

Evaluation of sustainable walk-up flats in terms of urban housing renewal in coastal area

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Abstract. Urban housing renewal aims to get added value while maintaining the sustainability of its environmental function and quality [4]. This research discusses the urban renewal which is done by rebuilding the affected area with walk-up flats. There are four aspects to be considered in achieving sustainability, namely: environmental, social, economic, and cultural [14]. This study is focused on cultural aspect. Sustainable walk-up flats, viewed from the micro context perspective, can later be used as one of the terms of reference in assessing the success of urban renewal projects in Indonesia. Especially in coastal areas, it becomes more challenging because coastal communities have different characteristics and the existing urban renewal flats are not necessarily appropriate for the coastal community. The methods used in this study are explorative, descriptive, ex- post, cross-sectional and synchronic evaluation. This research describes the characteristics of citizens, activities at home and the environment. Thus, the conclusions which are drawn by deductive reasoning are done using frequency, mean, etc. A mixed research method is applied combining with the analysis of quantitative and qualitative data collection and interpretation, including determining quantitative indicators and space design attributes, and qualitative user needs. This research is located in Surabaya as a sample of coastal cities with urban and environmental problems. The results of this study are the findings of indicators, directions, and concepts for Sustainable Housing Development in Coastal Areas which further can be made as scientific recommendation (to support the Housing Theory and Urban Renewal) and contribute to practical guidelines for sustainable low-cost walk-up flats in coastal areas.

Keywords: Evaluation of Sustainable Walk-up Flat, Urban Housing Renewal, Coastal Area

1. Introduction

Many cities in developing countries have serious problems about coastal slums. Besides environmental issues, communities also need to continue their livelihoods activities that can support their daily needs [11]. Because of that, the improvement of the area that leads to settlements rejuvenation should consider the communities' resettlement to a location that not so far from its original location [12]. It means that housing for low-income communities in coastal areas must be able not only to overcome economic problems but also to adapt to coastal areas' weather, climatic, and geographical conditions.

To accommodate the communities' need and overcome the occurring housing scarcity, it is necessary to improve the quality of areas that have been decline through urban rejuvenation. Urban renewal can



bring improvements to areas that are experiencing environmental degradation [7]. Urban renewal is known as the rejuvenation of built environment in urban areas that is attempted to rearrange certain location with the aim of obtaining adequate added value while maintaining the function and quality of the environment [5]. Urban renewal became one of the efforts to realize decent dwelling for all parties and sustainable development of settlements with the mission city without slums [9].

The construction of flats in the framework of urban housing renewal aims to improve the vitality and quality of the housing environment. Flat is an urban housing renewal through redevelopment, which is the rebuilding of areas by demolishing some areas of the city that cannot be maintained anymore (Act No. 24 / Year 1992).

Specifically, if the design of the newly constructed housing did not considering the context of efficiency and sustainability, then the development process will only become a new burden on the environment and climate, as it will only be an act of economic waste and social ugliness. Also, if large-scale housing renovations are conducted without regard to sustainable principles, the results will not be able to reduce the environmental footprint of existing housing [14].

There are four dimensions to be considered in achieving sustainable conditions, which are environmental, social, economic, and cultural [14]. This study will discuss the rejuvenation of the city that has done with rebuilding the affected urban areas through flats. Sustainable urban renewal will be seen from the perspective of social and cultural dimensions in the micro context, which later can be used as one of the terms of reference in assessing urban renewal projects in Surabaya.

2. Post-Occupancy Evaluation of Flats in Residents Perspective

Post-Occupancy Evaluation (POE) is the basis for the systematic study of occupied buildings, by looking at the effectiveness of human users who inhabit the building's facilities [6], [8]. POE is an attempt to collect information about the condition of the building by evaluating the feelings of the occupants and the fulfilment of their needs through inhabiting and settling on the building [6]. There are several things that could be seen in the function and performance of buildings through this evaluation. The results of a post-occupancy evaluation can be a form of guidance for the future design and implementation of the building, and it is inevitable to make a sustainable building [6], [8].

Specifically, post-occupancy evaluation is needed in evaluating the study case of Dupak Bangunrejo and Romokalisari flats that are located in Surabaya, with the aim of seeing the success of urban housing renewal viewed from a cultural aspect in sustainable development. Factors that can be taken into account and adjusted in this post-occupancy evaluation from local cultural perspectives are derived from the literature reviews and viewed from the criteria of UN Habitat (2011).

3. Methods

The research was conducted in several flats that were built to overcome urban problems caused by the degradation of previous environmental carrying capacity (old settlements) resulting in the quality degradation of residential environments (within the framework of urban renewal). Flats in question are vertical social housings that were built as a result of urban renewal in Surabaya in the context of cultural dimension.

The method that used in this study is explorative, descriptive, ex- post, cross-sectional and synchronic evaluation. Data collection techniques used are field observation and stratified random sampling by distributing questionnaires to 100 residence who live in Dupak Bangunrejo and Romokalisari Flat Surabaya. The questionnaire is needed as a reference for researchers in conducting structured interviews to each respondent. With that, the researchers give the scale of assessment according to the experience of the respondents. The scoring scale is Likert scale with details: 'agree', 'less agree', 'disagree' for the condition in the flat; 'never', 'rarely', 'often' for activities; and 'difficult', 'easy enough', 'easy' for adjustment from village to flats.

Specifically, research variables are adapted to cultural criteria in sustainable housing development from UN-Habitat (2011). Here are the variables of this study:

Table 1 Assessment of Cultural Sustainability based on UN 2011

No.	Cultural Sustainability (UN, 2011)	Aspect of Variable	Parameter
a.	Culturally responsive settlements and housing design and planning	Assessment of respondents to the apartment atmosphere	• Good relationship between neighbors • Trust between neighbors • Cultural outdoor living / more activities outside the home • Cultural living / cooperation • Togetherness of children when playing and learning
b.	Improving aesthetics, diversity and cultural sophistication of the built environment and residence.	The respondent's opinion on the aesthetic value of the flat	• The building and housing units are more beautiful than the conditions in the village. • Shared room/corridor of the flat is more beautiful than the streets in the village • The adaptation of flats in adapting to life/ culture in the village • Personalization of residents to flat units
c.	Helping residence creativity (i.e. via amenities; affordable sporting, cultural and entertainment facilities.	Assessment of respondents to activities in the apartment	• Cleanliness activities (work devotion) • Cultural activities (routine recitation for mothers and children) • Woman meeting activities and social gathering • Health activities (children and elderly) • The celebration of the big day (religious and national)
d.	Assisting people's transition from rural and slums areas to decent or multifamily housing	Assessment of respondents to the change of inhabitant's culture from horizontal to vertical	• Socialize with one-floor neighbour, between floors, and between blocks • To attend events (marriage, celebration, death, etc.)

4. Research Result

The study located in Dupak Bangunrejo and Romokalisari Flats Surabaya, are example of the flats resulting from urban renewal reasons in the former slums. Dupak Bangunrejo Flats is a simple rental flats (*rusunawa*) which are divided into six blocks (A up to F) and consists of 150 units with type of 18m² (3m x 6m). While Rumah Susun Romokalisari, is composed of 4 blocks and consists of 195 units, with type of 20m² (4 m x 5 m).



(a)



(b)

Figure 1. Location of Study in (a) Dupak Bangunrejo Flat and (b) Romokalisari Flat

4.1. Evaluation of Cultural Values Sustainability of Kampung's Residents in Current Flats.

Based on the criteria of "Culturally Responsive Settlements and Housing Planning and Design" from UN-Habitat 2011, evaluation is conducted for cultural values of Kampung's residents in the flats. This research will test 5 criteria which are good neighbourhood relation, trust between neighbours, outdoor living, helping each other, and children playing together. From the interview results, the data obtained are as follows:

Diagram 1. Percentage of the Continuity of Kampung Culture in Rusun Bangunrejo and Romo Kalisari

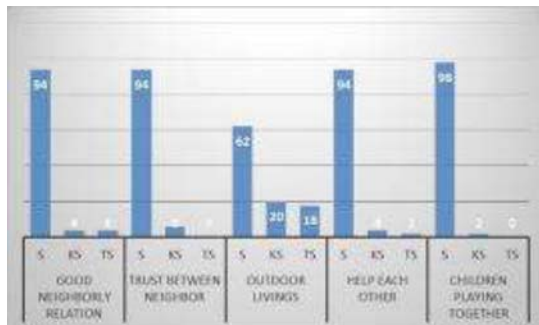


Diagram 1a. The Continuity of Kampung Culture in Dupak Bangunrejo Flat

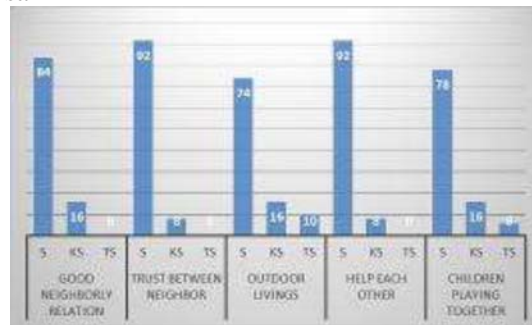


Diagram 1b. The Continuity of Kampung Culture in Romokalisari Flat

The diagram above illustrates the social and cultural conditions in Dupak Bangunrejo and Romokalisari's flat based on respondent's views. In both locations, it can be seen that there are similarities between the two flats. Although the numbers are different, the views of the majority of residents remain the same. What have to be noticed is that the activities outside the housing unit happened in more variety and lively in the Romokalisari Flat than that happened in Dupak Bangunrejo Flat. This goes this way probably because, in Dupak Bangunrejo flat, the respondents who are mostly women are engaged in activities inside the house whether performing household duties or certain business activities, and there are also women who work outside, so they rarely spend a time to hang out with neighbours. On the other hand, the percentage of children that playing together is bigger in Dupak Bangunrejo Flat than in Romokalisari Flat. This can be due to the amount of children who are there or the environmental conditions that do not allow children for playing outside together.



(a)



(b)

Figure 2. Children playing together in (a) Dupak and (b) Romokalisari Flat

In this criteria, almost all respondents (94% in Dupak and 84 % in Romokalisari) assume that the flats inhabitant hold the principle of mutual aid and help between the neighbours (good communal living). It can be seen in the various activities that are carried out together, such as community service among men, or cooking activities together among women. Also, their good communal living can also be seen if there were damaged facilities (such as water faucets in the bathroom), the users would together repair them through not only actions but also fund donations. Even so, there are some few of respondents who less agree and others do not agree with communal living, either because of busy with their work or with their activities. While on the fifth point, as many as 98% of respondents agreed that in the flats children are still free to play together, whether it is supervised or not.

4.2. Evaluation for Improvement of Aesthetics, Diversity and Cultural Sophistication of the Built Environment and Residence

Based on the criteria of "Improving aesthetics, diversity and cultural sophistication of the built environment and the residence" of UN-Habitat 2011, the assessment evaluated from residents are about the aesthetic element of the flats' compared to the kampung's conditions (landed housing and informal settlement) which are precisely their former residence. The criteria used for the evaluation are: the building of a flat is more aesthetic than that of kampung, the corridors of flat is more aesthetic than the alley in kampungs, and the daily living in flat is suitable for kampung's activity.

Diagram 2. The cultural aspect of aesthetic issues

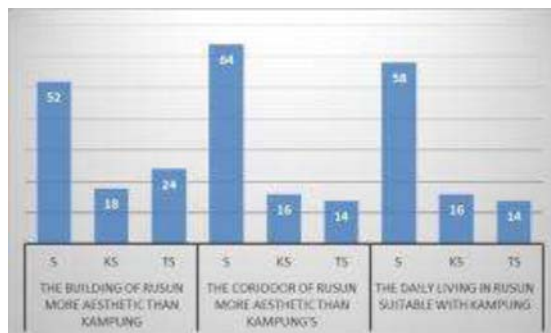


Diagram 2.a The cultural aspect of aesthetic issues
In Rusun Dupak Bangunrejo

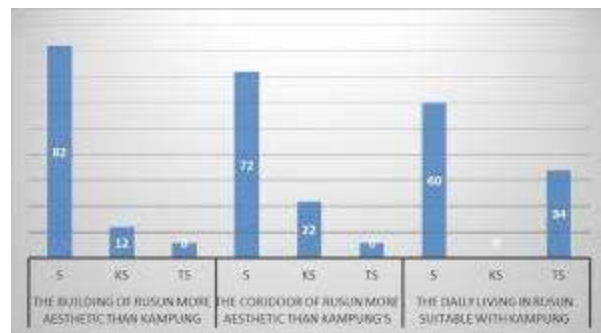


Diagram 2.b The cultural aspect of aesthetic issues
in Rusun Romokalisari

In diagram 2, it shows that in Romokalisari flat, people live there consider the flat has higher aesthetics than their previous resident (kampung), as well as communal spaces such as corridors that are considered more aesthetic than in kampung. Nevertheless, there are more people in Romokalisari who think that the daily habits in the towers are not the same as that in kampung.



(a)



(b)

Figure 3. The building's façade and corridors (a) Dupak Bangunrejo and (b) Romokalisari Flat

It explains that Romokalisari Flat is relatively new (was built in 2013) that the condition of the building is better and still well maintained, while Dupak Flats was built over 20 years ago. However, people who have long adaptation with the place turned out to be more able to adapt to the flats' conditions to make a good neighborhood, as well as they do in the previous residence (kampung).

4.3. Helping community creativity (i.e. via amenities; affordable sporting, cultural and entertainment facilities)

Based on the criteria of "Helping Community Creativity" from UN-Habitat 2011, the evaluations assess communal works, Qur'an recitation group for women, Qur'an recitation group for children, women's group for saving money (Arisan), Monthly clinic / healthy club (Posyandu) for children, Posyandu for elderly, also commemoration of National Day. These could be seen on the diagram below:

Diagram 3. The aspect of "helping community creativity" of Dupak Bangunrejo and Romokalisari flat

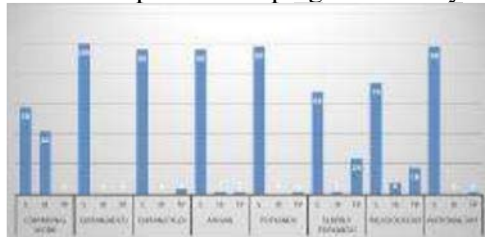


Diagram 3.a. The aspect of "helping community creativity" of Rusun Dupak Bangunrejo

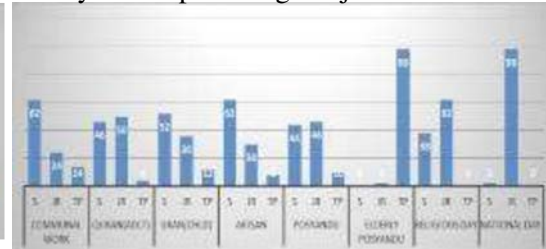


Diagram 3.b. The aspect of "helping community creativity" of Rusun Romokalisari

From the diagram above, it can be seen that those flats can help the creation of creativity and activities of the citizens, and communal activity is going well with a high level of participation. Comparing the two flats above, the condition in Dupak Bangunrejo Flat looks better, whether in the form of activities that connected with the community's cohesion, learning activities of Qur'an for children and adults, *posyandu* (health care) activities for children and elderly, or the commemoration of religious holidays, and national holidays.



(a)



(b)

Figure 4. The condition of Social relations in the Flats (a) Dupak Bangunrejo and (b) Romokalisari

The picture above shows that community social activities are related to local culture such as congregational prayer and recitation that are seen in Dupak Bangunrejo flat, while in Rusun Romokalisari the activities are still revolved around the socialization of residents.

4.4 Is the value of "Assisting people's transition from rural and slums areas to decent housing or multifamily housing" exist in Flat?

In the aspect of "Assisting people's transition from rural and slums to decent housing or multifamily housing" have been assessed several variables such as: the level of citizen socialization with other residents on the same floor, different floor and different blocks. It also assessed how the response of respondents if there are celebration event and the death of one of the residents. From the research, the result shows in the following table:

Diagram 4 The condition of social relations of citizens with other residents in Rusun

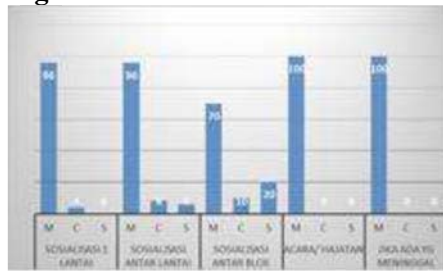


Diagram 4.a. Social relations of the community in Dupak Flat

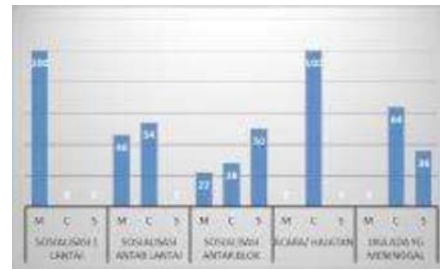


Diagram 4.b. Social relations of the community in Romokalisari Flat

Diagram 4 above describes the socioal and cultural conditions in Dupak's flat based on respondents' views. Associated with neighborhood relationships in one floor, it can be mentioned that they have a good condition of neighborhood relationships in which they interact and greet each other. But on the relationship between residents on different floors, even though they make connections, the intensity is not as intense as residents on the same floor. In this case, Romokalisari resident's relationship in different floors can be seen lower than Dupak has.



(a)



(b)

Figure 5. Social relations of community in the Flats

(a) The mothers prepare meals for the celebration of one of the residents and (b) Mothers chatting while nurturing their children.

This data shows that residents' length of stay also affects to the level of intensity of neighborhood relationships. Even, the interaction level of other social relations like celebration or funeral seems lower in Romokalisari Flats. It could be caused by the relatively new inhabitants who still don't know each other very well.

5. Discussion and Conclusion

5.1. Discussion

Urban housing renewal in Dupak Bangunrejo and Romokalisari flats can broadly represent the cultural aspects of sustainable development that society needs. Most of the flat residents see their current residence (flat) as a better housing environment meaning that it can improve their quality of life, while still providing the flexibility to live like in their previous kampung. The followings will discuss several crucial issues related to the habitual change of people who originally reside in Kampung with Flats settlement' vertical pattern consisted of several building blocks and stories.

5.1.1. Village Replication and Duplication

The most crucial shortcoming of Dupak Bangunrejo Flat according to the local community is the area of housing units that are not enough to accommodate an ideal family. Social relations, neighbourhood relationships, and principles of mutual cooperation still dominate the community behaviour pattern in the flats that are similar to the pattern of their old residences (kampung). Therefore, housing with a new

vertical culture of communal activities can go relatively well. However, when viewed more specifically, there are shortcomings that make it difficult for the people in the flats to find adjustments.

5.1.2. *Interaction Patterns are different from the previous (before)*

Also, the condition of vertical settlements complicates citizens to interact with each other. This different pattern also causes different treatment in neighbourhood activities. Before, the alley in kampung become a favourite place for residents to gather around. Then in the context of flat, there are corridors which replace the function of that kampung's alley. Social relationships are more intense within one-floor neighbors, then followed by interaction between neighbors in different floor. The last one is neighbourhood relationships with residents in another block. The same pattern is also seen in the interaction of social relations, such as reading Qur'an together, woman meeting, celebration, or during the death of one of the residents.

5.1.3. *Private space that becomes public*

Each family wants to have privacy, so that private facilities such as kitchens and bathrooms need to be placed together in one housing unit. Within one housing unit, it is necessary to divide the privacy zone, given that many flats residents who have adolescents and adults, or who live with large or multiple families, thus require a clear spatial separation. This is a rare thing in the flat project as the object of study. Lack of space makes residents try to "organize" their house unit in various ways, for example: using bunk beds, adding *mezzanine*, or using public space for non-private activities. In general, flats housing rejuvenation project are important to pay attention to the privacy zones of a family, so that the inhabitants not only have a good outside social life, but also comfortably live inside their house units as a personal family zone. Also, regarding Dupak Flats building as a scope of settlements, vehicle parking facilities are felt less useful in residents' opinion. The community needs a secured parking area for vehicles considering the number of their vehicles in the flat.

5.2. *Conclusion*

From the results of the previous discussion, it can be concluded that:

1. Flats can be used as a new residential pattern of people in Surabaya because it can interpret the habits of the previous Kampung's residents.
2. Private zone in each unit becomes the main part that must be considered in designing flats.
3. The community should be given an understanding of the social interaction pattern that is different from the previous kampung as an excess of changing the pattern from horizontal to the vertical dwelling.

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