

Conformity of House Physical Condition and Socio-Economic Mobility in Post Disaster Resettlement

Anggraeni Puspitaningtyas¹, Happy R. Santosa², V. Totok Noerwasito³

Department of Architecture, Institute of Technology Sepuluh Nopember, Indonesia

¹raenityas@gmail.com, ²happy_rs@arch.its.ac.id

Abstract: *Mudflow disaster damage job opportunity, disrupt social life and settlement, thus requiring resettlement. Need to understand whether physical condition of resettlement is in accordance with background and housing preference of victim, due to significant differences of housing design. Aspects studied were characteristic of resettlement, physical condition of house and socio-economic mobility. Research was done using qualitative method. Technique of data collection was used retrospective interviews and observation. This research result indicates that most participants experienced conformity in house physical condition and socioeconomic mobility. Reason of unconformity condition is housing facility which has not meet housing standard.*

Keywords: resettlement, disaster, house, socio-economic mobility

I. Introduction

The risk of disaster should be seen in terms of social vulnerability for variety of economic and social impact (long-term housing impact, health, economy, and social structures), not only about physical destruction [1]. Before disaster, Porong, Sidoarjo was productive area because there are many factories, paddy fields and shops. In addition, most of residents also have home-based industry. This is supported by main road that links many towns around the city. This road can facilitate citizens to work in another city. Disaster caused problems in socio-economic aspect, attachment to place, and conformity to new house.

Criteria for house physical condition that suitable for disaster victims should have similar characteristics to old housing. So, it is underlying the importance of victims' participation in planning and construction phase [2] [3]. The majority of mudflow disaster victims derived from informal housing, which is characterized by diverse house design. It means that new housing requires design variation to accommodate various inhabitant desires [4]. It was because principle of sustainable reconstruction should not only build back better and permanently, but also requires community involvement [5]. However, new housing for mudflow disaster victims is formal housing with typical design. This design can meet housing needs of disaster victims quickly but do not give opportunity to them to participate in planning and development phase. This condition can be used as case studies to know the impact and assessment of occupants, so it can be a consideration in designing new housing for disaster victims.

New housing design for disaster victims reflects image of housing for high income people. This could affect victims' decision to live there because election of new house is an adjustment process within residents to housing and environment characteristic. There is theory of self-congruity which explains that there is adjustment between housing image and someone self-concept before determining house [6] [7]. Several factors that need to be considered before buying house are environment, location, physical attributes, and house price [8]. Formal housing built by responsible parties has good location and infrastructure with design that appropriate to high income people. This could affect residents' image and opportunity in obtaining new job or affect proximity to work. Therefore, location and housing design can affect opportunities in socio-economic mobility.

II. Research Theory

House is human need that requires involvement of prospective residents since planning phase. If not, house can provide certain impact so occupants need to make adjustments to the house [2]. However, each house will always require adjustments in line with changes in occupants' condition [3]. Therefore, resettlement should provide opportunity for prospective residents to stay involved in construction process despite in completion phase only [4]. House physical condition can be seen of conformity with housing standard [9]. Housing area needs to be equipped with facilities and infrastructure. Infrastructure design that includes attention to basic building coefficient, the coefficient of building area, and the coefficient of the green area; equipped with primary and secondary network of environmental infrastructure such as roads, drainage and sewerage; primary and secondary drainage network or drainage should be connected with river, lake, or ocean. Meanwhile, housing facilities that need to be provided are educational, health, shopping, worship, green open spaces, and government facilities.

The victims tend to renovate new house after resettlement as a form of adjustment quantitatively or qualitatively [10]. House renovation can be caused by house quality that can be assessed by three major aspects of location; land design (which can be seen from the visual impact, spatial and environmental planning; open space; routes and movement) and house design (size; plan; noise levels, lighting, and services; accessibility; the issue of energy, environmentally friendly, and on-going); and performance [11]. In addition, good housing should meet

standards of facilities and infrastructure. Meanwhile, in order to determine improvement of house physical condition can be seen from the increase in area of room to be more comfortable [12] [3] [13], adjustment of bedroom requirements based on number of family members [3], the use of better material [12], completeness of infrastructure [12], there is garden at home [12], and existence of business space [3].

There is reciprocal relationship between house physical condition and inhabitants' socio-economic conditions [2] [3] [14] [7]. House physical condition can be influenced by inhabitants' socio-economic conditions and changes of these conditions can be associated with changes in house physical condition. Therefore, house development process can be attributed to occupants' socio-economic mobility [15], because house development runs along with development of occupants' financial condition [3]. Moreover, the purpose of house development is to get certain quality to show socioeconomic status [13]. House quality and social class of occupant are component of place identity theory which is focused on home [16] [14] [7].

Socio-economic mobility is changes of social class for person at a time [17]. Socio-economic mobility can be assessed based on development of job [18], income changes [19], education [20], and position in society [2] [21]. Thus in this study, aspects of socio-economic mobility that need to be investigated is comparison of jobs, income, and education of disaster victims before and after inhabit new housing. Measurement of socio-economic mobility also needs to consider impact on person's chance, lifestyle, and self-esteem [22].

III. Methodology

This study was used qualitative method. This method emphasizes actual situation, focus on interpretation and meaning, respondents understanding, and can use variety of data acquisition techniques [23]. Qualitative research involves subjective assessment of attitudes, opinions and behaviour [24]. This study aims to explore data about effects on physical conditions and socio-economic which determine the success of resettlement. To achieve the main objective, data needed is conformity of physical condition of new home by participants and impact of resettlement in socio-economic aspects. One type of qualitative research is retrospective study. Retrospective study focuses on biographies of participants or asking participants to recall events that have passed [25]. In this study, participants were asked to compare his condition before and after resettlement both in terms of house physical condition as well as socio-economic mobility.

Research population was residents of resettlement who were affected by mudflow disaster and still inhabit new house.

This housing has been chosen because mud disaster victims are advised to occupy this housing by those responsible. After determine research population, research sample also need to be determined. Determination of appropriate sample will produce high-quality research [25]. Research should be done in short time in order to be able to compare sample condition, because the longer it takes, sample's perception can be changed [26].

The determination of research sample was used purposive sampling technique. Method was used to access people who know well about specific issue because of role, strength, accessibility and expertise [25]. Qualitative research on life history in certain population relies on purposive sampling. Samples are not always related to research sites, but rather assessment of researchers to find representative sample [26]. This technique was used because some houses are no longer inhabited by disaster victims. The samples were used in qualitative research depends on heterogeneity. The more heterogeneous the more the number of samples required [25]. Mud disaster not only damaged informal housing as many as 18 villages but also formal housing. Therefore, selection of sample should include citizens who come from formal housing. There are two types of housing available for disaster victims, so that selected samples also need to represent both types of houses.

The scopes of substances that are discussed in this study are as follows:

- House physical condition include condition of infrastructure between old and new housing based on housing standards; physical condition of old and new houses in terms of land area, house area, number of rooms, and existence of business space.
- Aspects of socio-economic mobility include income, employment, and education, social activity of victims before and after resettlement.

IV. Results and Discussion

Based on Table 1 it is known that most of participants get better physical condition in new house. This condition is associated with increase in land area that allows participants to get bigger house size by increasing number of rooms. Better conditions can also be seen from availability of business space in new homes. Meanwhile, poorer physical condition caused by changes in land area owned by participants in new housing. If considered from house area between old and new house, there are no significant differences. However, some participants have large land area in old housing. Participants who experienced a broad decline in house condition occurs because of land area in old house were quite large.

Table 1. Matrix of house physical condition

Participant	Research Aspects	Old House in Disaster Area	New House	Comparison of House	Conformity of Physical Condition
1	a	247 m ²	135 m ²	1	10 = B
	b	142 m ²	135 m ²	2	
	c	3	3	3	
	d	None	Available	4	
2	a	142 m ²	162 m ²	4	15 = A
	b	95 m ²	126 m ²	4	
	c	2	4	4	
	d	None	None	3	
3	a	900 m ²	162 m ²	1	10 = B
	b	117 m ²	128.6 m ²	4	
	c	3	3	3	
	d	Available	None	2	
4	a	135 m ²	178 m ²	4	15 = A
	b	99 m ²	119.6 m ²	4	
	c	3	4	4	
	d	None	None	3	
5	a	90 m ²	108 m ²	4	16 = A
	b	45 m ²	75.5 m ²	4	
	c	2	3	4	
	d	None	Available	4	
6	a	72 m ²	90 m ²	4	15 = A
	b	36 m ²	54 m ²	4	
	c	2	3	4	
	d	None	None	3	
7	a	145 m ²	162 m ²	4	15 = A
	b	100 m ²	119 m ²	4	
	c	3	5	4	
	d	None	None	3	
8	a	867 m ²	403 m ²	1	13 = A
	b	201 m ²	213 m ²	4	
	c	3	4	4	
	d	None	Available	4	

Legend:

- a = land area [1] condition decreased 31% - 100%
 b = house area [2] condition decreased 0% - 30%
 c = number of bedroom [3] no change in condition
 d = business space [4] improvement condition

- [A] Appropriate physical condition according to points 13-16
 [B] Less appropriate physical condition according to points 9-12
 [C] Not appropriate physical condition according to points 4-8

Based on Table 2 it is known that most participant experienced upward socio-economic mobility. Migration to new housing does not significantly affect participants' job changes. New housing location made some participants closer

to workplace. However resettlement is not so influential for participants who are now further away from workplace, because they still work in the same place. Participants who changed profession from private into self-employee due to the factory where he worked was not operate anymore.

Table 2. Matrix of socioeconomic mobility

Participant	Research Aspects	Condition in old housing	Condition in new housing	Comparison of Condition	Socio-Economic Mobility
1	a		Increase 30%	4	14 = A
	b	Police	Police	3	
	c	High School	-		
	d	active socializing	Activists of compensation	4	
2	a		Increase 50%	4	15 = A
	b	Office Boy in school	Office Boy in company	4	
	c	Elementary school	Still in junior high school		
	d	Not active	Not active	3	
3	a		Increase 5%	3	11 = B
	b	Teacher (participant), private employee (1st child)	Pension (participant) private employee (1st child), jobless (2nd child), teacher (3rd child)	2	
	c	High school (participant&1st child), Diploma (2nd child), Bachelor degree (3rd child).	-		
	d	Members of social organizations	Not active	2	
4	a		Increase 30%	4	13 = A
	b	School Security	School Security	3	
	c	High School (parent)	Elementary school (1st child)		
	d	Not active	Not active	3	
5	a		Increase 30%	4	14 = A
	b	Bank employee	Bank employee	3	
	c	Bachelor degree (parent) Elementary school (1st child)	Junior high school (1st child), Elementary school (2nd child)		
	d	Not active	Head of community (RW)	4	

Continuation of Table 2.

Participant	Research Aspects	Condition in old housing	Condition in new housing	Comparison of Condition	Socio-Economic Mobility
6	a		Increase 10%	3	13 = A
	b	Navy	Pension	2	
	c	High school (parent, 1 st & 2 nd child) still attending high school (3 rd child)	In college (3 rd child)		
	d	Not active	Head of community (RW)	4	
7	a		Increase 10%	2	12 = B
	b	Trader	Trader	3	
	c	High School (father), Junior High School (mother), Junior high school (1 st child), elementary school (2 nd child)	High school (1 st child), still attending high school (2 nd child)		
	d	active socializing	active socializing	3	
8	a		Increase 5%	3	8 = C
	b	private employee	entrepreneur	2	
	c	High School (parent), Junior high school (1 st child), elementary school (2 nd child)	still attending high school (1 st child), Do not want to continue his education (2 nd child)		
	d	active socializing	Not active	2	

Legend:

- a = income [1] condition decreased 31% - 100%
- b = occupation [2] condition decreased 0% - 30%
- c = education [3] no change in condition
- d = social participation [4] improvement condition
- [A] Upward socio-economic mobility
- [B] Horizontal socio-economic mobility
- [C] Downward socio-economic mobility

Based on Table 3, it is known that there are two conditions of unconformity that occurs in this research, which are participants who got worse physical condition of old house but experienced upward mobility socioeconomic increased; and participants who get better physical condition house but suffered downward socioeconomic mobility. The condition of first unconformity caused by widespread decline in land area and differences personal assets owned participants with assets in old house. Meanwhile, the second condition of

nonconformity was caused by participants' inability in adapt and develop its economic conditions in new housing.

Table 3. Matrix of conformity between house physical condition and socioeconomic mobility

Participant	Comparison of House	Socio-Economic Mobility	conformity of house condition and socioeconomic mobility
1	B	A	Not appropriate
2	A	A	Appropriate
3	B	B	Appropriate
4	A	A	Appropriate
5	A	A	Appropriate
6	A	A	Appropriate
7	A	B	Not appropriate
8	A	C	Not appropriate

IV. Conclusion

The results provide input for post-disaster resettlement program, that housing which is different from the old one can be implemented, as long as it has a better physical condition. Conformity of house physical condition and socioeconomic mobility in this research can be seen as case study that shows the impact of new housing design to disaster victims. In practical, this study can help improvement of new housing from the side of procurement of facility and infrastructure, to restore or even improve socioeconomic condition of disaster victims.

The interviews show some conditions in new house that is considered better by participants. The factors that support conformity of house physical condition and socioeconomic mobility are as follows:

- Residential location
- Completeness infrastructure
- Increased physical condition house
- The location of the house is adjacent to a residential community in the old housing
- Housing design that takes into account existing community

However, there are some conditions in new house which showed discrepancies. Some of the causes of these are as follows:

- Distance attainment to markets and highways far
- Most of the green open space is not maintained properly
- Inability participants in adjusting and restoring economic conditions in the new housing.

References

- i. Carpenter, Ann, (2013), *Social Ties, Space, and Resilience: Literature Review of Community Resilience to Disasters and Constituent Social and Built Environment Factors*, Federal Reserve Bank of Atlanta Community and Economic Development Discussion Paper Series, No. 2-13.
- ii. Turner, John F.C., (1976), *Housing by People*, Marion Boyars, London.
- iii. Tipple, Graham, (2000), *Extending themselves: user-initiated transformation of government-built housing in developing countries*, Liverpool: Liverpool University Press ISBN 0-85323-913-4.

- iv. Blunt, Alistair, & Silas, Johan, (2010), *Rebuilding Lives and Homes in Aceh and Nias Indonesia*, Asian Development Bank, Manila.
- v. Sustainable Building Canada, (2006), *Designing for Post-Disaster Reconstruction: A Canadian Response*, SBC, Canada.
- vi. Sirgy, M.J., Grzeskowiak, S. & Su, C., (2005), "Explaining Housing Preference and Choice: The Role of Self-congruity and Functional Congruity", *Journal of Housing and the Built Environment*, 20, 329-347.
- vii. Lien, Laura L., (2009), "Home as Identity: Place-Making and Its Implications in the Built Environment of Older Persons", *Housing and Society*, 36 (2), page 149-170.
- viii. Anastasia, Njo, (2013), "Peta Persepsi Konsumen terhadap Atribut Rumah Tinggal di Surabaya", *JMK*, Vol. 15, No. 2, Page 141-152.
- ix. Indonesia, (2006), *Peraturan Menteri Perumahan Rakyat tentang Petunjuk Teknis Kawasan Siap Bangun dan Lingkungan Siap Bangun yang Berdiri Sendiri*, Nomor 32, Indonesian Government, Jakarta.
- x. Nurdiansyah, M. A. W., (2013), *Perancangan Rumah Instan untuk Korban Bencana Alam dengan Pendekatan Fleksibilitas Arsitektur*, Magister Perancangan Arsitektur, Institut Teknologi Sepuluh Nopember, Indonesia.
- xi. Imrie, Robert, (2006), *Accessible Housing: Quality, Disability and Design*, Routledge, London.
- xii. Cernea, Michael M., (2000), *Impoverishment Risks, Risk Management, and Reconstruction: A Model of Population Displacement and Resettlement*, The World Bank, Washington, DC.
- xiii. Atilas, Jorge H., & Bohon, Stephanie A., (2003), "Camas Calientes: Housing Adjustments and Barriers to Social and Economic Adaptation among Georgia's Rural Latinos", *Southern Rural Sociology*, Vol. 19, No. 1, 97-122.
- xiv. Hauge, Åshild Lappégard, (2009), *Housing and Identity: The Meaning of Housing in Communicating Identity and Its Influence on Self-Perception*, Philosophiae Doctor of Architectural Design and Management, Norwegian University of Science and Technology, Norwegia.
- xv. Silas, Johan, (1993), *Perumahan : Hunian dan Fungsi Lebihnya, Pidato Pengukuhan Guru Besar, Institut Teknologi Sepuluh Nopember, Surabaya*.
- xvi. Cuba, Lee & Hummon, David M., (1993), "A Place to Call Home: Identification with Dwelling, Community, and Region", *The Sociological Quarterly*, Vol. 34, No. 1, pp. 111-131.
- xvii. Pitzl, Gerald R., (2006) "Social Mobility", *Encyclopedia of World Poverty*. Ed. M. Odekon. CA: SAGE Reference, Thousand Oaks, Vol. 3, 992-993. Gale Virtual Reference Library.
- xviii. Saunders, Peter, (2010), *Social Mobility Myths*, Cromwell Press Group, Wiltshire.
- xix. Mishel, Lawrence, Bivens, Josh, Gould, Elise, & Shierholz, Heidi, (2009), *The State of Working America*, 12th Edition, Cornell University Press, New York.
- xx. Isaacs, Julia B., Sawhill, Isabel V. and Haskins, Ron, (2008), *Getting Ahead or Losing Ground: Economic Mobility in America*, Brookings Institution Press, Washington DC.
- xxi. Thakore, Bhoomi, & Embrick, David G., (2008), "Social Mobility", *Encyclopedia of Race, Ethnicity, and Society*. Thousand Oaks, CA: SAGE Publications, Vol. 3, 1253-1256. Gale Virtual Reference Library.
- xxii. Saunders, Peter, (1990), *Social Class and Stratification*, Routledge, London.
- xxiii. Groat, Linda & Wang, David, (2002), *Architectural Research Methods*, John Wiley & Sons Inc, New York.
- xxiv. Kothari, C. R. (2004), *Research Methodology: Methods and Techniques*, New Age International Publisher, New Delhi.
- xxv. Cohen, Louis, Manion, Lawrence, Morrison, Keith, (2007), *Research Methods in Education: sixth editions*, Routledge, New York.
- xxvi. Bernard, H. Russel, (2006), *Research Methods in Anthropology: Qualitative and Quantitative Approach*, Altamira Press, Oxford.