How Liveable is living in public housing? a Liveability measurement at low-income apartment of Kompleks Rumah Susun Sombo, Surabaya

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Abstract. Rumah Susun or walk-up apartments has long been a solution for housing needs in an urban area where land is limited, and housing prices are unaffordable for some people, especially the low-income. Kompleks Rumah Susun Sombo is a public housing complex, one of the oldest walk-up apartment in Surabaya. Its initial aim is to provide more liveable housing needs for people in Kampung Sombo in a well-equipped vertical housing complex. Therefore, in this study, the concept of liveability is used as an approach in measuring the public housings and the quality of life for the people whose living in there. This study consists two main stages; determining the factors that are affecting the quality of life in public housing through scoring analysis, and mapping the gap between facts and ideal perception of good quality of life by the user of the public housing through Importance Performance Analysis (IPA) methods. The findings show that there are 4 quadrants in liveability factors of Rumah Susun Sombo, and the main quadrants, that is the most important aspects that should be maintained in performance are Condition In Shelter Units, Space Adequacy, Air Circulation, Security, Fire Protection, Quality Of Power Infrastructure, Access Clean Water Infrastructure.

1. Introduction

Indonesia is a country with a high population density with total population 262 million inhabitants, and this number will be continued increase in every year. The rate of population growth in Indonesia is 1.49% (Central Bureau of Statistics of Indonesia, 2018) which will affect housing needs increasing in every year. Demand for land needs for housing can lead to reduced land availability for housing, and it will cause housing needs in urban area are limited, and housing prices are unaffordable for some people, especially the low-income. As a result, settlement areas inhabited by low-income community tend to be congested and do not pay attention to the existing settlement standards so that it will create another slums settlement.

Slum settlement is one of the problems that almost felt in every city in Indonesia. One of the Indonesia government's efforts to reduce the number of slums is through the provision of Low-Income Apartments or “Rumah Susun.” One of the supporting government programs is Building Project “Rusun 1000 Tower.” However those program is not balanced with the quality of housing, this happens because of the lack of attention from the government and also the resident of rusun to maintain the sustainability of housing with decent quality dan infrastructure (Media Indonesia, 2016).
Kompleks Rumah Susun Sombo is a public housing complex that exists in Kampung Sombo, Surabaya since 1989 and also one of the oldest walk-up apartment in Surabaya. Its initial aim is to provide a better environment and more liveable housing needs for people in Kampung Sombo in a well-equipped vertical housing complex. During the time, its population doubled than the capacity, when it was informally functioned as refugee camp for people in conflict from several places outside Surabaya and also inadequate quality of buildings and fire protection facilities in Sombo Flat Housing and the absence of facilities for disabled and elderly people, it can affects the comfort and safety of live so that it will affect the quality of life for residents of Rusunawa Sombo.

Based on the description of the problem that occurs in Rusunawa Sombo, this can affect the quality of life on Rusunawa Sombo which have to impact the comfort of the settlement and closely related with the concept of Liveability. Therefore, in this research concept of liveability can be used as a reference in identifying whether Rusunawa can fulfill criteria of liveability and determine efforts to improve the quality of living as a solution to solve settlements problems, especially in Rumah Susun. The results of this research are expected to be input for the government in the development public housing complex or Rumah Susun in the future.

2. Method

The data for this study collected in Kompleks Rusunawa Sombo via questionnaires, observations, and interviews to the resident who lives in Kompleks Rumah Susun Sombo, Surabaya. All methods are carried out with the aim that the validity of the data can be accounted for and not assessed from the subjectivity of the researcher.

The data analysis used was divided into two stages, Stage I measured the level of Livable Eligibility (performance) and level of expectation (importance) on Rusunawa Sombo refers to resident’s perception, this stages used scoring analysis through likert with a scale of 1 to 5 which is then weighted as in the following table below:

| Description                  | Weights |
|------------------------------|---------|
| Not Very Satisfactory        | 1       |
| Not Satisfactory             | 2       |
| Quite Satisfactory           | 3       |
| Satisfactory                 | 4       |
| Very Satisfactory            | 5       |

Then stage II is to mapping the gap between facts (performance) and ideal perception (importance) of good quality of life by the user of the public housing through importance performance analysis (IPA) methods. This stage is done to be identified characteristic of liveability, which is the main priority for residents in improving the quality of life in public housing, especially “Rumah Susun.” In this analysis, respondents were asked to assess the level of livable eligibility (performance) and level of expectation (importance), then the average value of performance and importance were analyzed in the importance performance matrix, where the x-axis represents livable eligibility (performance) while the y-axis represents expectation (importance). Then the results will be in the form of four quadrants according to this following picture.
The four quadrants in importance performance analysis are characterized as:

I. Concentrate here: high importance, low performance: requires immediate attention for improvement and are major weaknesses.

II. Keep up with the good work: high importance, high performance, indicates opportunities for achieving or maintaining competitive advantage and are major strengths.

III. Low priority: low importance, low performance: are minor weaknesses and do not require additional effort.

IV. Possible overkill: low importance, high performance: indicates that business resources committed to these attributes would be overkill and should be deployed elsewhere.

The results in the analysis in stage II is characteristics of liveability which are the main priority and important for residents, and then those characteristics of liveability will be compiled for recommendations efforts to improve the quality of life in realizing livable public housing especially for “Rumah Susun” through the Liveability concept approach in Kompleks Rumah Susun Sombo based on the perceptions of residents.

3. Results and Discussions

3.1. Overview of Rusunawa Sombo

Kompleks Rumah Susun Sombo is located on Sombo Street, Simokerto sub-district, Surabaya. Rumah Susun Sombo is one of the oldest flat that owned by surabaya city goverment, it was built in 1989 and began to be occupied in 1990. Kompleks Rumah Susun Sombo occupies an area of 700m², each block was built in four floors with total 10 blocks from Block A to Block J, there are 618 units with an area of rooms is 3m x 6 m (18m²) and 3 x 3 m (9m²), as well as each room unit is equipped with 450 Watt electricity and Clean Water.

Rumah Susun Sombo inhabited by 2747 people, consist with 658 head of households, with the rental fee is ten thousand rupiah to fourty thousand rupiah per month. Public facilities available at Rumah Susun Sombo include mosques, community activity centers, UPTD offices, street vendors, coffee shops, and security posts.
Figure 2. Map Location and Condition Of Rumah Susun Sombo

3.2. Level of Livable Eligibility (Performance) and Level Of Expectation (Importance)

Quantitative analysis is used for this stage with scoring analysis where the final results are used to see the level of Livable Eligibility (Performance) and the resident's level of expectations (Importance) for characteristics of Livability in Kompleks Rumah Susun Sombo.

The following are the results of the assessment can be seen in the table below:

Table 2. Level of Livable Eligibility (Performance) and Level Of Expectation (Importance)

| Characteristics of Liveability | Level of Livable Eligibility (Performance) | Level Of Expectation (Importance) | The Gap between Level of Performance and Importance |
|-------------------------------|------------------------------------------|----------------------------------|---------------------------------------------------|
| **Physical Building**         |                                          |                                  |                                                   |
| 1. Condition In Shelter Units | 52%                                      | 93%                              | -41%                                              |
| 2. Space Adequacy             | 38%                                      | 92%                              | -54%                                              |
| 3. Air Circulation            | 49%                                      | 93%                              | -44%                                              |
| **Social Interaction**        |                                          |                                  |                                                   |
| 4. Existence Of Public Spaces | 74%                                      | 81%                              | -7%                                               |
| 5. Interaction / Social Relations | 75%                                      | 89%                              | -14%                                              |
| 6. Ongoing Social Activities  | 80%                                      | 82%                              | -2%                                               |
| 7. Mutual Cooperation Between Neighbors | 84%                                      | 94%                              | -10%                                              |
| **Stability**                 |                                          |                                  |                                                   |
| 8. Security                   | 67%                                      | 90%                              | -23%                                              |
| 9. Fire Protection            | 66%                                      | 92%                              | -26%                                              |
| **Culture & Environment**     |                                          |                                  |                                                   |
| 10. Interesting Cultural Activities | 66%                                      | 80%                              | -14%                                              |
| 11. Environmental Cleanliness | 69%                                      | 97%                              | -28%                                              |
| **Health**                    |                                          |                                  |                                                   |
| 12. Access To Health Service  | 84%                                      | 95%                              | -11%                                              |
| **Accessibility**             |                                          |                                  |                                                   |
| 13. Access To Educational Facilities | 85%                                      | 92%                              | -7%                                               |
| 14. Access To Trade And Service Facilities | 84%                                      | 93%                              | -9%                                               |
| 15. Availability Of Facilities For Disabled People | 33%                                      | 84%                              | -51%                                              |
| 16. Accessibility Of The Workplace | 70%                                      | 89%                              | -19%                                              |
| 17. Availability Of Public Transportation Facilities | 74%                                      | 84%                              | -10%                                              |
Characteristics of Liveability | Level of Livable Eligibility (Performance) | Level Of Expectation (Importance) | The Gap between Level of Performance and Importance |
--- | --- | --- | --- |
Public Infrastructure | | | |
18. Quality Of Power Infrastructure | 66% | 91% | -25% |
19. Access To Clean Water Infrastructure | 60% | 95% | -35% |
20. Quality Of Solid Waste Infrastructure | 80% | 92% | -12% |
21. Quality Of Drainage Infrastructure | 80% | 89% | -9% |
| **68%** | **90%** | **-22%** |

Based on the results of the analysis in the table above there are several of the characteristics of liveability that have not reached the maximum level of Livable Eligibility (Performance), such as the adequacy of space and the availability of facilities for disabled people. Overall the level of Livable Eligibility of the characteristic Liveability (Performance) on Rusunawa Sombo is 68%.

For result of analysis for level of expectation (importance), it can be seen that all characteristics of Liveability are include in the level of expectation (importance) that is important for residents, therefore overall the residents need all of the characteristics of liveability to be able to provide comfort in living in public housing especially for “Rumah Susun”. Overall the level of expectation of the characteristic of Liveability (importance) on Rusunawa Sombo is 90%.

Based on Gap between Level of Performance and Level Of Importance, Rusunawa sombo is necessary to fulfill 22% of the level of Livable Eligibility (Performance) to realize what is expected by residents.

3.3. The Characteristics of Liveability Which Are The Main Priority And Important For Residents
The characteristics of liveability, which are the main priority for residents are obtained through Importance Performance Analysis (IPA). The following are the results of the Importance Performance Analysis (IPA) in the form of a quadrant graph as follows:

**Figure 3. Result of IPA Framework**
By using those data presented in the above graph, the priority order the characteristics of liveability in Rusunawa Sombo is as follows:

Table 3. The Priority Order Based on Result of IPA Framework

| Quadrant | Priority | Code | Characteristics Of Liveability                      |
|----------|----------|------|-----------------------------------------------------|
| I        | First    | A    | Condition In Shelter Units                          |
|          |          | B    | Space Adequacy                                      |
|          |          | C    | Ventilation/Air Circulation                         |
|          |          | H    | Security                                            |
|          |          | I    | Fire Protection                                     |
|          |          | R    | Quality Of Power Infrastructure                     |
|          |          | S    | Access To Clean Water Infrastructure                |
| II       | Second   | E    | Interaction / Social Relations                      |
|          |          | G    | Mutual Cooperation Between Neighbors                |
|          |          | K    | Environmental Cleanliness                           |
|          |          | L    | Access To Health Services                           |
|          |          | M    | Access To Educational Facilities                    |
|          |          | N    | Access To Trade And Service Facilities              |
|          |          | T    | Quality Of Solid Waste Infrastructure               |
| III      | Third    | J    | Interesting Cultural Activities                     |
|          |          | O    | Availability Of Facilities For Disabled People      |
| IV       | Fourth   | D    | Existence Of Public Spaces                          |
|          |          | F    | Ongoing Social Activities                           |
|          |          | P    | Accessibility Of The Workplace                      |
|          |          | Q    | Availability Of Public Transportation Facilities    |
|          |          | U    | Quality Of Drainage Infrastructure                   |

The efforts that can be made to improve the quality of life in Rusunawa Sombo is by improving the quality of the characteristics of liveability in Quadrant I, it’s because characteristics of liveability in quadrant I have high importance and low performance, so its requires immediate attention for improvement of quality and are major weaknesses. So characteristics of liveability which are main Priority for residents are Condition In Shelter Units, Space Adequacy, Ventilation/Air Circulation, Security, Fire Protection, Quality Of Power Infrastructure and Access To Clean Water Infrastructure

3.4. Quality of life Improvement Efforts

So the recommendations for improving the quality of the characteristics of liveability in Quadrant I are:

**Condition In Shelter Units** Provide a comfortable and safe shelter to live with the periodic improvement of the bad conditions in Rusunawa Sombo through the rejuvenation of the building on Rusunawa Sombo especially in the Block A and E; this is done to improve the comfort and safety of residents to stay in Rusunawa Sombo.

**Space Adequacy** impose restrictions on the number of residents in each Shelter Unit in Rusunawa Sombo, as well as for the government, in the future in order to make the regulatory restriction regarding the number of residents where each shelter unit with room area 36 m² can be occupied by a
maximum of 4 family members (1 Family). It’s done to provide sufficient comfort so it can affect the quality of life of each resident in the Rusunawa Sombo

**Ventilation/Air Circulation** Ventilation system in each shelter unit of Rusunawa Sombo is already in accordance with government regulations but for some residents are assessed still insufficient, therefore the effort that can be done is to add additional supporting facilities such as exhaust fan or ventilating fan which is placed cross with front opening this aims to make the air rotation can run optimally

**Security** To increase the level of security it is necessary to add CCTV on each floor, maximizing the function of security officers in Rusunawa Sombo where security officers can patrol the complex every 1-2 hours and maximize the security post function in Rusunawa Sombo.

**Fire Protection** Improving the quality of fire protection through the procurement of fire extinguishers on every floor & hydrant, and socialization to residents regarding fire prevention and mitigation that might occur in Sombo Rusunawa.

**Quality Of Power Infrastructure** A good quality of Power Infrastructure is important to create comfort living in public housing especially in “Rumah Susun”, so the effort that can be done is to be held inspection and maintenance of Power Infrastructure on Rusunawa Sombo periodically and routine to reduce potential for electrical short circuit so as to ensure the safety of Rusunawa Sombo residents

**Access To Clean Water Infrastructure** good Access To Clean Water Infrastructure is important to create comfortness of living in public housing especially in “Rumah Susun” for residents, but not all blocks have good Access To Clean Water, so the effort that can be done to improve the quality of clean water through periodic checks and improvements to constraints that occur in Rusunawa Sombo and also need for the provision of WWTP(Waste Water Management Installation) in order to increase clean water supply and added benefits from household waste generated on Rusunawa Sombo

4. Conclusions

The final results in this study are characteristics of liveability which have the highest priority on Rusunawa Sombo and Recommendations for efforts to improve the quality of life through the Liveability concept approach. Referring to the first and second stage is to measure the level of Livable Eligibility (Performance) and Level Of Expectation (Importance) in Komplek Rumah Susun Sombo based on residents's perceptions, it was found that the level of Livable Eligibility (Performance) on Rusunawa Sombo is 68%, is included in the "Medium" level of Livable Livable Eligibility And the level of expectation of the characteristic of liveability (importance) on Rusunawa Sombo is 90% , is included in the "Importance" expectation level. The result of the third stage is Liveability characteristics which are the main priority and important for residents, Those are Condition In Shelter Units, Space Adequacy, Ventilation/Air Circulation, Security, Fire Protection, Quality Of Power Infrastructure, and Access To Clean Water Infrastructure. That characteristics of liveability need for Recommendation or Efforts to improve the quality of life through periodic improvement of conditions in Rusunawa Sombo. With the increase in quality of life and settling on Rusunawa Sombo, it is expected that in the future it can fulfill the characteristics of Liveability in Rusunawa Sombo so that the purpose of the procurement of Rumah Susun in improving the quality of life of residents can be achieved optimally

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