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Mangrove Forest Development as Sustainable Vegetation Disaster Mitigation against Coastal Abrasion and Rob Floods in Supporting Regional Resilience in Bekasi Regency

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Abstract. The impact of abrasion and tidal flooding will result in public security and human security disturbances. The ultimate impact of a disaster that is not handled properly is that it will disrupt state security. This study uses a qualitative descriptive design method. The purpose of this study was to analyze how far the mitigation of coastal abrasion and tidal flooding using mangrove forest vegetation mitigation and its effect on regional resilience in Muaragembong District, Bekasi Regency. The research was carried out at Mekar Beach, Simple Beach, Bhakti Beach, and Happy Beach, with 16 informants. Research data were analyzed using four steps. The results of the study show that the development of mangrove forests as a mitigation of sustainable vegetation is still being carried out by applying a new method called challenging the ocean currents from behind, and regional resilience is only supported by the existence of good social capital. The conclusion is that even though the development of mangrove forests only strengthens social and community capital, it is able to support the resilience of the Muaragembong region and support ensuring national security.

Keywords. Mangrove Forest, Sustainable Vegetation Disaster Mitigation, Beach Abrasion and Rob Flood

1. Introduction

To prevent coastal degradation, it can be done by carrying out coastal mitigation. Coastal degradation will facilitate abrasion and tidal flooding which is difficult to stop. Abrasion is a process of eroding the beach by the destructive power of sea waves and ocean currents (Wibowo, 2012). Beach abrasion or erosion can be caused by ocean waves and currents or by human actions. According to Azis (2006), the most frequent cause of abrasion is the movement of ocean currents in the form of horizontal, vertical or a combination of both. These three types of movement of sea water flow will create strong turbulence so that it can damage the soil and rocks on the beach. The impact of the abrasion process is the loss of land surface and existing land on the coast. As a result of this abrasion process if left unchecked will result in strategic changes to the beach area. Reducing the land area on the coast is not only detrimental in terms of the amount of land, but also results in the loss of habitat that lives around it. A

further consequence of the beach abrasion that is feared is that it facilitates the occurrence of tidal floods.

According to Aditianata (2014), tidal floods are floods caused by sea levels equal to or even exceeding the elevation height of an area, so that at high tide there is inundation, both in rivers and in low areas. In this study the low areas are the coastal plains on the coast of Muara Gembong, Bekasi Regency. This is proven that tidal floods in Muara Gembong. occurs in the rainy season and dry season, and its location occurs in areas lower than sea level.

The causes of flooding are climate change and high rainfall, logging of mangrove trees, excessive use of coastal groundwater, and obstruction of water flow elsewhere (Ligal, 2008). Hidayatullah et al (2016), the cause of flooding in Muara Gembong District is abrasion caused by natural factors such as the phenomenon of global warming and human (anthropogenic) factors. Besides that, the human factor as the cause was the policy of the Indonesian Ministry of Forestry at that time, namely by issuing Decree No. 475/Menhut-II/2005 concerning the Change of Status of the Protected Forest Area of Ujung Karawang (Muara Gembong) covering an area of 5,170 hectares to become permanent production forest (HPT). Armed with this policy, the Bekasi Regency Government issued Regional Regulation Number 2 of 2007 which contained the creation of a new spatial plan for the Muara Gembong area as an area that could be developed according to the needs of the Bekasi Regency Government or was no longer a protected forest (Indonesian Law No. 24 of 2007) . Since then, there has been damage to the mangrove ecosystem resulting in a decrease in mangrove diversity (Supriadi, et al, 2015).

The impact of the abrasion disaster and tidal flooding is causing material losses, cutting off roads and bridges and buildings, damaging the environment in the form of crop cultivation and fisheries, spreading infectious diseases, disrupting traffic, scarcity of clean water, and psychological effects in the form of an absence of a sense of security and comfort. If this condition is allowed to continue, it will have other negative impacts, such as no trade because transportation is disrupted, and there are no daily activities. If this condition is not handled properly, it will cause disturbances to individual security because they cannot meet their needs. Then it will propagate into a disturbance of community security, because the community's needs are not met. Eventually there will be regional security disturbances due to the unfulfilled social and economic needs of the Bekasi Regency area.

The abrasion and tidal floods have occurred since 2010 on the Muara Gombong beach, Bekasi Regency. The impacts that occur are such as standing water entering settlements and drying quickly, so that light transportation is disrupted but daily activities are not disturbed. The impact is considered mild so that the community and the government experience tidal floods as a normal thing as an everyday friend. However, in the last 5 years, the impact of abrasion and tidal floods has become intolerable and has disrupted daily activities. This was marked by the entry of water into people's homes and it took 2-3 days to dry it, the loss of fish farming pond boundaries, Mekar beach lost up to 2 hectares of land so that 10 houses were submerged, Simple beach lost up to 3.5 hectares of land 20 houses submerged. When viewed from the factors causing the occurrence of abrasion and tidal flooding, namely the large number of mangrove forests cut down for the need to expand fish ponds.

Natural mitigation efforts that have been carried out by the community and the private sector are trying to replant mangrove trees around the Muara Gombong beach, Bekasi Regency. There were several private parties that helped by planting mangrove trees on several beaches in Muaragembong which began in 1974. However, the planting carried out by the community and the private sector was not carried out in an integrated and systematic manner. As was done on the coast of Mediterania and Pantai Mekar, it is evident that abrasion and tidal flooding are still

occurring. Likewise, the planting that was carried out on the Happy beach proved that tidal floods were still occurring which reached the house and occurred almost every month. The tidal flood that is happening at this time lasts 5-10 days with water conditions that are difficult to recede and damage the road soil so that it disrupts land transportation. In the end, many people use sea routes, which are more expensive.

Other mitigation efforts that have been carried out by the government, the community and the private sector, such as carrying out structural mitigation efforts by constructing embankments in several locations on the Muara Gombong coast to prevent abrasion and tidal flooding. Embankments made of earth are placed on almost every beach that leads to community land. The government also supports the cooperation that is carried out by many private companies with several communities by utilizing CSR to plant mangrove trees. The location and period of cooperation carried out by the community and the private sector in tackling tidal flood abrasion by planting mangrove forests is not limited. The community also agreed to increase the planting of mangrove forests. This is due to the fact that the main function of planting mangrove forests is to prevent abrasion and tidal flooding. It turns out that the fruits of mangrove trees can be used for food and medicine.

The explanation above shows that there have been structural mitigation efforts such as building embankments on the beach, and non-structural measures such as planting mangrove forests. However, until now the results of planting mangrove forests as a sustainable vegetation mitigation are still not as expected. However, the latest information from Antaranews.com (2021), that since December 7 2021 floods have still hit 5 out of 6 villages in Muara Gembong District, namely Mekar Beach, Simple Beach, Happy Beach, Harapan Jaya Beach and Bhakti Beach. Therefore, this study will identify how far the influence of mangrove forest development as a sustainable vegetative mitigation of abrasion and tidal flooding in supporting regional resilience in Bekasi Regency.

2. The purpose

The purpose of this research are:

- a. Analyzing the implementation of mangrove forest development as vegetation mitigation in controlling abrasion and tidal flooding on the coast of Muaragembong, Bekasi Regency.
- b. Analyzing the effect of developing mangrove forests as vegetation mitigation on regional resilience on the Muaragembong coast, Bekasi Regency.

3. Method

This study uses a descriptive qualitative method to analyze how far the coastal erosion and tidal flood disaster management utilizes mitigation of mangrove forest vegetation in Muaragembong District, Bekasi Regency, West Java Province (Sugiyono, 2014; Moleong, 2005). This research was conducted in the Muaragembong District, Bekasi Regency, West Java Province, which was attended by 16 informants who met the research requirements. The object of research is the focus of the development of mangrove forests as vegetation mitigation in controlling coastal abrasion and flooding, and the impact obtained from planting mangroves on the resilience of the community's territory in Muaragembong District in Bekasi. Data collection techniques in this study were interviews, observation, and documentation. Before performing data analysis techniques, data validity was checked through construct validation by triangulating in terms of data, observers, theory, and methods. Conduct internal validation by going directly to the field, external validation by making detailed reports and purposive

sampling techniques from research subjects, constancy by comparing with previous studies, objectivity by carefully examining the object under study in accordance with the research objectives (Moleong, 2005; Yin, 2011 ; Soegiyono, 2014). Data analysis techniques use Miles, Huberman, and Saldana (2014), which include collecting or collecting, modeling and transforming data with the aim of obtaining useful information, providing suggestions, conclusions, and supporting decision making.

4. Result and Discussion

a. Efforts to Develop Mangrove Forests as Sustainable Vegetative Mitigation

The results of the study as described previously indicate that there are 5 elements used by the people of Muaragembong District in developing mangrove forests as vegetative mitigation to control coastal abrasion and tidal flooding, namely:

1) Involve Village and Community Officials

All activities related to prevention and mitigation efforts and preparedness in controlling coastal abrasion and tidal flooding must involve the Village community. If you look at the existing regulations, it shows that the coastal area is a transitional area between land ecosystems and marine ecosystems that are affected by changes that exist on land and at sea (Indonesian Law No.27/2007; Indonesian Law No.1/2014). Based on these two regulations, the use of coastal space is said to be sustainable if it pays attention to the territorial aspects, namely land space aspects and sea space aspects (Prestelo and Vianna, 2013). Seeing the status of the existing land in Muaragembong which has floating land status, it is difficult for the Bekasi Regency government to have the authority to carry out coastal and marine spatial planning by prioritizing sustainability. Land areas including terrestrial and oceanic areas on the coast have dynamic characteristics and influence each other between ecological, social and economic phenomenology (Conway, 1987).

The community's request to involve village officials and the community in developing mangroves deserves to be appreciated. This is because changes in coastal areas will be good or bad, also influenced by natural factors and human activities (Conway, 1987). There are bad habits of the Muaragembong people, for example building new ponds or repairing old ponds by cleaning trees or anything around them. From the depth of the pond it will reach 1.2 meters. This condition will facilitate abrasion of the pond boundaries so that the fish will come out. Another impact is that it is difficult to get clean water from groundwater.

There is high awareness among the majority of the Muaragembong community that coastal abrasion and tidal flooding will decrease and even stop without reaching the house, if there are mangrove plants near the beach. This understanding needs to be utilized in developing mangrove forest planting throughout the Muaragembong coast. The real change that can't be denied is that the presence of mangroves on the Happy Beach is able to prevent the tidal waves from reaching the house again. Community involvement is very important in rebuilding a better coastline to maintain environmental sustainability while bringing in higher income (BNPB, 2008). The impact is that the environment is protected because people are aware of the importance of living without causing too much damage to nature, in the end the sustainability of nature is maintained.

2) Structural Mitigation of Vegetation

Carrying out structural mitigation, can be applied again by making refreshing in the form of conducting training for village cadres controlling mangrove forests. Considering that each village already has a Disaster Resilient Village group, the disaster resilient Village group

is actively involved. The involvement starts from the planning, implementation, and evaluation stages. Training to re-awaken about the functions and benefits of mangroves, the importance of early mitigation, and how to strengthen the development of mangrove forests, and how to maintain mangrove forests starting from how to make seeds, plant, maintain, monitor and detect mangrove life and death, and embroidering.

Actually, researchers have good hopes for the high awareness and ability of the Muaragembong community regarding the importance of planting mangroves to control the threat of coastal erosion and tidal flooding. The community has a strong motivation to plant mangroves. However, the community really wants leaders or pioneers who are strong and persistent in providing motivation and good examples. For example, in Happy Beach there are 3 companies, namely Honda, MM2100 JM, and Pertamina, which use their CSR to plant mangroves. In fact, there are about 20 groups of volunteers who temporarily want to go directly to planting mangroves without excessive documentation.

3) Change the procedure for planting mangrove forests.

Coastal abrasion and tidal flooding to date are mostly caused by strong tidal waves and even come many times without anyone being able to stop them. Structural mitigation in the form of earth embankments and semi-permanent walls is also unable to withstand tidal waves of sea water. From this experience, it must find a way out. One of the effective ways carried out by a mangrove cultivator at Happy Beach is to plant mangroves from the mainland to the sea.

If it is analyzed according to the facts in the field, mangrove plants will be strong, it will take at least 4 years. A time that is impossible to achieve when planting mangroves on the shoreline, because every month or every year there are bound to be big and high tidal waves. However, if we plant mangroves from the mainland near people's homes, then the function of holding back the tidal waves will be seen. Slowly but surely the mangroves that live near the house will prevent abrasion and tidal flooding. If time is calculated, then every time there is a new mangrove planting, it will help the old mangrove plants survive and get stronger. Finally, in a period of 5 years, the mangrove plants will go to the beach with strong conditions to withstand waves.

The application of this method was experienced by Pantai Bahagia Village where in 2012, tidal waves of sea water were able to reach residents' homes, but since there was a way to plant mangroves from behind the house to the beach, then in 2018 tidal waves could not reach homes. This cropping pattern, in fact, can be proven effective, but scientifically it still needs further research. Another supporting fact is that around the perpetrator's house until he walked to the prayer room about 1 kilometer towards the mouth of the river, mangroves flourished which were filled with soil. When viewed mangrove species *avicenia* and *rhizophora* dominate. These two types of mangroves have the advantage of taking up sediment and forming new land, as happened at Cemara Banyuwangi Beach (Kurniadi, 2022).

The planting pattern that starts from the back of the house towards the coast is a new method as well as a new finding in this study. As a result of this mangrove planting pattern, sea water can only reach 500 m from people's homes. The researchers stated that the new mangrove planting pattern was successful. For this reason, researchers call this method of planting "challenging the ocean currents from behind". Another way that is very helpful from the findings of this study is to build a foot bridge from the edge of the house to the edge of the beach. The benefits of walking bridges are to monitor the progress of life or death of mangrove trees, embroider dead trees, collect fruit, and facilitate research or surveys.

4) Developing Mangrove fruit yields

Another interesting way is to make folk crafts from mangrove fruit. Mangrove plants will produce good fruit at least 4 years old so that various kinds of snacks and batik dyes can be made. There are several types of mangrove fruit that can be used for additional income for families, namely *avicenia* which contains a lot of carbohydrates so that it can be made into flour for snacks, *rhizophora* which can be made for antiseptics, dyeing batik cloth, and herbs, and *sonarotea* which can be used for hand sanitizers and soap.

From research on Cemara Beach, Banyuwangi Regency (Kurniadi, 2022) shows that proper management of coastal areas will increase fishermen's income. The fishermen formed a Joint Business Group to manage mangroves as a tourist destination as well as a research site for students and other groups. In order for the management of mangrove tourism to run well, a tourism awareness group was formed. In order to avoid bad management of tourism products, a community monitoring group was formed. The researcher identifies the reality on the ground and believes that the community in Muaragembong, spearheaded by Destana, will be able to implement Joint Business Groups to increase people's income.

5) Utilizing Corporate Social Responsibility from private companies

Utilizing cooperation with many private companies that want mangrove trees as a target for implementing Corporate Social Responsibility (CSR). Big companies definitely have partners in fulfilling their machine production. The Honda Group, for example, will invite suppliers of oil, fuel, tires, shockbreakers and others. All Honda subsidiaries are invited to participate in granting CSR programs. In order for the community in Muaragembong to have a sizable side business from the company, the mangrove planters must have planted mangroves successfully. The company will choose people who have proven success in developing mangrove forests. Companies that will finance start looking for good seeds to maintenance so that they can stand firm between 2 - 5 years. The abilities that must be possessed by a mangrove forest cultivator are able to: (1) choose and provide the right land; (2) select and provide superior seeds; (3) maintenance program; and (4) Perform monitoring reports.

b. Effect of Mangrove Forest Development as Vegetation Mitigation on Regional Resilience

Mitigation of vegetation with the development of mangrove forests from the previous explanation there are 5 types. Everything is intended so that the resilience of the Muaragembong Subdistrict area is able to deal with coastal abrasion and tidal flooding optimally, so that people's lives run normally. Resilience is generally seen as a broader concept than capacity because it goes beyond the specific behaviors, strategies and actions for risk reduction and management that are usually understood as capacities. In everyday usage, 'capacity' and 'handling capacity' often mean the same as 'endurance' (Twigg, 2009).

In this study, regional resilience uses the theory of Ellis (2000), where five forms of capital are required to maintain an area's territory. The five forms of capital are natural resource capital, physical capital, human capital, financial capital and social capital. In this study, the development of planting mangrove forests has not been as expected. Many of the mangroves on Mekar Beach, Simple Beach, Bhakti Beach and Happy Beach were destroyed due to strong tides. The condition of the pond or pond becomes river water which is being passed by sea water, so it cannot be used. Many rice fields are stagnant with water so they are not productive. The condition of the mangrove trees in Happy Beach is able to protect about 1 kilometer of the house from the direct brunt of the waves. Broadly speaking, the influence of the development

of mangrove forests as a mitigation of the five regional resilience assets owned by the people of Muaragembong Bekasi District are:

1) Natural resource capital

The seawater environment is an environment that dominates Muaragembong District, so it has the ability to generate income from the marine fisheries, aquaculture, seawater and riverwater transportation services, and port services. The results of the research show that people are very dependent on:

a) The catch of fishermen in the sea is currently uncertain. This is influenced by water pollution conditions on the coast so that there are few fish. Thus, they have to look for sources of fish from sea water, especially crabs farther from the coast. This is risky because small traditional boats cannot reach long distances. Only big boats (30% of owners) are able to find fish in the far sea. This condition is influenced by the west monsoon or east monsoon and the changing movement of ocean currents. The east wind season usually starts in the fourth month (April) to the tenth month (October), while the west season is the eleventh month (November) to the third month (March). The northeast monsoon provides lots of fish so fishermen go to sea a lot, while the west monsoon season has high waves so that rarely dare to go out to sea. Some fishermen change jobs to become scavengers in the city of Bekasi or in Jakarta.

b) The results of milkfish and nener fish and shrimp ponds. Before 2012, pond farmers just had to collect fish in front of their house without having to make expensive ponds. Currently the fishpond yields are erratic, because they are often disturbed by tidal waves of sea water which cause abrasion so that the ponds are destroyed and all the fish automatically disappear.

c) The result of digging sand in the Citarum river. For now it has begun to decrease because the fishing community is starting to become aware of the dangers of erosion and abrasion on the banks of the river, causing flash floods. This business is not routine, but it can increase income for fishermen who find it difficult to go to sea because the west season is coming.

Natural resource capital in Muaragembong Subdistrict has not been widely intervened with modern patterns capable of supporting disaster prevention. The area of the pond, which is 8,914 hectares or around 66.97 hectares, has not been able to provide sustainable welfare for pond farmers and paddy farmers. Meanwhile, the mangrove forest area of about 379 hectares, was also unable to prevent or deal with the enormity of the incoming tidal waves. Therefore, every time an abrasion disaster and tidal flood comes, it will disrupt people's life activities. Too much dependence on the kindness and friendliness of the marine and coastal environment is not always able to provide fish and others to improve the lives of the people in Muaragembong. Thus the basic capital of natural resources in the Muaragembong sub-district is already considered unfriendly in supporting maintaining a source of life, but it can still support the people's living needs, if natural conditions are good again. The value of regional resilience in terms of basic natural capital reaches a sufficient level, because it is able to meet the needs of people's lives.

2) Physical capital

Physical capital found in this study namely

a) Boats and fishing equipment for fishermen are inadequate, making it difficult to increase seawater fish catches. Not all fishermen have a boat that can block the waves, but only about 30% have a boat. The current condition is the east monsoon season where only large boats

can look for fish out to sea to the Thousand Islands (Pari Island and its surroundings) and the Karawang location. Therefore, not all fishermen have a stable income every month.

b) The condition of the pond is heavily influenced by sea tides. Currently, almost 90% of the ponds cannot be used because the high tide removes milkfish and nener fish, resulting in a drastic decline in income.

c) Farmers' rice fields as well, could not be planted because they were submerged by tidal floods. The income of paddy farmers also decreased drastically.

d) The highways that are required for activities to enter and exit the coast also cannot reach the Fish Auction Place. So that many fish collectors go by sea and increase the cost of purchase.

The condition of the physical capital in Muaragembong Sub-District has undergone many improvements. This is understandable, because the Bekasi Regency government still does not have full authority to handle it. The ability of this physical capital will also reduce people's income. Thus the physical capital in the Muaragembong sub-district is considered lacking in supporting the maintenance of a source of life. The value of regional resilience in terms of physical capital reaches a low level, because coastal life has not been able to support it optimally to facilitate the fulfillment of people's needs. The condition of the physical capital in Muaragembong Sub-District has undergone many improvements. This is understandable, because the Bekasi Regency government still does not have full authority to handle it. The ability of this physical capital will also reduce people's income. Thus the physical capital in the Muaragembong sub-district is considered lacking in supporting the maintenance of a source of life. The value of regional resilience in terms of physical capital reaches a low level, because coastal life has not been able to support it optimally to facilitate the fulfillment of people's needs.

3) Human capital

The ability of the people of Muaragembong District is around 67% who work in the big 3 professions, namely fishermen and pond farmers and rainfed or irrigation farmers. From the type of human qualities needed, there is no need for higher education to continue the work of his parents to become the top three professions. Researchers used fishing boats to inspect the sinking area of the beach twice. The two fishermen have indeed passed on their talent to their children who are still studying at the elementary school level. On the other hand, it is very rare to achieve a bachelor's degree or around 3-5 people per village.

The competencies needed from human capital in Muaragembong are shipping and marine engineering experts. Other important skills considering the condition of Muaragembong which has experienced a lot of abrasion and tidal floods, pump experts, agriculture experts, environmental experts, marine and fisheries experts and health workers as well as agriculture and plantation experts are needed. For the production of mangrove fruits, it is necessary to bring in pharmacists or medicines and biologists. From the findings in the field, there were those who took a master's degree in nursing in Thailand but chose to work in Jakarta. The local government should give priority to indigenous people in order to develop their area by returning to Muaragembong after studying at university.

4) Financial Capital (Financial Capital and Substitutes)

From the previous explanation, it can be said that the life of the people of Muaragembong Subdistrict at this time can be said to be a critical period. This is because many fishermen and pond farmers are unemployed, so their income is uncertain. Fishermen are still waiting for the price of crab to rise so that many are still not going to sea, pond farmers are

waiting for the tides to subside, rain-fed farmers are still waiting for the seawater to enter their fields to recede, small traders are still lacking in buyers. In the end, once affected by Covid-19, beach abrasion and tidal flooding, their income is less than the Regional Minimum Wage (UMR) because it is around 1 million per month. Most people in Muaragembong find it difficult to pay their school fees, pay taxes and pay for electricity.

In terms of health, with an income of 1 million per month, it will be difficult for people to pay for insurance. Especially if the pain is sudden, it will be difficult to pay with cash. From the data it was found that only about 15% of the Muaragembong people who have BPJS health insurance. UMR income of less than 1 million is still far from the UMR stipulated in the Decree of the Governor of West Java Number: 561/Kep.732-Kesra/2021 November 30 2021 concerning the UMK in West Java Province in 2022, namely IDR 4,816,921.17. This amount has increased by IDR 33,985 or 0.71 percent from the 2021 Bekasi UMR, which is only IDR 4,782,935.64. With this amount, Bekasi's UMR is still the highest in West Java beating Karawang's UMR (kitalulus.com, 2022). Thus the financial capital of the Muaragembong community is low, but has the potential to be developed.

5) Social Capital

The life of the people in Muaragembong District is already integrated with the sea so it is difficult to change this behavior. The people in Muaragembong are a mixture of Betawi, Javanese and Sundanese. The model of life in harmony and gotong royong is still often applied. It can be seen in daily life that Islamic values are still attached and inspire to keep the spirit to defend life. There is great potential because there are several people who like to volunteer as members of Destana and Tigana. In general, the majority in Muaragembong District support government programs in reducing the risk of abrasion disasters (Bruneau et al, 2003; Cutter et al. 2008).

With young people joining Destana and Tigana, they have the opportunity to play a bigger role in the development of mangrove forests. Moreover, information from previous informants that until now many students and students still have high motivation to help in tidal flood control activities by planting mangroves. By utilizing the Destana and Tigana groups, the development of mangrove forests. Thus, the social capital of the Muaragembong community is still very good in supporting the development of mangrove forests and supporting regional resilience. From the theory of regional resilience, it is found that there are 4 capitals that are still low, namely natural resource capital, physical capital, financial capital, and human capital. However, social capital status is still high. With the existence of high social capital, it can be utilized to form mangrove land awareness groups that significantly affect the sustainability and sustainability of mangrove ecosystems.

From the explanation above, it shows that the development of mangrove forests as a mitigation of sustainable vegetation is somewhat hampered by the status of land ownership which is still held by forestry or arable land, but the reality on the ground that mangrove planting activities are still ongoing with the initiation of Muaragembong community members and collaboration with several private companies. The results have proven to be good for holding back tidal waves of sea water so they don't reach the home page. The new method used in the development of mangrove forests in Happy Beach which researchers call a planting method "challenges the ocean currents from behind".

The effect of mangrove forest development as a sustainable vegetative mitigation on regional resilience shows that out of 5 regional resilience assets 4 capitals have less supportive status namely natural resources, physical capital, financial capital, and human capital, while

social capital is good. Even so, the condition of the resilience of the Muaragembong community area is in a condition of being able to survive with what is owned while waiting for the tides to subside and normal trading conditions to return. In other words, they are still strong enough to survive without help from other parties with the principle of being one with the changes in the existing environment. This is in accordance with what was said by Conway (1987) which states that social elements are the main key in maintaining a system to remain in a state of balance. This is proven in the Muaragembong community even though the 4 resilience capitals are not supportive, but with strong community social resilience, the Muaragembong community is still able to maintain survival.

From this condition, the government of Bekasi Regency should continue to demonstrate its authority administratively as the regional autonomy authority to assist in mitigation activities against coastal abrasion and tidal flooding. The conditions of abrasion and flooding have resulted in social and economic impacts so that incomes have greatly decreased and the number of unemployed has increased. To prevent political impacts from the community, there must be coordination between the Ministry of Forestry and the Environment, the Provincial Government of West Java and the Regional Government of Bekasi Regency in finalizing land status so that it will help find out who has authority over development in Muaragembong District in a planned and sustainable manner.

The existence of a Fish Auction Place to market marine fish and fish from ponds is still not accommodating. In the end, fishermen and pond farmers were unable to bring in large buyers who were more profitable. They rarely sell to wholesalers in Jakarta or Cirebon. Instead, collectors came from Jakarta, Bogor and Cirebon. Because they are sold to collectors, the income of fishing communities and pond farmers has not yet reached the Regional Minimum Wage.

The condition of the physical capital in Muaragembong Sub-District has undergone many improvements. This is understandable, because the Bekasi Regency government still does not have full authority to handle it. The ability of this physical capital will also reduce people's income. Thus the physical capital in the Muaragembong sub-district is considered lacking in supporting the maintenance of a source of life. The value of regional resilience in terms of physical capital reaches a low level, because coastal life has not been able to support it optimally to facilitate the fulfillment of people's needs.2) Physical capital (Physical Capital).

5. Conclusion

The conclusion of this study are;

a. The development of mangrove forests as a sustainable vegetation mitigation is still being carried out by community members and collaboration in the form of assistance from several private companies, where by applying a new method called challenging the ocean currents from behind, it turns out to be able to hold back waves of sea water from reaching residents' homes.

b. Regional resilience is in a less good condition than 4 capitals and which is only supported by good values from social capital, but in the field it is proven that most people are still able to maintain their lives even without the help of other parties.

Even though the reality on the ground is that the development of mangrove forests which function as sustainable vegetation mitigation only supports regional resilience only as social capital, the reality is that it is still capable of supporting conducive and good national security.

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