KnE Social Sciences

ISTEcS 2019
Equity, Equality, And Justice In Urban Housing Development
Volume 2019

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Conference Paper

The Development of Settlement in the Tsunami Red Zone Area of Banda Aceh City

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Abstract

This study aims to describe the rapid growth of settlement development in the red zone, Banda Aceh City. The qualitative descriptive of the method used in this study, and data collection through literature study for secondary data. Primary data gathered from observation and interview toward some developers of housing located in the red zone of tsunami's impact, Banda Aceh City. Finally, data analysis using the Delphi method. The study result showed various main reasons for the rapid growth in the development of settlement in that area. The Banda Aceh city government needs to have strict standards in building permits for red-zone tsunami area. The red-zone area has stated in "Qanun Kota Banda Aceh No. 2 Tahun 2018" including nine districts. This rule has not been adequately enforced. This can be seen from the growth of residential housing in the tsunami red-zone area that grew rapidly after 13 years of tsunami occurred.

Keywords: Development of Settlement, Tsunami Red Zone

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Received: 24 May 2019
Accepted: 25 July 2019
Published: 4 August 2019

Publishing services provided by Knowledge E

Selection and Peer-review under the responsibility of the ISTEcS 2019 Conference Committee.

1. Introduction

On 26 December 2004, Banda Aceh City was devastated as a result of earthquake and tsunami which occurred terribly [1–5]. But, now (2018) 14 years after the tsunami, Banda Aceh City had developed rapidly, as if that tsunami disaster never occurred at all in Banda Aceh City. If there are no tsunami monuments such as tsunami museum, tsunami's victim mass grave, floated PLTD boat, and various objects left by the tsunami in Banda Aceh City, it is probably that Banda Aceh City people had forgotten the tsunami disaster which ever occurred.

Development in various sectors is done again from zero after earthquake and tsunami destroyed Banda Aceh City on 26 December 2004. This development becomes an initial step in rehabilitation and reconstruction to restore Banda Aceh City to the condition before a tsunami occurs. Development is the planned growth and change effort which is done consciously by a nation, country, and government, toward modernity in the

effort of nation-building [6]. Then, [7] Development is the effort to develop or improve and increase the value of a thing which has been existed. Development also means humans' attempts to direct social and cultural change in accord with the goal of life in nation and state, that is, to achieve the growth of social and cultural life based on the targets which had been set.

The development not only in infrastructure sector but also in economic, social, education, agriculture, plantation, fishery, and another sector have a significant contribution to people's welfare and life in a region or area.

Speaking about development in physical sector or infrastructure, it is strongly related to the spatial plan. Banda Aceh municipality launched Spatial Plan 2009-2029 in "Qanun Kota Banda Aceh No. 2 Tahun 2018". Regarding the disaster-prone area mentions "disaster-prone areas are areas with conditions or geological, biological, hydrological, climatological and the geographical area for a certain period reduces the ability to prevent, dampen, reach readiness and reduce the ability to respond adverse effects of specific hazards.

Specific discussion of the tsunami area, in article 49 paragraph 8, Tsunami prone areas are located in: (a) Meuraxa District; (b) Kutaraja District; (c) Kuta Alam District; (d) Syiah Kuala District; (e) Jaya Baru Subdistrict; (f) Baiturrahman District; (g) Baiturrahman District; (h) Banda Raya District; and (i) Lueng Bata District.

Infrastructure development occurs rapidly in Banda Aceh City, such as administrative center building, shopping center, entertainment center, people housing, star hotels which continuously increase each year in Banda Aceh City. Then, the development of housing in Banda Aceh City is as rapid as development in another infrastructure. It is seen from the increasing number of new house and settlement each year in Banda Aceh City. The development of Banda Aceh City today mostly constructed by the government and private agency who become a stock investor in Aceh Province.

It is undeniable that housing (settlement) is a primary need for society as home to do various activities such as take a rest after doing all activities in the office, to do worship and family gathering. House is a building which functions as home or residence and place for the family to stay [8]. It is as mentioned in the Republic of Indonesia Act No. 1of 2011 about housing and settlement area. Chapter I, Article 1, clause two states that housing is a collection of houses as part of the settlement, both in the urban area and rural area completed by infrastructure, facility and public utility as the result of effort in fulfilling livable houses. Clause 3 about settlement area is part of the life environment outside the protected area, both in an urban and rural area, which function as the living environment and the place of activity which support life.

The development of new housing (settlement) in the area of Banda Aceh City and Aceh Besar Regency located in the red-zone area of a tsunami also grow rapidly. As if that the developer build houses for people without considering the aspect of safety from a natural disaster. Whereas it had been mentioned earlier in Republic of Indonesia Act No.1 of 2011 about housing and settlement area, Chapter II article 2 state that housing and settlement area is established based on principles of a) welfare; b) justice and equality; c) nationality; d) efficiency and benefit; e) accessibility and feasibility; f) independence and togetherness; g) partnership; h) suitability and balance; i) coherency; j) health; k) preservation and sustainability; l) safety, security, order and regularity.

According to the author, the developer who builds the houses in the area of red-zone tsunami area pays less attention to the safety aspect of people who stay in those housing and settlement from tsunami disaster which can occur anytime and cannot be predicted before. As happens in another region, the development of houses or settlement usually starts from core regions to suburb and also influenced by some factors such as land scarcity, population pressure and the need for housing infrastructure.

Based on observation result in field, there is no land scarcity in Banda Aceh City as happens in another area, " At a global scale, the land is becoming a scarce resource, asserting the need for more efficient land use allocation [11]. There are so many lands that exist in Banda Aceh City and Aceh Besar Province mainly which are not located in tsunami red zone. The lands are still, and those empty lands are very deserved to be built for housing, office, storage, and other functions. Unfortunately, the developer agency more interested in building house in tsunami red zone than in another area which is safe from the tsunami disaster.

Land scarcity usually happens as a result of economic globalization occurs in an area, and that land scarcity also effected on the change of land use function exist in people life. Economic globalization combined with looming global land scarcity increases the complexity of future pathways of land use change, predictions of the expected land use impact of national policies have become more uncertain [11].

The population of Banda Aceh City is 254.905. The population growth in Banda Aceh City is 1.84% per year with population density is 4.154 people /Km2 [12]. If it is seen from that data, the increasing number of population in Banda Aceh City also not happens rapidly or massively. So it impacts on the low level of population pressure which happens in Banda Aceh City. Population pressure is concerning the urgent need for food and housing [13].

Even though the level of population pressure is absolutely not high in Banda Aceh City, but it is undeniable that the need for housing facility in Banda Aceh City is very

high, and people enthusiasm to buy house in Banda Aceh City also very high, so the developer build the housing in the area of Banda Aceh City. It is also influenced by the increasing economic growth in Banda Aceh City marked by many job opportunities, so the increase of workforce who come from outside area cause the need for housing is also increasing.

The development of new settlement (housing) in Banda Aceh City should consider the aspect of urban land use which is natural disaster-friendly. Land use plan is a process to determine the structure of land or pattern which comprise various land use plan, the aspects of environmental preservation among other is physical condition of disaster prone-area, so land use plan must be in the long term [14].

As mentioned previously, the Spatial Plan of City of Banda Aceh 2009-2029 it requires to give an effort for the aspect of safety from the natural disaster. Banda Aceh municipal government have to socialize its disaster prone-area map as well as disaster safe-areas map. The developer should also consider that aspect of disaster prone-area when building houses for people in Banda Aceh City.

“Focusing on the last point, one way to provide people with knowledge on safe route and destination is by conducting regular evacuation drills. However, the drill is expensive to be carried out, and it is difficult to enable many residents to take part” [15]. People should know which area that become red zone from tsunami disaster so that they know the safe place to save themselves from tsunami disaster [16]. It aims to reduce the number of deaths if tsunami disaster occurs again in Banda Aceh City in the future, to avoid numerous of disaster victims as happen when tsunami stroked Banda Aceh City in 2004.”

The concept of land use which is good and tsunami disaster- friendly will help reducing death toll as a result of tsunami disaster, the area included in red zone from tsunami disaster cannot be inhabited by people, or in the other word, there should not too many people who inhabit that red zone area [16]. However, the red zone (prone-area) of tsunami disaster is the area located in the surrounding of the coastal area. Based on various problems which had been explained above, then the author is interested in studying the phenomena which are occurring now with the title “The Development of Settlement in Tsunami Red Zone, Banda Aceh City, Aceh Province.”

2. Methodology

The qualitative approach and the descriptive of the method used in this study, and data collection through literature study relevant to the theme discussed for secondary data,

for primary data collection used observation and interview. The subject characteristic in this study toward some or ten developers of housing located in red-zone of tsunami area, Banda Aceh City. Finally, data analysis using the Delphi method.

3. Result and Discussion

Today, the development of settlement and housing area is overgrowing in Banda Aceh City. The red-zone of tsunami area considers in the southern of Banda Aceh City that has a direct border with Aceh Besar Regency. This area becomes the main center of development or new city of Banda Aceh City. It includes Batoh/Landom and Lhong Raya areas which become part of Banda Raya Regency and Lueng Bata Sub-District. Meanwhile, those two districts clustered in the red-zone tsunami area in Banda Aceh. The map of red-zone of tsunami area as seen at Figure 1.

MAP OF RED-ZONE OF TSUNAMI AREA IN BANDA ACEH

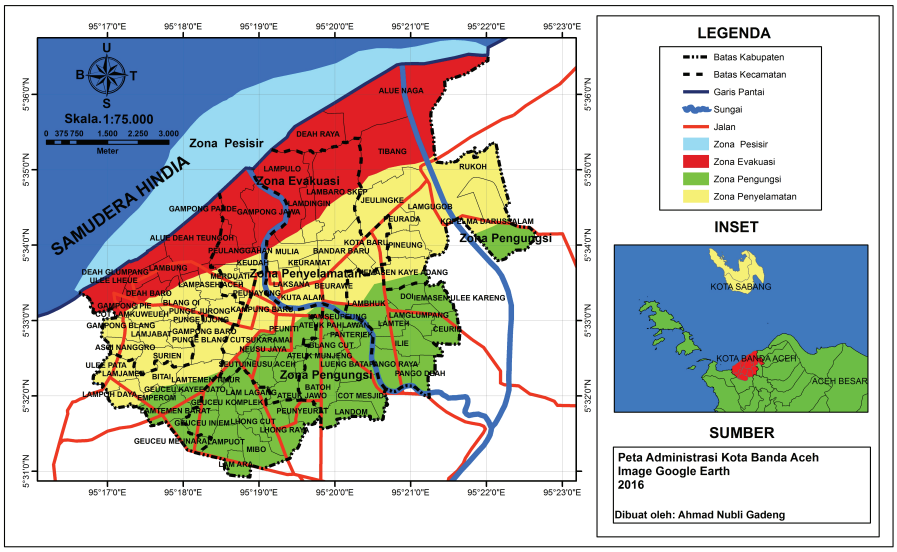

Figure 1: The Map of Red Zone Tsunami Disaster Banda Aceh City. (Source: redraw by author based on Administrative Banda Aceh map.)

Based on the result of observation conducted in the field, the land in tsunami red zone such as in Banda Raya Sub-District, Lueng Bata Sub-District, Ulee Kareng Sub-District, the price relatively higher compared to another area. The rate for housing market prevailed in Banda Aceh City in particular and Aceh Province in general, namely about ± Rp.800.000,00 until > Rp.1.600.000,00 per meter. The prices in those sub-districts consider higher compared to other areas, which categorized as expensive housing.

This article then describes the areas that are located in red-zone of tsunami area based on the disaster area that had occurred on Sunday, 26 December 2004. Later, it is compared with the Regional Spatial Plan of Banda Aceh 2009-2029, specifically for Jaya Baru Sub-District, Meuraxa Sub-District, Kuta Alam Sub-District, Baiturrahman Sub-District, Kuta Alam Sub-District, and Syiah Kuala Sub-District. So many new settlement and housing grow and develop in some sub-districts which are disaster prone-area, particularly a settlement that subsidy from the government. It is because some of those sub-districts become the main center or old city of Banda Aceh City which ever destroyed as a result of tsunami disaster 14 years ago. It also because the land price in sub-districts of tsunami disaster prone-area is relatively low. As for market price prevailed in Banda Aceh City in particular and Aceh Province, in general, is about ± Rp.300.000,00 until Rp.800.000,00 per meter. Cheap and easy accessibility are the main reasons people buy houses in the city of Banda Aceh [18, 19]. The following is Figure 2 which display the map of Banda Aceh City.

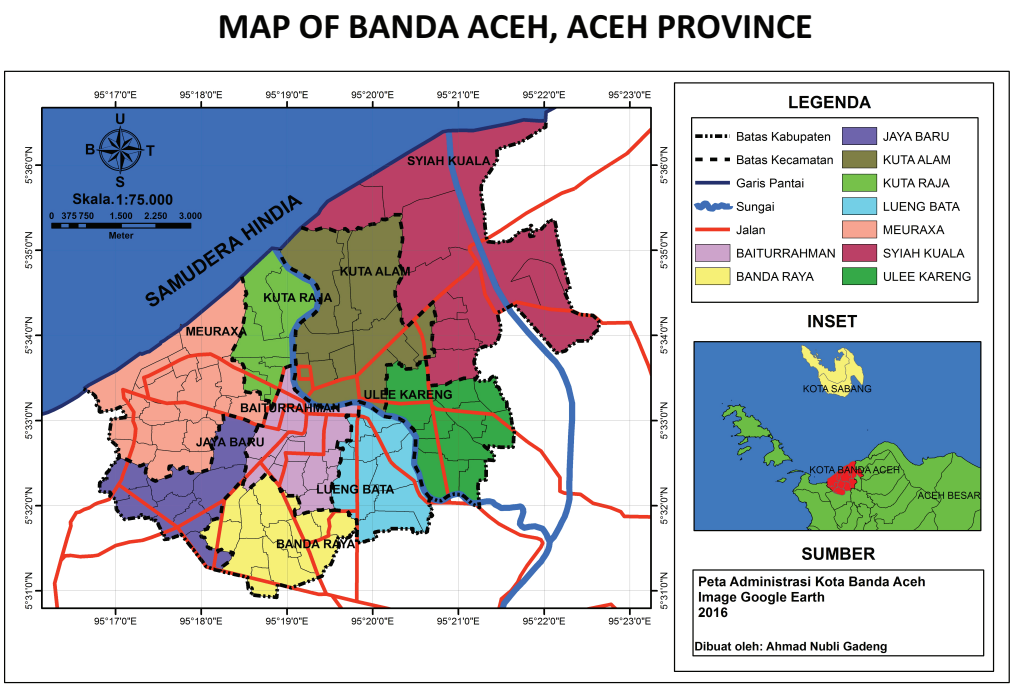

Figure 2: The Map of Banda Aceh City.

The people of Banda Aceh City in particular and Aceh Province, in general, give a positive response to the development of new settlement and housing located in red-zone of the tsunami disaster. People enthusiasm to buy the subsidy house is evidenced by the units of the house provided in that new settlement which sold out quickly just around two months. Even the location of the new settlement is located in red-zone of

the tsunami. The majority of consumers who buy the house in Banda Aceh Province are those who are immigrants and the people who never experience tsunami disaster. Very few people who ever experience tsunami are interested in buying again the house in settlement and housing located in the red zone (prone area) of the tsunami disaster. The traumatic felt influences it by Banda Aceh people which is not recovered totally as a result of tsunami disaster occurred on 26 December 2004 ago until the present time.

Various reasons/motives of consumers [18–20] who buy the house in settlement and housing located in red zone tsunami, among others are: First, people believe that if tsunami will not come again in until a century ahead. Second, people only surrender and accept the fate/reality which comes from God (Allah SWT). These people have believed that the disaster is the willing of God. Aceh people also have a principle "whenever we go, and if the dead comes to us, we will die anyway." That principle means that avoid tsunami, we stay away from the sea and go to the mountain (the higher place). And even vice versa, to prevent volcano eruption, we go to the sea. The conclusion is at sea the tsunami occurs, in the mountain the volcano eruption occurs. So, there is no safe place from disaster in this world. That's the principle inculcated deeply in the heart of Aceh people now, and traumatic feeling is related to the psychology of aspect [19].

Third, the traumatic feeling begins to fade away and disappear. There are few people who had forgot [21, 22] tsunami disaster occurred 14 years ago, and also people had known the right procedure of tsunami disaster mitigation, so people are not afraid anymore to live in settlement and housing located in the red zone (prone area) of tsunami disaster, so people have alerted tsunami disaster. Forth, particularly for immigrants and people with middle and lower income [18, 19], there is no other alternative house with low price and near the workplace for people who live in around Banda Aceh City and Aceh Besar region. Fifth, the house bought now is made to become media for investment [19] in the future, because home is valuable property and it is impossible that the price will decrease from purchasing amount. Indeed, the house's price will continuously increase each year, and the house can be rented and become a business opportunity.

Sixth, particularly for immigrants and people who stay outside Banda Aceh City and Aceh Besar Regency, the house can be made to become transit place when they are visiting Banda Aceh. Seventh, particularly for immigrants and people who stay outside Banda Aceh City and Aceh Besar Regency, the house is an investment for their children to stay when they continue their study in the future because Banda Aceh City is the most significant education center existed in Aceh Province. Another attraction of the city is the availability of higher education, the variety of entertainment facility and amusing modern life [23]. Those are seven motives of consumers why they buy the house located

in settlement and housing of a red zone of the tsunami. The researcher had found the answer when conducted a study in the field.

As for the primary purpose of developers to build settlement and housing in red zone (prone area) of tsunami disaster are: First, it is because the land price which is cheaper [19] makes developers are more interested in developing housing in some sub-district located in tsunami disaster prone-area (red zone), so the developers can sell it with lower price to consumers. Second, it is because the need for housing facility in Banda Aceh is very high [19, 20]. Consumers' high demand for housing evidence. The rapid development and advance influence it in Banda Aceh City which causes many immigrants to come to Banda Aceh City to find a job, and they need a comfortable house to stay together with their family. This positive and excellent market opportunity make the developers increase more settlement and housing development located in the red zone (prone area) of the tsunami disaster, with an expectation to reap a significant financial profit. In determining the excellent and ideal location for settlement and housing then it should consider political and economic factors: easy in its marketing because the potential consumers prefer the location and it can give average profit for its developers [24].

Third, it is because the developers want to develop or rebuild some sub-districts which are located in the red zone (prone) of the tsunami disaster, the availability of empty land in that area which has not been utilized by people and government. The destruction of all facility and infrastructure in those sub-districts caused by the tsunami, make many people trauma and prefer to sell and leave the land of the house they own before a tsunami occurs in Banda Aceh City. And also many people who move and build their home in safe zone area of the tsunami disaster. The developers expect that by rebuilding settlement and housing located in the red zone of the tsunami disaster, the population will increase in some of those sub-districts and the economic level can develop as expected by the government.

Forth, the area of red zone of tsunami is located in the old city center of Banda Aceh City, so it is accessible and near with workplace and various centers [23][24][18][19, 20] such as worship center, government center, education center, market center, health center, and entertainment and recreation center for public. Inland use, it should consider the accessibility aspect which is in accord with Chapin, 1995 [25]. The land use for city service facility tends to approach the access of goods and humans, so it near with transportation network and accessible from settlement area, and education facility.

In determining the good and ideal location of settlement and housing, it should consider the feasibility factor: it is better to choose the location which is accessible to

get drink water, electricity, school, market, hospital, public health center, etc. [24][19, 20]. It better that the location is accessible from the resident's workplace.

Each change in land use certainly will bring direct and indirect impact on people's life around that area. The impact can be positive and negative [26]. Similarly, it happens in Banda Aceh City. There is a positive and negative impact of settlement and housing building located in the red-zone of tsunami-. The following is positive impact of building housing in tsunami red zone (prone-area): First, the construction of settlement and housing can help people to own house which is deserved to be inhabited with low price and accessible by all people [23][24][18][19, 20], from people with low, middle and high income. It also helps the government to create subsidy housing and reduce slum area.

Second, the development of this settlement can utilize empty and unmaintained land to become productive land which has a high selling value. Formerly, most of the properties in the red zone tsunami area are unused vacant land with bushes, wild plant and swam [24]. Determining good and ideal location for settlement it should consider land utility factor which is (a) it is not riced field area, (b) it is not functional plantation area, (c) it is not business area such as shop, office, hotel, factory/industry; not destruct the existing environment, even improve it. Finally, there is no empty land anymore located in the red zone of the tsunami disaster, so the conversion of land function become very beneficial for Banda Aceh City people and government in particular and Aceh Province government in general.

Third, the settlement and housing development can create a pleasant climate in economic because the new centers of population growth in Banda Aceh City are established. It is because the land had been inhabited by many people and filled by various activities, and automatically the shops will grow and develop a shopping center in people-environment to fulfill their daily needs. So the outcome of this trading can increase household income of the low-income family. [24] in determining the good and ideal location of settlement and housing, it should consider economic factor: creating job opportunity and business for surrounding people. Finally, it can eliminate isolated and undeveloped area in Banda Aceh City. The area located in the red zone of tsunami should avoid the overcrowded population so that disaster evacuation can be done quickly when tsunami disaster occurs in the future.

Banda Aceh City government also easily give the building permit to developers of housing located in tsunami red zone area (prone-area), so the government can implement well the regulation which had been mentioned in Urban Land Use Plan of Banda Aceh City in the year of 2009-2029. The settlement and housing located in

the red zone of tsunami divided into two categories, namely subsidized housing, and non-subsidy housing. The following is table 1 which display the house price based on its type.

Table 1: The list of house price in the red zone of tsunami area, Banda Aceh.

No.	Type of House	House Price (IDR)	Description
1	Type of 36	Rp. 195.000.000,000	Government Subsidies
2	Type of 38	Rp. 195.000.000,000	Government Subsidies
3	Type of 50	Rp. 270.000.000,000	Government Subsidies
4	Type of 54	Rp. 440.000.000,000	No Government Subsidy
5	Type of 55	Rp. 280.000.000,000	Government Subsidies
6	Type of 65	Rp. 300.000.000,000 up to Rp. 480.000.000,000	No Government Subsidy
7	Type of 70	Rp. 500.000.000,000	No Government Subsidy
8	Type of 80	Rp. 540.000.000,000	No Government Subsidy
9	Type of 85	Rp. 450.000.000,000	No Government Subsidy
10	Type of 100	Rp. 600.000.000,000	No Government Subsidy
11	Type of 115	Rp. 670.000.000,000	No Government Subsidy
Source: Field compilation, 2018			

Table 1 above shows the type of house, and the price offered to consumers. As for the house provided is from type 36 to type 115 with price from Rp.195.000.000,00 to Rp.670.000.000,00. These houses are located in the red-zone of tsunami areas, such as Jaya Baru Sub-District, Meuraxa Sub-District, Kuta Alam Sub-District, Baiturrahman Sub-District, Kuta Alam Sub-District, and Syiah Kuala Sub-District), so it is no surprise if they are offered with the price which relatively cheap. In contrary, if the houses are located in a safe tsunami zone, then the price offered will be more expensive or higher. The things which should be considered in the development of settlement and housing are zoning; utility technical factors; locations; aesthetics; community; city services, and cost [18].

The intensity of settlement development in the red-zone of tsunami area started in 2010 and remain until now. On the other hand, the victims of the tsunami, previously received fund assistance from the government and foreign donors, so they moved from the area.

One crucial point of housing in the red-zone tsunami area is that developers pay attention to their building structures for earthquakes. They realized that geologically Banda Aceh is in a position prone to earthquakes as well as the tsunami.

4. Conclusion

The cheap land price becomes the main reason for developers to develop settlement and housing which are located in the red zone of tsunami. Consumers have a positive response also become a consideration in the development of the settlement. The development of settlement in the red-zone of tsunami starts in 2010 without obstacles on managing building permit issued by Banda Aceh City government. Today, as if people more prioritize accessibility to various centers exist in Banda Aceh City than considering the aspect of safety from tsunami disaster, and as if that people now had forgotten tsunami disaster whichever occurred 14 years ago in Banda Aceh City.

Unavailability of binding rules for spatial planning and building permits also found as a weakness in housing construction in the red zone tsunami area.

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