Affecting Factors in Space Changing of Tsunami Assisted House in Gampong Bitai, Banda Aceh

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ABSTRACT

The rehabilitation and reconstruction program for Aceh and Nias after the earthquake and tsunami in Aceh in 2004 are included building relief houses, which in Gampong Bitai Banda Aceh as many as 235 housing units, type 45+ from the Turkey Red Crescent (TRC) in 2006. Currently (2022)), most of the houses seemed to be getting bigger, with the result the neighbourhood is getting denser. The purpose of the study was to determine the factors that influence the residents to change their houses. This research is important to understand the phenomenon in society, which could be as an anticipated in dealing with the slums in the future according to SDGs point 11. The research approach was using a combination of quantitative-qualitative research, on 40 sample units (17.02%), using the SPSS statistical method. The aspects were studied including: occupancy aspects (space changes): and occupant aspects (6 factors). The results showed that the priority hierarchy of residents have changed their houses, they are: lifestyle changes (92%), economic improvement (85%), self-identity (82%), using of new technology (82%), increasing the number of family members (82%), and socio-cultural influence (77.5%). The conclusion of the study is that lifestyle is very important to the society, while socio-cultural factors are not really important comparing to it. Changes in lifestyle related to people's conditions are increasing the society after the tsunami, demanding the modern living facilities which require additional space in their dwellings. Socio-cultural factors have little influence in this condition because generally some of the residents are immigrants.

Keywords: Change of space, Tsunami Relief House, Gampong Bitai.

1. INTRODUCTION

A major earthquake occurred in Aceh on 26 December 2004 centered in the Indian Ocean, resulting in a devastating tsunami that devastated coastal settlements in much of Aceh's North and West coasts [1], more than 150,000 deaths and more than 80% of all infrastructure damage [2]. Gampong Bitai is one of the villages located in Jaya Baru District, Banda Aceh City, which was worst affected by the tsunami. Gampong is located about 1Km from the beachfront of Ulee Lhueu. The death toll reached 73.35% before the tsunami was 1,580 people, after the 2005 tsunami only 421 people. However, the remaining and recorded residents are generally immigrants who have no historical connection with Gampong Bitai and or have no kinship and emotional relationship with the residents of Bitai [3]. This is related to the population migrating to the city of Banda Aceh before the 2004 tsunami, the Bitai area is still categorized as Banda Aceh suburban area (Informant Surya Dharma).

The destruction in Gampong Bitai, which has an area of 37.25 ha and consists of 4 hamlets, can also be seen from the destruction of the site / residential location. See Gampong Bitai location below:
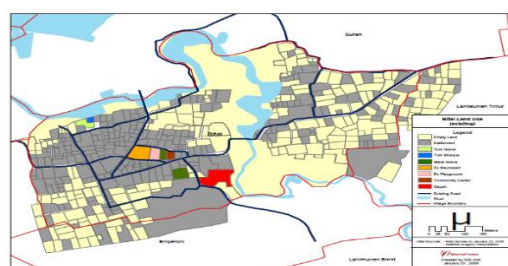

Figure 1. Location of Gampong Bitai and its Geographical conditions
Source: RTRW Kota Banda Aceh, 2009

According to The Law of the Republic of Indonesia No. 4 of 1992, a house is a structure that functions as a place to live and as a means to guide the family. Housing is a group of residences that function as a residential environment or residential environment complete with environmental facilities and infrastructure.

The rebuilding of Gampong Bitai was carried out by the Turkish government, because the history of Gampong Bitai used to be part of the Turkish settlement area that began during the XVI century Aceh kingdom [5], until now traces of settlements can still be traced with the graves of Turkish soldiers and modern-designed mosques, whose environment is guarded by Turkish descendants who have mingled with the Acehnese. Gampong Bitai received 235 units of type 45+ tsunami relief housing from donor Turkey Red Crescent (TRC).

The redevelopment of housing in the suburban area of Banda Aceh has a modern character, psychologically affecting the development of the suburban community. The experience of the development of the city of Banda Aceh which intervenes in traditional villages in it, makes the village lose its identity [6]. Therefore, building should pay attention to the character of local community life, including maintaining the ecological existence of the settlement by looking at the history of the settlement.

The design of the TRC relief house was designed by a local architect, namely: Ir. Elysa Wulandari, M.T, part of the PT. Mediatama Indokonsult Banda Aceh. The philosophy of building a relief house in Bitai based on the donor's wishes is to create a new environment with the character of modern Aceh and reveal the symbol of the Turkish relief house as a form of concern for distant relatives, who were once present to develop the civilization of the city of Banda Aceh XVII century. The relief house became a symbol of the new commitment to establish a long-lost Aceh-Turkish brotherhood. Therefore, it is hoped that later changes in the house in the future, do not change the architectural character of the existing house.

The design approach is carried out by examining the Islamic house philosophy of the Acehnese people, as well as as a large family residence (informant: Surya Dharma). The design is also adapted to modern conditions that allow the space to be used together if it is for social activities such as kenduri. The construction of reinforced concrete buildings that are resistant to tsunamis, so they are not easy to collapse.   See the TRC assisted house design image below.
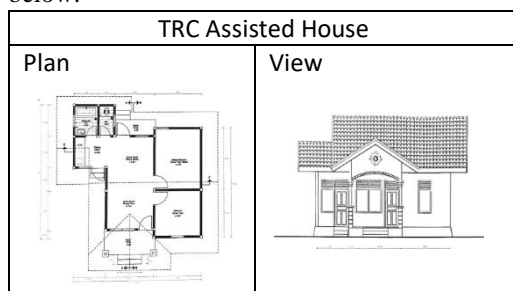

Figure 2. Plan and View of TRC Help House
Source: Archives of PT. Mediatama Indoconsult, 2006

The design of the house has a front and back porch as a gender approach, related to Islamic values that separate men and women. The living room, which is directly related to the family room and at the same time functions as a dining room, can be used together, but if needed, it can be given a non-permanent partition. There are 2 bedrooms, a bathroom and a toilet made separately and 1 kitchen as a service room, which other donor assistance houses are generally not provided.

The expression of the beauty of the relief house, displayed through the form of a floor plan configuration with the play of the field, so that the appearance of the house becomes dynamic, giving rise to a light dark shadow that

makes the expression of the building more vivid, interesting and varied. In addition, the crescent moon symbol on the curved pediment in front of the porch of the house, featuring the classic basic form of architecture in Turkey.

From quick observations at the study site, it appears that the more houses change in appearance, the larger the area of the house and almost eliminates the initial shape of the relief house. Changes in Aceh tsunami relief houses, also occurred almost everywhere, especially in Banda Aceh, which generally added and modified space in buildings which had an impact on changes in building design and construction [7]. This will also have an impact on the residential environment in general, such as increasing the basic coefficient of buildings which will affect the condition of the area's green open space and even disrupt the village infrastructure system including sanitation. This in the long run will lead to a slum environment. For this reason, it is necessary to examine the factors causing changes in houses that can later be anticipated in controlling the development of residential environments in the future, as mandated in SDGs point 11 on inclusive liveable settlement environments.

Based on the background that has been presented, the formulation of the problem in the study is to look at what factors most influence the change in space in the TRC relief house in Gampong Bitai.

2. RESEARCH METHODS

The research material includes two aspects, namely: 1) the physical aspect of the dwelling that looks at changes in the size of the house; and 2) non-physical aspects that look at factors that influence the decision of residents to change their occupancy, from 6 factors: self-identity, lifestyle, knowledge of new technologies, number of family members, socio-cultural, and economic.

This research uses quantitative-qualitative methods. The quantitative method is to obtain the tendency that occurs, while the qualitative method to explain the conditions that occur is mentioned. Data through questionnaires addressed to respondents as many as 40 people (17.02%) owners and residents of TRC Tsunami relief houses in Gampong Bitai whose homes have changed significantly.

The data were analyzed subjectively and statistically, with quantitative analysis using statistics and the application of SPSS to calculate the number and percentage to identify the causes that most influenced the observed changes. While qualitative analysis which includes the process of categorization, interpretation, and drawing conclusions from the data obtained using the existing theoretical and logical foundations, this research was carried out with analytical descriptive techniques.

3. RESULT

The research on Space Change in the Tsunami Relief House in Gampong Bitai was studied and analyzed the factors that most influence the occurrence of space changes in tsunami relief houses.

3.1 Analysis of Factors Causing Space Changes

This analysis was carried out to find out how much internal and external factors in the theory initiated by Habraken (1976) influenced the change of space in residential houses in this case, namely the TRC Tsunami relief house in Gampong Bitai. The size of the factors that influence space changes is studied quantitatively, namely by the chi square test using SPSS software. Before further analysis is carried out, a validity test of the variables used as questions in the questionnaire that determines the occurrence of space changes must be made first. This needs to be done in order to find out the questions on the questionnaire are appropriate to reveal what will be measured.

3.1.1   The Effect of Self-Identity Mirroring on Space Change

Table 1. Self-Identity Frequency Distribution (X1)

Self Identity	Frequency	Percentage
Displaying Self-Identification	33	82,5
Not Displaying Self-Identification	7	17,5

Source: Analysis

The descriptive statistics obtained from the SPSS output above are the distribution of data to 40 respondents. In the Self-Identity variable (X1) it was obtained that 33 respondents displayed self-identity, and 7 respondents did not display self-identity.

Table 2. Chi-Square Self-Identity (X1) against Space Change (Y)

Change of Space	Self Identity		Total	P -Value Chi Square	Correlation
	Displaying Self-Identification	Not Displaying Self-Identification			
Yes	32	2	34	0,00	0,728
No	1	5	6		
Total	33	7	40		

Source: Analysis

Based on the above SPSS output which is the relationship of the Self-Identity Variable (X1) to the Space Change Variable (Y) using the Chi-Square statistical test. Obtained sig value. = 0.000 < 0.05 which means that there is a relationship between the Self-Identity Variable (X1) and the Space Change Variable (Y). The correlation value obtained is 0.728, so it can be concluded that there is a close and positive relationship between the Self-Identity Variable (X1) and the Space Change Variable (Y). Such a positive relationship means that the higher a person displays his identity, the higher the likelihood of the person making space changes in his home.

3.1.2   Effect of Social Status Levels on Space Changes

Table 3. Frequency Distribution of Lifestyle Changes (X2)

Lifestyle Changes	Frequency	Percentage
Lifestyle Changes	37	92,5
No Lifestyle Changes	3	7,5

Source: Analysis

Descriptive statistics obtained from SPSS output of 40 respondents to measure the Lifestyle Change variable (X2) obtained as many as 37 respondents displaying lifestyle changes, and 3 respondents did not display lifestyle changes.

Tabel 4 Chi-Square Lifestyle Changes (X2) to Space Changes (Y)

Space Changes	Lifestyle Changes		Total	P Value Chi Square	Correlation
	Lifestyle Changes	No Lifestyle Changes			
Yes	31	3	34	0,449	-0,120
No	6	0	6		
Total	37	3	40		

Source: Analysis

Based on the above SPSS output which is the relationship of the Lifestyle Change Variable (X2) to the Space Change Variable (Y) using the Chi-Square statistical test. Obtained sig value. = 0.449 > 0.05 which means that there is no relationship between the Lifestyle Change Variable (X2) and the Space Change Variable (Y). The correlation value obtained is -0.120, so it can be concluded that there is no relationship between the Lifestyle Change Variable (X2) and the Space Change Variable (Y).

3.1.3   The Effect of Using New Technologies on Space Change

Tabel 5. Frequency Distribution of Use of New Technologies (X3)

Use of New Technologies	Frequency	Percentage
The use of New Technologies	33	92,5
No Use of New Technologies	7	7,5

Source. Analysis

Descriptive statistics obtained from the SPSS output of 40 respondents to measure the variable Use of Technology (X3) in 7 respondents there was no use of technology and as many as 33 respondents displayed the use of technology.

Tabel 6. Chi-Square Use of New Technology (X3) to Change Space (Y)

Space Changes	Use of New Technologies		Total	P Value Chi Square	Correlation
	The Use of New Technology	No Use of New Technology			
Yes	29	5	34	0,268	0,175
No	4	2	6		
Total	33	7	40		

Source. Analysis

Based on the above SPSS output which is the relationship of the New Technology Use Variable (X3) to the Space Change Variable (Y) using the Chi-Square statistical test. Obtained sig value. = 0.268 > 0.05 which means that there is no relationship between the New Technology Use Variable (X3) and the Space Change Variable (Y). The correlation value obtained is 0.175, so it can be concluded that there is no relationship between the New Technology Use Variable (X3) and the Space Change Variable (Y).

3.1.4   The Effect of Adding Family Members on Space Changes

Tabel 7. Frequency Distribution of Family Member Additions (X4)

Addition of Family Members	Frequency	Percentage
There are Lifestyle Changes	37	92,5
There are Additional Family Members	33	82,5

Source. Analysis

Descriptive statistics obtained from the SPSS output of 40 respondents to measure the variable Addition of Family Members (X4) in 7 respondents there were no addition of family members and as many as 33 respondents displayed the addition of family members.

Tabel 8. Chi-Square Addition of Family Members (X4) to Space Changes (Y)

Space Changes	Addition of Family Members		Total	P Value Chi Square	Correlation
	There are Additional Family Members	No Addition of Family Members			
Yes	31	3	34	0,001	0,544
No	2	4	6		
Total	33	7	40		

Source. Analysis

Based on the above SPSS output which is the relationship of the Family Member Number Change Variable (X4) to the Space Change Variable (Y) using the Chi-Square statistical test. Obtained sig value. = 0.001 < 0.05 which means that there is a relationship between the Family Member Number Change Variable (X2) and the Space Change Variable (Y). The correlation value obtained is 0.544, so it can be concluded that there is a relationship and positive between the Variable Change in the Number of Family Members (X4) and the Variable of Space Change (Y). Such a positive relationship means that the higher the probability of a person experiencing changes in the number of family members, the higher the likelihood of the person making changes in the space in his home.

3.1.5   The Influence of Socio-Cultural Background on Space Change

Tabel 9. Frequency Distribution of Socio-Cultural Background Influences (X5)

Influence of Socio-Cultural Background	Frequency	Percentage
There are Lifestyle Changes	37	92,5
Representing Socio-Cultural	31	77,5

Source. Analysis

Descriptive statistics obtained from the SPSS output of 40 respondents to measure the variable Influence of Socio-Cultural Background (X5) were found in 31 respondents to have a socio-cultural background with location, while the remaining 9 did not have a socio-cultural background with location.

Tabel 10. Chi Square The Influence of Socio-Cultural Background (X5) on Space Change (Y)

Space Changes	Socio-Cultural Background		Total	P Value Chi Square	Correlation
	Representing a Socio-Cultural Background	Does not represent a socio-cultural background			
Yes	31	3	34	0,000	0,780
No	0	6	6		
Total	31	9	40		

Source. Analysis

Based on the above SPSS output which is the relationship of the Socio-Cultural Variable (X5) to the Space Change Variable (Y) using the Chi-Square statistical test. Obtained sig value. = 0.000 < 0.05 which means that there is a relationship between the Socio-Cultural Variable (X5) and the Space Change Variable (Y). The correlation value obtained is 0.780, so it can be concluded that there is a relationship and positive relationship between Socio-Cultural (X5) and Variable Space Change (Y). Such a positive relationship means that the higher the socio-cultural representing a person, the higher the likelihood of the person making space changes in their home.

3.1.6   Improving the Occupant Economy Against Space Change

Tabel 11. Distribution of Frequency of Improvement of the Occupant Economy (X6)

Improving the Occupant Economy	Frequency	Percentage
There are Lifestyle Changes	37	92,5
There is an Increase in the Economy	34	85

Source: Analysis

Descriptive statistics obtained from SPSS output on 40 respondents to measure the variable Effect of Family Economic Improvement (X6) found that in 34 respondents there was an increase in the economy, while the remaining 6 respondents did not have an economic increase so that it could affect space change.

Tabel 12. Chi-Square Increases Occupant Economy (X6) to Space Change (Y)

Space Changes	Improving the Occupant Economy		Total	P Value Chi Square	Correlation
	Economic Improvement	No Economic Improvement			
Yes	33	1	34	0,000	0,804
No	1	5	6		
Total	34	6	40		

Source: Analysis

Based on the above SPSS output which is the relationship of the Economic Variable (X6) to the Space Change Variable (Y) using the Chi-Square statistical test. Obtained sig value. = 0.000 < 0.05 which means that there is a relationship between the Economic Variable (X6) and the Space Change Variable (Y). The correlation value obtained is 0.804, so it can be concluded that there is a close and positive relationship between Economics (X5) and the Space Change Variable (Y). Such a positive relationship means that the more it improves a person's economy, the higher the likelihood of the person making space changes to his or her home.

4. CONCLUSION

From the descriptive statistics obtained from the SPSS output obtained through a questionnaire distribution of 40 respondents at the study site which is the relationship of the Economic Variable (X1, X2, X3, X4, X5, X6) to the

Space Change Variable (Y) using the Chi-Square statistical test that has been described, it can be concluded that the significant value of occupancy change is influenced by two factors, internal and external. Internal factors are factors that come from within a person such as changes in family members, development of needs and changes in lifestyle. Meanwhile, external factors are factors that come from outside the self that affect a person's personality such as cultural background and educational background. The conclusions obtained are as follows:

1. The higher a person displays his identity, the higher the likelihood of the person making space changes to his home.

2. The higher the possibility of increasing the number of family members, the higher the possibility of the person making space changes in their home.

3. The higher the socio-cultural representing a person, the higher the likelihood of the person making space changes in their home.

4. The more an economy a person improves, the higher the likelihood of the person making space changes to their home.

5. Lifestyle changes and the development of new technologies have no effect on people's ability to make space changes to their homes.

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