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COMMUNITY ADAPTATION STRATEGIES IN FACING CLEAN WATER SCARCITY IN NDETUZEA VILLAGE, NANGAPANDA SUB-DISTRICT, ENDE

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ABSTRACT

Detuzea Village is one of the locations in Nangapanda Sub-District, Ende Regency, which is affected by drought which causes clean water scarcity. in 2010-2016 water sources from dug wells and rivers experienced drought, causing the people of Ndetuzea Village to experience a clean water crisis to meet their daily needs. Then in 2018-2020 some dug wells and also pam water owned by residents experienced drought. The purpose of this research is to find out how the form of adaptation strategies carried out by the community in dealing with clean water scarcity and to find out how the effectiveness of the adaptation strategies that the community does. The method used in this research is qualitative method, with data collection techniques using interviews, observation and documentation. The results showed that there were efforts from the community to deal with the water scarcity. Some of the efforts include, subscribing to community wells, subscribing to pam water and building water reservoirs. The preference of the Ndetuzea Village community for the adaptation carried out is quite effective because it has fulfilled the wishes and expectations of the respondents.

A. INTRODUCTION

Water is one of the sources of life that is indispensable for human survival. Drought disasters have a high victim. According to Law No. 24 of 2004 on disaster management defines drought as the low availability of water that is not in accordance with the need for water for living needs, economic activities, agriculture and the environment. (Prameswari, 2019). Ndetuzea Village is one of the locations in Nangapanda Sub-District, Ende Regency, which is affected by drought which causes a scarcity of clean water. Based on the events that befell Ndetuzea Village in 2010-2016, water sources from dug wells and rivers experienced drought, resulting in the Ndetuzea Village community experiencing a clean water crisis to meet their daily needs, which caused the community to have difficulty getting access to clean water. To get access to clean water, the people of Ndetuzea Village dug small wells on the edge of the dead river to fulfill their

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daily needs such as cooking, drinking and toilet.

In 2018-2020 there was another drought that caused a long dry spell. In 2018 there was quite a severe drought in May-September which resulted in 6 wells being ug in Pu,upau and Watumere hamlest experiencing drought, Then in 2019, Ndetuzea Village also experienced another long drought around July-October in Ndetuzea Village experienced a severe drought which resulted in as many as 4 dug wells belonging to residents experiencing total drought, then in 2020 in May-October there was also a long drought and as many as 3 wells of Ndetuzea Village residents experienced a decrease in water discharge and even experienced drought.

Based on the standard of clean water needs, the Department of Public Works sets 126.9 liters / person / day to meet the needs of clean water needs such as toilets, drinking, washing pakian, cleaning houses, watering parks, washing vehicles, ablution, and other uses. Meanwhile, the total water needs of the community in Ndetuzea Village per person per day amounted to 81.06 liters / org / day for household use. This is because there are several factors other than drought factors that cause the scarcity of clean water in Ndetuzea Village, namely the need for water in Ndetuzea Village is quite large because indeed the people in the area have a high population density level and in the dry season the water discharge is reduced so that the community minimizes water use in meeting daily needs.

Studies on adaptation have been carried out several times, one of which is community adaptation to water scarcity. The occurrence of clean water scarcity in Ndetuzea Village is a concern. This is in accordance with research that has been conducted (Puspajati 2020) entitled Study of Adaptation Strategies to Drought Disasters in Rejosari Village, Semin District, Gunung Kidul Regency.

The study aims to analyze (1) socioeconomic characteristics of people experiencing drought disasters, (2) analyze community adaptation strategies to drought disasters in Rejosari Semin village, Gunung Kidul Regency. The results of the study above show (1) socioeconomic characteristics in Karangpilang Lor Hamlet, Rejosari Village, namely the average age of 53 years with the majority of 27% aged 55-65 years, the average education level of 41% of elementary school graduates, the majority of 60% employment as farmers, the average income of 1,108,174 which is included below the UMR, and the pattern of using clean water for bathing purposes, the average amount of clean water is 134 appliance circuits per day. (2) There are three

types of community starategy, namely social, economic, and physical. a) social aspect strategy in the form of business by making public wells and providing mutual access to clean water, b) economic aspect strategy in the form of 13% of people buying clean water, and c) adaptation strategy of physical aspects in the form of building borewells, building public wells, and making water reservoirs.

Another research from (Kornita 2020) entitled Strategy for Meeting Community Needs for Clean Water in Bengkalis Regency. The study aims to analyze strategies to meet community needs for clean water and determine the model of providing clean water for people in Bengkalis Regency. The results showed that to meet the needs of the community for clean water in Bengkalis Regency, the SO strategy can be used, namely the strategy to achieve policy objectives by utilizing the strengths and potentials/ opportunities possessed by cooperation between stakeholders in meeting these needs.

Previous studies have shown that by using strategies that are in accordance with the environmental conditions of the area, the community can make adjustments to the disaster of lack of clean water, water drought, and meeting the community's need for clean water.

B. METHOD

The method used in this study uses qualitative research with descriptive analysis. This type of research is used to analyze data by describing or describing the data that has been collected as is. The use of qualitative methods is intended to determine the form of adaptation carried out by the people of Ndetuzea Village to deal with the scarcity of clean water that occurs. This research took place in Ndetuzea Village, Nangapanda District, Ende Regency. This location is in the north bordering Kerirea Village, the south bordering the Sawu Sea, the east bordering Sanggaroro Village, the west bordering Ndorurea Village. The consideration of researchers choosing research in Ndetuzea Village is because of the scarcity of water caused by a long drought.

The subjects in this study were taken using data saturation/data saturation techniques. In this study, 11 subjects were selected as information providers from many residents in Ndetuzea Village. Two of them were key informants, where researchers conducted in-depth interviews digging into data on subjects to find out the beginning of clean water scarcity in Ndetuzea Village and how the community adapted to face the problem of clean water scarcity.

Researchers chose this subject because they know clean water problems widely and in depth. In addition, the subjects were actors who felt the impact of the drought, and the subjects chosen for this research knew the strategies used to deal with water scarcity that occurred in Ndetuzea Village.

To collect data in this study using interview, observation, and documentation study methods. The interview method is carried out by asking questions face-to-face that have previously been systematically arranged to people who act as informants and research subjects. Interviews were conducted with the people of Ndetuzea Village who did know the situation that occurred related to the research problem and also those involved in the research problem.

The type of interview used is a structured interview, which is an interview conducted directly by sulking at interview guidelines that have been made by the researcher. Observations were made in this study by making observations around the Ndetuzea Village area. This observation is carried out based on aspects of physical environmental conditions, community conditions, water conditions, and also other aspects that need to add to the wealth of knowledge in this study. This observation was also carried out in government agencies, namely the village to get an overview of the condition of the community and also the condition of the physical environment in Ndetuzea Village, Nangapanda District. The secondary data used in this study is in the form of documents containing history and administrative data regarding village wiliyah boundaries and population data.

C. RESULT AND DISCUSSION

C.1. RESULT

a. Overview of Ndetuzea Village

Astronomically, Ndetuzea Village is located at 8º46'58"S121º29'05E. The geographical location of Ndetuzea Village is as follows: The north borders Kerirea Village, the south borders the Sawu Sea, the east borders Sanggaroro Village, the west borders Ndorurea Village. The size of the area is related to the availability of space that can be used in all population activities. Ndetuzea Village is one of the villages in the Nangapanda sub-district, Ende district. Ndetuzea village has an area of 1.33 km^2 (Ndetuzea Village Profile).

Clean Water Condition in Ndetuzea Village: Water is a basic necessity for human life. Water is the most important substance or matter or element for life known to date on earth, but not on other planets.

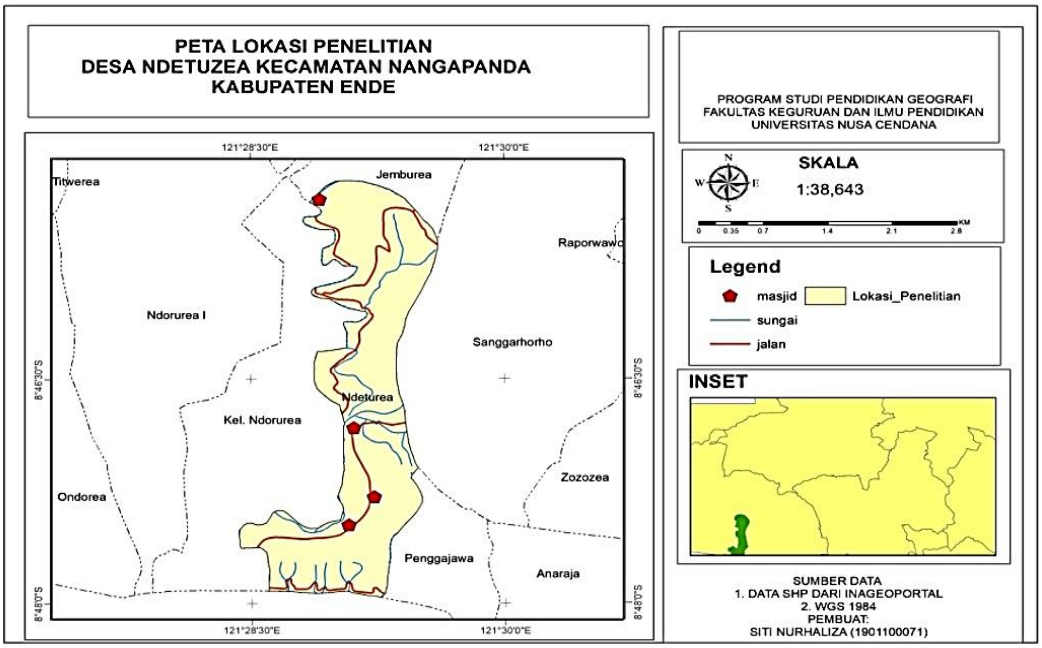

Figure 1. Research Location Map of Ndetuzea Village
(Source: data processing, 2024)

Almost 71% of the earth's surface is covered by water. There are 1.4 trillion cubic kilometers (330 million miles) of water available on earth. Water is mostly found in the sea (salt water) and on ice sheets (at the poles and mountain tops), but can also be present as clouds, rain, rivers, fresh water tables, lakes, steam, water, and sea ice (Nainggolan et al., 2019).

The water used for household consumption in Ndetuzea Village is in poor condition. This is because the water is not clean and sometimes has a murky color so that when it will be used it is not very feasible. This is exacerbated by the condition when the water source channel dies, it will certainly reduce the water supply for household consumption. In addition, river water, which is used as an alternative when the community experiences a shortage of clean water, also experiences pollution in certain months due to rock and sand excavation activities downstream. Meanwhile, well water has experienced a decrease in water discharge and even experienced total drought in recent years. This has led to the scarcity of clean water in Ndetuzea Village.

c. Forms of Community Adaptation Strategies in Facing Clean Water Scarcity in Ndetuzea Village, Nangapanda District, Ende Regency

Responding to various problems that occur related to the fulfillment and access to adequate clean water, the community certainly does not remain silent. The community both individually and collectively seeks several actions

aimed at solving various clean water problems in fulfilling household needs. These actions certainly require cooperation and key factors such as cost, energy and time so that each action taken by the community can be carried out properly. The actions taken by the community include the following. Can be seen in Figure 2.

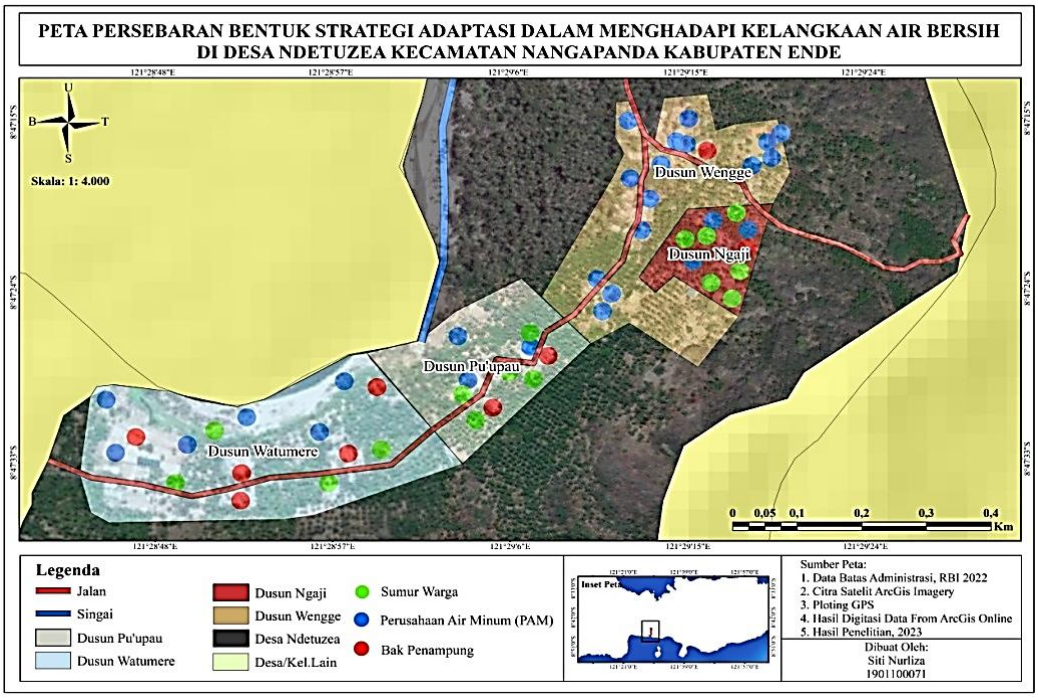

Figure 2. Map of the Distribution of Forms of Adaptation to Clean Water Scarcity in Ndetuzea Village
(Source: data processing, 2024)

1. Subscription to Resident Well

The easiest response to overcoming water shortages is to take water from neighboring residents' wells (subscribing to residents' wells). When experiencing clean water difficulties, the Ndetuzea Village community usually takes the easiest adaptation action for them to take well water from neighboring residents whose water supply is still sufficient for use. Not all residents have a water source in the form of a well in the area. This is because to make a dug well requires a fairly expensive cost and of course has sufficient land to later make a dug well in that place. Based on these factors, ownership of private wells owned by residents in Ndetuzea Village is very rare. If there are residents who have such wells, it will be considered a special gift for local residents, because in addition to the high cost, the land conditions are also rocky, making it difficult for the community to make wells.

The condition of the well water is very suitable for consumption by residents. Residents who take water from the well are quite numerous and to take water in large quantities they make a joint venture of 5,000 per person to charge electricity because the well uses a water pump that requires electricity. But there are also those who take water using a simple method with the help of pulleys only, and there is no charge only requires a little queue because those who consume the well water are quite a lot especially during the dry season.

2. PAM (PDAM) Water Subscription

The number of people who subscribe to the PDAM is quite large. Most of the residents who install PDAM pipes can be said to be residents who have sufficient income. This is because installing PDAM pipes that drain water from PDAM springs requires a lot of money. In addition to having sufficient income to subscribe to PAM Water, the people of Ndetuzea Village received assistance from PT Agogo, which is an excavation C mining company along the river in Ndetuzea Village, which is why many residents of Ndetuzea Village subscribe to PAM Water.

However, there are still many residents who do not subscribe to PAM water. According to most residents, the water supplied by the PDAM is of good quality. The water is suitable enough for household consumption needs. In terms of availability, it is also quite sufficient. This can be seen from the availability of water during the dry season, which according to most residents is quite sufficient, but there are also residents who consider that the water is not sufficient. According to the opinions of several residents collected, the average cost ranges from Rp. 40,000.00 - Rp. 150,000.00 but this figure is not absolute every month because it depends on the level of water consumption of t h e residents.

3. Building A Catch Basin

There are not many residents who own a catch basin. Most residents who own a catch basin can be said to be residents who have sufficient income and are not completely deprived. The reservoirs used by residents of Ndetuzea Village range in size from 650 liters to 3000 liters and last only 1-2 weeks with full use. The making of this water reservoir is not only used to collect water from wells and PAM. It is also used to collect river water and rainwater.

During the rainy season, Ndetuzea villagers use the catchment tank to collect rainwater. When the rainy season arrives, they utilize the rainwater by channeling rainwater that falls on the roof surface through gutters to be collected into a holding tank. The runoff from the full tank is then channeled into a buckets and jerry cans. In addition to the manual reservoirs that Ndetuzea

villagers made. Some people in Ndetuzea Village also procure water reservoirs. Some people think that making their own reservoirs is quite expensive and takes a long time. Therefore, some residents of Ndetuzea Village buy water tanks, because water tanks are easily available and more practical.

Water tanks in Ndetuzea Village are used to store water from river water, well water, rainwater or water from traveling water vendors in large quantities to meet daily needs in Ndetuzea Village. The capacity of each water reservoir used by the Ndetuzea Village community ranges from 1,000-2000 liters and can only hold water for 1-2 weeks, by distributing it through pipes that are channeled into residents' homes and then collected using buckets and jerry cans for cooking and drinking purposes.

d. Effectiveness of Adaptation Strategies Implemented by the Ndetuzea Village Community to Deal with Clean Water Scarcity

The preference of the people of Ndetuzea Village for the form of adaptation carried out is positive because it has fulfilled the wishes and expectations of respondents. In addition, the village and hamlet governments also made efforts to facilitate through the village physical development program. The community's response to the adaptations they made was quite effective in dealing with the clean water scarcity they experienced. Subscribing to community wells is the most common adaptation done by the people of Ndetuzea Village. This is because it is the easiest adaptation for the community to do and also does not require a large amount of money to obtain clean water. The community only subscribes to well water owned by their neighbors who still have sufficient water supply and do not even experience drought to meet their daily clean water needs.

Although this adaptation is not a long-term adaptation, it is quite effective for the people of Ndetuzea Village in dealing with clean water scarcity. As evidenced by several residents who said that they had subscribed to the well water for quite a long time, about 4 years they made this adaptation to overcome the water scarcity they experienced.

Subscribing to PAM water is the adaptation that most Ndetuzea villagers do to fulfill their daily clean water needs. Subscribing to PAM water (PDAM) is only done by residents who have sufficient income and do not lack economic problems because it requires a large amount of money to subscribe to PAM water (PDAM) starting from the installation of water meters to the monthly fees they must pay.

This is inversely proportional to the income of Ndetuzea villagers, most of whom work as farmers. However, subscribing to PAM water (PDAM) is the second most common adaptation that residents do because they get help from PT Agogo, which is a mining company that excavates stones and sand along the river in Ndetuzea Village. This is why subscribing to PAM water is the second most adaptation action taken by residents, because with this assistance it reduces the cost of installing the meter, the community only pays monthly water usage fees.

Even with a subscription to PAM water (PDAM) there are still some complaints from residents about the color of the water that experiences turbidity during the rainy season, and a little jammed during the dry season. However, these complaints are still within reasonable stages and can still be overcome. It cannot be denied that the adaptations they have made are quite effective in dealing with the clean water scarcity / clean water difficulties they experience.

Building a catch basin is the last adaptation that the community uses to deal with the clean water scarcity / clean water difficulties they experience. This adaptation is quite a lot done by residents but not a few residents who do not have a reservoir. This is due to the lack of funds to build a reservoir, and from the government there is also only one hamlet that received assistance in the form of a reservoir due to limited funds. However, some residents argue that this adaptation is quite effective in dealing with the clean water difficulties they experience.

Based on the results of the study, it can be concluded that the actions they take are quite effective because with the reservoirs they can collect large amounts of water and no longer lack water. They also use catch basins to collect rainwater as a supply during the dry season and can help reduce the fees they pay each month.

C.2. DISCUSSION

Adaptation strategy is an effort or systematic action taken by individuals or groups to be able to deal with the state of the surrounding physical environment for the purpose of meeting needs and achieving expected goals (Rahmadani & Akbar, 2021). Adaptation is environmental uncertainty and disaster as a response to unavoidable impactsin environmental change (Studi et al., 2022). Adaptation emphasizes self-adjustmentin attitude towards an uncertain condition. Adaptation is closely related to the influence of certain socio-economic and environmental conditions (Su Rito Hardoyo, 2011).

Reactive adaptation tends to focus on short-term activities. The easiest response to overcome water difficulties

is to subscribe to community wells. In addition, it is also by subscribing to pam water (PDAM). This method of adaptation can also be found on other small islands in the Indonesian archipelago. This can be done in small island areas in Indonesia, because as is the case in Pacific Island countries, water is still managed as a common pool resource, which is defined as a resource characterized by unclear property rights and responsibilities to preserve it (White,2007). Anticipatory adaptation is also still dominated by physical activities to increase clean water supply, both from the government and local sides.

The physical activity carried out is to build a container pack. for its capacity it will last for 1 munggi-1 month with a container tub size of around 1100-3000 litter with full usage capacity. However, not all residents have a catch basin. This is because building a catch basin requires a considerable amount of money.

Based on the results of the research, the adaptation used by the residents of Ndetuzea Village emphasizes on short-term adaptation. The results of this study are supported by research (Rachmawati, 2015) with the title Understanding Population Adaptation to Climate Change for Fulfillment of Clean Water Needs on Small Islands of Belitung. Belitung and intan communities, residents who experience clean water difficulties can go to other islands or to other water sources on their islands (wells / shared ponds) to collect water as needed without having to pay compensation for water collection, for Air Glubi Village and Mantang Village there are also cases that take water from other islands using paddled canoes.

Referring to previous research, it is known that the adaptation carried out by the Ndetuzea Village community, namely taking water from other water sources, is also carried out by other islands in Indonesia that experience the same problem of difficulty in accessing clean water.

This research is also supported by research (Lumaksono, 2013). With the title Community Adaptation Strategy in Facing Water Shortage (Case Study in Jomblang Perbalan Village, Candi Village, Candisari Subdistrict, Semarang City).

The strategy carried out by the people of Jomblang Perbalan Village is by establishing water stalls, subscribing to PDAM services, subscribing to gallon water, subscribing to community wells, and filtering water using cloth and trawas. Referring to previous research, the people of Ndetuzea Village also took adaptation actions by subscribing to community wells, subscribing to PAM water and also building reservoirs.

D. CONCLUSION

The form of adaptation strategies carried out by the Ndetuzea Village community to deal with clean water scarcity is: focuses on reactive and anticipatory adaptation, which is dominated by physical activities to increase the supply of clean water, both from the government and local sides. Subscribing to community wells is one of the easiest adaptation activities. The second is subscribing to public water (PDAM).

Another physical activity is the construction of water reservoirs. The construction of this reservoir was carried out collectively or individually. Collectively, these reservoirs were built by the Ndetuzea Village government and individually, the reservoirs were built in each resident's house. Another activity is to maintain environmental vegetation by conducting reforestation activities.

The adaptations that the residents of Ndetuzea Village have made are quite effective in dealing with the scarcity of clean water that occurs in Ndetuzea Village. Residents' perspectives say that the adaptations made have a good impact on meeting their daily clean water needs.

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