

## The Value of *Gotong-royong* in the Mountainous Settlement of Kepuharjo Village at Pagerjurang Permanent Shelter in Yogyakarta, Indonesia

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### ABSTRACT

Providing housing for refugees due to disasters is a common problem in countries prone to natural disasters. The eruption of Mount Merapi in Yogyakarta in 2010 has displaced the people of Kepuharjo Village to a new settlement in Pagerjurang permanent shelter. However, the process of settling in a new settlement requires adjustments because the people of Kepuharjo Village have been living on the slopes of Mount Merapi for generations. This research is a qualitative research which aims to find a reflection of the space-occupancy value system that occurs in the village of Kepuharjo at the Pagerjurang permanent shelter. The results of observations and interviews with 29 units show that the description of the activities and arrangement of the residential space in the Pagerjurang permanent shelter. The results showed that the motivation for the development of residential spaces is closely related to kinship and socio-cultural values in the daily life of the occupants. The socio-cultural reflection on the residential space of the Kepuharjo community in the Pagerjurang permanent shelter is in line with the social principles of mutual-cooperation (*gotong-royong*). *Gotong-royong* is expressed in the strengthening of space, expansion of space, and agreement of space.

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### 1. Introduction

Providing housing for refugees due to disasters is a common problem in countries prone to natural disasters. Interest in community-based housing solutions has revived in many countries in recent years (Fromm, Tummers in Mullins, 2018). For this reason, *Rekompak*<sup>[1]</sup> participated in building new community-based settlements to provide new settlements for disaster victims in Java, Indonesia. Community-based implementation has become part of existing development programs, which ultimately means that working in groups is also part of the local culture of life (Maly et al., 2015). However, community-based residential space development has limited space and funds. In the case of

resettlement in Yogyakarta, the provision of houses in the form of core houses that require their own development by the occupants.

The eruption of Mount Merapi in 2010 had buried Kepuharjo Village. As a result, the people of Kepuharjo Village need new settlements. For this reason, Pagerjurang permanent shelter is one of the post-Merapi relocations built by the Government and *Rekompak* to meet the needs of the victims of the eruption (Setiadi et al., 2020). The sudden movement of people due to the disaster to the Pagerjurang permanent shelter caused the Kepuharjo community to require adjustments to their housing patterns in new settlements. This is due to the fact that the people of Kepuharjo Village who have lived on the slopes of Mount Merapi for generations have a way of life in harmony with nature. That is,

their culture of life proves that society has viewed nature for the benefit of the future. For example, the act of willingness and seriousness in seeing natural disasters and mutual-cooperation (*gotong-royong*) is seen as social capital for disaster management during the eruption of Mount Merapi (Gunawan, 2015). The closeness of society to nature is also reflected in the ethics of interacting with nature, such as the ethics of farming, raising livestock and living (Fatkhani, 2006).

In the context of housing, Hatuka and Bar in Handel (2019) found that housing is a socio-cultural process, seeing homes and houses as representations of broader sociological and cultural phenomena. Rapoport in Atik & Erdoğan (2017) states that buildings, especially houses, are physical and cultural artifacts. In traditional Javanese, the house is often called *omah*<sup>2</sup>. Meanwhile, Darmanto-Jatman in Santosa (1997:2) "formulates *Omah* as comprising *O* and *mah*, which extend the meaning of *Omah* as the meeting point between the *o-ness* of space-sky-male and *mah-ness* of ground-earth-female." *Omah* is a reflection of Javanese people who are still bounded by the concept of life in which there are routine and ritual activities. *Omah* is also the life of a cultural group (Santosa, 2000). The meaning of *omah* is similar to the meaning of the life of a Javanese cultural group. Tjahjono (1989) states that *Omah* is

considered a place to calm the mind. Ronald (2005:8) stated that in the life of the Javanese people, it is also known about such the terms of space and place as *longkangan* (space), *panggonan* (place), *panepen* (residence / "settlement"), and *palungguhan* (seating for interacting). Javanese people use the term place (*panggonan*) to indicate the space in a traditional Javanese house. For Javanese, the term of place refers to the value and meaning of the activities which is carried out. This is conducted due to the understanding that every activity which is carried out is associated with the value and meaning in where the activity is carried out. It shows that the Javanese need for space (*longkang*), a place to live (*panggonan*), a place to contemplate (*panepen*), and a place to interact (*palungguhan*).

Subroto (1995) describes that the spaces of the Javanese house is divided into 3 (three) as : 1. the front space (*Pendopo* as the public domain), 2. the middle space (*Dalem* as central space and *Gandok* as female domain area) and 3. the rear space (*Pawon* or kitchen as service domain) (Figure 1). The front space as mentioned above is represented by the *pendopo* pavilion. The outer part of *omah* (house) is *emperan* (verandah).

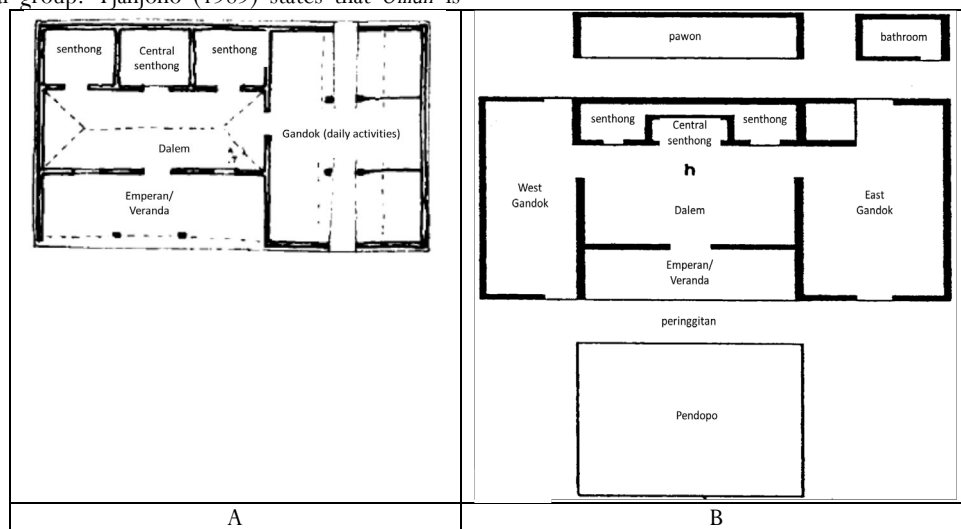


Figure 1 Javanese Traditional House Plans (Tjahjono, 1989:101; Subroto, 1995:28)

A. Simple House (*Omah*).

B. Ideal House (*Joglo*).

Furthermore, the *pendopo* is bright and open. The space between the *pendopo* and the *omah* has a *peringgitan*, which is an empty intermediate space. Thus, the division and value of space are fundamental in Javanese culture.

There are many concepts about residential space which have been published. As a bipolar space concept, many residential spaces are expressed in contradictions such as public and private, day and night, or front and back (Tjahjono, 1989). As a system, the artificial environment is formed through several subsystems. It is indicated that each subsystem consists of fixed feature, semi-fixed feature, and variable feature elements. The relationship between activities and settings is an important factor in identifying residential spaces (Rapoport, 1982). In addition, the need for shelter is a basic human need. Abraham Maslow classified the need for residential space at the two lowest levels of human needs,

namely physiological and security (Jerome, 2013). A house is purified by ritual processions and is still considered the dividing line between the sacred and profane worlds (Eliade, 1959). Residential space plays an essential role as capital for low-income households in urban areas (Marsoyo, 2012). Residential space creates a relationship between cultural and social values. For example: gender relations, social uniqueness, religious, and historical context in traditional houses in Jeddah (Al-Ban, 2016); application of vernacular spaces into contemporary houses in Yogyakarta and Surabaya (Subroto, 1995); interplay of interactions of social structure, economic and cultural life of residents in the transformation of the domestic architecture of Madurese housing in Surabaya and Madura (Faqih, 2005); the evolution of housing in terms of form and culture in Seoul (Seo, 2005); the relationship between culture and architectural forms in vernacular Hakka dwellings in Meizhou (Tao et al., 2018); and

the transformation of the Javanese house in Kotagede Yogyakarta (Ju et al., 2018). Other examples include changes in spatial organization as a consequence of social change, such as temporary middle class housing in Sri Lanka (Paranagamage, 2006); social-spatial relations in rural Pakistan (Mughal, 2013); a dwelling transformation in Bali (Agusintadewi, 2014); and traditional houses in Phrapradaeng District (Wongphyat and Suzuki, 2018). Several studies that have been carried out have confirmed the existence of values in residential spaces that are generated by social and cultural aspects in society.

This study is important because of the following interests: (1) the people of Kepuharjo have lived in spiritual, cultural, and social values for generations, (2) the displacement of the inhabitants of the slopes of Mount Merapi due to the eruption of the mountain needs a new settlement, and (3) new settlements, namely in Pagerjuran permanent shelter which was established by agreement and discussion involving all residents which shows the interrelation from old space to the new space. For this reason, this study aims to find a reflection of the space-occupancy value system for the people of Kepuharjo who live in Pagerjuran permanent shelter. It is hoped that this study can become part of the spatial reference pattern for the provision of new relocation

residential spaces as a built environment, especially for rural refugees damaged by the disaster by taking into account the values of the old residential space.

**2. Methodology**

The phenomenon in each case represents each hamlet in the Pagerjuran permanent shelter. Selection of case observations using purposive sampling method. Apart from that, the snowball technique was also used to determine the most appropriate cases. The house was chosen purposively based on existing phenomena. Each case represents a category, namely the name of the hamlet, the level of the story, the number of bedrooms, the number of families in one house, the number of residents, and the direction of the house so that there were 29 cases representing the five hamlets.

Data collection was carried out through observation and interviews. Observations were focused on activities and settings in the Pagerjuran permanent shelter unit. Interviews were conducted with residents and the village head. The interviews were conducted with the 29 heads of households.

**Table 1** Observation checklist (Author)

concepts		elements
Fixed feature elements	Houses elements	Walls
		Floor
Semi-fixed feature elements	Room Furniture	Furniture layout
		Furniture types
Variable feature elements	Activities	Spiritual activities
		Cultural activities
		Social activities
		Economic activities

As shown in Table 1, the observation guidelines is formulated based on Rapoport (1982) which refer to 3 (three) features as 1. Fixed feature: the partition (walls) as the permanent element, 2. Semi-fixed feature: layout and types of furnitures), and 3. Non-fixed feature : activities that occur in the space. This observation aims to see the spatial organization and the space usage.

The analysis carried out was the spatial reconstruction of the residential space in the Kepuharjo Village and the Pagerjuran permanent shelter. The spatial arrangement of the Pagerjuran permanent shelter is equipped with furniture layout. The selection of furniture in each room has provided information about the character of the room. Thus, the traditional Javanese residential space pattern acts as a reference to understand the similarities between the residential space in Kepuharjo Village and the Pagerjuran permanent shelter. This is because topological distances (Hillier & Hanson, 1984) and access charts are used in this stage to determine the spatial depth and spatial connectivity of the living space. Reflections on the relationship between activities and residential space settings in Kepuharjo Village in Pagerjuran

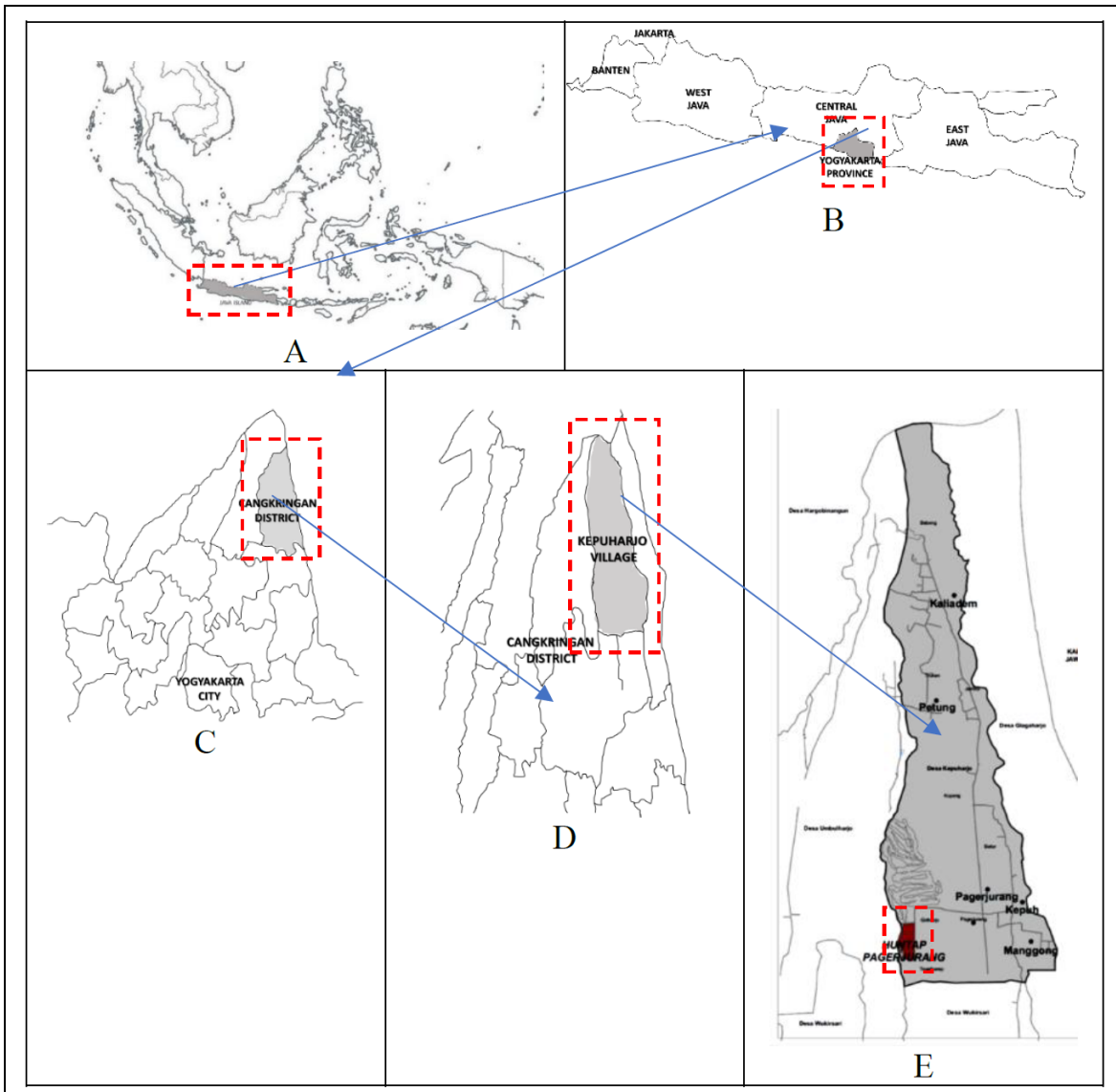
permanent shelter were found through the depth of the residential space, the connectedness of space, and the principles of Javanese house layout.

**3. Result and Discussion**

**3.1 Utilization Strategy of Space**

**3.1.1 The Characteristics of Pagerjuran Permanent Shelter**

Pagerjuran Housing has been inhabited since 2012. This is a new settlement for the people of Kepuharjo Village which was destroyed by a volcanic eruption. Pagerjuran permanent shelter is a permanent settlement with the largest number of units in Sleman Yogyakarta. The community consists of five hamlets on the slopes of Mount Merapi, namely Kaliadem, Petung, Manggong, Pagerjuran, and Kepuh, totaling 301 housing units. The research location is shown in (Figure 2).



**Figure 2.** Research location (Author)

A. Position of Java Island in Indonesia. B. Position of Yogyakarta Province in Java Island. C. Position of the Cangkringan district in Yogyakarta Province. D. Position of Kepuharjo village in Cangkringan District. E. Position Pugerjurang permanent housing and the hamlets in Kepuharjo Village.

The process of placing the housing units in the Pugerjurang permanent shelter is carried out by deliberation between the Head of Kepuharjo Village, the residents, and the Rekompak. The standard unit concept is called the core house<sup>[3]</sup>. The core house measures 36 square meters, with a total parcel area of 100 square meters. Each housing unit with a grant of IDR 30,000,000 and Rekompak applies the concept of a core house as a solution for providing housing in Java. However, residents were allowed to build the finishing unit independently. For construction purposes, as protection from recurring disasters, Rekompak applies high compliance with earthquake resistance requirements (Multi Donor Fund for Aceh and Nias, 2012).

This phenomenon shows that there was an agreement among residents to live a new life in the Pugerjurang permanent shelter based on life in Kepuharjo Village before the eruption. Firstly,

the name of the hamlet in Pugerjurang permanent shelter is based on the name of the previous hamlet in Kepuharjo Village. Secondly, each hamlet runs independently as before because it is still led by the previous hamlet head. In addition, there are mosques in every hamlet, and socio-religious activities and cultural traditions are carried out as previously done in Kepuharjo village. Thirdly, the arrangement of the units for each family is carried out through deliberation. Thus, each family has the right to one housing unit and chooses its position by considering its neighbors when living in the village of Kepuharjo. Fourthly, the economic life by raising livestock is still carried out in Pugerjurang permanent shelter. Every livestock that died as a result of the eruption of Mount Merapi in 2010 has been compensated by the government. It should be added that a communal cattle pen is provided for raising livestock on the west side of the Pugerjurang permanent shelter.

3.1.2 Activities and Setting in Dwelling Spaces

Activities carried out by the occupants are shown in Table 3. These activities are grouped into four categories: (1) spiritual, (2) cultural, (3) social, and (4) economic. These categories are arranged in two poles, namely sacred and profane. All activities

carried out at Pagerjurang permanent shelter are guided by all daily activities and rituals carried out in Kepuharjo Village. The author organizes activities and settings in residential spaces in group spaces, as shown in Table 2.

**Table 2.** Category of Space and Activity in Dwelling Spaces (Author)

Category	Activities
O	Activities carried out outside dwelling space
A	<i>Emperan</i> is transitional spaces between inner space and outer space.
B	Space to receive guests formally
C	Shared space for all family members
D	Bedroom, space used for sleeping
E	<i>Pawon</i> , space used for cooking
F	<i>Bathroom</i> , which is used for bathing, washing, and toilet
G	Space used for storing equipment and vehicle
H	<i>Kandang</i> , Cage, space used for animals, livestock
I	Space used for business and selling

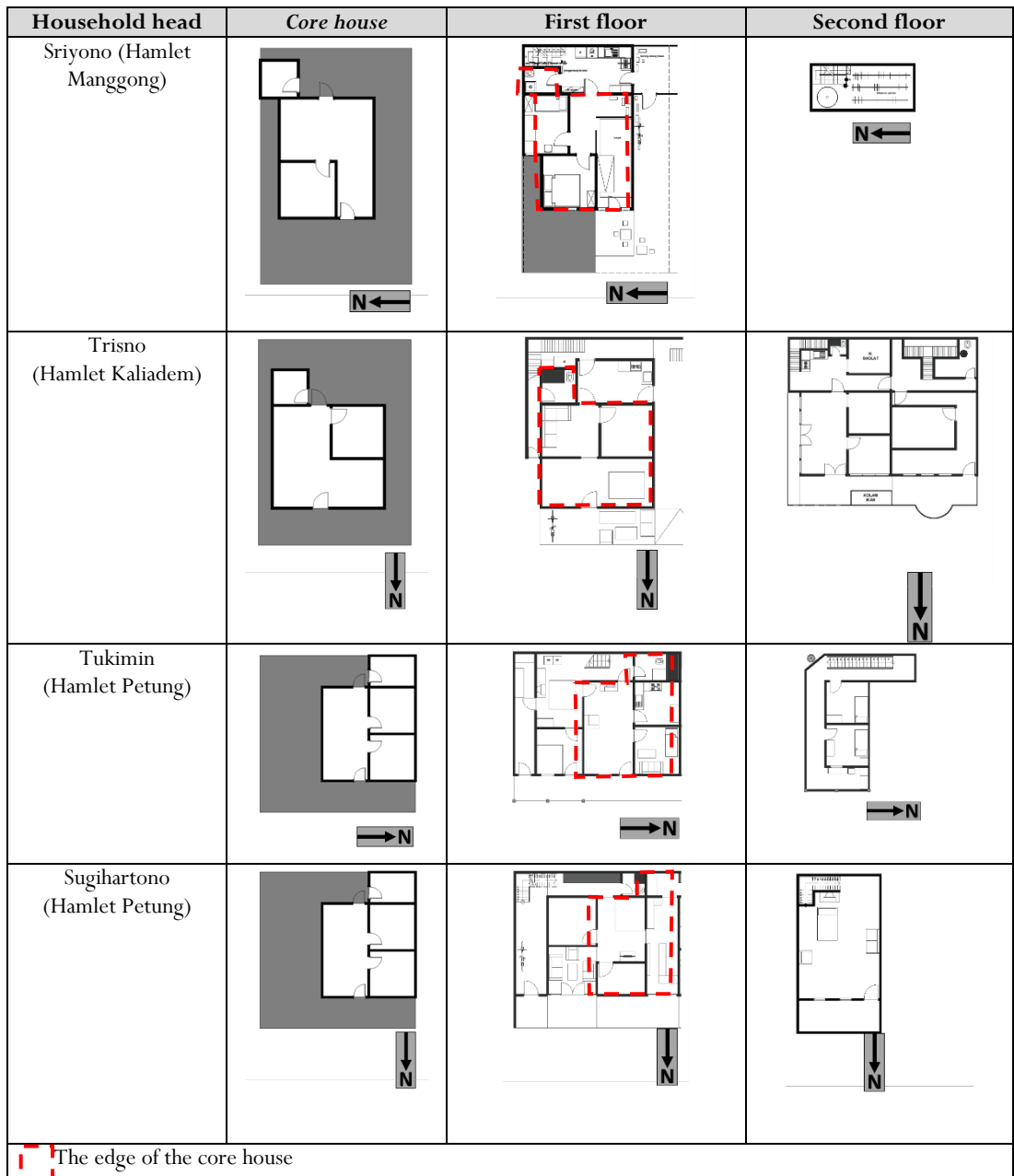
The category of space in the residential space in Kepuharjo Village and Pagerjurang permanent shelter obtained from interviews and observations turns out to be permanent, semi-permanent, and non-permanent. The permanent elements are the walls and structure of the unit. Semi-permanent parts are dividers and furniture which are easy to move. The non-permanent part is the activity of the residents themselves. Based on these elements, the floor plan and space category are described accordingly.

3.1.3 Expansion of Dwelling Space in Pagerjurang Permanent Shelter

The government provides an initial fund of IDR 30,000,000 for each family to build a core house with the basic structure. Through dialogue between the community and Rekompak,

three patterns of the core houses were obtained. The three patterns provide three spaces with a function: common room, bedroom, and bathroom. Patterns A and B have the same amount of space, namely one bedroom, one gathering room, and one bathroom, but the different ones were arranged from the entrance. Pattern C has two bedrooms, one meeting room and one bathroom. The pattern division is as follows: (1) pattern A consists of 12 units, (2) pattern B consists of 10 units, and (3) pattern C consists of seven units.

From 2012 to 2018 there has been a change in the position and size of space, as well as the shape of the unit. Firstly, a change in construction. For example, four units make up a two-story structure (Figure 3).



**Figure 3** Houses that Grow into Two-story Structures in Pagerjurang Permanent Shelter (Author)

In addition, the construction of the upper floors is based on the need for additional bedroom. Currently, the upper floors are widely used for storage, bedroom, living room. Secondly, the expansion is based on the needs of the bedroom. Five one-bedroom houses have made improvements to the shape of the rooms. However, not a single house unit that changed construction, for example Pak Heri's house from Manggong, was rented; therefore, construction changes are not allowed by the unit owner. It should be added that the two bedroom units have the most preference, which is 18 units. Four units have three bedrooms, one unit has four bedrooms (for example Pak Sardi's house from Kaliadem), and one unit has five bedrooms (Pak Trisno's house from Kaliadem). Thirdly, expansion of space due to changes in new family status. The number of families living in one unit is divided into two cases, namely: one

family and two families. The occupants of the chosen unit are generally one family. Initially the local government provided one house for one family. However, there are several cases where there has been an increase in the number of families following the transition process. Hence, there are three units occupied by two families. The increase in the number of families forced the addition of residential space to accommodate newly married couples.

After residents have occupied the main house since 2012, it turns out that they have added rooms in the house. These data represent additional space that accommodates the functions of the family room, *pawon*<sup>[4]</sup>, *tretepan*<sup>[5]</sup>, warehouse, and garage. The next level is the addition of a bedroom and living room. This data shows the trend of adding and developing space to

accommodate activities with categories C (family room), E (pawon), A (tretepan), G (storage room), B (living room), and D (bedroom). Rooms with categories C, E, A, G, B, and D, for spiritual, cultural and social activities.

### 3.1.4 Connecting Spaces Between Units

Limited space and cost are important factors that must be adjusted by residents. For this reason, the head of the household chooses a location by considering family relationships (Figure 4).



**Figure 4** Connecting space between houses in Pagerjuran permanent shelter (Author)

In the case of units 1 and 2, the connecting spaces are shared for social activities, such as meetings and household purposes, such as storage areas. Meanwhile, for units 5 and 6, the connected space is used for household activities, such as cooking and the garage. Likewise for units 7 and 8, the connected space is used

for household activities, such as cooking, which uses fire and the garage. In contrast to units 9 and 10, the connected space is used for household activities, such as cooking, washing and bathing. Likewise for units 12 and 13, the connected space is used for domestic activities, such as storing goods and vehicles. For units

14, 15 and 16, the connecting space is used for household activities, such as cooking and socio-cultural activities. Meanwhile, units 17 and 18, connected spaces are used for household activities, such as cooking, storing goods and vehicles, and for social activities, such as informal gatherings. Units 19, 20 and 21, connecting spaces are used for household activities, such as cooking and social activities. Likewise in units 22 and 23, the connected space is used for economic activities, such as selling goods and food for social activities, informal gatherings and cultural activities. For units 24, 25, and 26, the connecting space is used for domestic activities using connecting corridors, for social activities, such as formal and informal meetings, and cultural activities. Finally, for units 27, 28, and 29, the connecting space is used for domestic activities, such as selling goods for social activities such as formal and informal gatherings.

Referring to Figure 4, the connected spaces are categories O (outside), A (*tretapan*), E (*pawon*), F (bathroom), and G (storage space). It can be seen that the main function of the connecting space between units in the house is used for domestic and social activities. This connecting space also shows that the dividers between residential spaces are not essential, especially in units occupied by owners who have family relations. It can be seen physically that there is still a separation of space, but access

between residential areas is very open. The data show that the spaces are mostly connected at spatial depth levels of 1 (26%) and 5 (33%). The spatial depth indicates that the connected spaces actually occur in the front and rear rooms of the unit.

### 3.2 Relationship between Activities and Setting in Dwelling Space

#### 3.2.1 The Spatial Depth in a Dwelling Space

By using the spatial morphology graphic method, the level of control and space accessibility can be described. This will indicate the depth of the room. The value of spatial connectivity can be obtained through the depth of field. Connectivity is a dimension that measures spatial relationships by counting the amount of space that is directly connected in a spatial configuration. Measurement of spatial connectivity reveals the level of interaction of a room with other spaces around it (Hillier et al. in Siregar, 2014). The spatial depth of each unit in Kepuharjo Village and Pagerjurang permanent shelter is depicted by the depth of space for each unit (Figure 5).

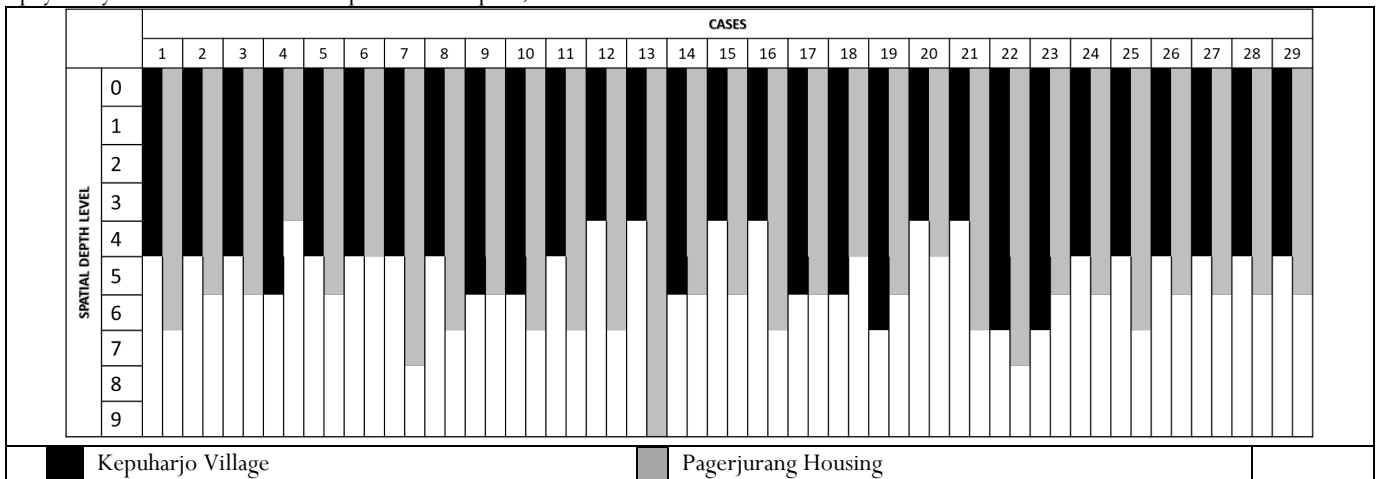


Figure 5 Spatial depth level of each case unit in Kepuharjo village and Pagerjurang permanent shelter (Author)

Figure 5 shows a black block that shows the level of spatial depth of the residential space in Kepuharjo Village. Meanwhile, the gray block shows the level of spatial depth in the Pagerjurang permanent shelter. From that figure, it can be seen that the spatial depth in the Pagerjurang permanent shelter is much deeper than in Kepuharjo Village. This indicates that the spatial

depth is caused by the need for a large residential space, but the available space is limited. Providing additional space is done by providing fixed elements and semi-fixed elements as space dividers. On the other hand, Figure 6 shows the room divider by *gedhek*<sup>[6]</sup> (6A), curtains (6B), and wood panels (6C, 6D).





**Figure 6.** Architectural elements as the space divider in Pagerjurang permanent shelter (Author)

- a. Space divider in Heri's house with a gedhek
- b. Space divider in Harjono's house with a curtain
- c. Space divider in Sriyono's house with a wood panel
- d. space divider in Mitrowiyono's house with a wood panel

### 3.2.2 Sacred and Profane Activities

Javanese life is inseparable from the belief that there is a spirit that can bring success, happiness, peace, or safety. But on the other hand, it can also cause mental and health problems and even death (Koentjaraningrat, 1993). Therefore, sacred activities must be carried out by the Javanese people to influence the universe. Activities carried out take the form of humble living, fasting, abstaining from exercising certain deeds or eating

certain foods, practicing salvation, and offerings. Dualism in the life of Javanese society is essential and can occur in public and private spaces, men's and women's spaces, spaces for gods and humans, because sacred and profane activities always occur in Javanese society. For the community of Kepuharjo Village, these rituals are still carried out after they resettled in a Pagerjurang permanent shelter, as shown in Table 3.

**Table 3** The Activities of the Pagerjurang Permanent Shelter Occupants (analysis by Author)

Sacred Communal/Individual Activities		Profane Communal/Individual Activities	
Spiritual	Cultural	Social	Economic
Praying (CNP)	Dandan kali (ceremony aims to pray for rain to the Almighty) (COP)	Formal/informal chatting (CND) (IND)	Ngobor (feeding cattle) (IOD)
Yasinan (read scriptures) (CNP)	Malam 1 Syawal (religious ritual for new year) (COP)	Merti Dusun (village cleaning ceremony) (COP)	Taking fodder (IOD)
Pengajian (a tradition to offer prayers)(CNP)	Tahlilan (ritual/ceremony to commemorate and pray for the dead)(COP)	Ronda (Neighborhood guarding) (COP)	food stalling (IOD)

	<i>Brokohan</i> (the Javanese traditional ceremonies to welcome baby birth) (CNP)	meeting of occupants (CNP)	<i>Milah sampah</i> (sorting garbage) (COP)
	<i>Selapanan</i> (the ritual of a 35-day-old baby) (CNP)	<i>Arisan</i> (rotate saving club) (CNP)	
	<i>Selamatan</i> (gathering ceremony to ask for blessing) (CNP)	taking a nap (IND)	
	<i>Kenduri</i> (CNP)	Eating (IND)	
	<i>Malam 17 Agustus</i> (ritual of Independence Day) (COP)	Cooking (IND)	
		Bathing (IND)	
		Washing clothes (IND)	
		Drying clothes (IND)	
		Relaxing (IND)	
		Storing goods (IND)	

C: Communal; Individually O: Outside house N: Inside house P: Periodically D: Daily

The categories of activities are carried out communal (C), individual (I), indoors (N), outdoors (O), periodic (P), and daily (D). The whole activities can be divided into two broad categories, namely sacred and profane. Cultural activities are conducted communal, inside and outside the house, and are carried out periodically. While, for social activities, they are communal and can be done inside and outside the house, which can be done daily. Economic activities are individual in nature, are carried out outside the house, and are carried out on a daily basis. Meanwhile, domestic activities are individual in nature, carried out daily in their house. It can be concluded that sacred activities require community involvement, where the implementation is carried out periodically in the house. In contrast, profane activities are carried out individually and need to involve the community, carried out daily in the house. Hence, there is a sharp contradiction between sacred and profane activities, especially with the individuals involved and the timing of their implementation.

### 3.2.3 Shared Spaces for Cultural and Social Activities

Data obtained through observations and interviews with a focus on permanent, semi-permanent, and non-permanent elements. Data obtained through photographs, sketches of residential space reconstruction in Kepuharjo Village, sketches of the spatial unit of the Pagerjurang permanent shelter, and the daily activities of the residents. The activities in these 29 units can be categorized into two main groups. The large group of activities consists of sacred and profane activities. Topological distance access charts are used to describe the relationship between the level of spatial depth and the category of residential space in Kepuharjo Village and Pagerjurang permanent shelter. The results of the access graph are illustrated in a matrix of the relationship between spatial categories, activity categories, and spatial depths that show the relationship between cultural and profane activities in the spatial category and spatial depth. The dominant common space occurs at spatial depth levels 0, 1, and 2. The data shows that in Kepuharjo Village, the dominant cultural activities occur at the spatial depth level 2 (Table 4).

**Table 4**The Proportion of Sacred and Profane Space to the Spatial Depth Level (analysis by the author)

Spatial depth level	Sacred		Profane	
	Kepuharjo	Pagerjurang	Kepuharjo	Pagerjurang
0		●39%	●9%	●19%
1	.3%	●23%	●29%	●11%
2	●94%	●30%	●19%	●17%
3		●8%	●19%	●16%
4	.3%		●16%	●20%
5			●6%	●12%
6			.2%	.3%
7				
8				
9				.2%

Based on the spatial depth analysis, it is found that the use of residential space is for cultural, economic and social activities. Figure 2 shows a common space for cultural and social activities. Socio-cultural activities occur at spatial depth levels of 0, 1, and 2 after resettlement to Pagerjurang permanent shelter.

The twenty-nine units have a unique pattern in the residential space in Kepuharjo Village and Pagerjurang permanent shelter. The position of space for cultural activities lies in the category O, A, B, C, D, G. The dominant positions are in A (emperan), B (living room), and C (family gathering room) (categories shown in Table 2). The dominant cultural activities are at level 2 in the village of Kepuharjo. After being relocated to Pagerjurang permanent shelter, cultural activities were spread out at spatial depth levels of 0, 1, and 2. Economic activities take place in living quarters, communal livestock sheds, and outside Pagerjurang permanent shelter. In accordance with the depth of space in Pagerjurang permanent shelter, the economic activity is at the spatial depth level of 0. It can be understood that the occupants' economic activities occur outside the home. In addition, the communal livestock pen serves as a source of income. Breeding dairy cows and cows is the livelihood of most residents. After being relocated, the room category H (cage) was not in the unit but was placed in another location: the communal pen on the west side of the Pagerjurang permanent shelter and another warehouse outside the Pagerjurang permanent shelter. This proves that the communal sheds are still preserved as the primary working location.

Social activities in Kepuharjo Village and Pagerjurang permanent shelter can also be explained. Most social activities in Kepuharjo Village occur at spatial depths at levels 1 and 2. After resettlement, social activities reach almost evenly at spatial depths at levels 0, 1, and 2. The similarity of activities from Kepuharjo Village to Pagerjurang permanent shelter is reduced at the depths of space level 1 and 2. The level 1 spatial depth in Kepuharjo Village is shown as a *tretapan*. The level 2 spatial depth is a formal meeting room, namely the living room (category B).

Domestic activities that occur in Kepuharjo Village and Pagerjurang permanent shelter are scattered at different spatial depth levels. Activities such as sleeping in Kepuharjo Village occur mainly at spatial depths at levels 3 and 4. After relocation, domestic activities also occur, especially at spatial depth levels 3 and 4. Cooking activities in Kepuharjo Village are dominant at spatial depth levels 3 and 4. In Pagerjurang permanent shelter, cooking activities mostly occur at level 4 depth. Bathing and washing activities in Kepuharjo Village occur at level 1 spatial depth, while in Pagerjurang permanent shelter it occurs at level 5. Informal family gatherings in Kepuharjo Village mainly occur at level 2 spatial depth. However, in Pagerjurang permanent shelter, family gatherings are more dominant at spatial depths 2 and 3. The main activities of these domestic activities indicate that domestic activities occur at spatial depths of levels 1, 2, 3, 4, and 5. Based on the spatial depth mapping of Pagerjurang permanent shelter, there is a common space between cultural

and social activities, which occurs at the spatial depth level: 0, 1, and 2.

### 3.2.4 Value of Space Connectivity for Cultural and Social Activities

The value of space connectivity shows the position of the room with other rooms. The room with the highest connectivity value indicates that space is associated with many different spaces. It is revealed that the balance between the contradictory elements of activity and space in Javanese society occurs in the middle of the residential space (Ju et al., 2018). The middle part of the living space is represented in *senhong tengah*<sup>[7]</sup> (the middle room in the house of common people) or *krobongan* (the middle room in the upper-class houses). The analysis revealed that the reflection of the spatial connectivity of Kepuharjo Village and Pagerjurang permanent shelter occurs at spatial depths level 2 and 3. The dominant position at level 2 spatial depth in Kepuharjo Village shifted to level 3 spatial depth after being resettled to spatial depth level 2. The data analysis shows that the connectivity space occurs in the category B and C, namely the categories of formal and informal gathering spaces for guests and family members. Spaces with high connectivity values are at spatial depth levels 2 and 3. This position reflects the value of spatial connectivity that also occurs at spatial depth levels 2 and 3 in Kepuharjo Village. The value of spatial connectivity that occurs at spatial depths 2 and 3 indicates that this is also the center of the residential space of the Pagerjurang permanent shelter. The center of residential space is also a shared space for cultural and social activities for the community of Kepuharjo Village.

### 3.3 Transformation of Dwelling Space and "Gotong Royong"

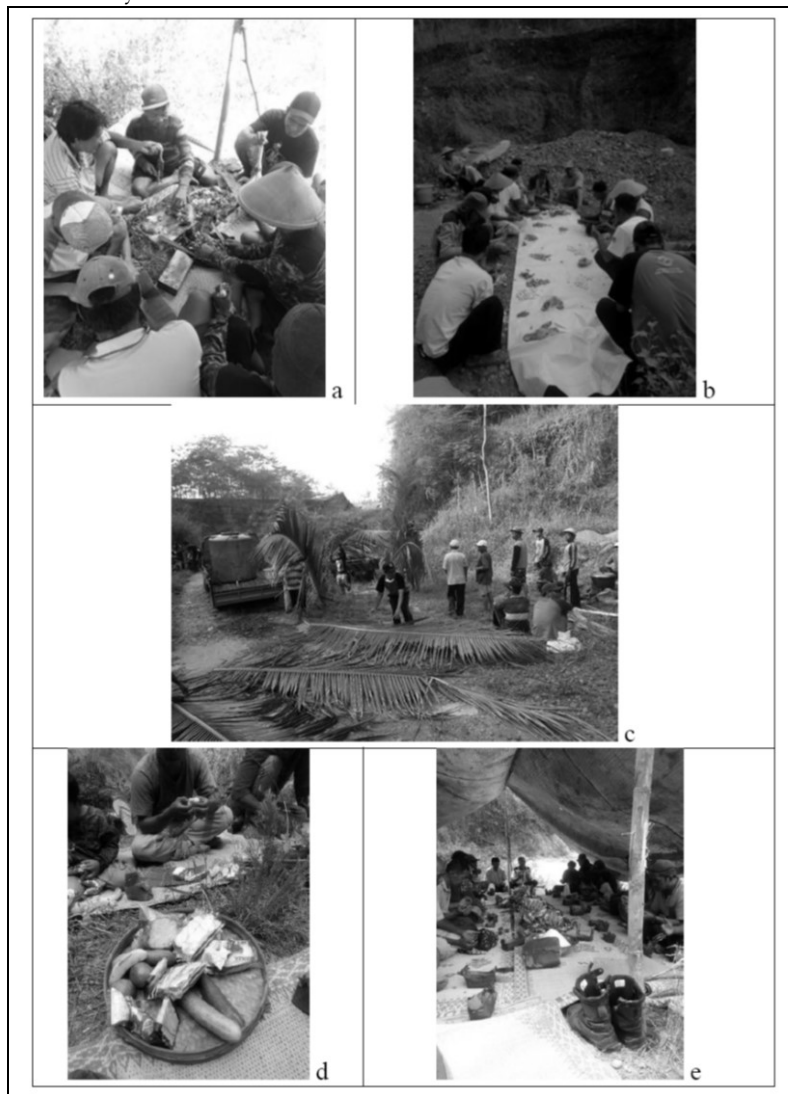
In Javanese upper-class houses, cultural space is a private domain within the house. The *Pendopo* represents social space as a public space. Cultural activities and social activities have strict limits. Subroto (1995) mentions that the three parts of the Javanese traditional house are often referred to as *omah ngarep* (front house), *omah jero* (inner house), and *omah mburi*<sup>[8]</sup> (rear house). Social activities are in *Omah Ngarep*, while cultural activities are in *Omah jero*. The houses in Kepuharjo Village have a village house spatial pattern. In this village house pattern, cultural and social activities use shared space. Cost-related factors determine the integration of cultural and social spaces. Despite it has limited costs, each residence has unlimited space.

After moving to Pagerjurang permanent shelter, sacred and profane activities were carried out in cultural and social activities. Referring to Table 6, the shared space between cultural and social activities is dominant at the spatial depth levels 1 and 2. The space categories at the spatial depth levels 1 and 2 are A, B, and C. Activities that occur in Category A, B, and C are in *tretapan* as informal gathering space, living room as formal gathering space, and family room as informal gathering space for families. These activities are related to social activities and are carried out daily (Table 5). These social activities can occur periodically between residents and the community and

between individual residents. Periodically refers to the time chosen based on sacred events.

Tjahjono (1989:100) states that the omah is divided into the outer and the inner part. *Emperan* (verandah or porch) is the outer part. On its east side stands usually an *amben* (bamboo bed), its west side is reserved for receiving guest(s). In Pagerjurang permanent shelter, when profane activity occurs, the verandah/porch is a place for receiving guests. However, *emperan* (verandah/ porch) was an extension of the living room during cultural activities, while the layout of furniture was changed by moving the *amben* and rolling out mats. Limited funds and space are factors in the occurrence of common space for cultural and social activities. Due to limitations, cultural activities require community support, which in the end, cultural activities as a private sphere in Javanese culture becomes public. The space used is also a space that is easily accessible by the community. Table 4 confirms that

the inner space used is at the spatial depth levels 1 and 2. Besides that, due to limited space in Pagerjurang permanent shelter, some cultural activities require additional space. There is an expansion of space where communal space and public space get permission from the occupants to be used as additional space for cultural activities. The use of public space as a shared space is expressed through various cultural events. The *dandan kali* or *becekan* ritual<sup>[9]</sup> is performed by residents of Manggong, Kepuh, and Pagerjurang hamlets on the Gendol River [Figures 7a, b, c]. Rituals are performed at the end of the dry season to pray for rain and are performed as part of *gotong royong* (mutual-cooperation) by men, including cooking, providing a goat to be sacrificed, and space for *kenduri*<sup>[10]</sup> (feast). The highlight of the *becekan* activity is *kenduri* which is done by sitting cross-legged and praying. The prayer is led by a *modin*<sup>[11]</sup> (cleric). The *Kenduri* is ended by eating together the food brought by the participants who had been prayed for [Figure 7d, e].



**Figure 7.** Ritual *Dandan Kali* (*becekan*)(photograph by Author)

a. *Preparing the ritual of dandan kali by a community of the manggong hamlet*      b. *The ritual of dandan kali by a community of the pagerjurang hamlet*      c. *Preparing the ritual of dandan kali by a community of the Kepuh hamlet*  
 d. *Food in the tray for the kenduri*      e. *Implementation of the kenduri led by a modin*

The need for additional development space was marked by the construction of a meeting hall in each hamlet in Pagerjuran permanent shelter. The meeting hall is a representation of the hamlet hall in Kepuharjo Village. The halls are also used for cultural ritual activities that invite many residents. Cultural rituals carried out in the meeting hall can be either individual or communal cultural activities. One of the communal cultural activities featured is the festive night of Indonesia's Independence Day on August 17th. The night of *kenduri* on August 17 is a tradition carried out by the people of Petung Hamlet to be grateful for the independence of the Republic of Indonesia.

The development of spatial planning is also demonstrated by the use of public spaces together, such as roads and residential spaces for local residents. Cultural activities involve the collaboration of all residents in the use of public spaces and residences. One example is the preparation for marriage by residents of the Petung hamlet in Pagerjuran permanent shelter. In preparation for the wedding ceremony of Pak Paing's daughter, it is called *rewang*<sup>[12]</sup>, a tradition in which residents cook together and prepare a shared room for the wedding ceremony. The residences of the neighbors around Pak Paing's house were used for additional preparation space.

#### 4. Conclusion

This study found that a reflection of the cultural and social life of the people of Kepuharjo Village in a residence after being resettled in Pagerjuran permanent shelter. Firstly, the people of Kepuharjo Village who live in Pagerjuran permanent shelter gradually develop their houses. This development is highly motivated by family values. For example, increasing the number of rooms to provide private space for newly married family members and the formation of connecting rooms that extend and connect residential spaces where the owner has a family relationship. Secondly, the socio-cultural values in the life of the people of Kepuharjo Village who resettled at the Pagerjuran permanent shelter greatly influenced the development of the depth of space. Thirdly, in terms of limited funds and space, socio-cultural activities are attached to one another so that the socio-cultural space is merged. Fourthly, the common space between cultural and social activities at Pagerjuran permanent shelter has become the core space which is the center of the residential space.

These findings also reveal the process of reviving the social and cultural values of the people of Kepuharjo Village. This is because the relocation process must be carried out suddenly by the community. Private cultural activities require validation to involve public social activities. Limited funds and space are resolved through overlapping spaces involving cultural and social activities. The positioning of the space is located without difficulty both visually and its accessibility.

Finally, the findings of this study confirm that socio-cultural values cannot be separated from the life of the people of Kepuharjo Village. Socio-cultural values are still applied in adapting to changes in the shape and dimensions of space. The

socio-cultural reflection on the residential space of the Kepuharjo Village community at Pagerjuran permanent shelter is in line with the social principles of *gotong-royong*<sup>[13]</sup>. *Gotong-royong* takes place in three aspects, namely: *gotong-royong* of space, *gotong-royong* of human power, and *gotong-royong* of resources. *Gotong royong* has eliminated the boundaries of residential space and supports spatial development. *Gotong royong* is expressed in the strengthening of space, expansion of space, and agreement on space. This is important because many countries in Asia are threatened by natural disasters. In Indonesia, many settlements were damaged by volcanic disasters. This study can be part of a spatial reference pattern for the provision of new relocation residential spaces, especially for rural refugees damaged by the disaster.

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## Notes

[1] *Rekompak* is the name of a community-based approach to large-scale reconstruction of homes and community infrastructure initiated in Indonesia by the MDF (Multi-Donor Fund) and JRF (Java Reconstruction Fund)

[2] *Omah* is a term used for vernacular homes in Javanese society

[3] A core house built in the basic construction and have one room for sleeping, one bathroom and a shared space for the community in the permanent house

[4] Space for cooking, eating, and resting. This space is located on the back of the house

[5] *Tretepan* is a term for the terrace of the house. It is an open building with an extended roof of the main building

[6] *Plait* made of bamboo planks for the walls of the house

[7] *Senthong* is a space used for resting and storing some sacred items. In Javanese houses, arranged in three parts, middle, left and right. *Krobongan* referred to central *senthong*

[8] The traditional Javanese house divided into three sections. The first section, *omah ngarep* referred to the front house. The second section, *omah jero* is central of the house. The third section, *omah mburi* referred to the service area at the back of the house

[9] *Dandan kali* ceremony also called *becekan* is a traditional ceremony of the community of Kepuharjo village. The ceremony is held for blessings and prays for rain.

[10] *Kenduri* also called *selamatan* is a gathering ceremony for asking blessings. The ceremony is carried out by the men.

[11] The man to read the prayer

[12] Participation of community for preparing the celebration

[13] *Gotong royong* is a type of mutual aid among community member in Indonesia