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Vernacular Pattern of House Development for Home-based Enterprises in Malang, Indonesia

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Abstract:

In the process of building and maintaining houses, residents as individuals and social human beings depend on their respective interests for improving their dwellings. The strength of tradition supports the element of stability from one generation to another. It indicates that there are groups of people whose traditions will generally be passed on to the next generation. Tradition is still maintained when utilizing the home as a Home-based Enterprise (HBE). HBE developments are based on a family's economic growth rate and also consider their household needs. In homogeneous houses, it appears that there is vernacular activity in building or repairing homes. As an example, in the case of HBEs, housing activities are maintained during the process of urban growth. Houses need to be expanded according to the needs of households and business activities within a limited urban area. In this research the pattern of house development based on vernacular HBEs, encompassing both living activities and business activities, has been investigated.

1. INTRODUCTION

Regarding the research related to the pattern of house development, the authors focus on changes of the spatial pattern in houses based on function from the view of Home-based Enterprises (HBEs). As a dwelling space, the houses serving as business spaces have been passed through generations; this study is expected to analyze the pattern of house development based on the needs of HBEs for their business activities. In the local community, imitation of the patterns is found in other residential places, in both physical and non-physical aspects, it is not only a shelter or home, but it can also serve as a mobilized resource for the occupants. Housing patterns are evident, not only based on home activities, but through identifying as vernacular it can be seen that the pattern is actually desired, by the occupant, to be passed to the next generation because the vernacular pattern is imitated by development in a particular area. The study of housing patterns based on income level is expected to assign a pattern appropriate for the needs of residences to be developed further, especially for HBEs.

According to Nunta and Sahachaisaeree (2012) the spatial pattern of human settlement was determined and readjusted not only by daily human needs, but also by their social norms and cultural settings. In addition, the local pattern and orientation of structural design was developed and transformed in accordance with the modern society (Saleh, 2000; Saleh 2001). The pattern of

vernacular settlement explaining the significance of social identity and livelihood in the past could be beneficial to explain the current social dynamics in the modern urban community. Vernacular patterns also show that the house has existed for at least several decades ([Aziz and Shawket, 2011](#))

A settlement is a residential place of activities that support human life. According to [Newmark and Thompson \(1977\)](#) the terminology of house as a residence are shelter (as a physical shelter), house (as a place for people to perform daily activities), and home (as a residence or dwelling for a person or family who has a psycho-social environment).

Thus, the notion of house means as a place of residence (physical) for persons or families to perform activities of daily living and as a venue for self-development processes (non-physical). According to [Silas \(1993\)](#), the function of the house is not just for shelter, rest, and family (residential), but it also can serve as a mobilized resource for the occupants. Here is an explanation for houses with combined functions of home and work: Home, a house used as a residence without other meaningful activities; and work, a house used for a productive or economic activity, which carries consequential aspects between production and home care.

Furthermore, there are several aspects to discuss about housing improvements such as: (1) Low building quality and slow construction evolution in the process of self-built houses ([Kowaltowski, 1998](#); [Bredenoord and Lindert, 2010](#); [Abbot, 2002a](#); [Abbot, 2002b](#); [Ferguson and Smets, 2010](#); [Shiferaw, 1998](#); [Al-Naim and Mud, 2007](#); [Kigochie, 2001](#); [Sullivan and Ward, 2012](#); [Tippie, 2004](#)), (2) The ability and motivation of households to consolidate their housing situation for self-help settlements ([Kellett and Granham, 1995](#); [Ghafur, 2002](#); [Gough and Kellett, 2001](#); [Mukhija, 2001](#)), (3) The symbiotic connection between house and economy, such as HBEs ([Onyebueke, 2001](#); [Sinai, 1998](#); [Coen, Ross, et al., 2008](#)). [Laquian \(1993\)](#) says that for the people who live in slum areas, the house is not just for home-life, but it is a place of production, marketing, entertainment, and financial institutions. Residential and business activities are integrated within single unit houses. Whereas, the [International Research on HBEs in 2002](#) states that, in general, an HBE is a domestic business activity. It is basically people's economic activities run by the family in which the activities are flexible and less bound by rules. According to [Ferguson and Smets \(2010\)](#), resources dedicated to incremental housing have to compete with other needs of the household.

House development can not be separated from the existing resource ([Silas, 1993](#)). The aspects of productivity and the function of the home have become increasingly prominent in a variety of shapes and composition. Furthermore, [Sarwono \(1992\)](#) states that humans will always adjust the environment by considering the feasibility elements for human habitation, which are related to human needs.

On the other hand, [Samadhi \(2004\)](#) said, humans make their decisions through some cosmological process. According to aspects of the norm, it is also a consideration in determining the direction of house development. [Turner \(1972\)](#) explains the concept of Housing as a process which is based on three things, namely the value of a home, home economic functions and authorities of a home.

There is a lot of research associated with the pattern of building a house. [Bredenoord and Lindert \(2010\)](#) generally explain the main factors in the procurement of shelter in developing countries. Massive numbers of people practice incremental self-help housing because other options are out of their reach. He mentioned that, in addition to the use value that the self-built house

has for residents, the commercial value of the property is not less important and will also tend to increase. A house can be the family's moneybox, especially if the family has a high degree of tenure security and if the house is built in a durable way. [Abbot \(2002a\)](#) argues that house development is based upon the ability of external interventions to address the key issue of vulnerability and argues for the need to plan for the long-term sustainability of housing. In addition, [Ferguson and Smets \(2010\)](#) argued about finance for incremental housing, incorporating current status and prospects for expansion, as well as housing finance that encompasses individual and group savings, and also households who combine a wide variety of sources in order to build their homes.

The function of the house can be as either, or both, home and work. Some houses are used for productive activities and consequences arise in relationships between aspects of economic and house functions. This work focused on residential and business activities integrated within single unit houses. The functionality aspects of the house became clear in a variety of shapes and patterns as a form of existence and sustainability. More over, the house is intended as vernacular architecture, which is the work of the whole society and not as the choice of an individual.

According to [Agenda 21 for Indonesia \(1997\)](#), housing and settlement development goals are to support economic activity in a coherent system that ensures the preservation of the carrying capacity of the environment and natural resources, so that all layers and segments of society that grew and evolved by these activities are embodied in settlements which support sustainable qualities.

This paper discusses the vernacular patterns in housing that has HBE activities, and is also expected to help support the development of housing in dense areas. This paper is organized as follows; firstly, it investigates literature regarding the influence of urbanization on housing, the pattern of residential building, and motivation of residents to develop their houses, particularly in the area of the city. Secondly, it describes the research approach and reviews the patterns of house development from questionnaires and mapping of the houses within the study area. Analyses are needed to explain the physical and non-physical conditions in order to understand the pattern. Thirdly, we discuss the vernacular housing pattern based on analysis and schematic diagrams. Finally, the conclusion states the importance of this study to enrich knowledge about house development in dense urban areas.

2. RESEARCH APPROACH

In vernacular buildings it is equally reasonable for people to be in daily connection with both the built environment and the surrounding environment; the housing pattern maintains this tradition. According to [Aziz and Shawket \(2011\)](#), the principles of house development are sustainable, as seen in patterns of vernacular development. According to [Ikuga and Murray \(2012\)](#), vernacular studies offer perspectives to deal with requirements such as sustainability. Vernacular structures provide communities with shelter using indigenous natural resources and meeting economic needs, while aligning with values, lifestyle and the more symbolic functions of a culture. This makes these forms a point of reference reflecting the whole of a culture's social structure.

HBEs allow houses to be expanded to meet the needs of business in line with the needs of the household. This development is done by mimicking what

has been done in the surrounding neighborhood. Because this housing is homogeneous, the considerations for the new construction of the house are similar. To capture the aspects that result in this similarity, questionnaires to residents were used as an investigative tool for data collection. This investigation took aspects of the tradition, business processes, and living activities into consideration. Here is the conceptual framework for conducting the data collection in order to acquire the appropriate data for analysis (Fig. 1)

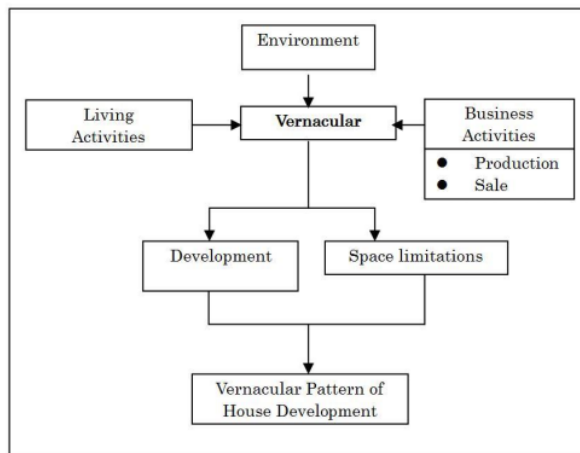


Figure 1. An Approach to the Pattern of House Development on HBE

Data were obtained from questionnaires conducted on housing development to gain insight into the housing pattern of residents who have business activities. The questionnaire enquired about living activities and business activities consisting of both productive and commercial aspects. The questionnaire aimed to acquire the data regarding basic similarities in vernacular patterns that occur in the area. In accordance with the development of family activities and business activities, there is a need for house development; this has resulted in the problem of space limitation. Analysis was conducted of the obtained housing patterns based on the level of need for the development of the living or business.

3. HBE HOUSING PATTERNS IN KAMPONG SANAN

The study area, Kampong Sanan, is located in the eastern part of the island of Java, Indonesia. The type of settlement is a kampong (urban village), which has a higher population density than the surrounding area. In Malang City, Indonesia, the place is popular for its "tempe", that is famously known for being produced in Kampong Sanan. This location is a dense residential region and most people have similar daily day activities. This kampong has an area of 20Ha (Fig. 2) and the area is divided into four neighborhoods with a population of about 3300 people (660 households) in 2011. Based on the existing designation, the area is zoned for residential area. The North and East sides of Kampong Sanan are bounded by the river and there are many new housing developments in the area. While the position of the kampong is

surrounded by rivers, it is limited on the West side by the highway leading to Surabaya City (The capital city of East Java Province).

3.1 House Development in Case Study Area

The houses of residents who live in Kampong Sanan have two functions: home and work. The productive activity of work has resulted in a unique pattern of settlement. The preserved areas (*Kampong Sanan Tempe*) maintain the image of the area as a *tempe*-producing area where there is a tendency for integrating their living space with the business space and their patterns are influenced by their economic level. Sanan residents can not be separated by their activities of producing and selling *tempe*, this particular activity differentiates this kampong from others. The residents try to maintain their activities and this has ensured the phenomenon remains today.

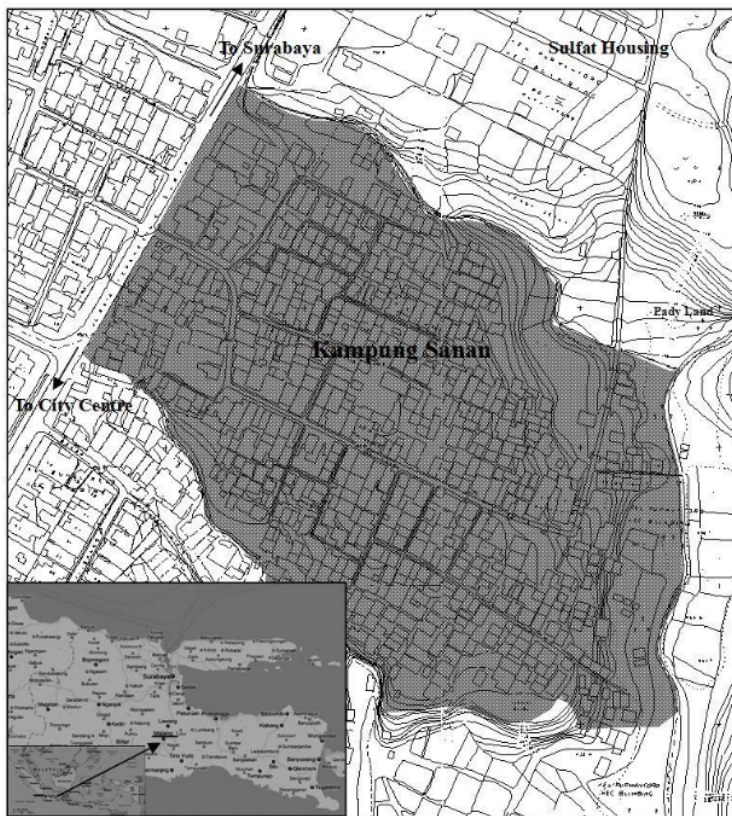


Figure 2. Kampong Sanan Boundaries.

Based on field observations, residents are differentiated into three groups based on their economic level, the high level, middle level and lower level. The high level residents are on the edge of the main road and they have a good opportunity to improve the home. The middle level residents have a chance to grow because they have direct access to the main road of the kampong. The low economic level residents are on the inside; their houses are difficult to

develop because of the limitations of the land and housing density (Table 1). Groups of houses in this area are illustrated in Figure 3.

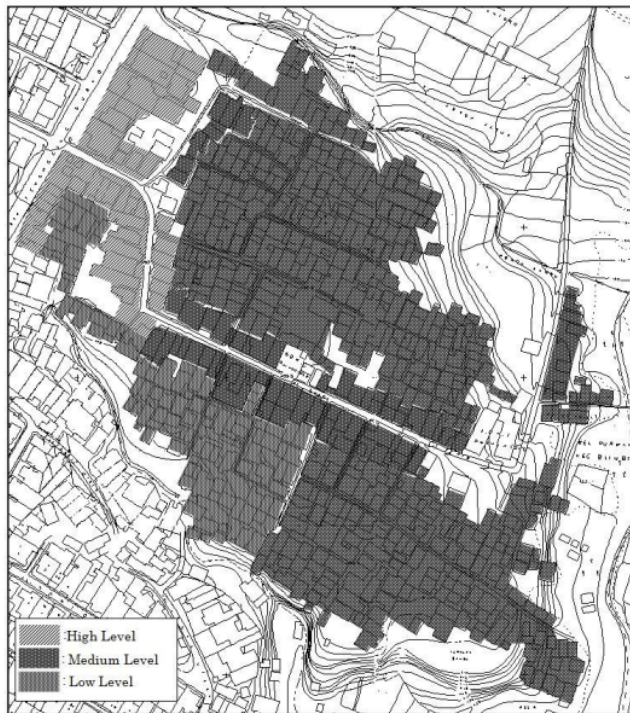




Figure 3. Three Groups of Resident in Kampong Sanan.

Table 1. The Economic Level and housing Condition (The pictures were taken in 2011)

No	Groups	Conditions		Figure
1.	High Level	Location	Located near the city's main road in front of Kampong Sanan, the appearance of the stores change completely.	
		Activities	They are focused on selling products, and have developed their entire ground floors for business activities.	
2.	Medium Level	Location	Almost all ground floors are used for economic purposes and, but the appearance of the house is still present. These houses are located near Kampong Sanan's main road.	
		Activities	The front of the house is used for economic purposes, but the appearance of the house is still present, these houses are mostly located inside the kampong.	

3.	Low Level	Location	At the rear of houses, both household and business activities (production) take place.	
		Activities	At the front of the house, there is also space used for business activities (production). There are some space limitations and conflicts between both activities.	

Residents will consider the construction of their houses relative to their economic level grouping. Their considerations are based on home ownership status, financial resources, and income per month.

Table 2. Relationships between ownership status, income per-month, and other finance

Ownership Status	Finance	Average Family income per month					Total	
		Low		Middle-		High		
		<=500.000	500.000-750.000	750.000-1.000.000	1.000.000-1.500.000	>1.500.000		
Own House	Cost	Savings	31.7%	39.7%	14.3%	3.2%	4.8%	93.7%
	Source	Borrow	6.3%	-	-	-	-	6.3%
Lease House	Cost	Savings	28.6%	57.1%			14.3%	100%
	Source							
Family Legacy House	Cost	Savings		45.0%	35.0%	20.0%		100%
	Source							
Total								

Based on the status of ownership, the largest financial resource for construction is from savings among families with a monthly income between Rp. 500,000 to Rp. 750,000 (39.7%). The main financial source for Lease House residents and Family Legacy House residents is also from savings (57.1%, 45% respectively), so people prefer to use savings rather than loans to others to improve their houses. From Table 2, we can conclude that the ownership status of residents living in the kampung is the most important condition to overcome obstacles in savings. The financial resource is an assurance in the process of house development.

Table 3. Relationship between Ownership status, Development Status, Income and Finance resources

Ownership Status	Development Condition	Family income per month	Finance Resources
Own House	Steadily	Most of the families with incomes Rp. 500.000,- to Rp. 750.000,-	Savings (59 respondents) and loans from others (4 respondents).
Lease House	Grows	Family with incomes Rp. 500.000,- to Rp. 750.000,-	Savings (7 respondents).

Family Legacy House	Grows - Steadily	Family with incomes Rp. 500.000,- to Rp. 750.000,-	Savings (20 respondents).
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Based on field data in *Table 3*, the cost for the process of repair and construction of homes is funded by both residents' savings and a fraction of borrowing from other parties. In addition, comparing the ownership status and the duration of business in the kampong with the reason for doing business can be organized as below, in *Table 4*.

Table 4. Relationships between ownership status, duration of business in the kampong, and the reason for keeping the business

Ownership Status	Business activity	Years	The reasons		
			Maintaining tradition	Being familiar with the product	Supporting Environment
Own House	The duration of doing business in the kampong	<1	7.9%		
		1-5	7.9%		
		6-10	11.1%	4.8%	
		11-15	4.8%		
		>15	39.7%	19.0%	4.8%
	Total		71.4%	23.8%	4.8%
Lease House	The duration of doing business in the kampong	<1	28.6%		
		1-5	28.6%		28.6%
		>15		14.3%	
	Total		57.1%	14.3%	28.6%
Family Legacy House	The duration of doing business in the kampong	1-5	35.0%	10.0%	
		6-10	10.0%		
		>15	20.0%	15.0%	10.0%
	Total		65.0%	25.0%	10.0%

Based on *Table 4*, the residents with Own House status residing for more than 15 years prefer to "maintain tradition" to support their business activity in the house (39.7%). The Lease House status residents preferred "Being familiar with the product" and "Supporting Environment" as their reasons (28.6%) for those who have resided from 1-5 years. The Family Legacy status residents who have resided from 1-5 years preferred "maintain tradition" (35%) as a reason that supports their business.

Table 5. Summary the influence of house status, main factor, and duration of doing business to development status.

Development Status	Ownership Status	The Main Factor	The duration of doing business
Steadily	Own house	Maintaining tradition (45 respondents)	More than 15 years (25 respondents).
Grows	Lease House	Maintaining tradition (4 respondents)	Between 1-5 years (4 respondents)
Grows-Steadily	Family legacy	Maintaining tradition (13 respondents)	More than 15 years (9 respondents) and 1-5 years (9 respondents)

The development status of their houses was influenced by ownership status for keeping the business, and the duration of doing business. As shown in *Table 5*, the development status for Own House residents is 'steadily'. It is described as such because the efforts made by both Lease House and Family Legacy House residents have been made since a long time ago, despite the ownership status of the building not being their Own House. Because of this,

most of them overcome obstacles in the process of house development gradually, utilizing savings. The motivation for family members to continue production in each development status differs, but is mostly to continue tradition.

3.2 Typical Vernacular Housing Pattern

In this section, the authors try to obtain specific information about a resident's motivation to renovate their house. The selected house is a house that has limited land and a low economic level in the case study area as shown in Figure 4. This exploration was conducted by drawing the initial floor plan based on the explanation of the owner, then we redrew the house which is now renovated. This house plan focused on the consideration of the needs of both the living activities and business activities.

First, this study was conducted by tracing patterns of the construction of houses in Kampong Sanan. This was done to get the full background directly from residents. One family was then selected for this investigation regarding the motivation of the construction of their house, this house was located on the inside of Kampong Sanan. In this case, the motivation for the renovations was an increase of family members.

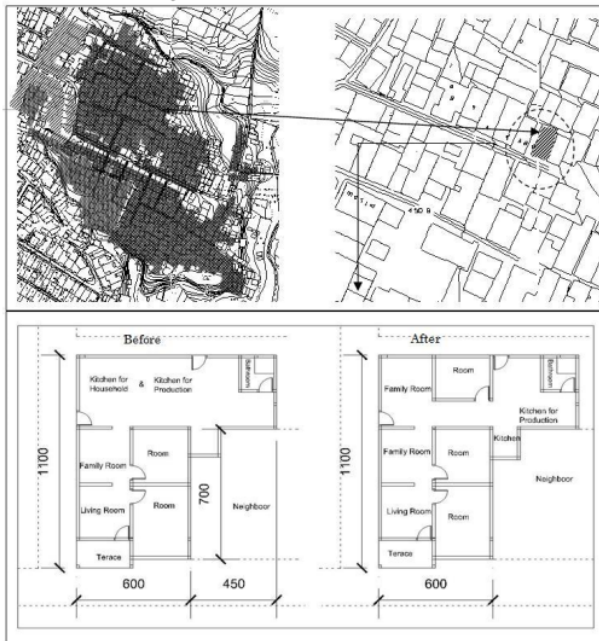


Figure 4. House Plan, before and after daughter's marriage

The pattern of house development as related to HBE changed in this house from the initial conditions to current conditions, as follows:

Previously, the house was owned by the father who was living with his children and grandchildren. His income was not enough to renovate the house. The position of the kitchen was at the back and it was last renovated in 2000 because the back of the kitchen collapsed. The results of the renovation were changes to a back room that used to be a part of the kitchen (Fig. 4). The reason to build back rooms was to add space for a married daughter. In the current condition, they built a room with limited funds, and although there

remains a desire to add a room again, the plan is only for adding to the front part of the house. They need a special room for “*leleran*” (a part of the production process for “*tempe*” making) and an expansion of the living room. They are currently using the corner of the family room for production and have plans to add a special space. 25 they have sufficient funds in order to build up the floor where goods are put at the back of the house. The space between rooms is used for ironing and family gathering.

Further studies were conducted in houses of 3 similar economic level residents. Based on the cases found different parts of the houses were taken into consideration during the renovation. Parts of the houses used included the kitchen, the appearance of houses, terraces, orientation and other parts. Through considering vernacular patterns, we studied the influence and the reason to do renovations (Table 6).

Table 6. The relationship between influencer, the reason for the renovation, and part will be maintained

Influencers		The reasons	The parts of house maintained					Total
			Kitchen	Building appearance	Orientation	Terrace	Others	
Family	Reason for renovation	Facilitate business	54.2%				25.0%	79.2%
		Adding to Household		4.2%	8.3%	8.3%		20.8%
Relatives	Reason for renovation	Facilitate business		100.0%				100.0%
Neighbor	Reason for renovation	Facilitate business	75.0%			12.5%		87.5%
		Adding to Household	12.5%					12.5%

Most of the reasons for doing house improvements were to facilitate economic activity rather than to facilitate household use. This is largely influenced by neighbors (87.5%) and family (79.2%). While the part of the house being renovated is usually the kitchen. The changes to house plans vary depending on what factors they prioritize. In the early development stages, they tend to improve their kitchen to support their economic activity (Fig. 5). Changes that occur to the houses are shown in Figure 6 below (LA= Living Activities; BA= Business Activities).

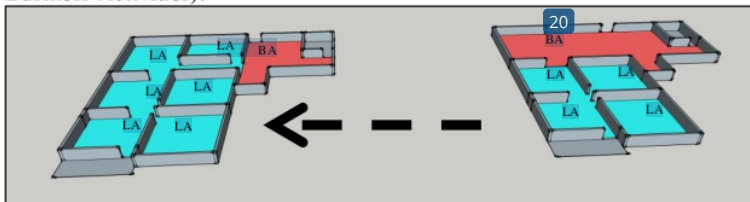


Figure 5. Figure regarding early development
 Note: Red for Economic Domain and Blue for Domestic Domain

This research also asked about expectations for development when land is limited, with no possibility to buy or add to the land, and while it is necessary to remain on the same property. After expansion, followed by a period of no change, they decided to steadily develop the house more. The possibilities that occur after the economic income improves are as shown in Figure 6:

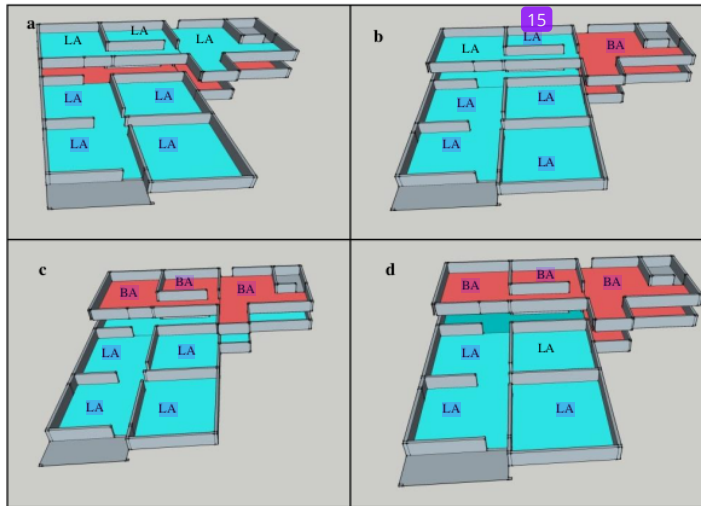


Figure 6. Figure regarding possible development; a) The back of the ground floor is used for economic purposes and an additional floor added at the rear for households. b) Both the upper and lower floors are used for the economic activity. ²³An additional floor at the back of the house is added for the economic activity. d) Both the side of the house and the additional floor at the rear are used for the economic activity.

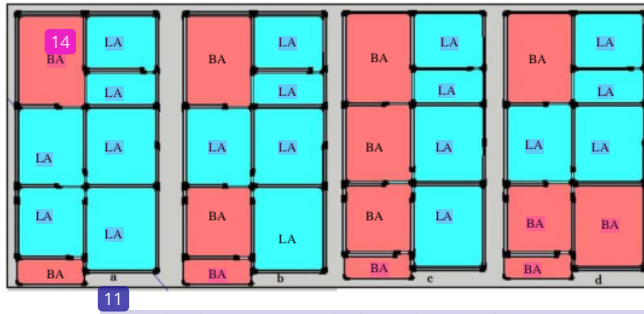
Based on these patterns, in the early stages of economic development decisions were made to maximize the rear of the house as an economic activity space. Considerations led to decisions to maintain the existence of the kitchen. The kitchen has two functions, both as a place for living activities and business activities. In the next stage of development the whole back of house is maximized, including the upper floor section for production, while the center of the house remains functioning as a living space.

4. LOCATIONS AND HOUSING PATTERNS OF HBE

Based on the analysis ¹⁷ in above section, the locations and economic levels are important ¹⁷ factors in determining the pattern of house development. At locations that are far away from the main road there are four alternative developments based on field observations, the pattern is often chosen by occupants. When the location is near the main road there are four developmental patterns according to the residents' economic needs.

4.1 Houses located far from the main road

In its development, the changes that occur can be of various kinds. In houses that are near the main kampong street, the front of their house is prioritized for economic activity, and the back for living activities (Fig. 7).



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Figure 7. The kitchen is at the rear and is always determined as a business zone, in addition a) The terrace is used. b) The terrace and the living room are used, and this is often a conflicting space. c) The terrace, living room, and family room are dual-purpose, greating the chances of conflict here. d) The terrace, living room, and front room are used, which is starting to create a business zone, distinct from the living area.

Some homes in *Figure 7a* only use the front of the house (the terrace), which is used for selling or production activities. Furthermore, the house has more rooms for living activities. In *Figure 7b*, residents use only the terrace and living room for business activities; this situation often generates a conflict of space. In *Figure 7c*, the terrace, living room, and family room are all dual-purpose, this pattern also generates the possibility of a larger conflict of space. This happens because more rooms are involved in the business thoroughfare. The pattern of *Figure 7d*, shows the business activity is carried out on the terrace, and in the living room and front room, this is caused by a business need that requires a separate room. In this pattern, the business zone is separate from the living zone.

4.2 Houses located near the main road



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Figure 8. a) Almost all the ground floor is used for the business and the added floor at the rear for households. b) The entire ground floor is used for business and the added floor at the rear for households. c) The entire ground floor and part of the upper floor at the rear are used for the business, while the top floor, extending to the front of the house, is used for households. d) The entire ground floor and rear of the top floor are used for the business and the front of the top floor for the household.

The houses that are located near the main street of the town utilize about 66% of the homes for economic activity; this causes the appearance of the store to change. Patterns that may occur are as follows (Fig. 8); Figure 8a shows almost all of the ground floor is used for business, while at the rear one more floor is built for living activities. Figure 8b shows the entire ground floor is used for business, while the upper part is used for living (50% of the house). Figure 8c shows the entire ground floor is used for business activities and extends to the second floor partially, while the upper floor is extended forward for living activities. In Figure 8d, the entire ground floor is used for business activities and extends to the back half of the upper floor, while the front of the upper floor is used for living.

In the current conditions, the front area of the kampong grew faster into a trading place. This situation resulted in a change to the shape and spatial layout of the houses, which look like stores, although the original function of the dwelling remains. The kampong tends to adopt development patterns from the surrounding area, and the rapid development of new housing in the area around the kampong also stimulates the changes.

Some assumptions about house development can be made based on the availability of resources and what kind of opportunities is created for the repair or construction of houses. Because of the inheritance of cultural values through cross-generational business inheritance, the business of "tempe" practices and its resources, including houses, is sustainable. The development of the house is greatly influenced by the decision of the family to make such house developments. The business activities have a great influence on the living space when the family facilitates business activities in those areas. The existence of the kitchen remains the same, and relatives have little influence on business activities and maintaining the appearance of the house. The neighbors have more influence than the relatives on the kitchen space because they live in the same place and have the same occupation, offering a perspective that can be informative to their neighbors. Most of them choose the kitchen to be maintained for business activities.

5. CONCLUSION

Through investigating the informal housing vernacular pattern occurring in the process of urban growth, Kampong Sanan has homogeneity as a village that produces and sells "tempe". Residents build houses in accordance with their economic level and the location of their home.

A research approach focusing on vernacular patterns is essential in order to know more about the needs and traditions of housing development. The questionnaire was an instrument in tracking and analyzing the patterns of house development as vernacular patterns; investigation in the case study area is useful to obtain detailed information on the changes, the motivation to do renovations, and the expectation of available funds to build.

The location of a house will determine the pattern of a house's development from the time of building. It can be concluded that the closer to the main road the house is, the greater the opportunity to utilize the existing land to maximize business activities. It is different for people who live relatively far from the main road, they try to maximize their houses under the condition of limited space, and the respective patterns are expected to be a reference for residents who live in densely populated areas and have limited land.

The city road is a factor that accelerates change to the housing patterns, and most changes occur near the main street. House changes that occur depend on the economic level of the residents, while the reason for changes is due to business activities rather than living activities, so the part of the house relating to business activities is the part of the house that needs to be developed. Furthermore, vernacular patterns occurred based on their traditions of home and work. The housing patterns reflected the conditions required by the household and the business activity. The respective patterns are expected to be a reference for people based on the needs of their household and the business.

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