Territorial characteristic through residential boundaries on Indo-Tiongkok relocation housing in Neuheun, Aceh Besar

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Abstract. Residents create boundaries through territories control according to what they feel, need, and their abilities in technical and technology. That is why territorial boundaries will be able to reflect the characteristics of the particular residents. This research is conducted in Indo-Tiongkok relocation housing which is located in a rural hilly area. Those aided houses were uniformly shaped given to the tsunami victims with very diverse socio-cultural conditions. This research uses survey methodology, observes the architectural object of plot boundaries, and in-depth interviews to find out the reasons for the creation of the boundary pattern. The result shows the characteristic in general, the pattern of the fence as a boundary appears based on social needs (self-actualization) and external disturbances, namely: a) disturbance that appears in limiting the activities of foreigners to the residential area; b) disturbance from animal pests to protect gardens and houses.. This research concludes that the development of residential boundaries for relocation housing is influenced not only from the internal aspects of the residents but also from the external aspects of the environment. In determining the relocation of post-disaster relief homes in rural areas, the threat of wild animals needs to be considered in planning housing areas.

1. Introduction

The 2004 tsunami devastated most of the coastal settlements so that many villages were relocated by providing assistance in the form of special housing areas for tsunami victims [1]. Relocation housing assistance after the 2004 tsunami in Aceh is generally built-in suburban rural areas that are safe from the threat of the tsunami hazard, such as in the Neuheun Village, Mesjid Raya District, Aceh Besar Regency. The housing development is generally designed in a certain pattern with a uniform type of house and the same footprint area, so that housing assistance does not differ between occupants and looks uniform.

The uniformity of the character of the residents’ dwellings is gradually changing, especially in the development of plot boundaries. Plots boundaries as architectural works become important to mark the boundaries of the controlled areas and even become identities of the residents [2]. The boundaries of the residential lot will form the architectural space of the residence. A dwelling has an area boundary which means ownership of a residence. Control of the coverage area means the ability to cover the area, limiting entry from outside interference. This is a way of human instinct in understanding the built environment.
The territory has the meaning of the occupancy where humans live and limits what comes in and out of the area.

Figure 1. Location of Indo-Tiongkok housing in Aceh Besar regency. Contour map, interval: 2 m.

The Indo-Tiongkok relocation household area, which consists of 600 lots with a house type of 42 m$^2$, is built in a grid following the contour pattern. The house is placed in the middle of the plot of the lot, where each plot does not have a clear land boundary visually, but the owner of the house knows the boundaries of each plot. The drawing of the location can be seen in Figure 1, while the environmental design, and the placement of the house in the lot can be seen in Figure 2.

Figure 2. Housing condition in the initial development without fences after two years of inhabitations.

Also from Figure 2, it can be seen that the community in their early years of occupation, the developer does not provide a fence directly. Homeowners start to build their fences with their characteristics according to their needs. The character of territorial boundaries also arises from the social right to defend oneself against outside interference. It is revealed that the territory in the architectural environment and behavior is defined as the extent to which a living organism determines its demands, marking, and defend it, especially from the possibility of intervention from other parties [3]. This concept was originally developed for a living organism is not human, but later used for human and environmental concerns are also perceived as an imaginary environment. Meaning for humans, the concept of territory is more than the demand for a regional spatial and physical, but also emotional and cultural needs.

The selection of Indo-Tiongkok as a subject is the reason why this research is important. Currently, the boundary is built using various kinds of types, from wooden fences, iron, bricks which can be questioned for the specific reasons toward the construction of these types of boundaries. The more
diverse the character of the community, the more varied the pattern of control of the occupancy site will be. The research was conducted in an Indo-Tiongkok relocation housing located in a rural hilly area, because the aid houses were uniformly shaped, given to tsunami victims with very diverse socio-cultural conditions. This study intends to understand how each person develops boundaries that describe their identity. This research is important to do concerning post-disaster relief evaluation of relocation housing, how the process of assimilation of a heterogeneous society, through the architectural creation of its residential environment. We can also observe how creativity in character building of a society, that views the forms of freedom of expression and which positive values will be transmitted to other residents. That is why the selection of Indo-Tiongkok relocation housing is an option where based on the data obtained, there is a diversity of ethnicities and work backgrounds of the residents of the housing. Besides that, the disturbance of wild animals from the hills outside the housing area has become a major consideration for how people protect their living space.

2. Theoretical review
Territoriality is related to human behavior toward their environment [4]. Territoriality is one behavior attributes that have a relationship between individuals, groups/organizations with the physical setting. Accordingly, it is explained that individuals in a physical setting related to behavior, activities, places, and times [3]. While, a physical setting has physical element and activity [5]. From some of these points of view, it can be concluded that there are three main territoriality elements, those are physical setting (territory), actors (individual/group), and a variety of activities. The need to cultivate crops makes the need for physical boundaries to protect residential areas from the environment. For example, garden predators such as disturbance of cows, goats, and wild boar. The three elements in the area boundary are land for cultivation, users as well as the farming activities.

2.1 Territory and boundary characteristic pattern
The territory is defined as occupying the behavior of humans. The physical formation might not yet be included here. The boundary that creates the territory is not mandatory. But more on the control of space. Personal space is a universal phenomenon, although a special dimension is determined by the culture of society. Territorial boundaries are not maintained by body language. However, it must be communicated with a marker. Other people must understand the boundaries of the territory being communicated so that these boundaries are not violated. The most basic way can be seen in the form of stones to pillars that indicate the borderline.

Although the boundary does not always mean territory consistently. The livestock fence is to restrict livestock from leaving, not to prevent others from entering. Walls and fences divide space, it may or may not mean a boundary. Gates as a housing boundary are constantly being challenged. If no one prohibits these restrictions from being breached, then the gate does not mean an area limitation that prohibits entry for everyone. And this will be repeated over and over again until there is a direct ban.

Any vacant land where there is a certain owner when there is no marker can be violated until real control is taken.

2.2 Claim on boundary
Claims on the boundaries of a residential area can be realized either in real or abstract ways. Fences, walls, or plants usually mark the coverage of a residence. This shape becomes a marker of territory for property owners, and a marker for its surroundings. Even without a fence, the property can still appear to be a private area with manicured grass that claims the boundaries of the residential area.

Meanwhile, the abstract form with differences in the ground material or using landscapes as a form of social limitation from the owner. Even though the doors and terraces of the house are boundary forms, they do not necessarily mark the boundaries of the house area. It's the garden of the house where the house is built. Doors and terraces can be boundaries to higher hierarchies. The built-up formation can be a claim to territorial boundaries, continuously from various outside environment disturbances.
2.3 Territorial hierarchy
The boundaries of a residential area have a hierarchy, housing has a hierarchy to even reach the city scope. In each hierarchy, different permission is required to enter within the boundaries of the region. In architecture, usually, the term of public, semi-public to private spaces are used as a guideline for the hierarchy of boundaries in a residential area. The fence plays the most crucial role in what can enter into a deeper room. Control from the top of the hierarchy plays the most important role in what is allowed within the boundaries of the area. The fence clarifies the boundaries between the dwellings in this discussion.

3. Research method
This study uses a survey methodology to observe the footprint of the housings and in-depth interviews to know the reason how the creation of the boundaries occurs. Direct observation is to see more clearly the house fences and boundaries between neighbors. This makes it easier to understand the boundaries between occupants that occur in the social community. Where the fence becomes a clear boundary of the residential area between spaces resulting from area boundaries. Data is taken in the form of random sample house sites, which shows a significant difference in architecture.

Environmental studies require the development of a methodology that includes inspection of the physical area of observation in the form of photos and floor plans, user observations of the environment, and direct interviews with users, which focus on use and reactions to the environment and are carried out by investigators with qualified skills. After seeing each house firsthand, we can compare the boundaries of each dwelling. These boundaries will greatly depend on the culture and perceptions of the people with different hierarchies of boundaries. The finding can be successfully spotted based on previously researched theories.

Furthermore, in our observations, we can compare the physical boundaries of a dwelling with the perception of area boundaries directly depending on the differences in people's perceptions of the boundaries of occupancy and local culture. The discussion in this study will emphasize the comparison between settlements and how culture can influence the definition of boundaries seen from the Indo-Tiongkok housing complex. Especially in finding the defensive character patterns of the local community.

4. Result and discussion
The territory is the formation of an area to achieve optimal privacy that is sought by developing physical settings [6]. Types and levels of privacy are influenced by behavior patterns in the cultural context, personality, and aspirations of individuals. Walls, screens, symbolic boundaries, and tangible boundaries, as well as distance, are mechanisms for showing privacy. The character of defense can be seen from the behavior patterns of the local community in a cultural and emotional context. A house that is a symbolic residence requires a marker at a higher level to give clearer boundaries. Further varied needs of residents to complement the psychological and aesthetic needs of the building.

From direct observation and discussion with residents of the houses in block C of the Indo-Tiongkok relocation housing. It was found that approximately 50% of the residents do not make the dwelling there as the main house for the owner. Some leave their houses empty, some are renting out, and some are using them as visiting houses. The difference in the atmosphere of a house that is occupied permanently and that which is not permanent can be seen in the management of the house barriers (Figure 3).

If we compare the coupling house as in Figure 3. It is clear that the character of the different boundaries between the occupants who make the main house and the house that is not inhabited by residents. Fences appear as markers that help restrict outsiders from entering private areas. Not only outsiders, but many animals are predators of plants in gardens. Moreover, residents like to plant plants in the form of chilies, pineapples, jackfruit, bananas, and so on. Fences become territorial boundaries that prevent plant predators such as wild boar, goats, cows from entering their territory. The need for gardening of the occupants creates physical boundaries that directly protect their territory from outside threats.
Figure 3. Coupling house: the difference in condition on occupied houses and vacant.

4.1 Emotional and cultural needs

The need for residents of the house to create clear boundaries to present a better aesthetic as in Figure 3. Besides that, it is also able to provide emotional comfort so that residents can feel safer and protected when in their homes.

In Figure 3b, the aesthetic that appears shows a high control over the function of the fence, the appearance of modern materials with contemporary colors shows that the residents come from educated urban people, have a high profile and high individual impression. Unlike the fence in Figure 3a, whose aesthetic function comes from natural materials, it is simple but has good natural knowledge. Low profile and met the purpose to protect themselves.

Territoriality is an individual or group relationship with the physical setting, which is illustrated with a sense of belonging and efforts to control the use of space [6]. In concrete terms, characterized by territoriality placement (occupancy) symbolically with attachment points (attachment). The territory is a space that can be defined and controlled by an individual or group through the use of physical space, ownership, defense, use exclusively, or signs of identity-oriented spatial access [7]. The identity of residential ownership is a factor in the existence of a marker of a physical residence. Furthermore, a part of the dwelling becomes a temporary residence for the settlers and further boundaries become a solution.

The residents of the housing complex who were victims of the earthquake and tsunami in 2004 consisted of various cultural, professional, ethnic, linguistic, and religious backgrounds. Table 1 indicates the types of work for residents of the housing complex.

| No | Occupation                  | Number of people |
|----|-----------------------------|------------------|
| 1  | Farmers                     | 73               |
| 2  | Fishermen                   | 59               |
| 3  | Entrepreneur                | 34               |
| 4  | Construction workers        | 90               |
| 5  | Traders                     | 47               |
| 6  | Government employees        | 30               |
| 7  | Retired                     | 7                |
| 8  | Others                      | 150              |

The residents of the housing complex live blended between employees, fishermen, farmers, motorcycle taxi drivers, civil servants, traders, and entrepreneurs. In terms of ethnicity, there are indigenous Acehnese, Aceh-Javanes, Padang, Batak, Chinese, and other ethnic groups. There are so many differences between fellow residents who live in the housing complex. However, of the many differences that exist, the most highlighted is the existence of religious differences. The housing complex is inhabited by some non-Muslim Chinese residents.
A visiting house needs clearer boundaries to avoid outside disturbances. This is also supported by the owner's higher economic level. Every need is realized optimally, not only based on the need for regional boundaries, but also aesthetics and culture. Territoriality has four main characters; ownership or rights from somewhere, personalization or marking of a particular area, the right to defend itself from outside interference, and control of multiple functions, ranging from meeting basic needs to the satisfaction of psychological cognitive and aesthetic needs [8]. The boundary has four main characters. Where in Indo-Tiongkok relocation housing, the character of the territorial boundaries arises from the type of fence that is presented by the occupants of the house. Because the house built from the developer does not provide a fence initially. Homeowners build their fences with their characters according to their needs. The character of territorial boundaries also arises from the social right to defend oneself against outside interference. From the data collected, socially the people in the Indo-Tiongkok relocation housing consists of various ethnicities and professional backgrounds, with different interests.

So it can be concluded that the community does not integrate completely with fellow residents of the housing. From the observation, the fence looks stronger for people who have sufficient funds to build according to their needs. The control that emerges from Lang is further explained by Robert Sommer following the needs of the homeowner. A shelter that becomes a symbolic temporary residence requires a marker at a higher level to provide clearer boundaries. Further varied needs of residents to complement the psychological and aesthetic needs of the building appear from several buildings.

4.2 Securing activities and natural predators

There are four types of territoriality that are useful in environmental design; attached territory, central territory, supporting territory, and peripheral territory [8]. We can identify three distinctive levels of territoriality, namely: personal space, home base (a space that is well maintained), and home range (is a behavior set that is built by somebody's life) [9]. From the author's observations on the habits of the residents as seen from one end unit of block G, the occupants of the house create a wider area boundary (home range) from their daily work activities. The inhabitants raise chickens across from their house. Road boundaries are no longer public places that can be crossed by many people. However, it is claimed to be the boundary of the user's territory. Moreover, the last house beside them was no longer inhabited for a long time. It appears that the claim for boundaries includes roads that are positive for the improvement of the community's economy (Figure 4a).

Sommer [10] stated that a territory is an area controlled by a person, family, or other face-to-face collectivity. Control is reflected in actual or potential possession rather than evidence of physical combat or aggression - at least at the human level. Robert Sommer emphasized that possession/ownership in the terms of the territory is more important than a desire to defend the territory from encroachment. Territories are areas controlled based on ownership and exclusiveness of use. 'This is Mine' or 'You keep off' [10]. From what Robert Sommer said, ownership is far more important than a concern to defend territorial boundaries from disturbance. In Indo-Tiongkok housing, there is a lot of disturbance from livestock and wild animals. So that active behavior to make clear boundaries is very important. This is
done to protect the territory from disturbance because animals do not use the same social assumptions as humans.

From the shelter in block G, there is a case from a garden who is own by Batak, a similar statement has been made stronger but the boundaries are strengthened by the presence of dogs to guard the garden (Figure 4b). Large gardens filled with organic vegetables require assistance from guard dogs to protect the garden from predatory animals. The differences in the culture of the residential owners who came from outside Aceh provided a choice of types guarding in various ways.

4.3 Boundary transparency
The same thing can be understood from public spaces such as SDN 3 Neuheun which has a transparent fence. This is done to provide an understanding that the area is open to admitting other people with interests such as school employees and students studying at the school.

We can distinguish the territory into four types; personal territory, territorial communities, society territory, and free territory [8]. The four types of these territories are classified based on: 1) Control degree that is used by other people, 2) A person or group of people who do the counterpart, and 3) the existence of a signal which has the function as a control point. If one of these elements do not exist or do not work effectively, the ability of territoriality formation territory will decrease. Area boundary formation is determined based on these three things for optimal boundary clarity. It is also seen that the boundaries of social facilities are more open than those of private areas [11]. This can be seen from the Village Secretariat facility in the area. It can therefore be concluded that the character that emerges from a boundary is determined by the need to limit external interference. From this theory, we can also see the hierarchy of the territorial boundaries in the Indo-Tiongkok relocation housing and how the strength level of the territorial boundaries is present in this housing.

The degree to which the individual feels inaccessible to the family (or family to the neighborhood) may be expressed in the thickness of the boundary, its degree of imperviousness, the distance from family spaces. The degree to which the individual feels accessible to the family (or family to the individual) may be expressed in these physical boundaries by the degree to which the boundary is broken by doors, windows, its proximity to family spaces, etc. The thickness, resistance of the fence, and the distance from the family room can be a transparent hierarchy of boundaries of a dwelling. A residence that uses a high and sturdy fence will have the meaning of keeping a distance from other people who live around it. Meanwhile, a house with a fence that is more transparent and simple means that the residential approach is more open to other people, as shown in Figure 5.

![Figure 5. Fence transparency which accommodate occupant personal character.](a) (b) (c)
5. Conclusion
The boundary has four main characters. Where in Indo-Tiongkok relocation housing, the character of the territorial boundaries arises from the type of fence that is presented by the occupants of the house. Because the house results from developer to the owner does not provide a fence directly. Homeowners build their fences with their occupant characteristics according to their needs. The character of territorial boundaries also arises from the social right to defend oneself against outside interference.

From the fact that the Indo-Tiongkok relocation housing consists of various ethnicities and work backgrounds, it appears that the interests of each occupant make the fence as a barrier appear very diverse, both in quantity and quality. This can be concluded that the community does not integrate completely with fellow residents of the housing. The difference in the economy of the people is visible in the appearance of the fence. However, in general, the pattern of the character of the fence as a regional boundary defense appears based on social needs (self-actualization) and external disturbances, namely:

- a) disturbance that appears in limiting the activities of foreigners to the residential area;
- b) disturbance from animal pests to protect gardens and houses.

This research concludes that the development of residential boundaries for relocation housing is influenced not only from the internal aspects of the residents but also from the external aspects of the environment where the housing location is located. Rural hilly areas are dangerous for residential gardening architecture from disturbance of wild animals. Therefore, it is necessary to pay attention to the existence of a buffer environment outside the housing environment, so that wild animals do not interfere. In determining the relocation of post-disaster relief homes in rural areas, the threat of wild animals needs to be considered in planning housing areas.

6. Acknowledgments
This paper is an initial review of the Master of Architecture thesis plan at the Faculty of Engineering Unsya and at the same time being involved in the research of the head lecturer Dr. Ir. Elysa Wulandari, M. T. entitled: Changes in the spatial housing area for tsunami relocation and its impact on the area's sustainability system, Case study: Neuheun Village, Mesjid Raya District, Aceh Besar Regency.

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