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Livability Assessment of Low-Income Flats in Dandangan, Kediri City

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Abstract

Rapid urbanization and land scarcity in Indonesia's urban areas have caused the demand for housing need of the low-income population to be more arduous to obtain. Regarding slum issues and the urgency of livable and low-cost housing, the government makes an effort to develop affordable rental flats for low income which is termed as Rusunawa. The use of Post Occupancy Evaluation (POE), focuses on the evaluation of the buildings. It is considered the rental flats as a physical building and not as a 'home' where the living area of the occupants should be a convenient place to live, which includes their social psychology aspect. Dandangan. This research aims to assess the livability of Dandangan Flats a rental flat in Kediri City that provides a comfortable home for low-income inhabitants and industrial workers as well as handling the slums. Determination of livable flat criteria uses expert judgment and assessment livability of Dandangan flats with service quality method. The result revealed that livability of rental flats has 44 criteria, which are divided into six aspects, i.e., physical dwelling, security and safety, accessibility to public facilities, amenities, social interactions and economical. The results of livability assessment in Dandangan Flat according to the gap score belong to medium category. Ex-slum dwellers (block A&B) have a better perception of Dandangan flats in the livability assessment. The most important aspects of livability are safety and security.

Keywords: livability, assessment, rental flats, low-income population, quality of live

1. Introduction

The rapid urbanization and the urban land scarcity have caused the demand for housing need of the low-income population. According to Maslow [1] hierarchy of needs, home is an essential human basic need and must be met. The house has a linkage to the social and economic needs of its inhabitants through identity, security, and stimulus [2]. In determining slums issues and the urgency of liveable and low-cost housing, the government settled the issues by developing affordable rental flats called rusunawa.

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Thus far, rental flats are evaluated by Post Occupancy Evaluation (POE) which is the process of evaluating buildings systematically and rigorously after they have been built and occupied for some time [3]. POE is an evaluation regarding rental flats as 'House' (attribute to building/construction) and not 'Home' (attribute to convenience and social-psychology of the occupants). The approach of rental flats development ought not only cheap and affordable for the low-income population, but also comfortable to live in order to satisfy the need of proper housing and to improve the quality of environment [4].

Dandangan rental flats are the first low-income rental flats in Kediri that provide a comfortable home for low-income inhabitants and industrial workers as well as handling slums. After being neglected for three years and having been damaged, today Dandangan low-income rental flats are fully occupied by the low-income population in the city of Kediri. The approach of rental flats development ought to be livable to avoid slums areas, in order to create a livable urban space. Therefore, the purpose of this research is to evaluate the livable condition of Dandangan low-income rental flats according to the perception of its inhabitants. The hope is that this evaluation can be replicated to other rental flats development in cities of Indonesia. Thus, the development of low-income rental flats is not only a solution for slums areas but also to enhance the quality of life and welfare of the low-income inhabitants who occupy it.

Figure 1: The siteplan of Dandangan Flat in Kediri City. (*Source: Public Works Office, Kediri city*).

Figure 2: Dandangan flats location (*Source: Public Works Office, Kediri city*).

2. Research Theory and Methods

2.1. Understanding livability

Livability is a broad term with no precise or universally agreed-upon/standard definition [5]. Livability studies inspired by the writings of Lynch [6], who theorized that the resident's perceptions of the city should inform future design process. Livable neighborhood streets should be places of sanctuary and comfort, places that were healthy and protected from noise, places that were free from pollution and traffic intrusions, and places with defined neighborhood territory, sense of community and neighborhood identity [7]. It broadly means *"the suitability of a place for comfortably meeting a resident's daily and long-term needs and desires".* According to [8] livability always refers to the perception of the environment, to the subjective evaluation of the quality of the housing conditions. As explained in [8] livability in four dimensions i.e.:

1. Quality of the dwelling / building

2. Quality of the physical environment, including the level of services and facilities

3. Quality of the social environment

4. Safety to neighborhood

According to *National Association of Regional Councils* in *Creating Livable Communities* [9], there are six principles of livability:

1. Provide more transportation choices

2. Promote equitable, affordable housing

3. Enhance economic competitiveness

4. Supporting existing communities

5. Coordinate and leverage federal policies and investment

6. Value communities and neighborhoods

POE involves a survey of building performance and resident's satisfaction after the residents have moved into development or neighborhood. POE attempts to assess whether the building has been successful in meeting its projected environmental benchmarks (in terms of energy, water, materials, etc.) Private consulting firms or academic institute usually carry out POE, as they are interested in quantifying building performance for either marketing purpose or academic studies [10]. More recently, POE is a popular tool for evaluating 'green buildings,' since the combined set of survey data can validate the attainment of sustainability goals. However, while energy and sustainability issues have been thoroughly examined, the social experience of residents in public housing has been largely ignored. Thus, it is important to assess the livability of a flat (housing neighborhood) that pays attention to the social experience of occupants and improve their quality of life. It can be concluded that the definition of livability in this study is the condition of comfort and occupancy of a residential neighborhood that supports the quality of life of the inhabitants.

2.2. Flat housing

The rapid urbanization, high population densities and urban land scarcity in urban areas caused various problems such as the growth of slums. Slums occur because of limited space in the city and house prices that are not affordable. UN-Habitat [11] stated that slums become one of the significant problems in developing countries like Indonesia. According to the Laws of the Republic of Indonesia [12], a slum is uninhabitable due to the irregularity of the building, the high building density, and the quality of the buildings and facilities that are not eligible. Slums need to be removed for the benefit of humans and the environment. It is certain that the development of vertical housing will continue

to grow along with the limited urban areas. The advantages of developing low housing are: it can reduce the use of land; to accommodate more household creates legal open space for the city and is an urban renewal strategy [4]. [13] Defines a flat as a multilevel building constructed in an environment divided into functionally structured sections, either horizontally or vertically, and each unit can be owned and used separately, especially for shelters equipped with shared parts, shared objects, and common ground. Flat development is one of the ways to reduce slums and provide livable housing for the low-income population in Kediri city. According to Laws of the Republic of Indonesia [13], the goals are to:

1. reduce the extent of the development of low housing and prevent slums

2. Improve the efficiency and effectiveness of the use of space and land, as well as providing green space in urban areas to create complete residential areas.

3. Ensure the fulfillment of the needs of decent and affordable flat housing, especially for the low-income populace in a healthy environment, safe, harmonious, and sustainable within a governance system that is integrated housing and settlement.

2.3. Research method

The research aims to assess the livability of Dandangan Flats, Kediri City. Based on the literature review the dimensions/indicators of livability are identified by 44 criteria which are grouped into six aspects; physical dwelling, safety and security, accessibility to public facilities, rental flats amenities, social interactions and economical. Determination of livability flat criteria with expert judgment and assessment livability of Dandangan flats with service quality method (gap analysis) are based on a perception of inhabitants of the flat. The gap analysis in this study is used to assess the relationship between the expected level and experienced level by the occupants. The analysis is done by a descriptive quantitative method. The primary data compiled from the questionnaires used the Likert scale 1-5. It uses proportional random sampling, a total of 100 rental flats units (20 units each twin block) are sampled out of 490 housing units. This gap analysis represents the livability assessment of Dandangan Flats.

3. Results and Discussion

3.1. Socio-economic characteristics of the respondents

The descriptive statistics show that 76% of the participants are female, and the remaining are males. About 92% are in the age of 20-60 years, and 61% obtained higher education (senior high school). Approximately 34% are work in the informal sector, 27% informal sector (laborers) and 39% not work. The majority of them 66% have between 3-4 members who live in one low-rental flat unit. However, 62% earned IDR 1.000.000 – 2.000.000 per month, 30% about under IDR < 1.000.000 monthly, and 7% above IDR 2.000.000 monthly. Furthermore, 83% use motorcycle for daily activities, and the remaining use cycle, walking, and public transportation. Also, on the length of stay 40% indicates one and 1,5 years (twin block A&B) and 60% about 1-3 month (twin block C, D & E).

3.2. Livability criteria of rental flat

The 44 variables assess using expert judgment method. Expert respondents are four housing and settlements expert consists of academics and government agencies of East Java and Kediri City. The result of this analysis is 44 livability variables clustered into six aspects shown in Figure 3 and Table 1.
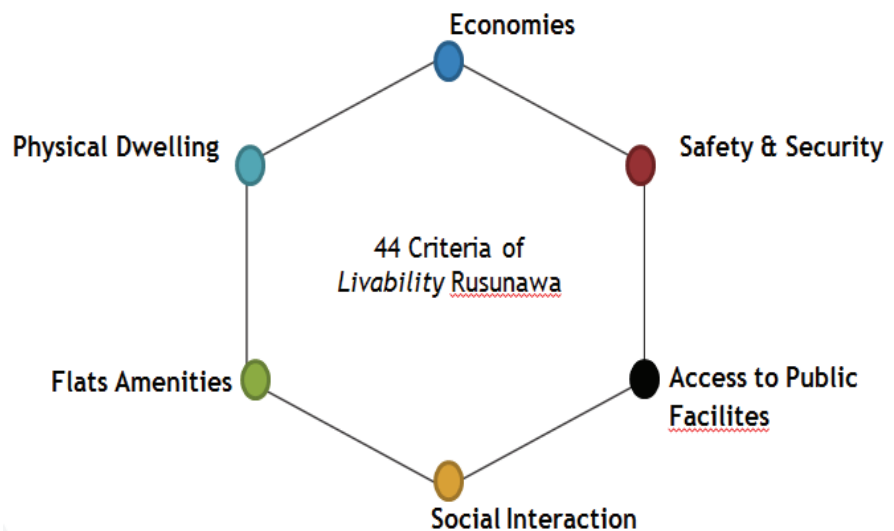

Figure 3: Aspects for flat livability criteria (Source: *Researcher, 2018 (modify)*).

TABLE 1: Flat livability criteria.

Code	Aspect	Criteria / Indicator
x1	**Physical Dwelling**	Floor area
x2		Quality of building
x3		Humidity/ Ventilation

x4		Lighting
x5		View
x6		Quality and availability of Kitchen
x7		Quality and availability of Bathroom
x8		Laundry room
x9		The availability of the road interconnect towers (sky bridge)
x10		Availability of parking area
x11		Cleanliness of the tower environment
x12		Availability of electricity
x13		Availability of clean water
x14		Priority of the disabled and elderly
x15	Security and safety	Safe from criminality (example: robbery)
x16		Safe from disaster/accidents (ex: fire, flood)
x17		Security post
x18		Street lighting
x19		Secure building design (for children and difabel)
x20		Sense of secure and comfort
x21	Accessibility to public services	Proximity to education facility (children)
x22		Proximity to commercial facility
x23		Proximity to health facility
x24		Proximity to recreation facility
x25		Proximity to worship facility
x26	Flat Amenities	Green open space/ playground
x27		Drainage System
x28		Waste management system
x29		Room for social interaction/discussion/gathering (hall)
x30		Sports facilities/ field
x31		Worship facilities (Musholla/ Mosque)
x32		Community health center facility (*puskesmas*)
x33		Kindergarten facility (*PAUD*)
x34	Social Interaction	Communication among neighbor
x35		Occupants participation
x36		Occupants social activities
x37		Organization/ association within flats
x38		Mutual help (*Gotong royong*)
x39		Harmony among neighbor
x40	Economies	Easy access to public transportation
x41		Affordable rental-flats
x42		Economic Improvement (The ability to save up)
x43		Free education and healthcare

x44	Business training (*UMKM*)

Source: Researcher, 2018 (modify)

3.3. Livability assessment of Dandangan flats (respondents livability perception)

Assessment of Dandangan flat livability has been done with service quality method that calculated the gap between expectations and perception perceived by the occupants. The result shows that occupants are not satisfied yet with the livable condition in Dandangan flat. The gap score ranges from 0.01 until -2.91, then categorized into 3 sections with good (< 0.4025), medium (-0.4025 until -0.7550) and poor (> -0.7550).

TABLE 2: Service quality analysis for assessing Dandangan Flats livability.

Code	Livability Flats Criteria	Mean Expectation	Mean Perception	Gap Score	Gap Score Category	Mean Gap(each aspects)
x1	Floor area	3.72	3.56	-0.16	Good	-0.57
x2	Quality of building	4.09	3.79	-0.30	Good	
x3	Humidity/ Ventilation	4.94	4.35	-0.59	Medium	
x4	Lighting	4.39	3.97	-0.42	Medium	
x5	View	3.84	3.85	0.01	Good	
x6	Quality and availability of Kitchen	4.22	3.66	-0.56	Medium	
x7	Quality and availability of Bathroom	4.38	3.75	-0.63	Medium	
x8	Laundry room	4.28	3.06	-1.22	Poor	
x9	The availability of the road interconnect towers (sky bridge)	4.18	3.77	-0.41	Medium	
x10	Availability of parking area	4.37	3.42	-0.95	Poor	
x11	Cleanliness of the tower environment	4.33	3.70	-0.63	Medium	
x12	Availability of electricity	4.46	3.72	-0.74	Medium	
x13	Availability of clean water	4.56	3.78	-0.78	Poor	
x14	Priority of the disabled and elderly	4.17	3.50	-0.67	Medium	
x15	Safe from criminality (example: robbery)	4.47	3.73	-0.74	Medium	-0.72
x16	Safe from disaster/accidents (ex: fire, flood)	4.38	3.80	-0.58	Medium	
x17	Security post	4.47	3.86	-0.61	Medium	
x18	Street lighting	4.43	2.71	-1.72	Poor	

x19	Secure building design (for children and *difabel*)	4.27	3.84	-0.43	Medium	
x20	Sense of secure and comfort	4.35	4.10	-0.25	Good	
x21	Proximity to education facility (children)	4.26	3.74	-0.52	Medium	-0.45
x22	Proximity to commercial facility	4.19	3.43	-0.76	Poor	
x23	Proximity to health facility	4.34	3.89	-0.45	Good	
x24	Proximity to recreation facility	3.31	3.17	-0.14	Good	
x25	Proximity to worship facility	4.41	4.01	-0.40	Good	
x26	Green open space/ playground	4.19	3.92	-0.27	Good	-0.62
x27	Drainage System	4.20	3.74	-0.46	Medium	
x28	Waste management system	4.29	3.99	-0.30	Good	
x29	Room for social interaction/discussion/gathering (hall)	4.02	3.49	-0.53	Medium	
x30	Sports facilities/ field	3.89	3.74	-0.15	Good	
x31	Worship facilities (Musholla/ Mosque)	4.33	3.79	-0.54	Medium	
x32	Community health center facility (*puskesmas*)	4.25	1.69	-2.56	Poor	
x33	Kindergarten facility (*PAUD*)	4.24	4.08	-0.16	Good	
x34	Communication among neighbor	4.27	3.59	-0.68	Medium	-0.64
x35	Occupants participation	4.19	3.69	-0.50	Medium	
x36	Occupants social activities	4.01	3.36	-0.65	Medium	
x37	Organization/ association within flats	3.89	3.02	-0.87	Poor	
x38	Mutual help (*Gotong royong*)	4.24	3.75	-0.49	Medium	
x39	Harmony among neighbor	4.39	3.74	-0.65	Medium	
x40	Easy access to public transportation	3.82	2.54	-1.28	Poor	-1.26
x41	Affordable rental-flats	4.42	4.24	-0.18	Good	
x42	Economic Improvement (The ability to save up)	4.29	3.69	-0.60	Medium	
x43	Free education and healthcare	4.48	3.11	-1.37	Poor	
x44	Business training (*UMKM*)	4.24	1.33	-2.91	Poor	
			Mean Gap Score			**-0.69**
			Category			**Medium**

Source: Analysis, 2018

From Table 2, we can conclude that the livability condition in Dandangan Flats lies in the category of medium with gap score of -0.69. Furthermore, 12 variables are in good condition, 22 variables are in medium condition, and ten variables are in poor condition. Besides, five aspects categorized in common condition and one aspect classified as weak, which is the economic aspect. Essential aspects of attaining Dandangan flat livability listed in order are security and safety (4,40); physical dwelling (4,28); economies (4,25); flat amenities (4,18); social interaction (4,17) and lastly, accessibility to public service (4,10).

Another interesting finding is a difference of perception in assessing the livability between ex- slums inhabitants (twin block A & B) and low-income inhabitants (twin block C, D & E). Ex-slums inhabitants (block A & B) have a better perception on Dandangan flats livability assessment, which is indicated by a gap value of -0,613 lower than the gap score of low populace inhabitants (block C, D & E) of -0,739.
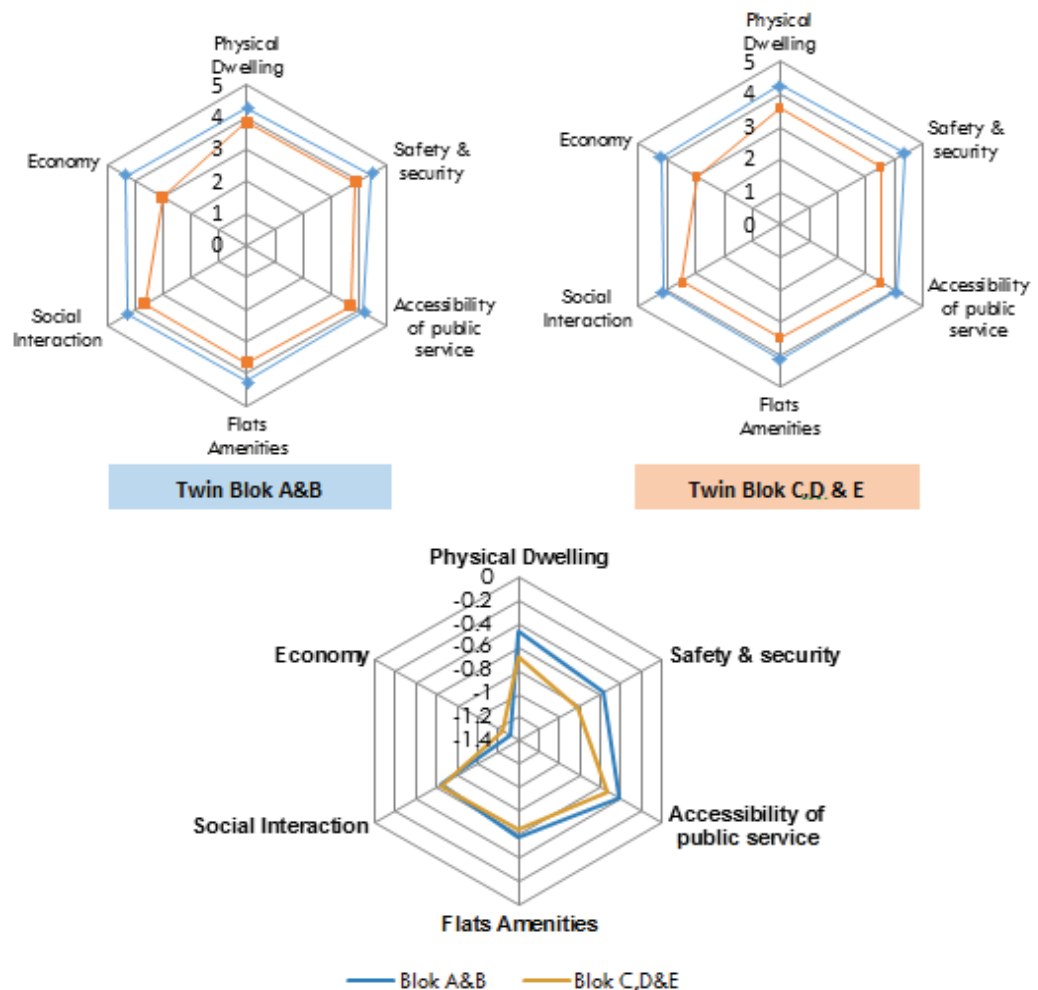

Figure 4: Difference of perception in assessing Dandangan flats livability (Source: Analysis, 2018).

From physical dwelling aspects, occupants from block A&B have a better perception because beforehand they lived in a slum area within Kediri City which conditions are far worse than Dandangan low condition even though in physical dwelling aspects, block A&B have the more miserable condition than other units. The same goes to safety and security, occupants from block A&B have a better perception, assuming themselves not having valuable items that might be lost/stolen. This is justified by the fact that occupants in Block A&B have lower income. Also with accessibility to public service, because occupants in blocks A&B lived earlier in the flat, they feel closer on accessing the public facilities around the flat. These differ with the social interaction and economy aspect, where occupants from block A&B have worse judgment. This is because social conflicts occur more often in twin blocks A&B. Occupants in block A&B have lower income and no permanent job, hence economics is a priority. The similar scoring is Flats Amenities, where occupants together, reasonably and conveniently can use the supporting amenities inside Dandangan flats.

3.4. The Importance of Performance Analysis to determine priorities to improve Dandangan Flats livability

Based on Importance-Performance Analysis (IPA) analysis using SPSS 17.0, it can be seen a priorities criteria to improve Dandangan flat livability. Those priorities criteria located in the first Quadrant consist of 6 principles there are a parking area, free education, and healthcare for inhabitants, laundry room, street lighting, community health center, and business training to improve the income of inhabitants that do not work.

4. Conclusion

In measuring the livability of the public low-income flat in Dandangan Flats, Kediri City, firstly, the dimensions and indicators of the livability of housing environment were established through the literature review and confirmation to expert as this lead to the construct of a conceptual framework for the study.

Secondly, to describe the livability of rental flats, there are 44 criteria which are divided into six aspects, i.e., physical dwelling, security and safety, accessibility to public facilities, amenities, social interactions and economical. The results of liveability assessment in Dandangan Flat according to the gap score based on a perception of occupants belong to the medium category. Besides, ex-slum dwellers (block A&B) have a better perception of Dandangan flats livability assessment, which is indicated by a
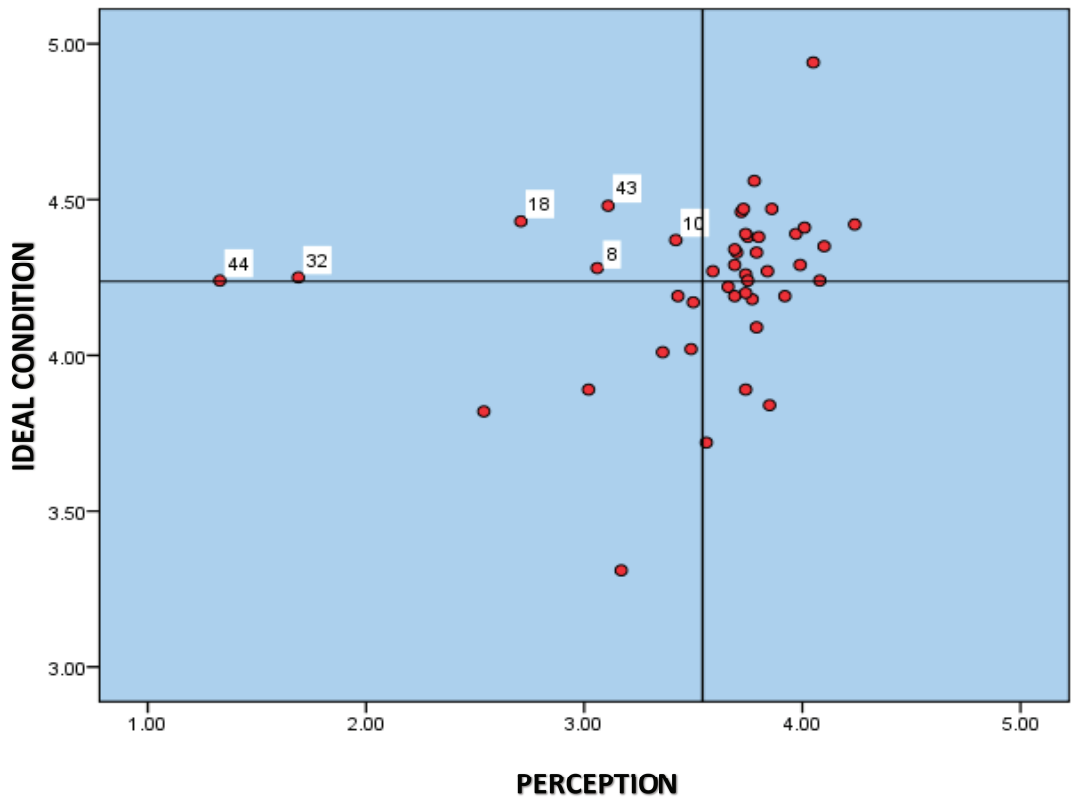
Figure 5: Priorities Criteria of Dandangan Flat Livability (Source: Analysis, 2018).

gap value of -0,613 lower than the gap score of low-income inhabitants (Masyarakat Berpenghasilan Rendah) (block C, D & E) of -0,739. The most important aspect of livability is safety and security.

Thirdly, the livability of rental flats is formed from the internal and external aspects of rental flats. Flats Livability is important to the livable neighborhood that will also contribute to the urban livability and improve the Quality of Life of low-income inhabitants in Dandangan Flats.

Acknowledgements

References

[1] Maslow, A. H. (1943). A Theory of Human Motivation. Psychological Review, 50(4), 370-96.

[2] Turner, John FC (1972). Freedom to Build, Dweller Control of the Housing Process, The Macmillan Company, New York.

[3] Preiser, Wolfgang F. E. (1995). Post Occupancy Evaluation: How to Make Building Work Better. Bradford: Van Nostrand Reinhold.

[4] Amir. A.L *et al.,* (2015). Dwellers participation to achieve livable housing in Grudo Rental Flats. *Procedia – Social and Behavioral Sciences,* 179, 165-175.

[5] National Research Council. (2002) "*Community and Quality of Life: Data Needs for Informed Decision Makin*g". Washington, DC: The National Academies Press.

[6] Lynch, Kevin (1960). The Image of the City. *The MIT Press.* ISBN 0-262-62001-4

[7] Appleyard, Donald (1981). "*Livable Streets"* Berkeley University of California

[8] Heylen. (2006). Liveability in social housing : *Three case-studies in Flanders* Residential Environments and People, ENHR Conference July 2006. Ljubljana, Slovenia.

[9] National Association of Regional Councils. (2009). '*Creating Livable Communities: An Implementation Guidebook'*

[10] Rabinowitz H. 1989. The uses and boundaries of post-occupancy evaluation: An overview, in Preiser WFE (ed.) *Building Evaluation*. New York, Springer: 9-17.

[11] United Nation Human Settlements Program. (2012). *Sustainable Housing for Sustainable Cities: A Policy Framework for Developing Countries.* UN Habitat. Nairobi.

[12] Undang-Undang Republik Indonesia, (2011). Undang-Undang Republik Indonesia tentang Perumahan dan Kawasan Permukiman. Number 1, Indonesian Government. Jakarta.

[13] Undang-Undang Republik Indonesia, (2011). Undang-Undang Republik Indonesia tentang Rumah Susun. Number 20, Indonesian Government. Jakarta.