

Analysis of Factors Cause Changes and Added Space on the Housing Type 21 m² (Case Study of Gunung Anyar Housing Surabaya)

Dyan Agustin

Architecture Department
University of Pembangunan Nasional
"Veteran" Jawa Timur
Surabaya, Indonesia
dyanagustin.ar@upnjatim.ac.id

Ninie Anggriani

Architecture Department
University of Pembangunan Nasional
"Veteran" Jawa Timur
Surabaya, Indonesia
ninieka.ar@upnjatim.ac.id

Erwin Djuni

Architecture Department
University of Pembangunan Nasional
"Veteran" Jawa Timur
Surabaya, Indonesia
Erwin95djuni@yahoo.com

Abstract— Type 21 m² housing is a limited area of housing to meet the needs of inhabitants of the middle and lower classes. In the process of inhabiting most of the occupants of type 21m² housing have made room changes from the standard design provided by the developer. This is done to meet the needs of residents caused by certain factors. The location of the research was carried out in the Gunung Anyar Surabaya housing which is a strategic location that is close to the education area, trade facilities and MERR roads (Middle East Ring Road). This study aims to reveal factors that influence changes in space in type 21m² houses both external and internal factors. The method used is descriptive qualitative method with a method of taking cases by purposive sampling. The results of the study showed that the average first space added was the kitchen. This is due to the unavailability of kitchen facilities on the standard design of 21m² type houses. The next addition is the bedroom, family room, living and dining room. The factors that cause change and increase in space are divided into two, namely external and internal factors. External factors that influence these changes are due to the rapid development of the area around the mountain housing caused by the Surabaya MERR east ring road. While internal influences are caused by, among other things, increasing income, increasing family members, increasing the age of family members, increasing vehicles, wider space requirements, and building quality factors that have been damaged.

Keywords: housing, added space, type 21 m²

I. INTRODUCTION

The increasing demand for land, especially in urban areas, has an effect on providing housing construction. Urban communities accept the need for this house in various ways, one of them by buying a house that has been provided by a developer called housing. For those who have a small income selling price and budget in development is one of the factors that are considered in buying a house. Because of the purchasing power factor, most urban people choose small type houses and then plan to make changes or development. With a small income in addition to fulfilling their daily needs, they have to save little by little to pay for the house they occupy and supplies to build a house which of course takes a long time [1].

Small type housing provided by the Government is type 21 m². Type 21 houses are houses measuring 6 meters x 3.5 meters = 21 m². The size of the land varies between 6m x 10m = 60 m² and 6m x 12m = 72 m², so it is called a type 21/60 or 21/72 house. This type of house is widely marketed by developers because the price is affordable and the model is simple, has 1 bedroom, 1 living room, and 1 bathroom so it is suitable to be occupied by young couples who do not have children. Of these facilities, of course, type 21 homes do not meet the ideal house criteria because there are some activities that are not contained in spaces such as family rooms, dining rooms, kitchens, bedrooms that are only 1 and so on.

Limited land and costs are a challenge to make changes to space in type 21m² houses. The lack of space in type 21m² houses requires residents to make changes and increase in space. From the results of previous studies, data from the survey conducted in one residential area showed 80 housing units or 59.7% of the 144 housing units sold under process design changes [2]. Some functions of the 21m² type room change over time. The function of the building related to the way the building can serve the needs of the wearer in an activity that contains a process [3]. When residents make renovations to their homes, it shows that some of the functions of the house are not or not in accordance with the needs of the owner. This is certainly influenced by the factors that cause these changes. The factors that cause change and increase in space are divided into two, namely external and internal factors. External factors that influence these changes are factors outside the housing environment while internal factors are influenced by the conditions and conditions of the occupants and the homes inhabited by the occupants themselves

II. RESEARCH METHODS

The method used is a qualitative descriptive method to get a detailed description of the factors that influence changes and the addition of space in a 21m² type house. Qualitative methods were chosen with the consideration that changes and additions to space can be observed through physical observation and equipped with interviews with residents. The descriptive method aims to obtain an overview and description of the problems to be resolved in this case is to find out the factors of change and increase the space in a

typical house 21m². Descriptive understanding is a form of research aimed at obtaining a description of the phenomena that are both natural and man-made phenomena. This phenomenon can take the form of activities, characteristics, changes, relationships, similarities, and differences between one phenomenon and another. The qualitative methodology would produce descriptive data in the form of written or oral words from people and observable behavior.

Housing Gunung Anyar Park Surabaya was used as the location of the study because the development of simple housing development in the area was quite rapid. The object of research is a simple house with an area of 21m² which experiences changes and increases in space. Case taking method is done by purposive sampling, namely sampling with a specific purpose. This is so that more varied data can be obtained and can produce more complete data.



Fig. 1. Photo of the research area in the Taman Gunung Anyar housing estate in Surabaya

III. LITERATURE REVIEW

A. Room

Space is the smallest system of built environment which has a very important role because most of the time is spent in it [4]. Space is defined as a place that is bounded by walls and roofs, whether permanent or not. Space can affect the behavior of its inhabitants. There are two types of space that can influence behavior, including:

- Space to fulfill a certain function.
- Space to fulfill flexible functions.

Space in a residential house is built to accommodate the activities of residents. The main activities of humans are eating, sleeping, MCK (bathing, washing, latrines). These three activities are the main activities of a house and can develop into other activities in accordance with the needs and desires of residents. In a residential area divided into 3 main areas based on the function and nature of space, namely the living area, sleeping area and service area [5]. The living area represents space for daily activities such as living room, dining room, family room, workspace. The sleeping area is used to rest or sleep. Usually consists of a bedroom and storage of personal items. While service areas are complementary areas such as kitchens, warehouses, garages. Each space has its own function. Space function in architecture is the fulfillment of human activities both natural and artificial [6]. The diversity and complexity of a function is influenced by the level of culture of a society.

Space in a residential house has functions such as:

- The Front Terrace is a space located in front of a residential house that connects guests and homeowners.

- The living room serves to receive and serve visiting guests. Usually, this living room is located close to the terrace and the front door .
- The kitchen plays an important role in a house. The kitchen serves as a place to prepare food and drinks for the family.
- The family room is a place for all family members to gather. This room is usually used by family members to relax, for example watching TV, playing and chatting. The position of the family room is usually in the middle between the living room, dining room and kitchen.
- The dining room is a special room that is used for eating and drinking activities for all family members. The dining room is usually located near the kitchen so that food dishes are easily served.
- The bedroom is a space that is private and is used to rest. This space is usually placed away from the crowd to get peace.
- The bathroom, usually one with a small/large toilet.
- Warehouse is a special room that is used to store items that are rarely used.
- Garage is a special room for storing vehicles such as cars, motorbikes and so on.

By their nature there are 4 types of properties in a residential house, including:

- Public space, namely space that can be accessed by all users, for example a living room, a terrace .
- Semi-public space, which is a space that can only be accessed by family members, such as family rooms, dining rooms.
- Private space, which is a private space such as a bedroom
- Services, including bathrooms, kitchens and garages.

Grouping these spaces is very important because it can affect the activity in the house. Activities are closely related to the behavior, beliefs held, values and norms held by a person that reflects the behavior of that person in daily life. The cultural and social context will determine the system of activities and human activities [7].

B. Space Change

The reason someone makes a change is a reaction of the reciprocal relationship between the occupant and his place of residence and depends on the conditions of the occupants, the physical aspects and the socio-cultural requirements of the occupants. Residents improve and change the physical structure of the house based on their individual needs. Physical changes also show the ability of users to make changes to their homes. The benefits gained by homeowners after making changes to the home include improving the standard of home quality, improving the physical appearance of the house, providing more space, providing more space, lowering occupancy rates, and increasing the satisfaction of the homeowner himself [8] . In addition, with changes to the house, it can have a positive impact on the economy, which

can provide more space to make money through leasing and increase investment that triggers economic activity . Home changes prevent a decline in appearance and increase the availability of housing related to the amount of space available, resources that can be rented out and others [9]. Sometimes in accommodating the changes needed, residents of the house make some adjustments, among others [10]:

- 1) Adaptation of family regulations.
- 2) Family adaptation structure
- 3) . Residence mobility
- 4) Change living quarters to be more feasible

In factors related to income, it can be concluded that income has an important role in the decisions of residents in making changes. Good financial conditions provide opportunities for greater change. Residents who have a higher education background have the opportunity to get a better job so they have more income. They will have a better standard of home quality so that they have a greater tendency to make house changes [11]. Based on the size and composition of the house there is a correlation between the number of occupants and the size of the house. Tipple argues that houses with a larger number of residents have a positive correlation with changes in housing [12]. Houses that are more populated by adults are more likely to experience changes than homes that still have small children. When children grow up they need higher privacy so that the pressure on home needs also increases

The dominant aspect that influences changes in housing in the present is sustainability. A sustainable house must fulfill five basic conditions so that residents can enjoy it both now and in the future:

- Support the improvement of the quality of life productivity of residents both economically, socially and politically.
- Does not cause interference to the environment in any form since the construction process or at the time of occupancy.
- Support the improvement of residents' welfare mobility both physically and spiritually.
- Maintaining a balance between the physical development of the house and the social and economic mobility of its inhabitants. At the beginning of occupying the physical condition of the house is higher than the non-physical state, but the condition will turn around after the occupants are settled in the house.

C. Privacy

Privacy is a person's ability to control their interactions with others both audio and visual to get what they want. There are two types of privacy :

1) Privacy to not be disturbed physically, manifested by withdrawal behavior, its forms include:

a) The desire to be alone (solitude), by limiting yourself to certain elements so that you are free to do anything and free from the attention of others .

b) The desire to stay away, avoiding the views and disturbances of neighbors or traffic noise.

c) The desire to be intimate with people around (intimacy)

2) Privacy to maintain the confidentiality of oneself, its forms include.

a) Desire to keep secret to yourself(Anonymity).

b) The desire not to reveal too much to others (reserve).

c) The desire not to get involved with neighbors (not neighboring).

IV. RESULTS AND DISCUSSION

The residential area of Gunung Anyar Surabaya is developing quite rapidly because it is located near the eastern ring line of Surabaya and is surrounded by educational facilities such as UPN Veteran Jatim and shipping. This affects the physical and spatial changes of the building to adjust the functions and needs of the occupants. Some houses are used for student boarding houses. Changes made include expansion, addition, replacement of functions or total changes. Based on the results of the study as many as 90% of residents have made changes and accretion of space while only 10% of residents did not make changes to their occupancy. residents who make total changes have the highest percentage of 66% and the lowest percentage (13%) in minor changes. The efforts made by residents in fulfilling more space needs by developing (building a backyard or front yard) as much as 94% .

TABLE I. DATA TYPE OF WORK

Work	total	%
1. entrepreneur	7	23
2. Private employees	12	40
3. Government employees	8	26
4.others (retirees)	3	11

From the results of the questionnaire, the amount of income obtained by respondents each month is quite large, on average more than Rp. 3,000,000 (94%). The amount of revenue is included in the applicable UMR in the Surabaya area, which is Rp. 3,200,000. The variable consideration of available funds is the variable that is ranked first as the dominant variable that influences design changes [13].

TABLE II. OCCUPANT INCOME DATA

Income	Total	%
1. <2.000.000	0	0
2. 2.000.000- 3.000.000	2	6
3. more than 3.000.000	28	94
Income	Total	%

Additions to the number of family members also influence the decisions of residents in making changes. Today, there are 40% of homes occupied by 4 people. At the

interview stage, data showed that at the beginning of the occupation the average number of young couples was occupied by the number of family members consisting of 3 people with a composition of parents and one child who was still small. After the residential process is almost 5-10 years the number of family members increases and the age of the child also increases

TABLE III. NUMBER OF RESIDENTS OF EACH HOUSE

Number of residents	Total	Prosentase (%)
1-2 people	2	8
3 people	8	26
4 people	12	40
> 5 people	8	26
Total	30	100

The age range of children of respondents is quite varied between 5-15 years. This is related to the level of privacy of a child where the more growing up, the higher the level of privacy. The results of the questionnaire show that the dominant age range of children is 5-10 years as much as 50%, then 10-15 years (27%), > 15 years (17%) and <5 years (6%).

TABLE IV. CHILD'S AGE DATA

Child's age data	Total	Prosentase (%)
< 5 years	2	6
5-10 years	15	50
10-15 years	8	27
> 15 years	5	17
Total	30	100

Fig. 2. The initial plan of type 21 m2 house in Gunung Anyar Housing Surabaya

Form Of Change

In the stages after the inhabiting process, a 21m2 type house experiences several changes and increases in space. The results of the analysis found several levels of change and increment of space that have been done by the occupants include.

A. Changes and slight accretion

This includes the category of change and light increase is the core area does not change the nature of space (private, semi-private, public, service) only a few increments. The

analysis found an increase occurred in the backyard, namely the increase in private properties (bedrooms) and service (kitchen).

TABLE V. ANALYSIS OF FACTORS CAUSING CHANGES AND MILD ACCRETION

Light change plan	Occupant data	Factors that cause change	Drivers of change
The physical form of the core house has not changed. The addition of space also only changes the function of the room without changing much in terms of the physical building (only the addition of the roof).	<ul style="list-style-type: none"> • Length of stay: 7 years • Number of family members: 5 (husband, wife, children aged 11 years, 8 years and 3 years) • Income: 2 million to 3 million per month • Motivation for staying: cheap price, close to school 	the unavailability of a kitchen at the time of initial occupation Having a business before moving so that the business continues at the house that is now occupied by using the front page.	The need to cook



Fig. 3. Sewing business by using the front yard of the house

The changes and slight increase above are caused by several factors. On the internal factors of the occupants, the average kitchen is added to the backyard because the developer does not provide a kitchen at the core of the house. The first additional space that is almost done by residents of the 21m2 type of house is the kitchen and without waiting for the availability of more funds. This is because the kitchen is included in the category of service space where its presence is needed by residents. So even though funds are not yet widely available, residents still try to have a kitchen even though they only use roofing material from asbestos waves and are not partitioned. The kitchen here also functions as a warehouse and washing place due to limited space.

Another addition is to make roofing and plastering on the front yard for motorcycle garages and clotheslines. The average inhabitant at the beginning had only a motorbike but most of them needed a canopy to protect their motorbike from heat and rain to make it shadier. The number of family members is actually more than 2, but because the age of the child is still small, it does not yet need a separate room. This is also influenced by cost factors. Their income is still insufficient to carry out renovations and increase space. In making decisions, residents / owners only pay attention to cost factors, time of construction, ease of implementation. Occupants / owners no longer pay attention to thermal

comfort by spending the entire plot closed building [14].

B. Moderate Change

Included in the category of moderate change is the core area has increased space in the back and front of the house. In the analysis found additional space in the back of the kitchen and bedroom while in the front adds a living room. Internal factors that cause an increase in the living room is because residents already want privacy and self-actualization. They do not want their privacy disturbed when watching television because there are guests. Besides that, with the increasing income of the families of the residents, they want to simultaneously remodel the appearance of the house facade as part of their existence .

TABLE VI. ANALYSIS OF FACTORS CAUSING CHANGES AND MODERATE INCREASE

Medium change plan	Information	Factors that cause change	Drivers of change
The physical form of the core house has not changed and has not changed the roof. Increased space is only done in the backyard area with the addition of partitions, roofs and floors that are used for the kitchen and bedroom. For the front yard there is no physical change, only the addition of functions becomes a place to dry	<ul style="list-style-type: none"> Length of stay: 7 years Number of family members: 3 (husband, wife, 16-year-old child) Income: above 3 million per month Motivation to stay: low prices 	<ol style="list-style-type: none"> The unavailability of a kitchen at the time of initial occupation The age of an adult child who needs a separate bedroom 	1. Funds are available to carry out renovations



Fig. 4. Front yard area for drying clothes and motorcycle garage

In the midst of changes the occupants only add to the room at the back of the house which is to add a bedroom and kitchen. The addition of sleeping space in the backyard area is due to the increasing age of the child. In the beginning, they inhabit using a room that has been provided by the developer. As time goes on the age of the child increases, it requires more privacy so that it requires another room. The

addition of the room space on average is practical, that is, only by adding partitions and doors to the area next to the kitchen. For the roof is already available before making the kitchen. This does not cost a large amount of development .

C. Severe Change

Included in the category of moderate change is the core area has increased space in the back and front of the house. In the analysis found additional space in the back of the kitchen and bedroom while in the front adds a living room. Internal factors that cause an increase in the living room is because residents already want privacy and self-actualization. They do not want their privacy disturbed when watching television because there are guests. Besides that, with the increasing income of the families of the residents, they want to simultaneously remodel the appearance of the house facade as part of their existence .

TABLE VII. ANALYSIS OF THE FACTORS CAUSING MODERATE CHANGE AND INCREASE

Floor plan changes in weight	Information	Factors that cause change	Drivers of change
The physical form of the core house is changing. Increased space in the back and front area of the core house. The bathroom was moved in the back area so that adjustments were also made to its utility. Besides that, the roof is also dismantled and made to adjust the development plan	<ul style="list-style-type: none"> Length of stay: 7 years Number of family members who live at home: 2 (husband, wife) Income: above 3 million per month Motivation of residence: calm conditions 	<ol style="list-style-type: none"> The unavailability of a kitchen at the time of initial occupation Want the core house to look spacious so that it moves the bathroom area behind Want a bigger room 	<ul style="list-style-type: none"> Funds that are already available Self existence The quality of the initial building is not good

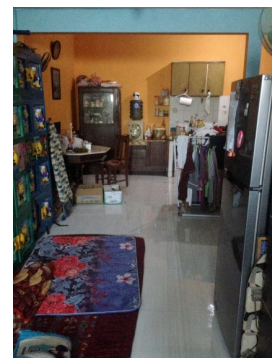


Fig. 5. The living room, family room and dining room area that looks spacious

V. CONCLUSION

The main factor that causes residents to increase space is due to internal factors, namely the increase in the number of family members, the quality of buildings that have been

damaged. Whereas external factors are due to the rapid development of the area around the mountain housing caused by the existence of the Surabaya MERR east ring road. This is related to the factor of self-existence of the occupants. Factors Causing Change and Increase in Space :

1) Changing the backyard into a kitchen in a mild change is because the developer does not provide kitchen facilities while the kitchen is an important requirement for residents .

2) Changing the backyard into a sleeping space due to factors that increase the age of family members. At the beginning of inhabiting most family members between 2-3 people with details of fathers, mothers and children whose ages range from 1-7 years. After inhabiting about 5-10 years the age of the child increases to 17 years where at this age the child has started to be a teenager. Many also increase the number of family members, for example, increasing children, there are relatives who live, etc. This causes the occupants to need additional sleeping space to complete their privacy needs

3) . The change in the terrace to the living room under moderate changes is due to the residents' need for self-actualization, self-esteem and privacy. They do not want guests to enter the inner room area because the occupants do not want to be seen by their activities.

4) The change in the front yard into a room in severe changes due to increased family members

5) The addition of room space on the upper floor due to heavy changes due to self-actualization factors. The number of occupants is more than 4 and all of them require privacy. Usually, the age of the child is more than 17 years and the number is more than 1. Besides that, it is also a factor in increasing the income of residents so they can make major changes

6) Funding factors, self-existence, the quality of the initial building that is not good to be a variable driving resident to make major changes in occupancy

ACKNOWLEDGMENT

The author would like to thank the UPN Veteran Jawa Timur for funding this research from the independent RISTI 2019 research program

REFERENCES

- [1] Zaenal, "Rumah Tumbuh membangun rumah tahap demi tahap Rencana dan bahan yang dipakai", PT Gramedia ,Jakarta. 1982
- [2] R. A. Irzan, "Faktor faktor dominan yang mempengaruhi perubahan desain rumah standar oleh konsumen di perumahan Citra Raya. (Studi pada kawasan Perumahan Villa Taman Telaga)," 2004.
- [3] H. Ishar, *Pedoman Umum Merancang Bangunan*, Jakarta, Penerbit PT Gramedia, 1992.
- [4] Haryadi, and B. Setiawan, *Arsitektur, Lingkungan dan Perilaku*, Yogyakarta, Gajah Mada University Press. :PP-PSL,1995.
- [5] T. Surowiryo, *Dasar Perencanaan Rumah Tinggal*, Jakarta, Pustaka Sinar Harapan, 2002.
- [6] Hendraningsih, et al, *Peran, kesan dan Pesan Bentuk Bentuk Arsitektur*, Jakarta, Penerbit Djambatan, 1982.
- [7] A. Rapoport, *Human Aspect Of Urban Form*, Oxford: Pergamon, 1977.
- [8] A. G. Tipple, and A. Salim, "User Initiated Extensions as Housing Supply : a study of Government – Built Low-Cost Housing Estates in Malaysia," *TWPR*, vol. 21 no 2, pp. 119-154. 1999.
- [9] N. P. Sueca, "Transformasi Rumah : Prospeknya Untuk Memperbaiki Keadaan Rumah di Indonesia," *Jurnal Permukiman Natak*, vol 2 no 1, pp 1-55, 2004.
- [10] I. Sinai, "Moving or Improving : Housing adjustment Choice in Kumasi, Ghana," *Housing Studies*, vol 16 no 1, pp. 97-114, 2001.
- [11] N. P. Sueca, "Faktor faktor Determinan Transformasi Rumah di Bali," *Jurnal Permukiman Natak*, vol 3 no 2, pp 62-101, 2005.
- [12] A. G. Tipple, *Extending Themselves : User Initiated Transformations Of Government Built Housing In Developing Countries*. Liverpool, Liverpool Univ. Press, 2000.
- [13] D. Ardianto, *Analisa Faktor Faktor Yang Mempengaruhi Perubahan Desain Rumah Standart Oleh Konsumen*, Prosiding Seminar Nasional Manajemen Teknologi XV Program Studi MMT-ITS, Surabaya. 4 Februari, 2012..
- [14] R. Laksmitasari, "Pengambilan Keputusan Pemilik Rumah Sederhana Sehat (Rss) Tipe 36 Pada Pengembangan Hunian Berkonsep Bangunan Hijau", *Faktor Exacta*, vol. 10 (4), pp. 300 – 310, 2017.