inside Rusunawa. Before relocated, most residents were usually hanging out in the front porch of their house, so it encourages the others to have a conversation or even visiting them. In Rusunawa, some stated that many of their neighbors stayed inside their units and often left the door closed, so it discouraged the others from visiting their neighbors. They often did this because of some reasons like security and did not want to be disturbed by journalist or students who were doing research or interview. Van et al. (2017) also stated that the interaction between units or neighbors rarely happened in Rusunawa Jatinegara Barat.

Some respondents managed to have an increased frequency of visiting neighbor, but it was because they actually had to visit them sometimes. For example, some of them were elected to become a treasury for their respective RT, so they need to go to each neighbors to collect some contribution money. Some were also often visiting other neighbors on the same floor as they were involved in a group activity like cooking, preparing for events, doing outsourced jobs, and many else.

Beside staying inside the units and closed doors, most respondents' frequency of visiting neighbors on the different floor was decreasing because they do not want to bother themselves to wait for an elevator, compare to before where they could easily walk to other neighbors' houses. Residents were found to have more social interactions if the situation is within their expectation, and they were willing to adapt to it (Pell, 2012). However, in Rusunawa Jatinegara Barat, some residents were still struggling to do that. Most respondents stated that the waiting time for the elevator was relatively long. Even though when it was not, they had to stop on some floors to pick-up another resident or when residents are coming out from the same elevators. Occasionally, the respondents still visit some of their neighbors living in between 1-2 floors above or beneath them using stairs, but only if there was an important business. They do, however, still occasionally visit their close friends or neighbors even though there were on different floors or even different tower.

4.2. Changes in the frequency of the residents having interaction after relocation

The next most significance after the frequency of visiting neighbors was the frequency of residents having interaction with each other after the relocation. After relocated, most residents were having less interaction compared to before, which indicate that there was a significant change to the frequency of having interaction. The most noticeable different was the number of
residents who were “often” or “very often” having interaction between each other were decreased which can be seen in figure 6.

![Figure 6. Changes on the frequency of having interaction](image)

**Figure 6. Changes on the frequency of having interaction** ($n=102$, $Z=-4.403$, $p=0.000$).

Based on the response from some of the respondents and the neighborhood leaders, the reason for frequency decreasing was that they require more effort to have interaction compared to before. In the previous dwelling location, the housing configuration and the custom of the residents were made it easier for them to interact with each other. As for now, considering the different situation, some residents had to wait for their neighbors to show up/come-out from their unit, or go to the ground floor using elevators/stairs where most of the residents were, or even arranged some meeting with the others to meet at a specified location. In the previous dwelling location, wherever the designated location the residents want to go, they can always have some interaction in between. However, in Rusunawa Jatinegara Barat, when residents using the elevator to go through designated floors, they missed all the possible interaction in between.

As stated by Pell (2012), social interaction decreasing can be explained by a low level of integration, engagement, and inclusion. In Rusunawa Jatinegara Barat, some formal events like weekly prayer, meetings, and other occasional events were held by the residents no matter which floor they lived. However, what they were missing were the informal events where the residents were having unintentional interaction with the others like before they were relocated because even after the events, most residents stated that they did not feel included in the community. Lack of informal interaction also means a lack of engagement between the residents and resulted in the decreasing of social interaction.

Another reason was similar as discussed before, that the residents were not close to their neighbors in the same floor, that they had to travel to a different floor if they want to meet or interact with their close neighbors of friends. Unlike before in Kampung Pulo, they can go outside their house and meet and interact with lots of people.

Some respondents have more interaction after relocated because they become less busy. Other residents felt that they have a better neighborhood in Rusunawa compare to before and some also involved in a group activity that facilitated by the manager of the Rusunawa to have their own space for their activity which means that they have more time together compared to before.

### 4.3. Changes in residents’ relationship with old neighbors

Parallel with the findings from Zito (1974), Tognoli (1987) and (Michelson, 1977), the relationship with the old neighbors was also decreasing. After the relocation, the residents still
manage to occasionally visit their neighbors in Kampung Pulo or visited by them in the weekend. Some of the respondents also stated that they were having interaction with their old neighbors who were also relocated, but sometimes only to those who live in the same tower, especially on the same floor. As there might be another factor like psychological that affect the quality of relationship with each other, and the fact that this study was done only after two years, the result might not be accurate. The difference between before and after relocation as shown in Figure 7 were not as noticeable as the frequency of visiting each other and having interaction in general which can be seen in Figure 5 and 6 respectively.

Figure 7. Changes on relationship with their old neighbors (n=102, Z=-3.843, p=0.000).

Some respondents that felt their relationship were more inferior mostly because they were living in the separated floor with their close old neighbors. They claimed that some of their old neighbors either lived on a different floor or did not get relocated and still living in Kampung Pulo, and that was part of the reason why the quality is decreasing. Before the relocation, they can easily interact with each other. But after relocation, they had to travel to a different floor, which increased their effort, thus eventually increase the relationship gap between them. Before relocated, some residents were involved in a group activity in the RT. However, after the structure of the RT was changed in Rusunawa, they were no longer involved in those activities.

Respondents who did not feel any difference in their quality of relationship mostly were they who live on the same floor as their old neighbors or frequently meet with each other daily. Some respondents even felt their relationship were better after relocation because they were more involved in some activity compared to before they were relocated. Some also managed to continue their activity in a group even after relocated. For example, a group of residents who have activity like opening bakery still maintain the same activity with the same group of residents even though each of them was living on a different floor.

4.4. Changes in residents’ perception of the number of friends

Most respondents stated that their number of friends were decreasing after being separated with their old dwelling and living for two years in Rusunawa. Michelson (1977)\(^{7}\) stated that most of high-rise residents' friends were coming from outside the building like from work, for example. While it was true that the residents of Jatinegara Barat mostly having friends from outside the Rusunawa, it was actually from their old dwelling in Kampung Pulo and not from work. During the first few months after relocation, the residents still managed to visit their friends in Kampung Pulo as the distance from the Rusunawa was not relatively far from them and occasionally, their friends return the favor by visiting them in Rusunawa instead. However, some respondents stated
that this activity of visiting each other applies only to close friends. That was why some of them confessed that their number of friends were decreasing because they eventually lose contact with some of their friends that were not close enough in the relationship. The numbers shown in Figure 8 also shows that the residents’ perception regarding their number of friends is decreasing after being relocated.

![Figure 8. Changes on perception of the number of friends](image)

In the situation on Rusunawa, even though no evidence directly links between the frequency of interaction or visiting neighbors and the number of friends, some respondents stated that it was hard for them to make new friends because, after the relocation, most residents mostly spent their free time in their units which eventually made it hard for them to interact.

In the study by Pell (2012), he also found that the number of friends was significantly decreasing after being relocated. In his study, the reason for the decreasing number of friends was because of less receiving and giving help. In case of Residents in Rusunawa Jatinegara Barat, some of the residents did not know each of their neighbors even on the same floor, let alone asking for help. In some case of emergency or in the position of needing help, they usually contact someone they already know, their nearest neighbors, or to the managers directly if it is something related to the Rusunawa.

One of the problems of high-rise housing was having fewer friends and many strangers, and that friends were coming from the same floor as the residents (Gifford, 2007). However, In Rusunawa Jatinegara Barat, only a few residents that befriend their neighbors even on the same floor. The residents mostly were making friends with those who live in the different floor because they mostly spend time together with the others, which came from various floors, in public open space rather than in their respective floors. Interestingly, during the interview, some residents claimed that they knew more people compared to before because they were forced to meet lots of new faces in Rusunawa, even though they only treat them as an acquaintance rather than a friend.

4.5. Changes in the place of spending free-time

In terms of spending free time, there were only slight changes after the relocation \((p \text{ value}=0.027)\). After relocation, some respondents changed their habits from spending free-time indoor to outdoor. Some respondent claimed that the main reason for changing the place of free-time was because of the architectural feature of Rusunawa. Respondents who answered "indoor" mostly lived in the upper-floor (from eighth to sixteenth floor). Ridwana et al (2018) stated that social problems in the high-rise settlements was related to the behavior of the residents. In this study, one of that behavior was seen in where they spend most of their free time in Rusunawa.
In figure 9, it can be seen that before relocated, the residents were spending their free time in both indoor and outdoor. While after being relocated, most of them were spending free time in Indoor rather than in outdoors.

Compared to before relocation, it became hard for them to go outside because of increased effort like waiting for the elevator. Beside inside the units, most upper-floor respondents like to spend their free time in the corridor by setting up a day-bed or couch outside their units. Compared to upper-floor respondents, lower-floor respondents were mostly spent their free-time outdoor because the air circulation was better compared to the situation in their units or the corridor. Pell (2012)\(^\text{10}\) also found in his study that residents tended to stay inside their units because it was more comfortable to do so. In Rusunawa Jatinegara Barat, this mostly applies to those who own air conditioner or live on the upper floor because of better air circulation.

### 4.6. Changes that were least significant after relocation

*Duration of interaction* and *place of having interaction* after relocation was in the bottom two of the Wilcoxon analysis and was not statistically significant. It means that those two variables were the least significant changes in residents' social interaction after the relocation. Relocation to the Rusunawa seems does not affect the duration of interaction by much. Same applies to the place of having interaction. In the corridors of their dwelling location in Kampung Pulo, most residents were opening stalls in front of their house. This activity became the central area of residents to interact with each other. Even those who did not have stalls, they like to spend their time in their coach outside their house because they were attracted to the activity outside their house and pushed to interact with people passing by.

Residents were having interaction mostly in outdoor because it were the only places with many stalls stand by, and the discussion with the neighborhood leaders reveal that, in Rusunawa, stalls were the main attraction for the residents to come and interact with each other. This was parallel with the findings from the study by Ridwana et al (2018)\(^\text{19}\). Some of the interaction was also happening in the Indoor area around the units on the existing floor, but not much. Most of their interaction usually centered around those who open stalls (usually selling food), during special occasions like weekly gathering, or daily conversation between residents who spend their time around the corridors. This means that even though they were relocated to entirely new housing environment, they still were drawn to have interaction in the place that has a similar feature as before relocated which aligned with Pell (2012)\(^\text{10}\) statement that similarity was one of the critical changes in housing relocation.
5. Relationship between Floor-level and Social Interaction

This analysis will use the same results as the ones used in the Wilcoxon analysis. However, only values from ‘after relocation’ were used in this Chi-square analysis. Besides the questionnaire and interviews, field observation was also conducted in order to further support the findings.

| Variables                                      | p-value |
|------------------------------------------------|---------|
| Frequency of visiting neighbors (on the different floor) | 0.662   |
| Frequency of visiting neighbors (on the same floor)        | 0.562   |
| Frequency of interaction                               | 0.009** |
| Duration of interaction                                 | 0.146   |
| Place of spending free time                            | 0.011*  |
| Place of interaction                                    | 0.013*  |
| Relationship with old neighbors                         | 0.603   |
| Relationship with new neighbors                         | 0.722   |
| Perception of the number of friends                     | 0.057   |

*) significance at 95% **) significance at 99%

Only three out of nine variables were significant in Chi-square analysis: (1) Frequency of interaction, (2) Place of spending free time, (3) Place of interaction.

5.1. Relationship between floor-level and frequency of interaction

Frequency of interaction was the most significant difference pattern of social interactions between upper- and lower-floor residents (p-value of 0.009). It is also clear from the table below that lower-floor respondents were more frequently having interactions with each other. For example, there were nine respondents of lower floors who were very often interacting with each other, whereas none of the higher-floor respondents experienced the same level of interaction.

|          | Rare | Occasionally | Often | Total |
|----------|------|--------------|-------|-------|
| Upper floor | 24   | 22           | 7     | 53    |
|           | 45.3%| 41.5%        | 13.2% | 100%  |
| Lower floor| 13   | 17           | 19    | 49    |
|           | 26.5%| 34.7%        | 38.8% | 100%  |

Table 5. Frequency of interaction by Floor level ($\chi^2=11.05, p=0.009$)

The p-value for the frequency of interaction was 0.009, which was at the significance level of 1%, and which means that the pattern of frequency of interaction was different between upper- and lower-floor residents. Looking at the proportion of spending free time between upper- and lower-floor respondents at Table 5, almost half of the lower-floor respondents (23 out of 49
respondents) were spending their free time in outdoor areas, which gave them more chances to interact with each other compared to upper-floor respondents whose only around a third (16 out of 53 respondents).

| Table 6. Place of spending free time by Floor level \( (x^2=3.02, p=0.082) \) |
|-----------------|-------|-----|
|                 | Outdoor | Indoor | Total |
| Upper floor     | 16     | 37    | 53    |
|                 | 41.0%  | 58.7% | 52.0% |
| Lower floor     | 23     | 26    | 49    |
|                 | 59.0%  | 41.3% | 48.0% |
|                 | 39     | 63    | 102   |
|                 | 100%   | 100%  | 100%  |

Outdoor areas considered as the epicenter of where interactions took place; therefore, it was apparent that those who spent their free time in the epicenter of where interactions happened would have better chances to interact with other residents. Also, it was logical to assume that every vendor of the food stalls on the ground floor was having most of their interactions there. It means that the area which can provide better engagement resulted in better social interaction, as the engagement was one of the factors that affect social interaction (Pell, 2012)\(^{10}\).

Higher-floor respondents were having less interaction compared to the lower-floor respondents because they spent their free time mostly in the indoor areas, whether inside their units or around the corridor. Looking at the situation around the dwelling-units, things that could potentially stimulate interaction in those areas were very few. Some interaction around those areas usually happened in around food stalls. However, the existence of those stalls was prohibited by the managers of the Rusunawa. The study by Van et al (2017)\(^{18}\), also states that outdoor areas have higher interaction rates compared to areas around the dwelling-units, which were not suitable for social interaction.
High-rise housing, in general, discourages social interaction among its residents, even though this can be mitigated by providing designated places for social interaction (Holahan, 1976)\(^{24}\). In the case of this Rusunawa, as mentioned in the previous discussion, most interactions happened in outdoor areas, which were designated as places of interaction, compared to the areas around the dwelling-units, which have a lower interaction rate.

### 5.2. Relationship between floor-level and place of spending free time and interaction

In Rusunawa, residents were spending most of their free time in their dwelling-unit (inside or outside their dwelling-unit, but still around the corridors) and we're having most of their interactions in or around the ground or second floors of Rusunawa. Hypothetically, residents on the lower floors are likely to go to the ground or second floors more frequently—because they can use the stairs, which is more practical than waiting for the elevator—compared to residents who live on the higher floors.

Sixty-three respondents—which represents 61.8% of the total samples—were spending their free time in indoor areas, while the least portion of the samples was spending free time in outdoor areas. More than half of the respondents tend to spend their time in the area of their dwelling units, because back in Kampung Pulo, they usually spent their time around their house, and those behaviors carried over after they relocated to Rusunawa as well. However, the p-value for the place of spending free time was 0.082, which was at the significance level of 10%, and this means that the pattern of spending free time was different between upper- and lower-floor residents. Those who were spending time in dwelling units was mostly upper-floor residents and those who were spending time in outdoor areas, mostly lower-floor residents.

Although a certain level of 90% was considered normal to be used in research, the significance level at 10% is considered weak. Because of that, a further test of the significant difference between upper- and lower-floor residents was carried out by changing the structure of the strata. In this analysis, this research found the best result of significance level by comparing respondents from the third and fourth floor, and respondents from the fifth and sixteen-floor. The result was that the p-value decreased to 0.011, which was more significant at the significance level of 5%.

| Floor level-modified | Outdoor | Indoor | Total |
|----------------------|---------|--------|-------|
| Upper floor (5th to 16th floor) | 25 | 54 | 79 |
| | 64.1% | 85.7% | 77.5% |
| Lower floor (3rd and 4th floor) | 14 | 9 | 23 |
| | 35.9% | 14.3% | 22.5% |
| | 39 | 63 | 102 |
| | 100% | 100% | 100% |

Some of the upper-floor respondents who claimed to spend their time in outdoor areas were usually those who were opening stalls in the ground floor and second floors, as well as those who were frequently accompanying their children to play or do activities outside. Some respondents
said that they spend most of their time in outdoor areas because they were looking for crowds or pursuing the kinds of interaction that happen there.

Some lower-floor respondents mostly spend their time in outdoor areas because they complain about the mosquitos and that they felt stiff and hot inside their dwelling-unit. Some of those respondents who spend their free time in their dwelling-unit have air conditioners in their units. Based on the explanation above, most respondents were spending most of their time in their dwelling-units, while a lesser proportion of the samples spend their time outdoors. However, the proportion of respondents who spend their time in indoor areas were dominated by the upper-floor residents. In Mitchell's study (1971)\textsuperscript{12}, he also mentions that the residents of the upper-floors were more confined to their units compared to the lower-floor residents. In other words, compared to lower-floor residents, upper-floor residents were more dominating the interaction that happened in Indoor areas.

Sixty-nine respondents—which represents 67.6\% of the total samples—were having interactions in outdoor areas, while the other portion of the samples had interactions in indoor areas. Outdoor areas were filled with activities such as food stalls and children playing, so the outdoors became the epicenter of social interaction for the residents. In Rusunawa Jatinegara Barat, high rates of social interaction were found in several outdoor areas on the first and second floors that integrated with access to facilities like library, hall, and public rooms (Ridwana et al, 2018)\textsuperscript{19}.

Table 8. Place of interaction by Floor level ($\chi^2$=6.14, $p=0.013$)

| Floor level   | Outdoor | Indoor | Total |
|---------------|---------|--------|-------|
| Upper floor   | 30      | 23     | 53    |
|               | 43.5\%  | 69.7\% | 52.0\%|
| Lower floor   | 39      | 10     | 49    |
|               | 56.5\%  | 30.3\% | 48.0\%|
|               | 69      | 33     | 102   |
|               | 100\%   | 100\%  | 100\% |

Figure 11 shows a clear example of the significance of activity on the ground floor to the residents' social interaction. During the first observation\textsuperscript{(7)} (left picture), there were still many activities taking place on the ground floor because of the existence of food stalls. However, during the second observation (right picture), there were no food stalls to be found anywhere on the ground floor which resulted in a drastic change of things that happened on the ground floor. After the stalls were gone, there was barely any activity there at all. Some activities that could be identified on the ground floor were mothers over watching their kids playing, for example, but no more than that. However, no information after the first observation in 2018 could be gathered regarding whether or not this changes of activity were only temporary or permanent phenomenon.
The $p$-value for the place of interaction was 0.011, which was at the significance level of 5%, and which means that the pattern of the place of interaction was different between upper- and lower-floor residents. Most upper-floor respondents had interactions in and around their dwelling-unit (on the same floor), and lower-floor respondents had interactions in the outdoor areas. The pattern of spending free time might affect the residents' place of interaction. From the total respondents who were spending free time in outdoor areas, 59.0% as seen in Table 6, were from the lower-floor residents, and from the total number of respondents who have interaction in the outdoor areas, 56.5% as seen in Table 8, were also from lower-floor residents. In contrary, based on the total number of respondents who were spending free time in the indoor areas, 58.7% as seen in Table 6, were from the upper-floor residents, and from the total number of respondents who have interaction in the indoor areas, 69.7% as seen in Table 8, were also from upper-floor residents.

Looking at the previous study by Gifford (2007)\textsuperscript{22}, it was clear that most social interaction happened between residents on the same floor. Even though his study did not distinguish between upper- and lower-floor residents, Mitchell's study (1971)\textsuperscript{12} gives a clear example indicating that floor levels are related to social interactions. For example, upper-floor residents found it more challenging to move away from the floor, which they lived-in. As a consequence, they were forced into limited social interaction with the other members of their dwelling-unit, such as their families and relatives. In the case of Rusunawa Jatinegara Barat, the interaction was not only limited to the members of their dwelling-unit but also their neighbors. Lower-floor residents tend to spend time in outdoor areas because maybe it was easier for them to access these areas.

Outdoor areas—especially on the ground floor—were filled with trees and greenery, which attract residents because the natural elements also seem to factor into social interaction in high-rise housing. Some researchers have studied the existence and location of trees and greenery, and their relation to where most of the young and adult residents spend their time. Areas with trees and greenery attracted more groups of residents than did spaces without those elements (Coley, Kuo & Sullivan, 1997)\textsuperscript{25}.

6. Conclusion and Recommendation

Results from Wilcoxon and Chi-square analysis can be put side-by-side, as shown in Table 9. This way, it can be seen which variable is significant on both analysis and which variable that was not significant at all on both analyses.
Frequency of interaction was the second-most significant changes after relocation, and at the same time, also there was a pattern differences between upper- and lower-residents. Based on this finding, it is safe to say that the aspect of social interaction that mostly affected by relocation to high-rise Rusunawa was the frequency of interaction, especially for those who live in the upper-floor. The opposite of this was the duration of interaction, which was not significant both on Wilcoxon and Chi-square analysis. It seems that relocation to high-rise Rusunawa or change of physical environment did not have any impact on this aspect. Interestingly, even though the frequency of visiting neighbors was the most significant changes after relocation, the floor-level factor of Rusunawa did not have any impact on this aspect or in other words, there was no pattern difference between upper- and lower-floor residents.

Upper-floor residents tend to spend most of their time around their dwelling-units compared to lower-floor residents who spend most of their time in the outdoor areas. In this case, the pattern of difference between upper- and lower-floor became more significance when comparing between the first two floors of dwelling-unit (third and fourth-floor) and the rest (fifth through the sixteenth-floor). In other words, most third and fourth residents were spending free time in outdoor areas compared to other floors. It might be because it was easier for them to access those areas by stairs compared to the higher floor. In terms of place of interaction, most interactions happened in the outdoor areas because of the physical elements that attract crowds and eventually stimulate interaction, such as food stalls, children playing, and natural elements such as the presence of greenery. However, social interactions in outdoor areas were dominated by lower-floor residents, as upper-floor residents mostly only have interactions around their dwelling units.

In the Rusunawa, most residents often stayed in their unit, which made it pretty hard for them to make new neighbors or friends. Eventually, most of the social interaction that happened between the residents were limited only to their old and close friends or neighbors.

The most significant difference in terms of social interaction pattern between upper- and lower-floor residents was the frequency of interaction. Lower-floor residents had more interaction than the upper-floor residents and might affect the residents' perception of their number of friends in the Rusunawa, as lower-floor residents felt that they had more friends compared to those who lived on the higher floors.

Ultimately, there was a pattern difference in social interactions between upper- and lower-floor residents. In this case, lower-floor residents have overall better social interactions compared to upper-floor residents.

Based on the findings of this research, some recommendations are proposed for policymakers, especially the managers of the Rusunawa Jatinegara Barat. As most of the social interaction happened between the residents were limited only to their old and close friends or neighbors, the managers and neighborhood leaders should work together to organize events that involve residents on the same floor so that residents can get to know each other better. Events like cleaning the corridors together, being involved in the same seminar, and other events like that would hopefully increase the rate of social interactions in around dwelling-units.

The social interaction quality was declining because most residents were mostly stayed in their units and closed their doors, which drastically decrease the chance of interaction happened. Future Rusunawa should include at least one common facilities on each floor, such as a shared kitchen or laundry area, in order to stimulate more social interaction in the dwelling areas, especially on the upper floor. By doing this, residents who mostly stayed inside their unit would occasionally go out and have a greater chance to interact with each other. Another option is to allocate an entire

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floor (in the upper floor, for example) to be intended for a shared or stalls area. In other ways, the management could even allow some residents to open stalls in their units, which was prohibited before. In this way, it could also stimulate interaction among the upper-floor residents.

The management should condition the lower floors to be more attractive and comfortable so that they can attract more residents especially upper-floor residents to spend more time outdoors and hopefully can increase the frequency of interaction by the residents getting to know to each other. This way, even though they already have quite a significant number of interactions in indoor areas, they might still have some eagerness to go to the ground floor in order to interact with other residents from different floors.
| Variables                                      | Likert-scale                              | Wilcoxon | Chi-square |
|------------------------------------------------|-------------------------------------------|----------|------------|
| Frequency of visiting neighbors (on the different floor) | 5-scale from very rare to very often | -8.353  | 0.000**    | 0.662      |
| Frequency of visiting neighbors (on the same floor) | 5-scale from very rare to very often | -6.607  | 0.000**    | 0.562      |
| Frequency of interaction                        | 5-scale from very rare to very often | -4.003  | 0.000**    | 0.009**    |
| Relationship with old neighbors                 | 5-scale from poor to excellent           | -3.843  | 0.000**    | 0.603      |
| Relationship with new neighbors                 | 5-scale from poor to excellent           | -        | -          | 0.722      |
| Perception of the number of friends             | 5-scale from much less to much more      | -3.062  | 0.002**    | 0.057      |
| Place of spending free time                     | Indoor or outdoor                        | -2.219  | 0.027*     | 0.011*     |
| Duration of interaction                         | 5-scale from very rare to very often     | -1.707  | 0.088      | 0.146      |
| Place of interaction                            | Indoor or outdoor                        | -1.206  | 0.228      | 0.013*     |
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Notes

1) In Kampung Pulo, the stalls were located right in front of their houses or in their front porch. Therefore, in this case, spending time in stalls counted the same as spending time in front porch.
2) "Rukung tetangga" or in short RT is the division of villages and also the lowest administrative division in Indonesia.
3) In Pell study (2012), zones of action refer to regions or areas where the residents do their activity or simply passing by those areas starting from their own house/units, front porch/common area, bounded neighborhood, and areas beyond the neighborhood.
4) As for comparison, the price for renting a house or apartment in Jakarta usually ranging from Rp700.000 to Rp2.500.000 for apartment with similar features. The price may vary depending on the location. The Rusunawa's rent fee is subsidized by the Government with the maximum occupancy of three years.
5) Six total floors for the lower-floor divided by fourteen total floors of Rusunawa resulted in 0.429 / 42.9% and eight total floors for the upper-floor divided by fourteen total floors of Rusunawa resulted in 0.571 / 57.1%.
6) Originally, the questionnaire survey was done in a 5-scale Likert, in this particular analysis, it was merged into 3-scale on the analysis to reduce the degree of freedom.
7) The first observation took place between 19\textsuperscript{th} – 24\textsuperscript{th} September 2017 (left picture, taken at 12.05 o’clock, on 19\textsuperscript{th} September 2017). The second observation took place between 22\textsuperscript{nd} – 25\textsuperscript{th} February 2018 (right picture, taken at 11.14 o’clock, on 23\textsuperscript{rd} February 2018).
8) Compared to other situations/variables which were significant at 99%, place of spending free time was only significant at 95% (Table 2). Therefore, the author regard this as a slight changes after relocation.

References

1. Andrea, E. P. Study on impact of urbanization and rapid urban expansion in Java and Jabodetabek megacity, Indonesia. 2015
2. Kapoor, M., S.V. Lall, M.K.A. Lundberg, and Z. Shalizi. Location and welfare in cities: impacts of policy interventions on the urban poor. World Bank Policy Research Working Paper 3318. The World Bank, Washington, D.C. 2004.
3. Alonso, W. Location and Land Use. Cambridge, Mass., Harvard University Press. 1964.
4. Mills, E. An aggregative model of resource allocation in a metropolitan area. Papers and Proceedings of the American Economic Association. 1967, vol. 57, p. 197-210.
5. Fried, Marc. Grieving for a lost home. In Leonard S. Duhl (ed.), The Urban Condition. New York: Basic Books. 1963, p. 151-71.
6. Zito, J.M. Anonymity and neighboring in an urban, high-rise complex. Urban Life Cult. 1974, vol. 3, no. 3, p. 243–263.
7. Tognoli, J. Residential environments. In: Stokols, D., Altman, I. (Eds.), The Handbook of Environmental Psychology. Wiley, New York. 1987, p. 655–690.
8. Michelson, W. M. Environmental choice, human behavior, and residential satisfaction. Oxford University Press. 1977.
9. Jephcott, P. Homes in high flats: Some of the human problems involved in multi-story housing. Edinburgh: Oliver and Boyd. 1971.
10. Pell, C. W. Neighborhood Social Interaction in Public Housing Relocation. 2012.
11. Williamson, R. C. Adjustment to the highrise: Variables in a German sample. Environment and Behavior. 1981, vol. 13, no. 3, p. 289–310.
12. Mitchell, R. E. Some social implications of high density housing. American Sociological Review. 1971, p. 18–29.
13. Gärling, T., & Golledge, R. G. Environmental perception and cognition. In Advance in Environment, Behavior, and Design. Springer. Boston, MA. 1989, p. 203–236.
14. Dillman, J. J., & Dillman, D. A. Private outside space as a factor in housing acceptability. Housing and Society. 1987, vol. 14, no. 1, 20-29.
15. Burgess, J., Harrison, C. M., & Limb, M. People, parks, and the urban green: a study of popular meanings and values for open spaces in the city. Urban studies. 1988, vol. 25, no. 6, p. 455–473.
16. Fanning, D. M. Families in flats. British Medical Journal. 1967, vol. 4, no. 5576, p. 382.
17. Silalahi, R. C. FAKTOR-FAKTOR YANG MENYEBABKAN PERMASALAHAN RELOKASI BANTARAN SUNGAI (STUDI KASUS: KAMPUNG PULO KE RUSUNAWA JATINEGARA BARAT). Jurnal Muara Ilmu Sosial, Humaniora, dan Seni. 2018, vol. 1, no. 2. Indonesia.
18. Van, H., & Hardi, J. Pola Pemanfaatan Ruang Bersama pada Rusunawa Jatinegara Barat. Vitruvian. 2017, Vol. 6, no. 3. Indonesia.
19. Preiser, W. F. The evolution of post-occupancy evaluation: Toward building performance and universal design evaluation. Learning from our buildings a state-of-the practice summary of post-occupancy evaluation. 2001
20. Ridwana, R., Prayitno, B., & Hatmoko, A. U. The Relationship between Spatial Configuration and Social Interaction in High-Rise Flats: A Case Study on the Jatinegara Barat in Jakarta. In SHS Web of Conferences. EDP Sciences. 2018, vol. 41, p. 07003.
21. Henry, G. T. Practical sampling. Sage. 1990, vol. 21.
22. Gifford, R. The consequences of living in high-rise buildings. Architectural science review. 2007, vol. 50, no. 1, p. 2–17.
23. Ginsberg, Y., & Churchman, A. Housing satisfaction and intention to move: Their explanatory variables. Socio-economic Planning Sciences. 1984, vol. 18, p. 425-431.
24. Holahan, C. J. Environmental effects on outdoor social behavior in a low-income urban neighborhood: A naturalistic investigation. Journal of Applied Social Psychology. 1976, vol. 6, p. 48–63.
25. Coley, R. L., Kuo, F. E., & Sullivan, W. C. Where does community grow? The social context created by nature in urban public housing. Environment and Behavior. 1997, vol. 29, p. 468-494.