



Coastal Urban Community Knowledge of Coastal Hazard and Conservation in Semarang towards Sustainable Development Region

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Abstract

Coastal is the most vulnerable area in climate change, with no exception in Coastal Java island. Reveal, 65% of the Java island population is to be vulnerable to coastal hazards such as tidal flood. The northern Java coastal area has a significant position in logistic connectivity throughout areas in the entire Java island. Abrasion and sedimentation are the most frequent effect were impacted to the coastal land cover (i.e. ponds, mangrove forest, and settlement). However, there is a lack of awareness among local communities, although they directly impact of those hazards. This study aims to identify local community knowledge of coastal disaster mitigation in Mangunharjo, Tugu sub-district Semarang, by using quantitative methods. Field observation and a simple descriptive statistic were used to analyze. The result showed that the majority of the respondents has high vulnerability on coastal hazard and disaster since they are living very close to the coastal water body.

Keywords: coastal; community; disaster; hazard; vulnerability

1. Introduction

The capacity development is one of the most effective on disaster risk reduction (DRR) (Hagelsteen & Becker, 2013). The ability of the community to have resiliency on DRR depends on their capacity on practices and local knowledge (UNU-EHS, 2011). Local community knowledge and understanding about their surrounding neighborhood is fully needed to be effective in reducing the impact of disaster. Based on the The United Nations International Strategy for Disaster Reduction (UNISDR) terminology, hazard is "a dangerous phenomenon, substance, human activity or condition that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage". Thus, disaster is "a serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources" (Niño-southern, 2009). Since Semarang urban coastal community has high vulnerability of marine disaster, disaster risk reduction (DRR) at local level is essential.

Semarang is one of the strategic city on Java island where has the opportunity to be a metropolitan city in the future. It can be seen from the new population, industrial, and economic growth in recent years, in northern Semarang city. Mainly, coastal northern Semarang is dominated by industrial, business-economic, and settlement where often impacted by tidal flood both on the dry season and wet season (Ambariyanto & N.S, 2012). Cities will double impacted by natural disasters than in another environment (Ginige, Amaratunga, & Haigh, 2014; Amaratunga, Malalgoda, Haigh, Panda, & Rahayu, 2018).

Serious coastal hazard problem is directly facing northern Semarang cities such as abrasion, land subsidence and sedimentation (Abidin, Andreas, Gumilar, Sidiq, & Fukuda, 2013; Widiasamratri & Aswad, 2017). The direct impact of coastal hazard is clearly affecting surrounding local community where

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potentially to be disaster in future by (1) increase sea-level rise and coastal flooding hazard, and (2) increasing coastal exposure to these hazard due to on-going coastal development (Martinez, Armaroli, Costas, Harley, & Paolisso, 2018). A community's resiliency of DRR can be improved when latest technique and knowledge integrate (Hiwasaki, Luna, & Shaw, 2014). This study aims to identify local community knowledge of coastal disaster mitigation in Mangunharjo.

2. Methods

A quantitative method applied by combined two analysis techniques: field observation and a simple descriptive statistic. Field observation was used to observe an existing condition in focus area impacted on the coastal hazard (i.e., abrasion, and tidal flood), whereas the descriptive statistic was used to analyze the distribution frequency of the questionnaire. The research was done in the dry season (August 2018) for three weeks. The questionnaire was used to assess the spatial and disaster mitigation knowledge of respondents based on their understanding of DRR. Three issues that identify to the respondents, namely: community DRR knowledge; regulation knowledge; and the community affected by tidal and inundation

The questionnaire is distributed to the Mangunharjo (Figure 1) communities randomly. The total number of samples was 100 respondents (30 – 50-year-old).



Figure 1. Mangunharjo, Semarang Municipality
(Source: Authors' Analysis, 2018)

3. Result and Discussion

3.1 Community DRR Knowledge

In developing countries, people perceive hazard and risk perception are based on their religious experience and cultures instead of modern science, as well as in Indonesia (Adiyoso & Kanegae, 2012, and Baytiyeh, 2017). They will think that disaster is coming from God as the consequences of human sins. Risk perception also coming from the neighbors' comparison experience (Ardaya, Evers, & Ribbe, 2017). Figure 2 shows that 72% of respondents do not have any basic knowledge of DRR regarding their

settlement area were vulnerable to the coastal hazard. Most of the respondents argued: “*Nowadays, we are saved. The disaster (inundation, worst abrasion, or overflow) not happen in previous years.*” It happened around 2010s”. Additionally, 28% respondents have basic knowledge of DRR, and it can be proved by their worries about their settlement because they are living in hazardous locations. Low land price is the main reason why they are living in that location without any information about hazard map. Instead, they understand or not understand the threat.

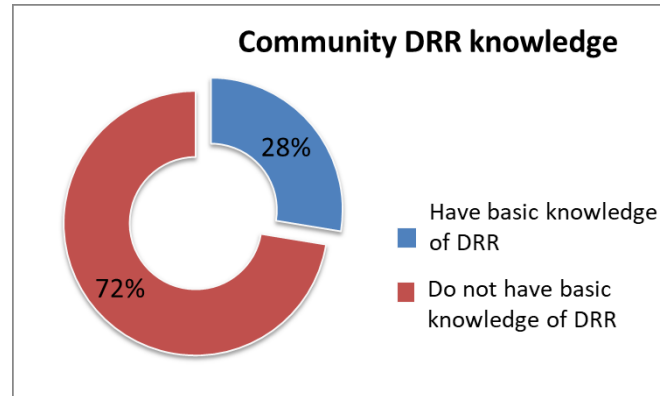


Figure 2. Community DRR Knowledge

3.2 Regulation Knowledge

It thoroughly understands that major city's challenges are population growth that impacted the land needed. By increasing the population density, there will be pressure on land services, unplanned informal settlements, settlement in hazard-prone areas, lack of capacity in DRR, weak local governance and lack of regulatory framework, decline ecosystem, uncoordinated emergency services (Amaratunga et al., 2018). Indonesia's policy has been clearly stated that spatial planning must be based on disaster mitigation (*UU Penataan Ruang No 26 Tahun 2007, UU Penanggulangan Bencana No 24 Tahun 2007*). Unfortunately, only a few people know this policy. It can be seen in figure 3, 85% of respondents never know about spatial regulation in their area (both local and national policy), and only 15% of respondents ever know the regulation. By this fact, we can understand that we need to address this challenge, not only increase the community awareness but also local stakeholder awareness to inform their policy since the purposes are to increase human safety or reduce victims of disaster incidence.

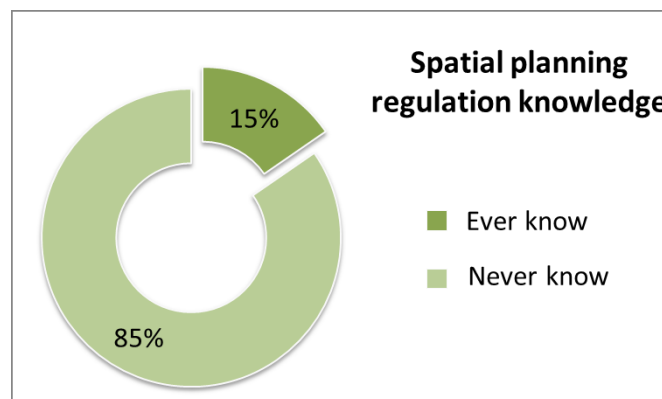


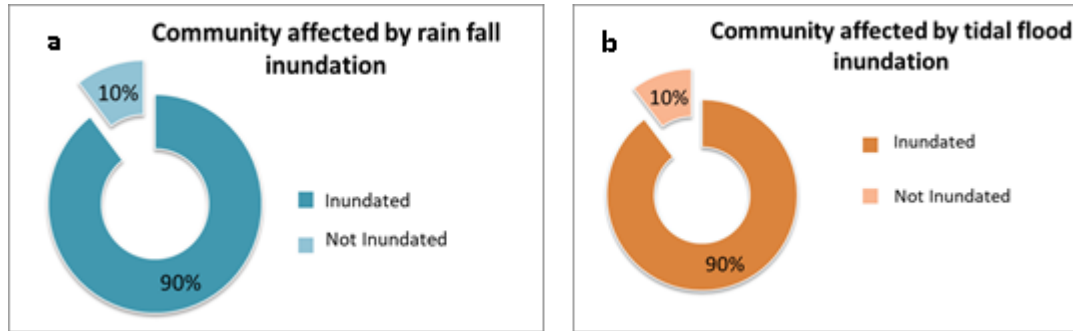
Figure 3. Spatial Planning Regulation Knowledge

3.3 The Community Affected by Tides and Inundation

Mangunharjo is one of the villages located in the coastline northern Semarang city. Some of the settlements were crossed by the river estuary (Figure 4a and 4b). Since the location is in the low land area, and lack of waste management awareness, some settlements are often to inundate, both of tidal flood inundation and rainfall.



(a) (b)
Figure 4 (a). River Estuary, which Cross Settlements, (b). The Settlement that Nearby the Coastline



(a) (b)
Figure 5 (a). River Estuary, which Cross Settlements, (b). The Settlement that Nearby the Coastline

Based on figure 5a and 5b, most of the community at Mangunharjo was experiencing water inundation, particularly in the wet season. 90 % of respondents answered that their settlements were inundated by tides and rainfall; only 10 % respondents answered that their settlements were safe from rainfall inundation and tidal flood (figure 5a and 5b). From figure 6, 54% of respondents answered that the distance between their settlements and coastline is 10 – 50 m, which that means it is very close to the coastal water body (figure 6). The settlements-coastal water body distance might correspond to the tides inundation. However, in this research, author did not investigate more.

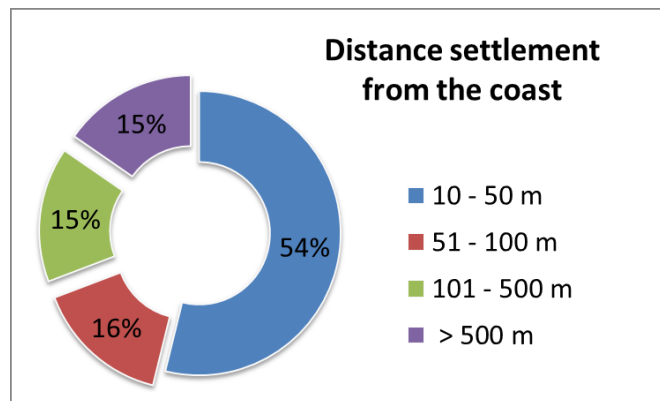


Figure 6. Distance Settlement from the Coast

4. Conclusion

This paper explored the level of knowledge of respondents as a part of local communities in Mangunharjo village. Even though the samples could not be represented all the population, generally, this research is showing how is the community knowledge of hazard and disaster in their livelihood. Based on this study, 85% respondents do not have any basic knowledge of DRR, and they never know about spatial planning regulation from the local stakeholder. Most of the respondents (90%) answer that, periodically, their settlements were inundated by the tides and rainfall. Related to the settlements-coastal distance, 54% respondents answered that they are living close by the coastal water body (10 -50 m). These findings imply that most of the respondents have a high vulnerability to coastal hazards and disaster, and it getting worse while they do not have enough knowledge and education on DRR.

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