

Housing Satisfaction in Public Housing in Suburban Area: The Relevance of Income Level and Commuting Activities of Rusunawa's Residents in Tangerang City, Indonesia

Alpraditia MALIK, Tomohiko YOSHIDA, Mustika WARDHANI

Abstract

The rapid urbanization of Greater Jakarta has resulted in the urban expansion of its peripheral cities, one of which is the Tangerang municipality, which is considered the most developed peripheral city compared to the others. While the development of housing and commerce is widespread in Tangerang Municipality, as a suburban area, the development of infrastructure is still insufficient, especially in neighborhood and public transport facilities. As an effect of urban expansion, the emergence of slum settlements and inadequate housing was inevitable and has increased the amount of housing backlog. The development of subsidized apartments was chosen by the planning officials to mitigate the housing backlog by providing housing with better facilities and building features. However, the residents' satisfaction toward housing has often not been taken into consideration when developing such apartments. This study aims to understand the relevance of income level and commuting activities of residents in housing satisfaction. The result was, there was no difference in the housing satisfaction between different income groups. However, there was a difference on what predict their housing satisfaction. In addition to that, some variables from commuting activities are important on predicting housing satisfaction.

Keywords: Housing satisfaction, Tangerang city, Public housing, Slum settlement, neighborhood facilities, commuting activities

1. Introduction

The emergence of development in big cities in Indonesia has resulted in positive economic growth in those cities. As a result, those cities will become a magnet for new residents to come seeking work and eventually settle there (Darin-Drabkin, 1977), a process which is often referred to as urbanization (Andrea, 2015). However, rapid urbanization has caused various kinds of problems because it can sometimes get out of control. One of the biggest problems caused by urbanization is the uncontrolled population increase. In turn, this kind of rapid urbanization has caused various other problems such as increasing slum settlements and a high rate of unemployment, which could eventually lead to an increase in urban crimes, and many other problems (Todaro, 1969). One city that has

experienced this kind of rapid urbanization is Greater Jakarta. As the capital of Indonesia, Jakarta is also known as one of the largest metropolitan areas in the world (Kotkin and Cox, 2013) and is the largest urban area in Indonesia and even Southeast Asia. The development of Jakarta province, in the end, spread into the surrounding peripheral areas of Bogor city, Bogor regency, Depok city, Tangerang city, Tangerang regency, Bekasi city and Bekasi regency (Firman, 2013).

One problem of urbanization in Asian cities including peripheral cities of Greater Jakarta was poor or developing urban infrastructure (Sorensen et al., 2004). The clear example of this issue was Tangerang City, that currently in the phase of developing its infrastructure such as the expansion of Airport, toll roads, development of schools, health clinics, and so on. In the other hand, since 2012, Tangerang city changed its function from an industrial city to city for trades and services. This kind of change attracted many private sectors to develop malls and apartments along the main road of Tangerang city, replacing the factories. Not to mention, there were lots of slum settlement can be found in Tangerang City. With the developing of infrastructure, private housing and commercials, and slum areas, the land availability in Tangerang city is decreasing (Andrea, 2015). In order to provide an affordable housing for the low-income households, and to reduce housing backlog¹ with the limited land availability, started in 2007, Rusunawa² were developed by the Governments (Cahyandari, 2016).

Rusunawa is part of housing provisions enacted to provide an adequate and affordable housing for low-income households and people with no access to housing (Pujianto, 2006; Sinombor, 2008). Currently there are three Rusunawas in Tangerang which are Rusunawa Manis, Gebang, and Betet. All of the Rusunawas are managed by Technical Implementation Unit (UPTD in local term), a unit established by the government to manage the Rusunawas. As for the residents, originally it was limited only for those who considered as low-income households³ and prioritized for local residents of Tangerang City. However, as for the current situation, Rusunawa were also occupied by residents that are not considered as low-income households.

Some scholars stated that income level might affect people's perception toward their housing (Huang and Du, 2015; Grigolon, et al., 2014). Not only housing, income level also plays an important role on people's commuting activities (Shaleh, 2008). Currently, Tangerang city was in a position where it cannot freely provide affordable housing for both income group. Because of that, the local government of Tangerang city has no other choices than to facilitate different income group in one housing complex.

At the time this study was done, the number of housing backlog in Tangerang City has reached around 56.000 households⁴, means that those households don't have any kind of house or currently live in an inadequate one. Currently the local governments already planned to build another fourteen Rusunawas to fulfill the number of housing backlog, where the tentative location can be seen in figure 1. Based on their guidelines and regulation on developing Rusunawa, the criteria set by the government are that the location must be close to the workplace, easy access to public transportation, and also neighborhood facilities such as schools, clinics, market/commercials, etc. In addition to that, it also required to provide adequate, safe, and comfortable shelter for the residents as well as parallel with government programs. However, in order to acquire a land with these kinds of criteria, the local governments would need to acquire extra land by either land acquisition, or by converting a slum area, which both could have its own consequences.

As Tangerang city faces land shortage, it begs the question whether or not Rusunawa can be built in a less favorable location and still satisfy both income group. Therefore, it is necessary to conduct a study that is able to assist the government in the development of Rusunawa, especially in order to effectively choosing the locations. One of the methods is by determining what factors that were actually important for the residents, which can be done by measuring their housing satisfaction.

Table 1. Development planning of the upcoming Rusunawa

Name of the Rusunawa	Units	Development planning (year)
Rusun I	393	2020
Rusun II	424	2021
Rusun III	786	2022
Rusun IV	1,742	2023
Rusun V	1,845	2024
Rusun VI	292	2025
Rusun VII	438	2026
Rusun VIII	5,214	2027
Rusun IX	8,452	2028
Rusun X	3,844	2029
Rusun XI	1,835	2030
Rusun XII	14,378	2031
Rusun XIII	8,917	2032
Rusun XIV	6,859	2033
Total unit planned	55,419	

Source: Head of Division of Tangerang City Regional Planning Agency (2019)

As there were no evidence of a similar study done in Tangerang city, this study is expected to help the Local Governments decide the best direction for the next development of Rusunawa in Tangerang city

2. Previous Studies

2.1. Definitions of Housing Satisfaction

Housing satisfaction usually used to measure how successful a housing project is, where success means that the residents' new housing is equal to or better than what they expected (Parker and Mathews, 2001; Hanif et al., 2010). It is also an important parameter of successful policies regarding housing developments (Adriaanse, 2007) as 23% of the variation from the overall life satisfaction was represented by housing, neighborhood, and regional satisfaction (McCrea *et al.*, 2005). In addition to that, after marital satisfaction, housing satisfaction was the second most important criterion of life satisfaction (Fried, 1984). Based on some previous study, in case of low-income household in the developing countries, infrastructure such as public facilities, public transport, and all factors related to the mobility and daily activities of the residents are important (Amerigo and Aragones, 1997; Abe and Kato, 2017; Lundberg, et al., 2004).

2.2. Methodology and variables

Housing satisfaction itself was considered a popular topic to be studied. The most common way of measuring housing satisfaction was by using some parameters as an indirect question that was grouped into three main categories: the house, neighbors, and the neighborhood (Canter and Rees, 1982). Nowadays, those three categories

were used by most scholars when doing study on housing satisfaction.

The mostly used variables that were based on those three categories were: building structure and floor area (Li and Song, 2009), housing amenities (Tao, et al. 2014), housing type and characteristics (Grigolon, et al., 2014; Huang and Du, 2015), social interaction (Ibem and Amole, 2013; Vera-toscano and Ateca-Amestoy, 2008), feeling of safety (Ibem and Amole, 2013), homeownership (Elsinga and Hoekstra, 2005), distance to neighborhood facilities (Teck-Hong, 2012), and residents perceptions of housing features, density and safety (Amerigo and Aragonés, 1997).

Shaw (1994) stated that more study of the relevance of commuting activities on housing satisfaction was required. The importance of including commuting activities to model of housing satisfaction seems valid as some previous studies stated that location and distance to neighborhood facilities was an important factor to explain housing satisfaction (Sulaiman and Yahaya, 1987; Teck-Hong, 2012) which may correlate with commuting activities. Regarding this, Abe and Kato (2017) did include expenditure on gasoline use which considered as variable of travel behavior to measure housing satisfaction.

Regarding the methodology, several methods were used to measure how these three categories related with the housing satisfaction. Since early 90's most study in housing satisfaction utilize statistical analysis such as factor analysis (Amerigo and Aragonés, 1990; Türkoğlu, 1997; Liu, 1999; Adriaanse, 2007), regression analysis (Amerigo and Aragonés, 1997, Grigolon, et al., 2014; Ibem and Amole, 2013; Bergeijk, et al., 2008; Tao, et al., 2014; Huang and Du, 2015), and path analysis (Abe and Kato, 2017; Jiang, et al., 2017; Ghafourian and Hesari, 2018)

2.3. Income level and Housing Satisfaction

Concerning the relationship between income group and housing satisfaction, there were some studies that has been done. Income level was one of the main factor that indicate the ability for people to realize their housing needs and goals (Schwanen and Mokhtarian, 2004). In other word, income level might affect housing satisfaction as it was one of the household characteristics that proved to have direct impact on it (Huang and Du, 2015). Based on Youth Media Campaign Longitudinal Survey (Powell, et al., 2006), stated that household with lower income are more struggling to access some neighborhood facilities, public transportation, and more concerns about safety. Parallel with that, in studies about housing satisfaction of low-income residents, Salleh (2008) in his study, stated that access to public transport is one of the important factors in housing satisfaction. On the other side, Lundberg, et al (2004) argued that it was actually the commuting cost that influenced the successfulness of housing relocation. In addition to that, Grigolon, et al. (2014), stated that households with higher income level are more likely to be more satisfied with their housing, as they face fewer financial problems. In some cases, income level also trumps housing satisfaction in predicting housing mobility. In a study by Rumimper (2018), even though the residents weren't satisfied with the overall housing environment, they didn't want to move because it was much cheaper to live in the current housing.

2.4. Commuting Activities and Housing Satisfaction

Commuting activities of the residents was rarely taken into accounts when discussing such housing satisfaction in many previous studies. While many models of housing satisfaction did care about the distance between housing and neighborhood facilities (Mohit et al., 2010, Abe and Kato, 2017; Varady and Preiser, 1998; Ukoha and Beamish, 1997; Ibem and Aduwo, 2013), no further variable concerning commuting activities were used in the models (Shaw, 1994). Lundberg et al., (2004) in their study also stated that in the case of housing environment after relocation for low-

income household, commuting cost along with other thing was the most important factor.

Senbil, et al. (2006) stated that utilizing mixed land-use such as apartment land use can be used to reduce travel distance lengths and change modes. Different activities in close proximity to each other might normally reduce travel distances and reduce the number of trips, which ultimately reduces the residents' commuting costs

In a study done by Setiadi (2015) and Rumimper, (2018) in the case of housing satisfaction in public housing in Jakarta province, Indonesia, found that proximity with neighborhood facilities including public transport, and also the location of the public housing itself was the most significance predictor. In other case, Mohit, et al., (2010) found that those who were more satisfied with the neighborhood facilities express greater overall housing satisfaction compared to those who were more satisfied with physical condition of the building. Ibem & Aduwo (2013) also stated that poor access to neighborhood facilities results in the dissatisfaction of the residents.

Shaw (1994) also argued that existence and access to public transport was vital in determining housing satisfaction. Infrastructure is also often considered as one of the important predictors and staple variables of housing satisfaction (Amerigo and Aragones, 1997). This was true especially in the changing urban form of Jabodetabek, where neighborhood facilities play an important role (Abe and Kato, 2017).

In another study, well placed Rusunawa resulted in high neighborhood satisfaction (Setiadi, 2015). In the previous study done in the same exact location of Rusunawa in Tangerang City by Wibowo, et al. (2019) found that in overall, the residents felt satisfied living there even though the study didn't mention about location or commuting activities at all. To further understand the effect of location to housing satisfaction, commuting activities should be concerned as well (Shaw, 1994).

In addition to all of that, based on the study of Litman (2014), housing and commuting were one of the expenditures that need to be taken into account in order to reach affordable life. Thus, exerting the importance that the relevance of commuting activities in housing satisfaction need to be further explored.

In the case of developing countries, there are only a few studies regarding housing satisfaction that can be found (Amole, 2009). At the same time, most developing countries including Indonesia, rarely consider housing satisfaction in their housing development policy (Moghalu, 1984).

In author knowledge, in previous studies of housing satisfaction, income level was only analyzed as part of the housing characteristics. Therefore, the differences between their importance toward housing satisfaction could not be distinguished. In addition to that, following the statement from Shaw (1994), only one study that can be found that actually included commuting activities as one of the variables which was a study from Abe and Kato (2017). Because of that, this study will further explore the differences between different income group in terms of the predictors of their housing satisfaction. At the same time, this study will also include commuting activities as one of its variable and see how it affects housing satisfaction for different income group.

3. Methodology

3.1. Study area

The scope of research of this study was limited to Tangerang city area. While some studies were done in Greater Jakarta region, whether it include all its peripheral cities or not (Abe and Kato 2017, Rumimper 2018, Setiadi, 2015), the purpose of this study was to give more insight and detailed look on what was happening in the suburban area rather than the entire Greater Jakarta. Tangerang city is also in the middle of developing its infrastructure and at the same time changed its function to city for trade and services from industrial city recently. Therefore, it would be

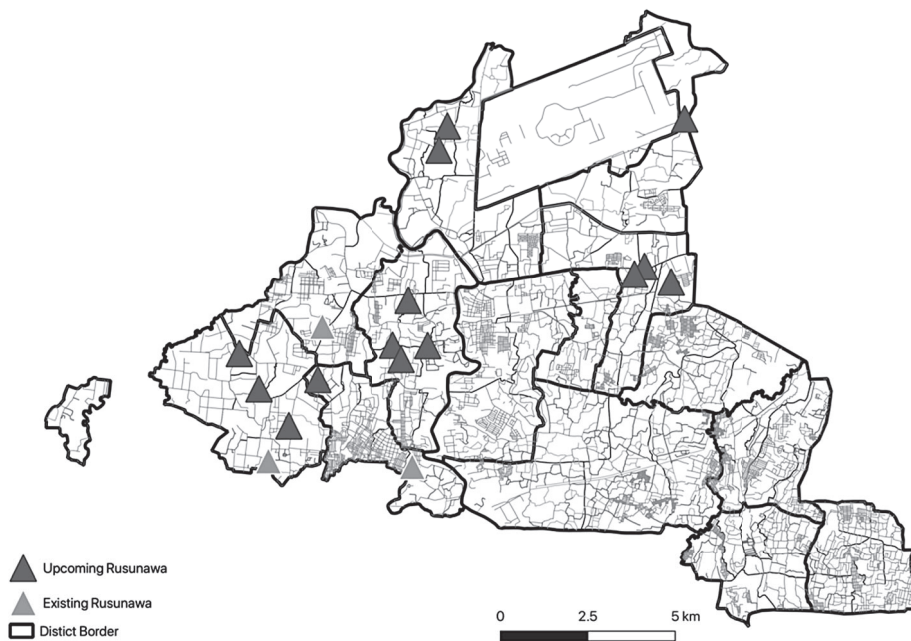


Fig. 1. Location of the Rusunawas

Source: Author (2019)

important to discover how was the housing satisfaction of its residents while living in public housing/Rusunawa.

There were three existing Rusunawas that were studied, Rusunawa Gebang, Manis, and Betet. There were some different specification between those Rusunawas in terms of year built, number of blocks, units, rooms, and facilities. Initially, the government already set the specification for each Rusunawa. For example, the floor area for each unit was planned to be one bedroom of 24m². While it was true for Rusunawa Gebang, the newest Rusunawa Betet consist of two rooms with floor area of 36m². One blocks of Rusunawa was designed to accommodate ninety-six households while currently each of Rusunawa has different number of blocks based on the land availability at that time. In the other hand, Rusunawa manis was built around seventeen years ago. Currently, the government already planned to build another fourteen Rusunawa.

3.2. Data

In this research, quantitative methods (in the form of a questionnaire survey) were conducted to residents of Rusunawas by interviewing them face to face. This was done to avoid confusion and errors when answering the questionnaire (Ibem and Amole, 2013; Rustiadi, 2015; Bunawardi et al., 2016; Rumimper, 2018). The confidence level (Z) used for this study was 95%, with a toleration for error (e) of 5%, and a standard deviation (p) 50%. The total population for the residents of three Rusunawas was (N) 792. Based on the formula below which adopted from Tao et al (2014), 260 respondents were required for this study.

$$SS = \frac{\frac{Z^2(p)(1-p)}{e^2}}{1 + \left(\frac{Z^2(p)(1-p)}{e^2+N}\right)}$$

For regression analysis, the general sample size was ten times the number of independent variables (Fellows and Liu, 2008). This study has nine total variables which requires at least ninety respondents. As many respondents didn't provide clear answers or even refused to be interviewed, the final respondents for this study were 159

respondents of all three Rusunawas.

The survey was conducted between August 2019 and September 2019. Before the start of questionnaire distribution, the author has been granted the permission by the Tangerang City Regional Planning Agency to do the field work with two Indonesian assistants. The questionnaire survey was done in the local language of Indonesia. Data were obtained from household heads (male or female) that were present at the time the author visited the Rusunawa using structured questionnaire. Rather than leaving the respondents to fill out the survey by themselves, the author and the assistants conducted the interview directly to avoid confusion or misunderstanding that might happen. This approach of data collection has also been done by several scholars (Ibem and Amole, 2013; Setiadi, 2015; Bunawarda et al., 2016; Rumimper, 2018).

While this study concerns about residents' commuting activities, housewives were also included as the respondents for the analysis. While they do not have daily jobs, they were still doing some routines which requires them to commute such as driving or accompany their children to school, going to market, etc. With that in mind, any questionnaire results from respondent that do not have any kind of commuting routines were omitted from the analysis.

The respondents were asked questions about household's characteristics, and several question regarding the variables used in this study such as social situation, neighborhood facilities and their commuting activities. The respondents was divided into two income groups; those who have income under four millions and those who have income above four millions each months in the last six months in average in Indonesian Rupiahs. This division was based under the regulation of definition of low-income people by the Governments of Indonesia.

3.3. Variables

The selection of the independent variables or predictors for this study were based on previous study done on housing satisfaction with little modification. There were total of four variables used in this analysis. First was the physical aspects of the Rusunawa. As respondents live in the same building condition, this variable will use the value floor area per person instead as used by some scholars (Vera-Toscano and Ateca-Amestoy, 2008; Abe and Kato, 2017). Second was social aspects of the residents, which ask the respondents about the condition and opinion regarding their social life in Rusunawa (Elsinga and Hoekstra, 2005). Third was neighborhood facilities, which measure the distance from the Rusunawa to the facilities in the neighborhood that frequently used by the respondent such as markets, clinic, etc (Abe and Kato, 2017). This measurement of distance was based on the study De Chiara and Koppelman (1929) which theory set up some boundary or best distance to reach specific facilities from their housing which can be seen in detail in figure 2. Same with physical aspects, as respondents live in the same location, this variable will measure the distance to facilities that were frequently used by respondents. The last was commuting activities, which ask several question regarding their commuting activities (Senbil et al, 2006; Lundberg, 2004; Grigolon et al, 2014; Abe and Kato, 2017). Distance to work was used as a proxy for their daily commuting distance to further measure their commuting activities (Prillwitz et al, 2007; Grigolon et al, 2014). More details regarding variables can be seen in Table 2.

3.4. Model and Hypothesis

The objective of this study is to explore the relevance of income level and commuting activities to the housing satisfaction of Rusunawa residents in Tangerang city. This study will first describe the general data of the household

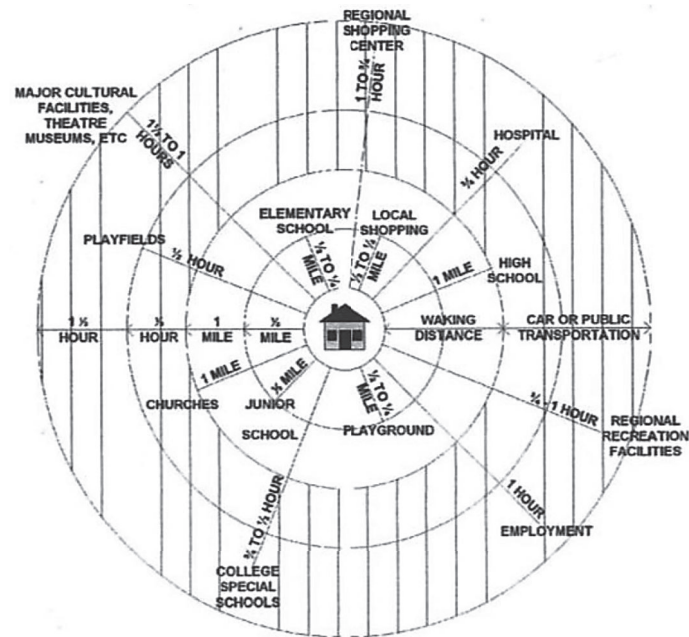


Fig. 2. Distance to facilities by De Chiara and Koppelman (1929)

Source: De Chiara and Koppelman (1929)

characteristics of the respondents in order to understand the general situation of the demography. Those characteristics were age, sex, income level, occupation, household size, and total length of stay in Rusunawa. Then, the descriptive analysis of mean comparison between both income groups regarding each variables will be discussed. The result was then supported with the statistical analysis using Ordinal Logistic Regression in order to determine how each predictors affect housing satisfaction as the dependent variable. As for the regression analysis, the data were analyzed in the three different models; where the first model include all samples, while both the second and third models analyze different income group. This method was adopted from the study of Huang and Du (2015) that tested several models with different cases. This was done to see the general case of residents of Rusunawa, and whether there are any differences between both income groups' predictor of their housing satisfaction or not.

All the models will be analyzed by using statistical analysis program of SPSS. The final results for this study will then explain which predictors are significant to the residents' perception regarding their satisfaction toward Rusunawa.

Based on the previous studies, the first hypothesis for this study was, apart from whether or not there was a differences between both income groups regarding their housing satisfaction, there are differences of significant predictors of housing satisfaction between both income.

The second hypothesis was, that the commuting activities especially commuting cost would be the most important factor or variable to predicts residents' overall housing satisfaction especially in the case of a city that in the middle of infrastructure development.

Table 2. List and description of each variables and their sub-variables

Category	Measurements	Description
<i>Physical aspects</i>		
Floor area per person	Scale	The floor area for each persons, by dividing the floor area of unit with the number of person in one households in meter squares
<i>Social aspects</i>		
Frequency of group interactions	7-scale Likert (1=less than once a month, 7=more than four times a week)	Frequency of residents participating on any event/social interaction such as gatherings, meetings, or any events involving two or more other residents
Feeling of safety	7-scale Likert (1=I feel very unsafe, 7=I feel very safe)	The residents' feeling regarding their safety on living in Rusunawa ⁵
<i>Neighborhood aspects</i>		
Distance to Market	Scale (in miles)	Measure the distance from Rusunawa to the market that frequently visited by each respondents
Distance to Schools	Same as above	Measure the distance from Rusunawa to the nearest school where their children goes to.
Distance to Clinics	Same as above	Measure the distance from Rusunawa to the clinic that frequently visited by each respondents
<i>Commuting activities</i>		
Frequency of using public transport	0=less than once a week, 1=more than once a week	Frequency of residents using any kind of public transport (except online taxi) in the last six months in average.
Commuting cost	Scale (in Indonesian Rupiahs)	The amount of money spent on gasoline or using public transport per month in the last six months in average.
Distance to workplace	Scale (in miles)	Measure the daily commute distance of each respondents. In this case, distance from Rusunawa to their workplace was measured.
<i>Housing Satisfaction</i>		
Housing Satisfaction	7-scale Likert (1=very unsatisfied, 7=very satisfied)	The residents' perception regarding their overall satisfaction on living in Rusunawa ⁶

Source: Author (2019)

4. Discussion and Findings

4.1. Household characteristics of the respondents

Most respondents were in their late thirties when interviewed. The average length of stay of the respondents were 4.92 years which exceeded the allowed length of stay of three years. Most respondents that were past the limit of their length of stay were mostly from lower income group. It might be because they do not have enough resources to find a new home. However, some respondents from higher income level stated that they were also still struggling to do so.

In the development planning of Rusunawa, the size of unit was designed as 24m² which was intended for household with the size of four people. As for the average size of the household, the average value was 3.65, which in

accordance with the planning. However, there were still some cases where one unit with the size of 24m² was occupied with more than four people.

In general case, the average income of the respondents was 3.69 millions Rupiahs. While based on the local government regulation that those who were eligible to stay in Rusunawa were those whom define as low-income people, it seems there were also some relaxation to those who have higher income to stay at Rusunawa.

Total male respondents that were interviewed was 101 respondents (63.50% of the total respondents). They were mostly formal workers and factory workers. At the same time, even though there were only forty-seven respondents (29.60% of total respondents) that were factory workers, most of the residents of Rusunawa in Tangerang city were consists of factory workers.

Female respondents that were interviewed makes up to 36.5% (fifty-eight respondents) of the total respondents. Those respondents were usually working as factory workers, teachers, and other non-formal jobs. There were total of fourteen housewives (8.8% of total respondents) that were interviewed. Even though they do not have daily jobs, they still have daily routines such as driving their children to school, going to market, doing side job outside Rusunawa and any other else.

Most respondents (62.30% of total respondents) had senior high school as their last education. As for the bachelor's

Table 3. Descriptive statistics of household characteristics

	<i>General case</i> n=159		<i>Lower income group</i> n=117		<i>Higher income group</i> n=42	
	Means	St.dev	Means	St.dev	Means	St.dev
Household characteristic						
Age (<i>years</i>)	38.16	11.21	38.37	11.94	37.60	8.97
Length of stay (<i>years</i>)	4.92	3.98	5.39	4.11	3.62	3.31
Household size (<i>person</i>)	3.65	1.21	3.67	1.22	3.62	1.16
Income per month (<i>in millions IDR</i>)	3.69	1.45	3.06	0.62	5.44	1.69
Sex						
Male	63.50%		69.20%		52.40%	
Female	36.50%		30.80%		47.60%	
Education						
Elementary	7.50%		8.50%		4.80%	
Junior High	21.40%		22.20%		19.00%	
Senior High	62.30%		65.80%		52.40%	
Bachelor degree	8.80%		3.40%		23.80%	
Occupation						
Factory workers	29.60%		27.40%		35.70%	
Formal	31.40%		35.00%		21.40%	
Non-formal	30.20%		31.60%		26.20%	
Housewives	8.80%		6.00%		16.70%	

Source: Author (2019)

degree holder, it was only total of fourteen respondents (8.8% of total respondents). However, the number was higher for the higher income group (23.80% as opposed to lower income group that was only 3.40%). Besides from that, there were no other significant differences between lower and higher income group in terms of household characteristic.

4.2. Descriptive situation by Rusunawas

Concerning three the case for three different Rusunawas, there were some differences that can be distinguished. Practically, the most noticeable differences between all three Rusunawas were their physical condition. Rusunawa Manis were built the longest compared to the other two. While having the largest number of units available of 394 units, Rusunawa Manis has the smallest room size of 20m². However, it was located relatively near to the factories where majority of its resident work.

As for Rusunawa Gebang, it has 366 units with room size of 24m². While for Rusunawa Betet, it has the largest room size of 32 m² and it was recently built. However, Rusunawa Betet has only one block with total number of 48 units.

Table 4. Specifications of Rusunawa

Name	Blocks	Number of units	Room size	Year Built
Rusunawa Manis	7	394	21	2002
Rusunawa Gebang	8	366	24	2008
Rusunawa Betet	1	48	36	2015

Source: Head of Division of Tangerang City Regional Planning Agency (2019)

Table 5. Descriptive statistics of variables by Rusunawa

	<i>Rusunawa Manis</i>		<i>Rusunawa Gebang</i>		<i>Rusunawa Betet</i>	
	n=67		n=62		n=30	
	Means	St.dev	Means	St.dev	Means	St.dev
Social aspects						
Frequency of group interaction	4.81	1.90	2.97	1.66	2.73	1.99
Feeling of safety	5.25	0.89	5.10	1.25	5.63	0.80
Physical aspect						
Floor area per person (<i>in meter square</i>)	7.23	3.68	7.88	4.10	8.91	5.58
Neighborhood facilities (<i>in miles</i>)						
Distance to Market	2.10	1.47	0.90	0.76	1.87	1.42
Distance to School	0.86	1.72	1.12	1.45	0.97	1.10
Distance to Clinics	0.50	1.14	1.19	1.06	0.53	0.62
Commuting activities						
Distance to workplace (<i>in miles</i>)	2.54	2.93	3.56	4.99	1.62	2.18
Frequency of using public transport	0.18	0.39	0.24	0.43	0.27	0.45
Commuting cost (<i>in millions IDR</i>)	0.16	0.14	0.18	0.12	0.13	0.07
Housing Satisfaction						
Overall housing satisfaction	5.69	1.22	5.63	1.03	5.17	1.51

Source: Author (2019)

From the perspective of the variables as can be seen in Table 4, there were also some noticeable differences among Rusunawas. For example, residents of Rusunawa Manis were more often engaged in group interaction compared to the other Rusunawas. Concerning neighborhood facilities, residents of Rusunawa Gebang have to travel the furthest to reach schools, clinics, and workplace. However, they were the shortest to reach the market compared to other residents in other Rusunawas.



Fig 3. Distance to market with half a mile and one-mile radius from each different Rusunawa

Source: Author (2019)

Interestingly, there were no noticeable differences between residents in different Rusunawas in terms of their frequency of using public transport and their commuting cost. Despite having different physical quality of the building and was built in different characteristic of location, there were no significant difference of residents' housing satisfaction among all Rusunawas.

4.3. Descriptive situation by different income level

Looking at descriptive statistic of variables on Table 6, some average value of measured variables can be seen. For the case of the general case, most respondents at least having group interaction once a week. Those kind of group interactions usually were in the form of communal afternoon prayers and other religious activities, weekly residents meeting, even having dinner together. While for lower income group, their frequency of social interaction was higher compared to higher income group. While there were no noticeable differences between lower and higher income group in terms of neighborhood facilities, it can be seen that distance to market was too far from Rusunawa based on figures made by De Chiara and Koppelman (1929).

For both income group, they were highly dependent to private motorcycle. This was reflected in their average frequency of using public transport of 0.26 and 0.12 point for lower and higher income group respectively (less than once per week). Most respondents use motorcycle to go to work, market, and clinic. They use motorcycle almost for any kind of commuting activities, even if their destination were only under a mile. Based on the interview, most respondents occasionally use public transport to go to market when they need to buy large goods or go to any places when they have to bring their entire family. In other words, respondents mostly using public transport only when it could not be done by using motorcycle.

Table 6. Descriptive statistics of variables by income level

	<i>General case</i>		<i>Lower income group</i>		<i>Higher income group</i>	
	n=159		n=117		n=42	
	Means	St.dev	Means	St.dev	Means	St.dev
Social aspects						
Frequency of group interaction	3.70	2.05	4.03	2.008	2.76	1.897
Feeling of safety	5.26	1.05	5.35	0.941	5.02	1.278
Physical aspect						
Floor area per person (<i>in meter square</i>)	7.80	4.27	7.59	4.09	8.40	4.74
Neighborhood facilities (<i>in miles</i>)						
Distance to Market	1.59	1.35	1.63	1.38	1.47	1.26
Distance to School	0.98	1.51	0.84	1.22	1.38	2.09
Distance to Clinics	2.87	1.20	2.90	1.18	2.78	1.27
Commuting activities						
Distance to workplace (<i>in miles</i>)	2.77	3.82	2.15	2.87	4.48	5.37
Frequency of using public transport	0.22	0.42	0.26	0.44	0.12	0.33
Commuting cost (<i>in millions IDR</i>)	0.16	0.12	0.15	0.12	0.20	0.14
Housing Satisfaction						
Overall housing satisfaction	5.57	1.22	5.65	1.22	5.33	1.20

Source: Author (2019)

In average, respondents' distance to work was 2.77 miles. Usually those distance could be reached under an hour by the respondents. In this case, higher income group has further distance to work compared to lower income group, even though the reason was not clear and would not be discussed further in this study. In terms of commuting cost, in average, respondents spent around 0.16 millions IDR for costs related to commuting activities. Commuting cost was measured as an additional way to reflect their commuting activities (Abe and Kato, 2017). Interestingly, there are no significant difference between lower and higher income group in this case. It means that their commuting activities were somewhat similar.

Based on the study by Huang and Du (2015), it was found that income level affect housing satisfaction, similar with the study by Grigolon et al (2014). In average, the level for housing satisfaction for all respondents was 5.57 (tend to be very satisfied with the housing). However, looking at the Table 5, there was no significant difference between the average value of housing satisfaction between both income groups. This study will further analyze how each variables predict the overall housing satisfaction for the general case, as well as to see whether or not there are any differences of significant predictors between lower and higher income group.

4.4. Relevance of income level to housing satisfaction

The regression analysis were done by three different models as explained in the methodology. It can be seen in the table 7, all three models were significantly better than the null model (with intercept only). Concerning the pseudo R-square, the third model has better value compared to the other two models. More detailed information regarding the result of the regression result can be seen in the table 8. All three models use same dependent

variable of overall housing satisfaction and same set of independent variables.

In the first model, *feeling of safety*, *frequency of group interaction* and *using public transport*, *distance to workplace* and *market* were significant in the first model. In the second and third model, there were some differences that can be found between lower and higher income group. Going back to the hypothesis, the result in the second and third model prove that the first hypothesis can be accepted. While there was no noticeable difference between their overall *housing satisfaction*, both income groups have different factors that were important for them. This is somehow parallel with the study by Schwanen and Mokhtarian, (2004) that stated that different income level means having different importance.

Table 7. Statistic information for each models

	All case n=159	Higher income group n=117	Lower income group n=42
Model Fitting Information	0.000	0.001	0.045
Pseudo R-square (Nagelkerke)	0.212	0.225	0.355

Source: Author's analysis using SPSS (2019)

Table 8. Statistic information for each models

	All case n=159	Low-income group n=117	High-income group n=42
Social aspects			
Feeling of safety	0.351**	0.248	0.718**
Frequency of group interaction	0.160**	0.113	0.256
Physical aspects			
Floor area per person	0.072*	0.101**	-0.005
Commuting activities			
Frequency of using pubtrans	0.917**	0.666	1.97*
Commuting cost	1.22	1.84	2.58
Distance to workplace	-0.062**	-0.104***	0.001
Neighborhood facilities			
Distance to market	-0.529***	-0.516**	-1.216***
Distance to hospital	-0.709	-1.749	-0.855
Distance to school	-0.139	-0.334	0.342

*, **, ***: significant at 90%, 95%, and 99%

Source: Author's analysis using SPSS (2019)

For lower income group (second model), *floor area per person*, *distance to workplace*, and *market* were important for them which indicated by the significances of those variable in the model. As for the model for higher income group (third model), only *feeling of safety* and *distance to market* that were important.

Floor area per person that previously was not significant in the first model, turned out to be significant in the

second model. It seems that lower income group was pretty much concerned regarding unit size. Looking back at Table 3, there were no significant difference of *household size* and *floor area per person* between lower income group and higher income group. In other words, lower income group has different preference or perception regarding their unit size compared to higher income group. However, for them, social activities were not so important to define their housing satisfaction. As for the case for third model, only *feeling of safety* that were significant. It seems that the more income the residents have, the more they were concern about their safety while living in Rusunawa. This findings was contrast with the results from Youth Media Campaign Longitudinal Survey (Powell, et al., 2006) that stated otherwise.

Similar with first model, *distance to workplace* and *market* were significant in the second model. However, only *distance to market* that were significant for the third model. When compared across all models, *distance to market* was the only variable that was significant. When compared between lower and higher income group, the parameter estimates was higher for higher income group. It means that higher income group would be more likely to be less satisfied for each point increase in this variable compared to lower income group.

4.5. Relevance of commuting activities in housing satisfaction

In the first model, variables of commuting activities was significant at 95% along with other variables. *Frequency of using public transport* and *distance to workplace* were significant in the first model. Going back to the hypothesis, the result in the first model prove that the second hypothesis can be accepted at some point. *Commuting cost* were not significant not only in the first model, but also in the other models too. Turned out, in terms of predicting housing satisfaction, the commuting activities of the respondents could not be measured by using *commuting cost* alone. This was contrast with the findings from previous studies that stated that *commuting cost* was important in case of housing relocation for lower income group (Lundberg, 2004). However, their study was more about the case of relocated residents which was different with this study.

While most respondents were more dependent on private motorcycle rather than public transport, *frequency of using public transport* was significant. The finding from scholars also stated that public transport play an important role for predicting housing satisfaction (Shaw, 1994). Salleh (2008) also found that the access to public transport was important predictor of housing satisfaction for the low-income group. The parameter estimates for this variable were positively correlated means that the probability of the respondents who were using public transport more than once a week to be more satisfied with their housing was higher compared to those who did not. This finding complement the other finding in the study by Setiadi (2015), which stated that access to public transport was strongly correlated with housing satisfaction.

Contrary with the study of Grigolon et al (2014) which stated that *distance to workplace* was not significant, it seems the case was different in this study. *Distance to workplace* (as a proxy of the residents' daily commute distance) was significant and the parameter estimates for this variable were negatively correlated. It means that, for each one-mile increase in the distance between Rusunawa and their workplace, it will reduce the probability of residents to be more satisfied with their housing.

Interestingly, if looking at the second and third models, the significances of commuting activities as a predictors of housing satisfaction changes. For example, while *frequency of using public transport* was significant in the general case, it became insignificant in both second and third models. It means that if looking at specific case of income level, *frequency of using public transport* became less important compared to other variables in predicting housing satisfaction. In the other hand, the significances of *distance to workplace* in the second model was increased from 95%

to 99%. In other words, in case of lower income group, *distance to workplace* was a very important factor in predicting their housing satisfaction.

5. Conclusion and Recommendation

5.1. Conclusion

This study analyzed how each variables predicts residential satisfaction of Rusunawa residents in Tangerang city. Ordinal Logistic Regression was conducted to test the significances and estimate the parameter of social and physical aspects Rusunawa, neighborhood facilities, and commuting activities on residential satisfaction on three different models. The results of this analysis complement previous studies on residential satisfaction in suburban area by adding empirical evidence on how commuting activities and income level predicts housing satisfaction. In overall, commuting activities and income level does at certain points affect the housing satisfaction of the Rusunawa's residents. Following previous study, commuting activities was a significant predictor of housing satisfaction. However, the significant variables representing commuting activities was different. Regarding income level, not only the findings in this study parallel with previous studies, it also discover the fact that the different between income groups lies in their predictors of the housing satisfaction, not the housing satisfaction itself.

In the general case, social aspects, neighborhood facilities, and commuting activities predicts housing satisfaction. Surprisingly, the result from physical aspects in Rusunawa did not show enough significances when predicting housing satisfaction. However, only one dimension of physical aspects that were included in this study which was *floor area per person*. Regarding the social aspects, *feeling of safety* and *frequency of group interaction* significantly predicts housing satisfaction.

As for commuting activities, most residents were highly dependent on motorcycle. However, the more the residents use public transport, it will also significantly increase their satisfaction. In the other hand, the further the *distance to workplace* significantly decrease their satisfaction.

Concerning the different income groups, lower income group seems to concern with *floor area per person*, and *distance to workplace* and *market*. While higher income group seems to concern with *feeling of safety* and *distance to market*. Furthermore, the further the distance to the market, the more it will reduce the housing satisfaction of the higher income group rather than other one. The only similarities between different income groups in this case was the *distance to market*, which was shown by the significances across all models.

5.2. Policy recommendations

This study implicated that housing satisfaction of different income groups were affected by different factors. The local government should pay attention to whom a Rusunawas are built for. For lower income group, the floor area of the unit was important while for higher income group, their concern regarding safety was important. Knowing what was important for each income groups was crucial in developing Rusunawa and its designation. For example, in the event that the upcoming Rusunawa would be mostly occupied by lower income class, the floor area of the unit needs to be considered.

Housing satisfaction of the residents could be improved through better location with shorter distance to public facilities especially market and workplace. Integrating market and Rusunawa altogether could work as fine, considering other Rusunawa in neighboring city already done so.

Institutionally, it would be better if local government made some adjustments in the regulation regarding the limit of length of stay. Based on this study, most respondents who past their length of stay limit were from lower income group. While some relaxation has been made, it should be more targeted toward the lower income group. This study also found that the lower income group seems to concern with the distant to workplace. Based on that, local government may also prioritize lower income group who work near the Rusunawa to live there.

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Notes

1. Housing backlog means the number of housing units that need to be provided by the government.
2. Rusunawa stands for "Rumah Susun Sederhana Sewa" which literally means "Rented Modest Apartment". The term is often used for a rented apartment where the monthly rental fees are subsidized by the government. These apartments are designated to be occupied by low-income class residents exclusively.
3. In Tangerang city, a low-income household is a household with income less than four million Rupiahs equal to around USD 253 per month.
4. Based on interview with Head of Division of Tangerang City Regional Planning Agency.
5. The residents were asked "*regarding the safety, from 1 to 7 with one being the lowest and 7 being the highest, how safe do you feel when living in this Rusunawa?*". Before the question was asked, the interviewer made clear that the 'safety' here means something related with criminal or suspicious activity, and Rusunawa's security in overall.
6. The residents were asked "*In overall, from 1 to 7 with one being most unsatisfied and 7 being most satisfied, how satisfied are you living in this Rusunawa?*"

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