

Adaptation Strategy of Tidal Flood Handling a Case Study in Sayung Sub-District, Demak

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Abstract

Sayung subdistrict is one of the sub-districts located on the north coast of Demak Regency which until now experienced rob floods that threaten the social, economic, and physical conditions of the environment. A series of adaptation strategies as a form of mitigation against rob floods are needed to minimize risk. This study aims to analyze the adaptation strategy and implications of tidal flooding on the living systems of coastal communities in Sayung District, including the villages of Sriwulan, Surodadi, Bedono, and Timbulsloko. The research approach used is descriptive quantitative. Data collection is done by sampling method and survey technique using a questionnaire which is then calculated the percentage of each component. So that various community efforts can be seen based on the level of adaptation capacity and structural adaptation.

Keywords

Tidal Phenomenon; Adaptation Capacity; Adaptation Strategies

INTRODUCTION

The phenomenon of Tidal flood on the north coast of the island of Java continues to increase every year caused by the pressure of climate change and human activities such as building industrial that are often found in coastal areas. The problem contributes to the use of land that has implications to increase the burden of soil so that there is a decrease in the face of the soil. From time to time the area affected by rob inundation is increasingly widespread land impacts that are quite significant for the environment and the lives of people living in coastal areas both in terms of economic and social that encourages people to carry out various adaptation strategies.

Demak regency is one of the regencies that are partly located on the coast of Java Island, namely Sayung Subdistrict,

especially Sriwulan Village, Bedono, Timbulsloko, Surodadi. Every year based on the calculation of the risk value of sea level rise in the coastal region of Sayung reaches 0.06-1.15 per year, thus categorized as a high-risk area (Suryanti & Marfai, 2016; Rudiarto et al., 2020). In addition, judging from the geomorphological conditions of the coastal region of Sayung which has a high level of erosion insecurity reaches 13 meters per year (Rudiarto et al., 2020) with the intensity of the length of the inundation reaches 3.5 hours/day. These issues encourage people to adapt to these conditions. Thus, research needs to be done related to "the extent of efforts made by the sayung community, especially Sriwulan Village, Bedono Village, Timbulsloko Village, Surodadi Village in the face of rob phenomena".

RESEARCH METHOD

This research aims to find out the extent of efforts made by the people of Sriwulan Village, Bedono Village, Timbulsloko Village, Surodadi Village in dealing with rob phenomenon. Thus, to achieve this goal, scientific steps are needed in data collection, data processing so as to produce valid research. The method used in this research is sampling method with survey techniques using questionnaires, so that the data obtained will be in accordance with the target population, then processed in the form of percentages. Based on the data that has been obtained this research is included in the research with a descriptive quantitative and qualitative approach so as to explain the conditions at the research site. Here are the stages of analysis.

Sampling Technique

The sample is based on a random sampling technique so that all members of the population can be sampled (Sabari, 2010: 282), by looking at population variations including population members, spatial populations, temporal existence variations. The following is the calculation of population samples, whereas the number of populations Sayung subdistrict 6,395 population, while in determining the percentage of tolerance error 10% so that the level of research trust 90%.

$$n = \frac{N}{N(e)^2 + 1}$$

$$= \frac{6.395}{6.395(0,1)^2 + 1} = 98$$

Obtained a sample of 98 people who were then distributed into four research sites through proportional random sampling techniques.

$$\text{Village Samples} = \frac{n(\text{Samples})}{\text{Populations}} \times \text{Populations}$$

So that samples can be obtained from each village, 58 respondents Sriwulan Village, 14 respondents Bedono Village, Timbulsloko, Surodadi.

Data Analysis Technique

Data analysis techniques are used by calculating the percentage of social demographic components based on the sub component of dependency ratio and education graduation of household heads, in the social network component based on the sub component of government assistance and organizations or community groups, in addition to the livelihood strategy based on sub-components of the number of working family members, alternative sources of income, households saving. So based on that percentage will be known the level of adaptation capacity indicators of each household. In addition, descriptive analysis is carried out based on structural adaptations made by the community.

FINDINGS AND DISCUSSION

Adaptation Capacity

Adaptation capacity is an indicator that provides an overview of a system's ability to cope with and adjust the impact pressures of climate change (Schneider et al., 2007). In this research, the adaptation capacity of household respondents of Sriwulan Village, Bedono Village, Timbulsloko Village, Surodadi Village will be described through social components and livelihood strategies.

Social Demographics

Based on the results of social demographic research described by the average percentage of household dependence ratio of respondents from the four villages reached 38%, so it can be said that the level of dependence of respondents' households is quite low, this is based on a

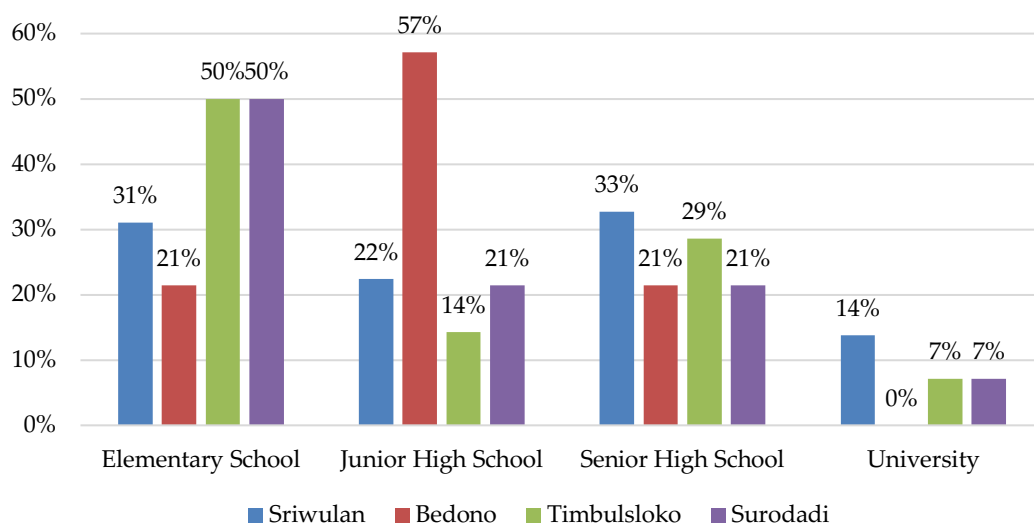


Figure 1. Level of Education of The Head of Household (Researcher Analysis, 2020).

higher number of productive ages compared to the unproductive age. At the level of education based on the results of research, the majority of respondents' household heads are elementary and junior high school graduates. In more detail see figure 1 explains the education of the head of household respondents in each village. Thus, it can be said that the level of education of the head of the household is still low.

Social Network

Social networks affect the adaptive capacity of households based on household relationships and organizational involvement. Based on the results of research on the relationship of household respondents in Sriwulan Village, Bedono Village, Timbulsloko Village, Surodadi Village with village officials, sub-district officials, district government, BPBD and the central government in order to increase the community's adaptation capacity to minimize the impact of the rob phenomenon, manifested through assistance which includes physical infrastructure development, business

capital, financial assistance, daily necessities.

Most of the community receives assistance in the form of physical infrastructure development, while other assistance adjusts the needs of each household including daily needs, financial assistance, and business capital. However, some households of respondents who have not received assistance from the government, so it can be said that the assistance is still not evenly received by the respondent's household. In more detail figure 2 indicates the percentage of assistance obtained by households of respondents each village.

The involvement of community organizations in Sriwulan Village, Bedono Village, Timbulsloko Village, Surodadi Village, is more detailed described in percentage figure 3 to show the level of household involvement of respondents in each village, where most of the community such as family heads and youth are not active in the organization. While housewives tend to be active in community organizations in the social field such as *arisan* and studying.

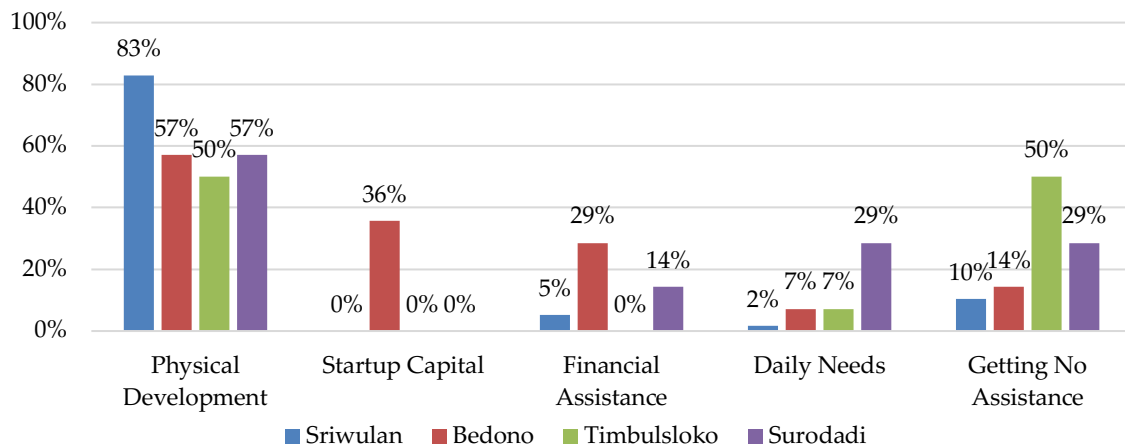


Figure 2. Percentage of Assistance (Researcher Analysis, 2020).

While related organizations or disaster groups have never been formed, similarly disaster training or simulation has never been done. However, in Bedono Village and Surodadi Village, training activities or disaster simulations have been conducted from educational institutions, where the implementation is only done one day, other than that it only involves *Lurah* and youth representative groups. So that the activity has not been channeled to the scale of households that have an impact on the level of knowledge related to disasters in each household is still low.

Economic Livelihood Strategy

Livelihood strategy is an effort made by every household to meet daily needs based on income including livelihoods, alternative livelihoods, and household income. In addition, the spending component includes household savings rates and loans.

Income

Household income respondents Sriwulan Village, Bedono Village, Timbulsloko Village and Surodadi Village based on research that has been done the majority of respondent households from the four villages that work reached 2 to 3 people who are mostly household income sources

respondents are farm farmers/fishermen, followed by private/civil servants/state-owned enterprises and others, traders, and laborers, but in Sriwulan village still found households that do not work, in detail can be seen in figure 4.

In addition to alternative sources of income, based on the research results, the majority of respondent households do not have alternative sources of livelihood, while households with alternative livelihoods are generally only temporary when the tidal phenomenon occurs so that their main livelihoods cannot be implemented or are permanent where everyone in one household has a number of livelihoods more than one. In addition, alternative livelihoods are generally construction and trade workers.

Expenditure

The household expenditure of respondents in Sriwulan Village, Bedono Village, Timbulsloko Village and Surodadi Village can be seen based on the research that has been carried out having an average level of saving ability of 56% based on the total number of respondent households in the four villages. This problem is caused by households that tend to spend the income earned in accordance with current urgent

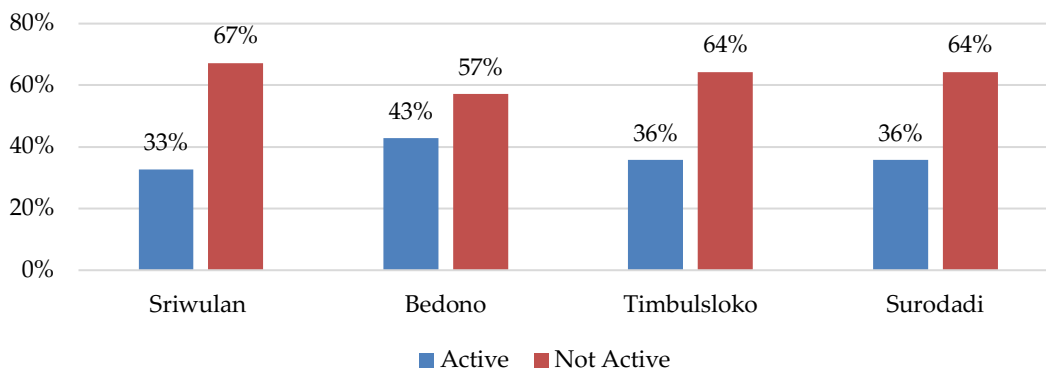


Figure 3. Percentage of Institutional Engagement (Researcher Analysis, 2020).

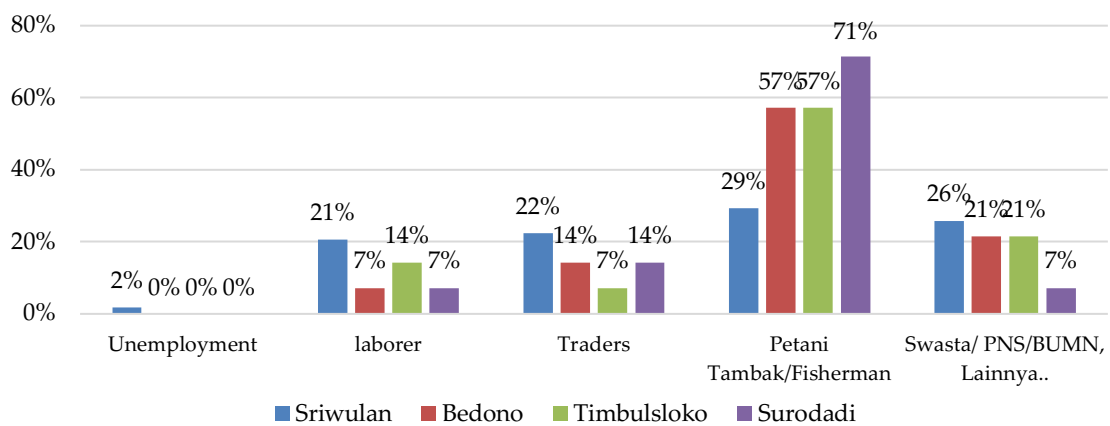


Figure 4. Percentage of Sources of Income (Researcher Analysis, 2020).

needs, especially in dealing with the adaptation of the tidal phenomenon which causes both material and non-material losses.

In addition, some households from the four villages made loans to banks, cooperatives, families and neighbors. This was done in order to increase the adaptive capacity, based on the results of the research that an average of 78% of the total respondent households from the four villages made loans to repair houses affected by tidal flooding.

Structural Adaptation

Structural adaptation is one of the physical efforts made by the community in Sriwulan Village, Bedono Village, Timbulsloko Village and Surodadi Village in overcoming the tidal phenomenon. Based

on the results of the adaptation research carried out by household respondents from the four villages, it is divided into two types, namely the adaptation group consisting of backfilling the road and making embankments, where in the implementation there is interference from the government and other related parties. While the strategies carried out individually include raising the floor of the building and raising household furniture, in practice it is influenced by the livelihood strategies of each household.

Group Adaptation



Figure 7. Back Road Filling (Researcher Analysis, 2020).



Figure 8. Village's Embankment (Researcher Analysis, 2020).

Individual Adaptation



Figure 9. Floor Elevation (Rudiarto et al., 2020; Researcher Analysis, 2020).



Figure 10. The Raising of the Household furniture (Rudiarto et al., 2020; Researcher Analysis, 2020).

CONCLUSION

Based on the research results so far, every household in Sriwulan Village, Bedono Village, Timbulsloko Village and Surodadi Village has made efforts to overcome the tidal phenomenon through indicators of adaptation capacity and structural adaptation indicators. On adaptation capacities based on socio-demographic components, social networks and livelihood strategies. Where, based on the socio-demographic aspect, the level of research tends to be low, but it does not support the level of education of the head of the respondent household which tends to be low, where the head of the household has graduated from SD and SMP. Meanwhile, seen from the social network, the relationship between the respondent's household and the government through the assistance provided has not been evenly distributed, and there is no organization or simulation related to disasters

The household livelihood strategy is based on the component of income sources where the average working household reaches 2 to 3 people, with the majority of the professions being pond farmers or fishermen. In addition, loans reached an average of 78% of the total respondent households in the four villages. However, the respondent's household tends not to

have savings so that the proceeds from income and loans will usually be used directly to meet urgent needs, especially for carrying out structural adaptations such as elevating building floors. Thus, seen from the three components, including social demography and social networks, household respondents tend to have a low level of dependence but are not supported by the ability to understand disaster-related issues. Meanwhile, the livelihood strategies carried out by the community tend to be able to overcome the tidal phenomenon that occurs. So, it can be said that the increased adaptive capacity of households in the four villages tends to be supported by livelihood strategies. In the structural adaptation of households, respondents divided into two types, namely group adaptation including road backfilling and embankment construction, then individual adaptation, namely the elevation of building floors and raising household furniture.

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