Study on the Green Open Space in the Context of Disaster Prevention in Kampung Urug

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Abstract. While Indonesia is facing many natural disasters, for example earthquake, flood and heavy rain, the people living in traditional villages (locally called Kampung), have kept a sustainable life for a long time. This study focuses on Kampung Urug which is located in Sukajaya District, Bogor, West Java. The traditional community has some unique characteristics such as green open spaces, architectural buildings, ritual and customs, events based on local wisdom. However those in some traditional villages and nearby areas are on the verge of being lost due to rapid expansion and development. The name of Kampung Urug is related to the geographical conditions which is located on a hillside, with high rainfall. Because of the potential for landslides, this village is called Urug, which means landslides in Sundanese. There are some studies from the viewpoints of architecture or history about Kampung Urug, but there are few studies investigating from disaster. The purpose of this study is to find stakeholder perceptions of the green open space in the context of disaster, to analyze a spatial approach to minimize the disaster impact, and to find traditional social approaches and physical or technical approaches of local wisdom. Based on field surveys, agriculture is generally conducted in green open spaces, and land use is flexibly adapted to landslides and erosion. One reason for this is that many farmers are willing to maintain the farmland as much as possible. There is no change in the region where agriculture has been thriving since ancient times. It is necessary to create evacuation maps based on traditional land use and past disaster histories.

Keywords: disaster, green open space, Kampung Urug

1. Introduction

A large number of incidents ended with disasters in some parts of Indonesia. Indonesia is facing many natural disasters, for example earthquake, flood and heavy rain. Several number of disasters in 2019 was caused by heavy rainfall, a trigger for floods and landslides. The combination of nature and anthropogenic is the main cause of the increasing some kind of disasters.[1] There is a movement to promote disaster prevention infrastructure that can be achieved not only with concrete as green infrastructure.

Most villages in Indonesia urbanized along with the development. Among them, some villages have continued their traditional life. Kampung Urug is one of the traditional Sundanese villages that still maintains its local wisdom. There are principles of simple and independent living held by the people of Kampung Urug. One form of self-sufficiency here is that people can fulfill their own needs. A natural environment that is well maintained and managed so that it can provide these needs. Peoples live with the surrounding natural environment in harmony. Local wisdom practices are carried out for generations so that the environment can be used sustainably and maintained for the next generation.[2]

Analyzing the green open space in the context of disaster prevention in traditional village based on local wisdom is important to study in order to know how to manage the village and
improve disaster prevention. By identifying the factors it is possible to create an evacuation route map.

2. Study Purpose
The purpose of this study is to find stakeholder perceptions of the green open space in the context of disaster, to analyze a spatial approach to minimize the disaster impact, and to find traditional social approaches and physical or technical approaches of local wisdom.

3. Study Method
3.1 Study Area.
This study focused on Kampung Urug, Sukajaya District, Bogor, West Java, geographically located at coordinates 6 ° 34 '42" S, 106 ° 29' 28" E. Kampung Urug is located 42 km from Cibinong and 165 km from Bandung. It was included in the Kiara Pandak Village area, Sukajaya Subdistrict, until it finally expanded in 2012.

The boundaries of the Urug traditional village include: the front or north boundary is the tomb of karuhun, the border on the east is the Cidurian River, the south border is the prohibited forest, and the western border is the break slope of Amirmita's house. The total land area is 24.2 ha (242,234 m2). The location of the Urug traditional village is on the outskirts of the Cidurian River which is also the boundary of Sukajaya District with Nanggung District. The indigenous inhabitants of the traditional village of Urug are Sundanese and still use Sundanese as the main language in their daily interactions. The livelihoods of the residents of the Urug traditional village are still dominated by farming activities, then the second highest number is followed by trade activities that are mostly cultivated by young people. The total population of Kampung Urug is approximately around 3217 people (900 families) in 2016.[3]

The name of Kampung Urug is related to the geographical conditions which is located on a hillside, with high rainfall. Because of the potential for landslides, this village is called Urug, which means landslides in Sundanese.[4]

3.2 Materials and Methods
To find stakeholder's perceptions of the green open space in the context of disaster, interviews by using the map was employed. The community of Kampung Urug has the kasepuhan system as an institutional system in its community led by a traditional leader, Abah Kolot. Now the Abah Kolot is Abah Ukat, who acted as a traditional leader since 2004, continuing Abah Adang. In addition to the customary leader there are no other leadership positions or roles such as representatives or others in the history system. The survey included 4 village peoples, including Abah Ukat, and Abah maman.

To find the layout of spatial phenomenon including constructions, roads, houses and topographical conditions, land use survey, a fieldwork and a literature survey were employed.[3]
4. Results  
4.1. The perceptions of green open spaces  
Results on the perception of the stakeholders on the disaster in Kampung Urug showed the village people are generally agreed that a great disaster in Kampung Urug is landslide that occurred in 5 to 8 years. They don’t have books and records related to disaster history, however, the landslide that caused the collapse of 3 houses seems to be new to the memory of the village people. The causes of disaster is new residents built the houses in steep area, even though local village people knew it was danger.

At the same time soil crack was occurred in the same area, the place is now used for *leuit*; storehouse to store rice or crops (Figure 2). On the other hand, formerly *leuit* become housing area because the number of people is increasing.

Besides landslide, soil erosion in rice field is also problem. Village people needed to carry the soil from the forbidden forest to near rice field because of soil erosion.
Figure 2. Soil crack and leuit

Figure 3. Risk of landslide
Figure 4. Elevation map

Figure 5. Land use map
4.2. Spatial awareness for disaster

As a result of interviewing the villagers about the dangerous and safe areas, the result was an area where both dangerous and safe areas were organized like Figure 3. It turns out that the safe area for the villagers is around their homes, and flat place in topography. On the other hand, dangerous area was where landslides and fire once broke out and people were damaged. But most of the people have been aware that the area has been safe since the disaster has not occurred since the landslide.

![Figure 6 Spatial awareness for disaster in Kampung Adat Urug](image)

4.3. Management method of the green open space

Abah maman said there are forbidden forest and activity forest, and village people do maintenance every Wednesday and Sunday. The name of the forbidden forest is *Hutan Laragan*. There is no fruit tree not to allow the people enter into for a long time.

The village have a traditional rule, religion, government. When they build new houses, they usually held a ritual activity before construction, during construction, and after construction to pray construction safety.

5. Discussion

Based on field surveys, agriculture is generally conducted in green open spaces, and land use is flexibly adapted to landslides and erosion. One reason for this is that many farmers are willing to maintain the farmland as much as possible. There is no change in the region where agriculture has been thriving since ancient times.

On the other hand, they have crisis management efforts to consciously reduce the risk of landslides in the green open space. For example, in the forbidden forest, fruits tree or vegetable are not planted and only a limited number of people can enter it, and in places with steep slopes, storehouses were created instead of a house for living. In this way, sustainable living has been carried out by combining unconscious norms that have been naturally
protected in the agricultural system for a long time and conscious efforts to complement them. In order to prevent the loss of a culture based on traditional wisdom of the area as the population grows in the future, it is possible to increase the value of the area from the aspect of disaster prevention and to make a plan that considers people's safety it is conceivable that how to manage the village and improve disaster prevention.

6. Conclusion
The big disaster in area was landslide. The causes of the landslide is that new residents built the houses in steep area, even though local village people knew it was danger. As the population increase, similar natural disaster can occur. Although the people have somehow recognized, they have no clear understanding of land use and green open space.

As a result of interviewing, it turns out that the safe area for the villagers is around their homes, and flat place in topography. On the other hand, dangerous area was where landslides and fire once broke out and people were damaged.

The village have a traditional rule, religion, government. These local wisdom not only strengthen the unity of the village communities, but also protect human lives from natural disasters.

It is necessary to create evacuation maps based on traditional land use and past disaster histories. Evacuation map can be used to make formula new regulation in other villages. And the importance of the role of green open spaces in traditional village provide recommendations to the government, community and related stakeholders in green spaces.

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