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Abstract. Samarinda as the capital city of East Kalimantan is a city that has a fairly rapid growth and also a place for migrants which has caused the city to be inhabited by various ethnic groups. Samarinda City is a city that always floods every year. One area of Samarinda City which often floods is the North Samarinda Sub-district. This paper tries to explore how the adaptation of multi-ethnic immigrant communities to floods. Data collection techniques used the Rapid Rural Appraisal (RRA) method and interviews. The results showed that the overall adaptation carried out by the community in North Samarinda Subdistrict was to raise the floor of the house, build a house on stilts, and make dikes. The shape of the house on stilts is a form of adaptation of the Bugis and Banjar tribes while the Javanese, Madurese and Mandar tribes only raise the floor of the house and make dikes. Based on the knowledge of local wisdom or the customs given from the ancestors, none of the respondents possessed one, which was caused by the absence of flood experience in the original place or because of the influence of modernization.

1. Introduction

Flooding is a problem that is vulnerable to threatening big cities in Indonesia. The issue of flooding has become an annual tradition that must be felt when the rainy season. Floods naturally cause inconvenience to the community in their activities, damage road bodies and other infrastructure due to frequent inundated, further can cause material losses and even fatalities[1] [2] [3]. Various efforts have been made by the government to tackle this urban flood problem, but have not succeeded in overcoming the threat of flooding[4] [5].

Samarinda is the capital city of East Kalimantan with an area of 718 Km2 and various ethnic groups are inhabiting (Kutai, Banjar, Dayak, Javanese, Bugis, Toraja, Sundanese, Minang, and Chinese). Samarinda City has a regional expenditure budget of 2.3 trillion rupiahs and is currently developing rapidly, but amid this development, Samarinda City is still had flooding problems. According to the meteorology and geophysics agency (BMKG) of Samarinda City, the annual rainfall in Samarinda reaches 2,021 mm, the highest rainfall in Samarinda up to 147 mm[6].

The high daily rainfall in Samarinda can cause flooding due to the lack of water catchment areas and poor drainage channels in Samarinda City. There are several points in the North Samarinda sub-district which in the event of rain within 2-3 hours with high intensity, will change into a flood area, such as, Sempaja, Remaja roads, Temindung , Ahmad Yani road, Lambung Mangkurat road, S. Parman road , Pemuda Road, Penjaitan Road , Mugirejo and Lempake[7]. Data on flood recapitulation in North Samarinda Subdistrict in 2018 showed flood depths ranging from 30 - 100 cm and inundated the area for approximately 3 hours[7].

Floods in North Samarinda Subdistrict hampered community activities so that many ways have been done by the community to deal with flooding by forming patterns of community adaptation to flooding. Flood adaptation is a method used for adjusting to something that is done spontaneously or planned. People who live in disaster areas tend to be more responsive in dealing with disasters[8]. In this condition, the community will always try to adapt to changes and new environmental conditions that are threatening. Adaptation will depend on the physical, social, cultural conditions of a particular community[9] [10]. The same physical condition of a region is, not necessarily the same adaptation is done, because each region has different social and cultural conditions. Physical and socio-cultural characters greatly influence the community in responding to environmental conditions. Therefore, there needs to be a study related to how the adaptation of multi-ethnic communities in the face of flooding in response to flooding that occurred in North Samarinda District.

2. Methods

2.1. Location

Sub-district of North Samarinda is located between 114°26'41 " LS-117°11 '66 'LS. The area of North Samarinda Subdistrict is 250.1 Km^2 which is divided into 8 villages (**Figure 1**). The topography of North Samarinda Sub-district varies from hilly, lowlands, and floodplain. Lowlands and floodplains are the areas most frequently affected by flooding in North Samarinda Sub-District.

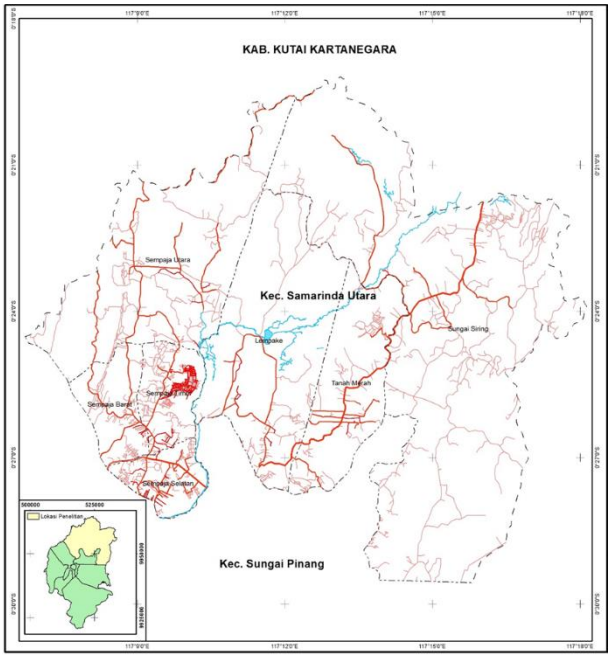

Figure 1. Map of Research Location.

North Samarinda is one of the destinations of migrants from both the Javanese, Bugis, Banjar and other ethnic. This is due to the attraction of Kota Samarinda as the capital city of East Kalimantan province which has the highest APBD in Indonesia. This population migration occurs from year to year with different intensity from each region. This condition resulted in North Samarinda being a multi-ethnic population of various tribes, nations in Indonesia. Ethnics in the city of Samarinda vary, ranging from the Javanese, Bugis, Banjar, Kutai, Dayak, and others[11].

2.2. Collecting and Analysis Data

The study was conducted qualitatively which focused on observing the subject of research, both behavior and action as a whole. Withdrawal of informants by using purposive sampling on groups of people affected by the flooding based on their ethnicity. In conducting this research, use the observation and interview methods as follows:

a. Field observation

The observation was carried out using the Rapid Rural Appraisal (RRA) method. In this method, region recognition is done quickly to get an overview of the area. Observations in observation activities carried out at:

- House Model,
- Shape of house renovation,
- Flood disaster risk reduction activities.

b. Interview

Interviews were conducted with informants or informants (people living in flood-prone areas) who were randomly selected. Information collected includes:

- Concept of floods,
- Impact of floods, and
- Knowledge and forms of adaptation for prevention and reduction of flood disaster risk.

Data analysis was done by the triangulation method. The process was carried out since field data were obtained with observations, interviews, and documents from BPBD, with the aim to simplify the data and easier to understand.

3. Results and Discussion

3.1. Flood-Prone Areas in North Samarinda Sub-district.

Based on data from the Regional Disaster Management Agency (BPBD) of Samarinda City, North Samarinda Sub-district is one of the sub-districts in Samarinda City which has a high level of flood vulnerability. Some areas in North Samarinda Sub-District which are prone to flooding are Sempaja Selatan, Sempaja Utara, Sempaja Timur, Sempaja Barat and Lempake villages (**Figure 2**). This area is based on the results of field observations and topographic maps, this area is in the low lying basin area that is prone and frequent flooding, both due to an overflow of the Karangmungus river and due to inundation of rainwater due to an overflow of drainage channels. In addition, based on the results of observations, Tanah Merah Village, especially in the area around the road to Tanah Merah waterfall is also an area that has a high level of flood vulnerability, both due to river overflow and due to rainwater inundation. Based on the above conditions, this research was conducted in four sub-districts in North Samarinda Sub-District (except housing-dominated areas such as the West and East Sempaja): South Sempaja, North Sempaja, Lempake, and Tanah Merah.

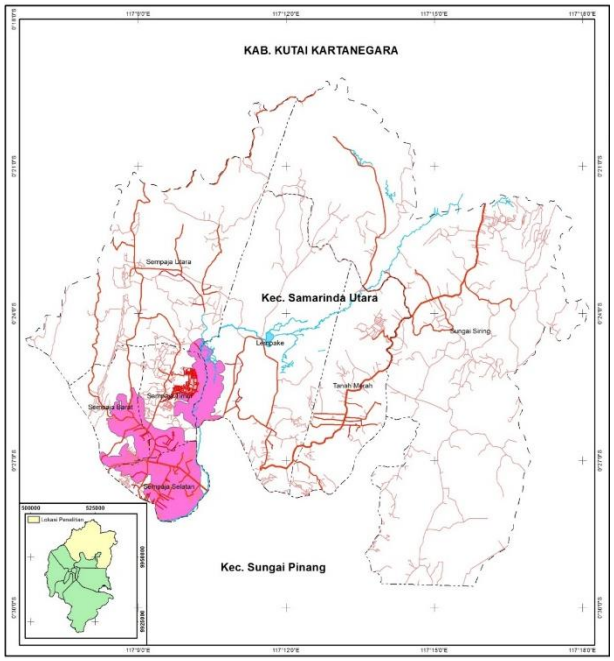

Figure 2. Map of Flood Prone Areas in North Samarinda Sub-district.
: Flood Prone Areas

3.2. The pattern of Community Adaptation in North Samarinda Sub-district.

The form of adaptation carried out by the community in North Samarinda Subdistrict was strongly influenced by knowledge/perceptions, characteristics of the area both physical, social and cultural, as well as economic activities. Communities in flooded areas in general already know the time of the flood and the cause of it. But the form of adaptation that is carried out to deal with flooding varies. The form of adaptation carried out by the North Samarinda Sub-District community can be seen in Table 1.

Table 1. Form of Adaptation of Communities in North Samarinda Sub-district

Village	Adaptation Model					
	Shape of House	%	Modification House	%	Other	%
Sempaja Utara	House on Stilts	15			-	
	Concrete Foundation House	85	Elevate the Foundation of the House	24	Clean the Drainage Canal	20
			Elevate Floor House	41		
			Making embankments from sandbags	15		
Tanah Merah	Concrete Foundation House	100	Elevate the Foundation of the House	20		
			Elevate Floor House	40		
			Making Cement Embankments	40		
	House on Stilts	11		-		

Village	Adaptation Model					
	Shape of House	**%**	**Modification House**	**%**	**Other**	**%**
Sempaja Selatan	Concrete Foundation House	89	Elevate Floor House	34	Clean the Drainage Canal	9
			Elevate the Foundation of the House	33		
			Making Cement Embankments	25		
Lempake	House on Stilts	32		-		
	Concrete Foundation House	68	Elevate Floor House	29	Clean the Drainage Canal	10
			Elevate the Foundation of the House	42		
			Making Cement Embankments	19		

Based on Table 1, the form of adaptation carried out by the people of North Samarinda District varies. Judging from the shape of the house some adapt to making a house on stilts, but people who have concrete houses adapt to modifications by raising the floor, raising the foundation of the house, and making cement embankments. The community also made mitigation adaptations by cleaning the drainage canal.

3.3. Multi-Ethnic Adaptation Pattern in North Samarinda Sub-district.

The pattern of Adaptation of multi-ethnic communities can be seen based on the type of houses in the study sample consisting of 5 tribes in the North Samarinda District, namely Javanese, Banjar, Bugis, Madura, and Mandar. Based on the results of observations in the study sample it was found that the pattern of adaptation to settlements in the face of flooding for the Banjar and Bugis was by making a house on stilts. As for the Javanese, Madura and Mandar adapt to flooding by raising the foundation and floor of the house or making embankments. This form of adaptation pattern can be seen in Figure 3.

When viewed from local wisdom in the ethnic group in North Samarinda in the face of flooding, all respondents from five ethnics said they did not have the knowledge or customs taught by their ancestors in the face of flooding. This condition is caused by several factors, such as respondents from the Javanese, Mandar, and Madurese who live in North Samarinda Subdistrict from areas that have never been flooded, so they have never received prior knowledge and customs in the face of flooding. Adaptation Flooding is only from their knowledge while living in the North Samarinda Area. As for the respondents from the Bugis and Banjar, although they did not feel they possess the knowledge or customs taught by their ancestors, the habit of building houses on stilts (traditionally), they got from seeing houses built by their ancestors[12].

The absence of local wisdom in dealing with flooding in urban areas and the outskirts of the city is often found in almost all cities in Indonesia, where the community has begun to be affected by the modernization and the fading of the customs of local residents[13]. The existence of this modernization has an impact on the building of residential settlements which are more likely to build with modern design and architecture, which over time displaces typical local ethnic buildings with their wisdom. Besides that, the population of urban areas that are more likely to be modern also makes the local customs disappear in managing the environment. This can be seen from the results of interviews with respondents who as a whole stated that there were no religious ceremonies / or customary ceremonies to cope with the flooding that occurred in North Samarinda District.

Figure 3. Resident's house of (a) Bugis in Sempaja Selatan Village, (b) Banjar in Lempake, (c) Javanes in Tanah Merah, (d) Madura in Tanah Merah.

Although the average community does not know local wisdom taught by their ancestors, due to flooding it forms distinctive local wisdom in the community, namely cooperation. This mutual cooperation is a form of community service directed by the people who live in flooded areas, especially during holidays. Forms of community cooperation to prevent or reduce the effects of flooding such as cleaning the drainage canal (**Figure 4**). Voluntary work was found to be fundamental pillars in sustaining to keep the environment.

Figure 4. Cleaning Drainage Channels By the people in Lempake.

4. Conclusion

Adaptation of the community in the face of flooding is formed because of the influence of ancestors or because of the influence of environmental conditions of residence. The form of community adaptation is not always physical but also in a non-physical form. The form of multi-ethnic community adaptation that distinguishes between ethnic groups in North Samarinda District is only based on the shape of his house where the form of Bugis and Banjar tribal houses in flood-prone areas is by building stilt houses. As for other tribes, adaptation in the face of flooding is only by raising the floor of the house and making dikes. In addition, due to the existence of this flood, there has been a mutual cooperation attitude to control and reduce the impact of floods such as voluntary work to clean the drainage canal on holidays.

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