

The Determinant Factors for Residential Selection of the Relocated Low-Income Communities in Jakarta, Indonesia

Hary Agus Rahardjo, Dwi Dinariana, and Viska Permana

Abstract—Flooding as a result of global climate change that hit several areas in Jakarta, Indonesia, in particular the area around the river banks and reservoirs cause suffering to the residents who are generally poor segments of society. Relocation is one solution. However, the limited land in urban areas, forcing them to move to a vertical housing. Changes in psychology, social, economic and cultural as a result of this relocation need proper handling. Therefore the determinant factor that affects the success of the relocation is important to note. This study is expected to know the opinion of the inhabitants of the vertical housing. The data used in this study is primary data and secondary data. Primary data were collected through questionnaires distributed to the inhabitants of the banks of the Ciliwung River residents in Kampung Pulo, while the secondary data obtained from the study documentation and interviews in Jakarta Provincial Office and Residents Association office in Kampung Pulo. The results of the study showed that location, environmental factor, and rental price, affect the considerations to stay in the flat. Partial test showed that the proximity of work is the most influential factor. Flat located near KampungPulo is the top choice of respondents. Expected rents are less than four hundred thousand rupiah (\$40) per month and the number of desired floor flats ranging between five to eight floors.

Index Terms—Decision, determination, planning, vertical housing .

I. INTRODUCTION

A. Background

Due to global climate change, the banks of the Ciliwung river in KampungPulo - Jakarta become more frequent flooding. The inundation is also getting longer. The dwellers, who are generally poor segments of society, suffer greater losses. Relocation is one solution. However, the limited land in urban areas, forcing them to move to a vertical housing. Changes in social aspects, economic and cultural result of this relocation needs proper treatment in order not to cause greater suffering and new problems for society. Therefore, the determinant factors that affect the success of the relocation are important to know. It is necessary to obtain an overview of the most important factors for the people (low-income communities) in choosing a place of residence. Then, should they move to the flats, what flat looks like is desired by them. The area that surrounded by a river can be seen in Fig. 1 below. When rain has come, the villages become flooded as indicated in Fig. 2. Therefore some people

want to move to a vertical housing which is expected as can be seen in Fig. 3.



Fig. 1. Villages – Jakarta, Indonesia



Fig. 2. Flooded area in Kampung Pulo.



Fig. 3. The expected vertical housing.

B. Research Objectives

Based on the problems description above, this research is intended to identify the factors that influence the decision-making of low-income communities for planning determination of flats in Jakarta, especially for the residents of Kampung Pulo, while the goal is to determine the factors that most affect low-income communities (LIC) in determining the selection of places to stay and find out what kind of flats is expected to place of residence.

C. Research Benefits

The results of this study are expected to provide input to the government or developers to build flats in accordance with the wishes of the dwellers of Kampung Pulo in particular and the people in general. People's willingness to switch from landed houses to vertical houses in which is fit to their wishes would reduce the impact of losses due to the floods that regularly hit before.

Manuscript received May 15, 2014; revised July 17, 2014.

The authors are with the University of Persada Indonesia (e-mail: rahardjo30@yahoo.com, dwidinariana@yahoo.com, viska_ars@yahoo.com).

II. THE RESEARCH METHOD

The study was conducted by analyzing primary data and secondary data. Primary data were obtained from the respondents, who is living in the study area, came from samples taken at random. Secondary data were compiled from the literature study and documentation of the information obtained from the relevant authorities such as Village officials, settlement agency official and also provincial-level officials. The statistical testing was performed by qualitative descriptive, which includes quantitative correlation and regression analysis.

III. LITERATURE REVIEW

According to the theory of residential mobility proposed by Turner [1], there is a different behavior in the community in determining the selected residence. Based on people's behavior in determining the residence there are three classes of social strata of society, namely:

- 1) Bridgeheaders, lower economic class of people who tend to choose a place to stay close to the workplace to reduce costs.
- 2) Consolidator, group with well-established economic capabilities and looking for a more comfortable environment.
- 3) Seekers, groups with strong economic capability and trying to get the recognition associated with social status.

According to Paciano [2], there are several criteria that must be considered in the housing selection, such as:

- 1) Zoning, that is a regulation related to several aspects, among others are the type and size of the building, the building height requirements, line worth building, etc.
- 2) Utilities, that is Includes the availability and the condition of drainage system, sanitation system, installation of gas, electric, and telephone.
- 3) Technical factors, which are related to the conditions of topography, drainage, design and cost.
- 4) Location, means accessibility, surrounding conditions, and traffic condition.
- 5) Aesthetics, includes scenery and landscapes.
- 6) Community, mainly related to social environment.
- 7) City service, which is include the provision of education, health services, and other services held by the government.
- 8) Cost, which is primarily according to the cost and affordability of tenants.

According to the decree issued by the Indonesian ministry of public housing, low-income communities criteria is as follows. Low-income people are the people who have income above Rp. 1.000.000,- (US\$100) -up to Rp. 2.500.000,- (US\$250) - per month. Lower Middle-Income Community is the people who have income above Rp. 2.500.000,- (US\$250) up to Rp. 4.500.000,- (US\$450) per month [3].

IV. RESULTS AND DISCUSSIONS

A. General Overview of the Kampung Pulo

Kampung Pulo is part of KampungMelayu village located

in the south of Jakarta, Indonesia. The total area of 47.83 hectares in Kampung Melayu divided into 8 neighborhoods, two of them are region of KampungPulo who are living around the river [4].

Kampung Pulo is a densely populated area. This density makes existing residential coincide with each other. In addition, the existing access road is only a narrow alley with just enough to be passed by a two-wheeled vehicle or motorcycle. KampungPulo is surrounded by Ciliwung river, when it rains, this area is always flooded recently. This has happened repeatedly in 2002, 2007 and even in 2013 yesterday, in some places, floodwaters reaching up to the roof of the 2nd floor [5].

B. Coomunity Profiles

The results of a survey conducted on the community of Kampung Pulo it can be concluded that the community profile is as follows. In Fig. 4, we can see that the sex percentage of the community is dominated by male with 77% of total community. People with the age of more than 50 years old are the majority (43%) as indicated in Fig. 5. The highest level of education of KampungPulo residents is only Senior High School, but they still have residents who only have primary school and junior high school in almost at the same percentage (Fig. 6). This education level implies to the occupation that they have. Most of them are working in an informal business as self employment and others (Fig. 7). Fig. 8 shows number of family living in the same house. Most people in Kampungpulo has monthly income around US\$200 – 250 (about 53%) as can be seen in Fig. 9 below.

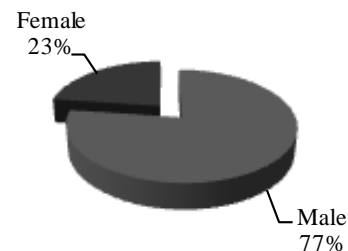


Fig. 4. Sex percentage.

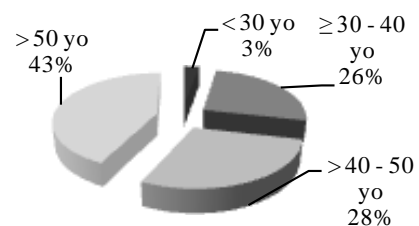


Fig. 5. Age configuration.

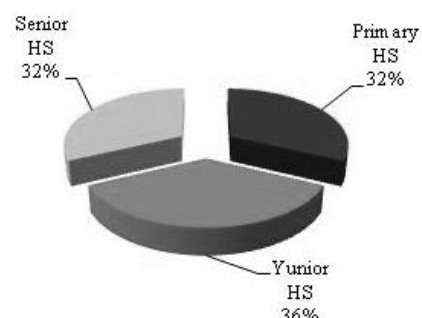


Fig. 6. Education level.

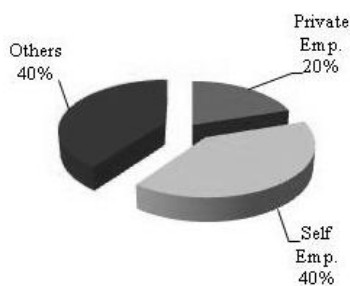


Fig. 7. Occupation.

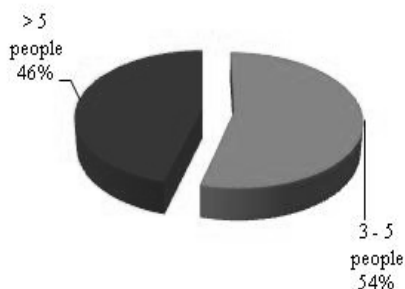


Fig. 8. Family members.

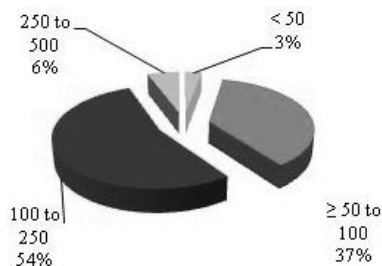


Fig. 9. Monthly income (US\$).

C. Correlation Analysis

Correlation analysis performed in this study to measure the strength of the relationship between the dependent variable on the factors of location, facilities, rent, type of units, environmental and physical condition of the building [6]. The analysis was conducted using Pearson's correlation (Product moment Correlations) assisted by SPSS 17.0 [7]. "r" value, which is obtained from the table of critical numbers *r* with degrees of freedom (df) 30 with significant level $\alpha = 5\%$ for one-way test, is 0, 349. Then the independent variables that have a correlation value of $r > 0.349$ for $\alpha = 0.05$ level on the dependent variable of flats selection decisions, are summarized as follows, as indicated in Table I.

TABLE I: THE RESULTS OF CORRELATION ANALYSIS

	Independent Variables	<i>r</i>
X1	Easy to reach public transport	0.659
X4	Close to the location of the workplace	0.771
X7	Close to market	0.428
X10	Conformity of the rental price to per month income	0.719
X18	Flood-free location	0.745
X19	The availability of clean water facilities	0.419

Source: SPSS data processed.

D. Factor Analysis

Factor analysis is intended to form groups of independent variables that considered valid in explaining the main characteristics of factors influence the flat selection [8]. In addition, there is inter correlation between independent variables, so that before forming the linear regression equation of the independent variables, these variables need to be grouped using factor analysis. Factor analysis aided by SPSS 17.0

Factor analysis of the independent variables that have a value of $r > 0.349$ against the decision of the selection of flats for eigen value > 1 has produced two (2) components of the dependent variable for the flats selection decision (*Y*). The first component consists of 4 variables: X1, X4, X10 and X18. The second component consists of 2 variables: X7 and X19. Those component are indicated in Table II below.

TABLE II: THE RESULTS OF FACTOR ANALYSIS

Faktor		Uraian Variabel Bebas	Koef
1	X1	Easy to reach public transport	0.881
	X4	Close to the location of the workplace	0.825
	X10	Conformity with the rental price per month income	0.750
	X18	Flood-free location	0.778
2	X7	Close to market	0.868
	X19	The availability of clean water	0.813

Source: SPSS data processed.

E. The Analysis of Determinant Variables

Determinant variables can be selected by analyzing various combinations between each potential independent variables of each factor, with the criteria that the independent variables of each factor has inter correlation coefficient $r > 0.349$ [8]. The combination of independent variables is selected from variables having low inter correlation coefficients, so that the combination produces determinant variables which is optimal to the performance of flats management, in the sense of having a high *R*² and optimal model stability as well as meets all the criteria of testing (*F*, *t* and *d*).

Based on these criteria, derived determinant variables representing the model that show relationship of location, facilities, rental rate, type of unit, environmental and physical conditions on the flats selection decision. These variables are indicated in the following Table III.

TABLE III: THE DETERMINANT VARIABLES

Dependent Variable	Independent Variable	Description
<i>Y</i>	X4	Close to the location of the workplace
	X18	Flood-free location
	X10	Conformity with the rental price per month income

Source: SPSS data processed.

F. Multiple Linear Regression Analysis

The independent variables used in the regression analysis obtained from the correlation analysis, intercorrelation analysis and factor analysis [9]. Analysis of linear regression was conducted to prove the initial hypothesis which is consist of its location, facilities, rental rate, type of unit,

environmental and physical conditions can influence the flats selection decision. The analysis conducted on the combination of multiple determinants of predefined variables assisted by SPSS 17.0 can be seen in Table IV as follow.

TABLE IV: THE COEFFICIENT OF REGRESSION

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig
	B	Std. Error	Beta		
3 (Constant)	0.94	0.399		2.354	0.026
X4	0.251	0.121	0.325	2.074	0.048
X18	0.308	0.126	0.348	2.448	0.021
X10	0.242	0.105	0.314	2.309	0.029

Source: SPSS data processed.

G. Test Autocorrelation (Durbin-Watson Test)

The next step is to perform the Durbin Watson Test which aims to determine whether there are any deviation assumptions on autocorrelation [9]. The analysis is about the correlation between the residuals in the observations with other observations in the regression model. Table V below shows the result from SPSS data processed about the Durbin-Watson Value.

TABLE V: THE DURBIN-WATSON VALUE

Model	Change Statistics					Durbin-Watson
	R Square Change	F Change	df 1	df 2	Sig. F Change	
1	0.595	41.067	1	28	0.000	
2	0.086	7.308	1	27	0.012	
3	0.054	5.333	1	26	0.029	2.225

Source: SPSS data processed.

The results obtained through the analysis of SPSS, shows that the value of the Durbin-Watson (DW) of 2,225, with N = 30, independent variables = 3, obtained from tables DL = 1.213 and DU = 1.649. it points out that DW value > DU, thus can be concluded that there is no autocorrelation in the observed data.

Three major factors in determining the location of the dwelling above constitute selection factors of low income households in general in Jakarta and other big cities in Indonesia. Factors residence proximity to the workplace is important because public transport facility as well as other transportation infrastructure in Jakarta is inadequate. The absence of integrated and cheap mass transportation facilities makes the society difficult to travel from one place to another. Moreover, the way to work requires punctuality. Public transport is not predictable in latency and far from comfortable situation. This situation makes people turn to choose a personal vehicle use. For low-income people who do not have a personal vehicle, the workplace location adjacent to the place of residence will allow them to leave for work just only by walking. They do not need to pay anything. Thus, they will save monthly expenses. Factors flood-free location is also a major concern for low-income society. Basically the problem is indeed the Jakarta area is flood-prone areas, either due to topographical conditions that

many basins areas and due to overflow in watersheds. Therefore, vertical housing will be one option. Another issue that then arises is the high price of vertical residential building. While the third factor of major concern is the affordability of rental price associated with their monthly income. In this situation, the government intervention in alleviating the burden of the rental cost needs to be realized [10]. The local government assistances with regard to affordable rental rates can be done by subsidizing the cost of the rental house. In addition, the real, central government and local government can also help ease the burden of the cost of renting this house from the beginning of vertical residential development. Central government assistances can be given in terms of the elimination of taxes or related vertical flats development. While local government can provide assistance related utilities facilities necessary such as electricity and water supply. When synergy between central and local government can be established, then the desire of low-income communities of the three main factors for the choice of the place of settlement would be realized.

V. CONCLUSION

Based on the above analysis of the research object in Kampung Pulo, Adjusted R2 = 0.705 obtained. This means that 70.5 % influence of the flats selection decision based on contribution of the determinant variables, ie by 58 % by proximity to work, 7.7 % by flood-free location and 4.8 % by suitability of rental rates. While the remaining (100 % - 70.5 % = 29.5 %) is explained by other causes.

Regression models derived from factors influence the flats selection decision is based on the analysis of the research object in KampungPulo, namely:

Un-standardized Coefficients of the determinant variables on the flat selection decision:

- 0.940 for the constant
- 0251 for the proximity to the workplace
- 0308 for flood-free location
- 0242 for compliance with the rental price per month income

Standardized Coefficients of the determinant variables on the flat selection decision:

- 0325 for the proximity to the workplace
- 0348 for flood-free location
- 0314 for compliance with the rental price per month income

REFERENCES

- [1] C. Coulton, B. Theodos, and M. A. Turner, "Residential mobility and neighborhood change: real neighborhoods under the microscope," *Cityscape: A Journal of Policy Development and Research*, vol. 14, no. 3, pp. 55-91, 2012.
- [2] M. Pacione, "The site selection process of speculative residential developers in an urban area," *Housing Studies*, vol. 8, no. 4, pp. 819-228, April 2007.
- [3] Regulation of Public Housing Minister, *Guidelines for Giving Stimulants for Governmental Housing for Low-Income Communities through Micro Finance Institutions / Non-Bank Financial Institutions*, Jakarta, Indonesia, no. 8, 2006.
- [4] Center Bureau for Statistics, Jakarta in numbers. (2012). [Online] Available: <http://www.bps.go.id>

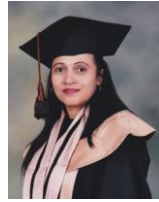
- [5] Kompas Daily News. (February 2013). Available [Online]: <http://www.kompas.com/>
- [6] SPSS Statistics Base 17.0 User's Guide. Available [Online]: <http://www.spss.com>
- [7] F. Ghozali, *Application Multivariate Analysis with SPSS Program*, Agency Publisher Diponegoro University, Semarang, 2006.
- [8] R. E. Walpole and R. H. Myers, *Probability and Statistic for Engineers and Scientists*, Mac Milan, New York, 2002.
- [9] W. R. Dillom and M. Goldstein, *Multivariate Analysis Method and Applications*, Jhon Wiley and Sons, New York, 2000.
- [10] D. Simon, "Situating slums, discourse, scale and place," *City: Analysis of Urban Trends, Culture*, vol. 15, no. 6, pp. 674-685, 2011.



Hary Agus Rahardjo was born in Tegal, Indonesia in 1959. He got his Ph.D. degree in civil engineering from Colorado State University, USA in 2002.

He is a lecturer in the field of civil engineering and the vice rector at the University of Persada Indonesia, Jakarta. His research area is about construction and infrastructure project management.

Dr. Rahardjo has publication in *Procedia Social and Behavioral Sciences*, *International Journal of Business and Management Studies*, *CD-ROM*, and *IACSIT International Journal of Engineering And Technology*.



Dwi Dinariana was born in Madiun, Indonesia in 1969. She got her doctorate degree in environmental and natural resources management from IPB, Indonesia in 2011.

She is a lecturer in the field of civil engineering and the head department of civil engineering master program at the University of Persada Indonesia, Jakarta. Her research area is about housing and construction management.



Viska Permana was born in Karawang Indonesia in 1988. She got her master degree in civil engineering in 2013.

She is a junior lecturer in the field of civil engineering at the University of Persada Indonesia, Jakarta. Her research area is about housing and construction management.