Living in Prone Flooding Area: in Coastal Areas of Semarang

W P Tyas¹

¹Department of Urban and Regional Planning, Diponegoro University, Indonesia

Email: w.p.tyas@pwk.undip.ac.id

Abstract. When settlements are not able to provide a comfort area to live in, in this case because of a periodic threat of tidal flood coming to certain settlement areas, it is likely that the people still cannot leave the area. This paper explores the leading factors of the attachment of people to the areas, from economic, physical, social and psychological factors, including a place attachment. Therefore, the approach of the problem solution to tackle the tidal flooding in the areas should be also concern and have considerations relate to the factors.

Keywords: Tidal Flooding, Adaptation, Place Attachment

1. Introduction

Semarang is a city that often experienced the flood of tidal flood. The causes are as follows: (1) decreased ground level due to uncontrolled drilling wells; (2) at the same time climate change occurs; (3) In the eastern part of Semarang City’s area experiencing faster surface decline due to the industrial area to the east of Semarang has the type industries that requires a lot of water, such as textile; (4) As with routine frequency, the tidal flood are pooled for several hours and continuously. If raining, the flooded will be worsen [1].

The consequence of tidal flood is greatly reduced by decreasing of accessibility level due to congestion, also low level of productivity due to flooding in ports, bus terminals and industrial estates and also activity disruption in settlements in the nearby coastline. The tidal flood has triggers responses both by government and society. For example in Tanah Mas Real Estate, Semarang City which designed for higher income households, the problems are handling tidal flood with the construction of polders, integrated systems of pumping systems in the area affected by the tidal flood.

However, the efforts are still insufficient, the tidal flood is still occured. Therefore, this study explores the communities how they survive in flood prone areas. Many factors seem affect to the adaptability. One of them is place attachment as an emotional binding factor to the place of birth can be a factor that binds the community still want to live in a certain places [2].

This paper explores the determinants of the local people who want to stay in the tidal flood prone area in Tambak Lorok Kampong, Tanjung Mas and Tambakrejo, Semarang will be explored, both economically, physically, socially and psychology. The organization of writing in this paper is the methodology, case studies, discussion, and conclusion.
2. Methodology

This study is a qualitative-based research, through searching data and facts in the field, by observation and interview. The research is carried out in the area that is inundated and observed its impact due to the tidal flood. The interviews were conducted both with tidal flood affected communities of Tambak Lorok kampong and Tambakrejo areas and with government staff of BPBD (Local Board of Disaster Mitigation) and PU (Public Work Agency) of Semarang City in an effort to obtain information related to policies and programs to mitigate flood in Semarang city.

The survey was conducted in 2017 and involved 6 heads of households interviewed to find out the strategies undertaken in tackling the impact of the tidal flood and why they able to stay and adapt with the difficulties due to tidal flood. The explanations of the causal factors persisted were analyzed and compared with the theories and concepts related to the place of attachment [3–5]. At the end is the conclusion also with the economic, social and psychology factors of the community in the installation of tidal floods in the study area.

3. General description of study area: Tambak Lorok Kampong, Tanjung Mas and Tambakrejo Areas of Semarang City

Tambak Lorok Kampong is one of the fishing or maritime kampong in Semarang City located in the coastline of Java Sea. Tambak Lorok Kampong belongs to the administrative area of Tanjung Mas Sub-District which consists of 5 Rukun Warga (RW)s/larger neighbourhood areas.

![Figure 1. Tidal Inundation Map Area in Semarang City](image_url)
Figure 2. Map Administration of Kampung Tambak Lorok and Tambakrejo

The five RWs are RW 12, RW 13, RW 14, RW 15, and RW 16. Tambak Lorok Kampong itself has borders, namely:

a) North: Java Sea
b) East: Banger River
c) South: Arteries
d) West: Electricity generator (PLTUG)

The main function of the existence of Tambak Lorok Kampong is as a residential area, fishpond and special trade for seafood [1]. It is located in the coastal city of Semarang, making the two locations become one of the areas prone to the flood disaster. Based on the results of interviews with one of the residents in Tambak Lorok Kampong, the tidal flood in Tambak Lorok Kampong has been going since 2000s.

Figure 3. Type of Jobs of Low-Incomer Family in Tambak Lorok

Source: PJM Kelurahan Tanjung Mas, 2014
The occupations of local people are various, but the biggest percentage is part time worker in any jobs and some of them works as merchants, industrial workers, in service or fisherman, but some of them does not have any job (Figure 3). It seems that the local people having a low quality of life but the people of those areas actually feel comfortable to live in areas prone to tidal disasters. There are several reasons why people live in disaster-prone areas, some of which are the majority of the people who live in Tambak Lorok Kampong and Tambakrejo.

4. Affecting Factors of The Survival Ability

This section is the exploration of the affecting factors so the local people can live in the harsh condition. The factors are economic, social and psychological aspects. The discussion of the factors as part of upcoming sections.

4.1. Economic Factor Due to Close to Work-Place

Many local people have an occupation that rely on maritime based occupation, and the closeness of their house to the work place become the main factor in this economic factor. It has been explained by these:

"Since I was born I’ve lived here.... Because my father is a fisherman ...and my mother’s father also lives here as well. "

If for example moving house also, the distance my husband’s workplace with home later also impacted”. Sunarwati, Tambak Lorok, 59

"But because here is already comfortable and my father and I work as a fisherman yes ...want to live here”. Eki, Tambakrejo, 23

Although he lives at a such not in ideal and even in economic limitation condition, but as he feel comfortable and have an attachment to the place he was born and grows, he can adapt with the difficult situation. This adaptability due to the work place. Turner in his classic books in 1970s [6], has been explains that economic factor is important for low income households, so the location of house has to be close to work place [7].

"First because I do not have too much money so usually just buy a house here, the second is because of work factors as well. Because the distance to my workplace is pretty close ”

“If for example moved any, do not know where to move....., house in Semarang City and its surrounding area is expensive now. Especially now, the house price which close to the factory is expensive at the majority”. Muhsin, Tambak Lorok, 35, Port Garment Factory Worker in Port Industrial Area

The distant to the job place is also important factor of local people as it need more cost to transport.

4.2. Physical Factor

Another various efforts have been managed by the government and community of Tambak Lorok Kampong to overcome the problem of existing tidal flood. One of the efforts of the community to reduce the impact of the flood disaster is to raise the building and make the house on stage, as an interview with one of the people who live in Tambak Lorok Kampong.

"The effort undertaken to reduce the impact of the flood tidal at most just raise or lift-up the building, or make a sand embankment, for some people who have more money may be going to make a house on stage otherwise move out from here ... “
Figure 4. Settlement Conditions In Tambak Lorok Kampong and Tambakrejo

The Figure 4 above shows that floor or houses or even path in Tambak Lorok Kampong have been elevated to avoid inundation from tidal flood that hit the area. Even on the second photo shows that the height of the gangway from year to year increase, the house that used to still have doors and windows now is buried with soil material to elevate the road or gangway in front of the house.

Strategy and adaptation from the side of physical factor is important.

"The effort undertaken to reduce the impact of the flood tidal at most just raise the building or make a dike from the sand, if for people who have more money may be going to make a house on stage otherwise move from here. So if for example ..see many houses canneo be seen from outside, because it already closed by sand to embankment of that houses. Another effort is to repair the house, because every year the house is hit by water tidal the wall can be easily damaged. So it must be repaired continuously. " Warno, Tambak Lorok, 65

the local people put many strategies to solve the tidal flooding impacts problem. Most of them elevate their floor of house or repair the house

"... a lot of effort that I have done to overcome the impact of more severe tidal flood. From tile repairs, wall repair even up the building I have done since the first. Almost every year that I would elevate the building about 10 cm. But in a few years the water has gone up again so every year I have to raise the building so as not to be hit by more severe tidal floods. " Prihono Tambakrejo, 46

The physical intervention of local people is a routine job, although the actions are not taken place every year for every person.

"Yes, but I elevate the building is not every year, I elevate the building every two years, so fit it up I elevate 5-9 cm every two years. The cost to raise the building is much cheaper than the cost of moving house ". Muhson, Tambak Lorok, 35,

The effort to elevate the building by the local community, combine with Government efforts. The government has also made efforts to reduce the impact of tidal disasters in Tambak Lorok Kampong. Some efforts made by the government is to provide clean water from the PDAM/Clean Water local Government Owned Enterprises and make improvements to tidal floods mitigation infrastructure. The provision of clean water is very important for the people of Tambak Lorok and Tambakrejo because if people use the ground water in their settlements, the ground water in their homes is already mixed with sea water caused. An interview with one of the residents of Tambak Lorok Kampong regarding the government's efforts to overcome the problem of the flood disaster in Tambak Lorok Kampong (Figure 5).
"...the actions of the government is quite a lot of to handle the problem of tidal flood. For roads, most of the existing roads in the area here are many that are paved by the government, even if there is a road that was once stagnant is now in landfill use of land to elevate thus let the road can be passed again. In addition, there is also assistance for the provision of clean water. The clean water here is now using water from the taps, so the taste of the water here is not so salty as it used to be."

![Image](image_url)

**Figure 5.** Government's Efforts in Reducing The Impact of The Flood Disaster

It seems that the physical condition of settlements in Tambak Lorok Kampong and Tambakrejo are quite bad, such as solid waste management that does not exist and the threat of land degradation every year. The disaster that always approaches the area to make the quality of life in Tambak Lorok Kampong and Tambakrejo very low.

In addition, the government support and also CSR from Private companies in the provision of water supply or pavement uplifting and renovation is very helpful. Based on interview to Public Work Staff (City Drainage Section and also Road and Bridge Section) The flood defence are designed infrastructure, in which formed in integration of drainage with road development and also pumping system, for example an emergency pumping in Kaligawe area and also sea defence and Toll road is part of the effort. This is part of Middle Term of Planning (RPJMD). Infrastructure development is one of the keys that make the flooded can decrease, even to eliminate. So, government policies and programme has a significant support for the physical aspect to solve the tidal flood problem. Both of the effort of local people and external from government and private sectors, has been contributed to create a better place.

4.3. Social Aspects

A mutual working among local people in the community, takes places in the area. A Gotong royong, which involves local people, for example to clean up their surrounding area, is one of cultures that also support the solid waste problems which worsen the flood in blocking the drainage system.

‘If works from the kampong usually work devoted to collect garbage.... Because if the tide of sea water worsen to impact of flooding, here too a lot of garbage come into this kampong(residential areas). Sometimes, gotong royong (mutual works), are also devoted to repair the road/gangway here’, Eki, Tambakrejo, 23

As part of social capital, that affect to place attachment [8,9] the culture in mutual work of gotong-royong seems contribute to support local people to adapt with their environment.
4.4. Psychological aspect: Place attachment

An emotional bonding to the place they live seems present to the local people to where they was born.

"Since I was born I've lived here. Yet even if my family and I moved... there is also difficult adaptation, here there are many my brother who live in the area here as well." Eki, Tambakrejo, 23

Pak Eki feels comfortable, although the condition is not ideal. His family also live there, so he feels that it also contributes to the attachment of the place. A Javanese usually also has a view that ‘mangan ora mangan sing penting kumpul’...which means that even they cannot afford to pay meal, the most important thing is that we can live close and together with families.

He feels comfortable to live there because, his his child's school place is also close to the area. Another local people also feels it is fine to live in the area.

"I think it's comfortable - just comfortable. My wife and children also feel comfortable living here. As far as the tidal flood will not go into my house. feel comfortable..." Muhson, Tambak Lorok, 35

The same answers when several local people interviewed about their condition in tidal flood condition.

"But because here is comfortable, and my father and I work as fisherman. yes want to and must stay here. Yet even if my family and I move out, there will be also difficult adaptation, here are a lot of my relatives who live in the area here as well." Sunarwati, Tambak Lorok, 59

An emotional bonding to live even in a very limited condition area contributes an important part to make local people feel comfortable. This is what Low and Altman [2] explain that place attachment as important factor that people still stay in a place, even where considerably not ideal place to live in.

5. Conclusions

The various factors leading to the people still stay in a prone flooded areas. Economic factor become the most important factor, as they seems in a low income group, and has low capability to move from the areas. They feel that to renovate and adapt with put sacks of sands or uplifting the floor is far more easier and cheaper so that is one of their solution. And they workplace, as a fisherman or worker in Port area, is close form their house, they feel better if they live there. For the people who live or even birth at that area, the place attachment is clearer as the family member also live nearby. In limitation, they feel comfortable to live there as as far as the water not inundate house. The work together mechanism in gotong royong (mutual working) in cleaning the neighbourhood area form solid waste is also routine work, which can increase the comfort and need each other.

The place attachment is one that can explain why in such limitation, people can stick to stay in a prone disaster area. Therefore the solution regarding the people who live in prone flooded area is not as simple as to relocate them from the area. As the relocation as not the a favorite solution for government as the higher fund will be needed, also if there is any solution regarding the relocation, it seems that the relocation area should be as close as the current jobs, which are in the coastal area. The effort to solve the tidal flooding has been also need to be more rigorous.

A Maritime Village Programme (Kampung Bahari) which is designed in Tambak Lorok, of President Jokowi idea, is one of a form of integrated solution, which maintain the kampong livelihood based on maritime activity. The areas then will be designed as kampong with
fisherman settlement completed with fisherman port and fish market, as well as small fish industries. Not to relocate in other area which seems not compatible with the existing livelihood of the kampong, but to maintain the maritime activity. So it is one of effort to keep place attachment of the local people, therefore, the root and emotional bonding of local people is still maintained. Furthermore, not only emotional bonding, but also economically, the local people who basically in fishing activities can be increased by the fish processing small industries, and fish market also ports.

6. Acknowledgement

The author would like to thanks to Yuki Riswanda and Januarta Kusdwimayanti as researcher assistants who have contributed in this paper.

7. References

[1] Dimitra S and Yuliastuti N 2012 Potensi Kampung Nelayan Sebagai Modal Permukiman Berkelanjutan di Tambaklorok, Kelurahan Tanjung Mas Tek. PWK (Perencanaan Wil. Kota) 1 11–18
[2] Low S M and Altman I 1992 Place attachment Place attachment (Springer) pp 1–12
[3] Hidalgo M C and Hernandez B 2001 Place attachment: Conceptual and empirical questions J. Environ. Psychol. 21 273–281
[4] Morgan P 2010 Towards a developmental theory of place attachment J. Environ. Psychol. 30 11–22
[5] Scannell L and Gifford R 2010 Defining place attachment: A tripartite organizing framework J. Environ. Psychol. 30 1–10
[6] Turner J F C and Fichter R 1972 Freedom to build: dweller control of the housing process (Macmillan)
[7] Turner J F C 1977 Housing by people towards autonomy in building environments
[8] Perkins D D, Hughey J and Speer P W 2002 Community psychology perspectives on social capital theory and community development practice Community Dev. 33 33–52
[9] Lewicka M 2011 Place attachment: How far have we come in the last 40 years? J. Environ. Psychol. 31 207–230