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PROCEEDING OF 3rd INTERNATIONAL CONFERENCE ON REBUILDING PLACE (ICRP) 2018

Towards Safe Cities & Resilient Communities

13 & 14 SEPTEMBER 2018
IMPIANA HOTEL, IPOH, PERAK

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A CASE STUDY OF CORE HOUSE DESIGN MODIFICATION ON SIMPLE HOUSING: KPR GRIYA MAHONI HOUSING, WEST ACEH

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Abstract - KPR Griya Mahoni Housing of West Aceh is a housing loan provided by banks to individual customers who will buy a house. Currently, the housing is in great demand, especially for those who have limited monthly incomes to build their own house as well as to buy it in cash. There are two types of houses offered by developers such as 36 type and 36 plus type which are designed with different space. Customers are able to choose the plan provided by the developer as desired. However, after the houses are occupied, many changes were done to fulfill residents' individual needs. The condition leads to some problems such as the formation of space with poor openings, less air ventilation and windows, and unorganized building mass. Based on these problems the study was conducted to determine what factors influence the residents to change the house and to examine how the core housing changes in the KPR Griya Mahoni housing of West Aceh. This research used quantitative descriptive research method with data collection obtained through observation, interview, questionnaire, and documentation. Based on the results of the study 56.70% of the residents in KPR Griya Mahoni did expansion to the house. Some the factors that affect the changes in the KPR Griya Mahoni housing are increased income, land status, land area and completeness of facilities and basic infrastructure.

Keywords - Home Design Modification, Griya Mahoni Modification, West Aceh.

1   INTRODUCTION

One of the main needs for the people is having a proper house to live. Moreover, the house also serves as a shelter where the family spends a lot of time to interact and communicate between the whole family members. This kind of housing is in great demand in the public, especially for those who have limited monthly income to build their own house as well as to buy it in cash. There are several causes of the situation mentioned earlier such as easy to have a house by paying DP (Down Payment) and easy installments payment within a certain period.

Figure 1 Site research

KPR Griya Mahoni housing is located on Jl. Imam Bonjol, Seuneubok, Johan Pahlawan, West Aceh Regency. The types of house offered by the developer are 36 type and 36 plus type with different space of interior. For instance, there is a house that only has a toilet without a kitchen and so on. Thus, residents can choose the plan that has been provided by the developer as desired. However, after the post-habitation of various forms of change in the core house, residents make changes in accordance with the needs of each occupant. This has caused some problems such as the formation of space with poor openings, lacks air vents and windows, unorganized building mass.

2   HOUSING AND MODIFICATION

KPR is an abbreviation of *Kredit Perumahan Rakyat* which means a house loan product of banks in terms of financing as well as the purchase of a home either for ready stock or indent. The ready stock house is a house that has been built and installed with all basic facilities in terms of electricity and water. Indent house is a new house built by the contractor through the government of the housing development (developer) after being ordered by the buyer. Not only houses that can be financed by the bank but also include home stores (shop), apartments, office homes, renovations, apartments, and also the construction of residential houses (Indonesian Banking Architecture).

The modification of core house is a change made to the main home design in order to have the minimum room space for the central activities but also to have the completeness of space for other activities. The changes are also meant that a home will not only meet the minimum requirement but also meet the standard requirement of the standard house (Nurasrizal, 2010). It can be concluded that the development and change of houses are aimed to meet the need for space effectively without having to move (Mai et al, 2007; Tipple, 1992).

There are several factors that may affect residents in making changes to the core house in terms of the number of family members, improvement of income, family business factors, proximity to the workplace, land status, the size of the housing area and the completeness of basic facilities and infrastructure. In addition, the types of core home changes include improvement. It involves not to change the type, number and shape of the house but only to make quality improvements to the material of house. Partial improvement involves change is only done by enhancing the quality of material and it is only done for few numbers of houses. Reshuffle involves changes made for the whole house. Expansion includes a change made to the home by extending outwardly. In addition, maintenance includes a change that does not make any kind of modification and the quality improvement of materials of the house.

Changes made to the core house should be done using the concept of growing house. According to Agusniansyah et al, (2016) growing house is a house developed from small size to larger size. In the development of the house, itcan be done horizontally and vertically. However, if the house was changed after purchasing it, it would be more difficult than directly building it with the concept of growing house. Houses that grow horizontally are done when there is availability of vacant land, so the house grows towards the side, front and rear, while the house grows vertically if the occupants have limited land. The absolute requirement for a vertically growing house is that it must have a solid foundation that aims to prepare the building to grow vertically in the future.

According to Agusniansyah et al, (2016), the stage of implementation of construction and development of houses is carried out in stages as it is to accommodate the addition of space needed by the occupants and adjusted to the amount of budget of the occupants and the amount of land that is available. For the design of the vertical-grown house, the types can be done in the following way: construction of the initial design was built by preparing the structure for the top design. So, the building for 1st-floor is prepared for 2nd floor. The direct home design is made thoroughly to compliment the designdevelopment.

3   RESEARCH METHODOLOGY

The housing is located in a potential and strategic location which means a place away from the crowd and it only takes 5 minutes from the highway and trade and education center. It is very close access to Teuku Umar University, Education Science College of Bina Bangsa Meulaboh, Economics and Management College of Meulaboh. The housing is also equipped by public facilities such as mosque, kindergarten, green open spaces, wide asphalt road 6 meters, and drainage. This research was located at Jalan Imam Bonjol, Seuneubok, Johan Pahlawan, Ranto Panyang Timur Village, Meureubo Sub-district, Aceh Barat Regency, Aceh – Indonesia, 23617. This research focused only on 36 type houses (31 units) and 36 plus types (39 units) of KPR Griya Mahoni Housing. This is because only these types of houses are facilitated by a home loan from the banks. The method used for this research is descriptive quantitative. In principle, this quantitative research aims to answer the problem of core house design modification of KPR Griya Mahoni housing in West Aceh. Moreover, quantitative research is also often referred to as the traditional research in terms of concrete, rational, measurable, and systematic.

Furthermore, to obtain the necessary information in the research, researchers use some data collection techniques. This refers to the opinion of Gulo (2002) that data collection in a study aims to collect information related to the object of research in order to achieve research objectives. In this study data collection techniques conductedwere observation, questionnaires, and documentation. The technique of determining the number of samples was done by simple random sampling technique. It was selected because of limited time and financial matter. The number of samples can be determined by using the following formula:

Slovin Formula (Ridwan, 2005:65)

$n = N/N\ (d)^2 + 1$

whereby:

n	= Sample
N	= Population
d	= Precision Value 95% or 0.05

Therefore:

Population in KPR Griya Mahoni housing West Aceh can be calculated:

Population (N) = 70 HoH (Head of Household)

$n = N/N\ (d)^2 + 1$

$n = 70/70\ (0,05)^2 + 1 = 59,57 \sim 60\ HoH$

Meanwhile, data analysis selected by the researcher in the study was Rank Spearman Bivariate Correlation Analysis and quantitative descriptive data analysis. Non-Parametric Bivariate Correlation Analysis Rank Spearman is an analysis used to find correlations of factors that influence changes in core houses with changes in core houses. While the analysis of quantitative descriptive data is data collection carried out by researchers by explaining what factors are the cause of house changes, what elements/types of space arise due to changes in houses that occur and what changes occur in housing KPR Griya Mahoni Aceh West, and then the factors found were analyzed to draw conclusions (Nazir, 1998).

4   RESULTS AND DISCUSSION

Table 1 Correlation of Core House Change Factors

No	Factors Observed	correlation coefficient Terms > 0	Significance Terms <0.10	Info
a.	Number of family members vs core house design changes	0,168	0,200	Not determined
b	Increased Income vs core house design changes	0,522	0,000	determined
c	Family business factor vs. core house design changes	0,120	0,361	Not determined
d	proximity to the workplace vs. core house design changes	-0,041	0,755	Not determined
e	Land Status Vs core house design changes	0,459	0,000	Determined
f	Size of the housing area Vs core house design changes	0,249	0,055	Determined
g	Completeness of basic facilities and infrastructure Vs core house design changes	0,382	0,003	determined

(Sources: SPSS Analysis Calculation Result, 2018)

From the calculation of SPSS in Table 1, the researcher concluded that the significant factors that affect the core home changes are increased income, land status, size of the housing area and completeness of basic facilities and infrastructure.

Besides, the limitations on the amount of space available trigger residents to make changes by adding necessary spaces. This change affects the originally tidy house design and the previously well-structured building masses that become irregular due to the addition of space that is done either permanently or temporarily. The samples taken in this study were 60 families (25 units for house type 36 and 35 units for house type 36 plus). This sample division is in accordance with the technique of determining the number of samples using simple random sampling technique. Figure 2 shows the house type 36 and the layout of the 36 plus sightings.

After 2 years post-habitation, many residents have made house changes. The type of change made by most residents is the expansion and addition of space that reaches 56.70%. Many of the residents did add a permanent kitchen space to 26.98% with the average extension area (7.92 m²), and the temporary kitchen reached 7.90%, with the average area of expansion (4.91m²). Table 2 is a condition of room expansion that has been done by the residents.

Table 2 explains the reasons the residents did extensions and additions to the permanent bedroom (23.02%). 5 space-forming elements: floors, walls, and ceilings are already in good condition with an average area of 11.12 m². The residents also extend and add permanent washroom (17.78%) with average additions (2.68m²) and for temporary washroom (1.97%) with average expansion and average extension (1.65m²). Extension and addition were also done for dining room at 14.47% with the average addition being (7.7 m²), while for temporary only reaches 1.31% with wide expansion and average addition (7m²).
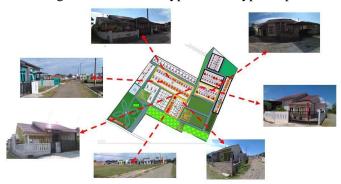
Figure.2. The house type 36 and type 36 plus

Table 2 Room condition of expansion that has been done by the residents

Addition of permanent rooms	Addition of non-permanent rooms
Addition of permanent kitchen	Addition of non-permanent kitchen
Addition of permanent bedroom	-
Addition permanent washroom	Addition non-permanent washroom

Addition permanent dining room	Addition non-permanent dining room

(Sources: Author Documentation, 2018)

Changes made by the residents varied. There is a change towards the back and towards the side. Changes were made according to the needs of each occupant. Changes in spaces by residents can be seen in the Table 3.

Table 3 Rooms modification of house type 36 and 36 plus

Sample	Original Plan	Original Room	Modified Plan	Modified Rooms
Sample 1 G/40 The direction of side and rear changes		1 living room 2 bedrooms 1 family room		1 kitchen 1 bedroom 1 washroom 1 clothesline
Sample 2 J/01 The direction of side and rear changes		1 living room 2 bedrooms 1 family room		1 bedroom 1 dining room 1 kitchen 1 washroom
Sample 3 G40 The direction of side and rear changes		1 living room 2 bedrooms 1 family room		1 kitchen 1 washroom
Sample 4 G40 The direction of side and rear changes		1 living room 2 bedrooms 1 family room 1 washroom		1 kitchen

(Sources: Author analysis, 2018)

Home changes made by the residents do not only affect the changes in the spaces in the house but also affect the air and light circulation. Good air circulation and light are when light and air can easily enter the room. Air and day light will easily enter the house when there is availability of a medium that it can pass through. One of the most important media is the presence of windows because through the air window and day light enable the light from outside to enter the house. To find the optimal openings in the space is from 1/6 x the total floor area (Esa D et al, 2011). The following is the percentage of optimal openings in the core house and the house that has made changes.

Table 4 Recapitulation of Percentage of Air and Light Circulation Rating at home type 36 plus and type 36

Name of Room		Assessment
		Percentage % √
Core House	Living Room	100%
	Bedroom 1	100%
	Bedroom 2	100%
	Family Room	100%
	Washroom	-
Modified House	Bedroom 3	-
	Kitchen	41,66%
	Dining Room	-
	Clothesline	-
	Washroom	-

(Sources: Author analysis, 2018)

Information:
- (√): Sufficiently wide-open aperture

In Table 3, it is found that the spaces in the core house such as the living room and bedroom are 100% sufficient and do not require expansion. When compared to home changes, the spaces that normally experience extension is only the kitchen space (41.66%) that meets the optimum open space. based on the findings, other spaces have not met the exposure area optimal set.

5 CONCLUSION

After conducting the research on Core House Design Modification on Simple Housing (Case Study: KPR Griya Mahoni Housing, West Aceh), it is found that the type of change that most residents do is expanding such as adding space as to meet the needs of daily life. This according to Maslow (as cited in Nurasrizal, 2010) that residents will make changes to the house only to meet the needs as in the stage of Survival Needs. This means that the changes made by residents at home only aim to meet the most basic needs in a single dwelling. Most of the residents do the expansion either permanently or temporarily. Thus indicating that income generation factor is the main factor of change in Housing KPR Griya Mahoni. Other main change factors are land status, land area and completeness of basic facilities and infrastructure. While other factors that affect the core home changes in accordance with the literature review is the number of family members, family business factors, and proximity to the workplace. Therefore, the researchers recommend that the concept of growing house in order to answer this housing problem. There are several steps in expanding the growing house. For instance, construction of the initial design is done by preparing the structure for the top design. Therefore, the 1st-floor building is prepared for 2nd building. The direct home design is made thoroughly by completing the design development. The initial house is devoted to the core of the overall design, and the next design wraps the old design. The first stage of development begins with a core house and after that followed by its modification in the concept of growing house.

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