

Full Length Research

Empowerment of Kampung Laut Community, Cilacap Regency, for Livelihood Orientation

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The communities of Kampung Laut District have various livelihoods that rely on the existence of water resources, such as fishing, transportation service, trade, and tidal agriculture. Consequently, in order to sustain the community livelihoods, impairment to the functioning of Sagara Anakan Lagoon should be anticipated, as it strongly affects the community life. The research aimed to: 1) Analyze conservation efforts to improve the community life of Kampung Laut District; 2) Analyze changes in the livelihood orientations of the community living in Kampung Laut District; and 3) Analyze efforts of community empowerment appropriate to the condition of the territory of Kampung Laut District. The research employed survey method using the analysis technique of field checking and interview with checklist. The community's ability to meet their needs has decreased as a result of shallowing and sedimentation of Sagara Anakan Lagoon. The lands frequently utilized for agriculture are often inundated and flooded. Meanwhile, shallow waters caused by sedimentation make it difficult for boats or ships to pass by. To improve the community's ability and its sustainable development, changes in livelihood orientation, coastal area conservation, and community empowerment should be done in the anticipation of the physical changes.

Key words: Shallowing, Sedimentation, Livelihood Orientation, Coastal Area Conservation, and Empowerment.

INTRODUCTION

The life necessities of Kampung Laut's community are highly affected by the changes and development of Sagara Anakan. In addition, population growth has created an increasing need for space, and Sagara Anakan as a body of water serving to provide the major resource has experienced great changes, one of them is shallowing by the formation of new deltas. Sugandi and Trianawati (2009) stated that the formation of new deltas triggers issues with community utilization of the deltas, creating conflicts of landholdings. In fact, the conflicts could be recently observed in deltas on Sagara Anakan Lagoon. Thus, the deltas should be managed and controlled by the government. However, the community needs have to be fulfilled, so that those deltas have been utilized for various community activities by disrupting the growing trees. Perdana and Sudjono (2011) mentioned that the sedimentation rate has increased since 1931, when the populations started to convert mangrove forests into agricultural lands.

The deltas formed on Sagara Anakan Lagoon are inhabited by the communities of Kampung Laut District,

while the waters function as conservation area. More specifically, the waters function as the habitat for sea biota spawning, temporary habitat for sea biota before reaching maturity, and flora and fauna development; hence, the area should be conserved. On the other hand, the conservation is inseparable from the efforts of meeting the communities' needs, because they will affect the conservation. Sagara Anakan Lagoon is vulnerable to changes, both natural and anthropogenic (human-induced). The changes caused by humans are due to the majority of the community relying on the area to cater for their needs. The fulfillment of community needs has made the preservation of the lagoon's environment and ecosystems the main priority. The force to provide for life has caused the coastal area that should actually serve as buffer zone to be unable to maintain its functions, so that coastal environmental damages take place.

A territory is an ecosystem consisting of various physical factors, such as air, water, soil, rocks, and microorganisms, as well as human beings. The final

factor, human beings, is one of the factors that can change the functions of the ecosystem, because human activities can destruct or sustain the environment. The environment always utilized by the community, in addition to Sagara Anakan waters, is the land. With the increasing number of the community, changes in land utilization will be unavoidable, resulting in environmental changes. It means that the more human activities, the greater the influence on changes of land function, ultimately the ecosystem. Lands will always shrink as a result of agricultural or residential activities. Asdak (2002) stated that ecosystem is an ecological system consisting of mutually integrating components that form a whole entity. Hence, in an ecosystem nothing stands by itself; a component has a relationship with another component, both directly and indirectly, in a big and small proportion.

The aforementioned statement depicts that community activities in a piece of land have an impact on the components of the ecosystem. Changes of a single component will have an impact on the other components of the ecosystem. Meanwhile, community is one of the most significant components in an ecosystem because of its dynamics. A single activity done in a piece of land will interfere with the ecosystem's components already formed in balance and stability. Sukojo Muljo (2003) said that the ongoing and finished development on the whole coastal areas of Indonesia has caused damages. Declining qualities of the environment or ecosystem are increasingly felt and have both direct and indirect impacts on the economic, social, and cultural aspects of life. The area of Kampung Laut District, Cilacap Regency, is formed by the sedimentation that in turn forms deltas. The deltas are located between Java Island and Nusa Kambangan Island and, until recently, they have transformed into lands connected to both of the islands. The district community lives and resides on the deltas. In order to meet their needs, they fish in Sagara Anakan Lagoon. Thus, the area is relied on by the community to meet their various needs, such as housing, family necessities, social, and education needs.

Sagara Anakan waters, as part of Kampung Laut District territory, are often called a lagoon. The waters are the habitat for the sea biota originated from the Indian Ocean. Ci Tanduy River, which contributes 740,000 m³ muds annually from the total sediment of 1 million m³/year, flows into other rivers. Sedimentation can threaten mangrove forest and cause the fish and shrimps production to dwindle (Satyana, 2010). The Large River Basin Organization as cited in Sukardi (2010) stated that the area of Sagara Anakan in 1984 was 2,906 hectares, in 1994 this area was reduced to 1,575 hectares, and in 2003 this area shrank to 600 hectares. It means that this area experiences shrinkage of around 104.8182 hectares/year. Meanwhile, the area of mangrove forest in 1974 was 15,551 hectares, and in 2003 it was reduced to

8,506 hectares (Sagara Anakan Area Management Agency, 2007). The large amount of mud deposited in the waters has been increasingly reducing the area of Sagara Anakan waters from year to year, and the waters have become shallowed covered by mud. The sediment brought from Ci Tanduy River into Sagara Anakan Lagoon amounts to more or less 74% of the total sediment there, while the remaining 26% is originated from other watersheds. Research results on the area of Sagara Anakan Lagoon showed how the area has changed over time from 2,906 hectares in 1984, to 1,575 hectares in 1994, and finally only 600 hectares in 2003, which means that the average shrinkage of this area is around 104.8182 hectares per year (West Java Provincial Office of Water Resources Management, 1998). The changes in Kampung Laut area, namely shallowing and the formation of new deltas, have caused fishermen's boats to wreck, disturbing the fishermen's mobility and transportation in general. Mujiono stated that to reduce sedimentation, dams will be built in four points: Tasikmalaya, Ciamis, Banjar Patroman, and Cilacap (Satyana, 2010). The statement shows that the formation of new deltas causes problems concerning ownership of the deltas as new lands, impacting on the agrarian law. Many of the deltas are claimed for their ownership, even though they are difficult to utilize. Another problem emerging due to sedimentation is concerned with the community sustainability, whose life relies on Sagara Anakan Lagoon. Shallowing has caused the potentials of natural resources to decline, requiring new efforts to develop other skills than fishing.

In addition to functioning as the area for sea biota spawning, Sagara Anakan is the resource for community life as well as other animals, such as birds and swamp plants. The area of mangrove forest in Sagara Anakan is the largest in Java Island, but it continues to shrink. The area was 13,500 hectares, and has continued to decrease due to land reclamation and mangrove logging. This is supported by the fact that the mangrove forest in Sagara Anakan is the home to 85 mangrove bird species: *Centropus nigrorufus*. The mangrove forest is even frequently made the place for flocks of birds migrating from Australia to gather (Erfteimeijer, Balen, and Djuharsa, 1988). Sagara Anakan Lagoon and Kampung Laut community form a good and stable ecosystem that will be sustainable if human activities there do not interfere with the waters. Sagara Anakan sustainability is not only influenced by the community whose livelihoods rely on the sea, but also by the community activities around the waters, including on the rivers that empty into Sagara Anakan lagoon. According to Sukmawardani (2006), mangrove forest is one of potential natural resources and is significant for the community in terms of economic, ecological, and biological aspects. Furthermore, mangrove forest serves to reduce water movement, such as put forward by Yanney (1990), who explained that mangrove flora has the characteristics of having

dark-green glossy leaves, cluttering aerial roots or pneumatophores, and the tendency for the vivipara that can be said to be peculiar. Mangrove flora plays the active role of forming lands on sea. Mangroves block the water flow and bind the soil with their roots. The mangrove forest in Sagara Anakan is occupied by the community working as fishermen; hence, efforts in the management of the forest need to be made in order to prevent the forests from degradation. Land degradation of this conservation area is caused by community activities. Research results demonstrated that there has been a decrease in the area of mangrove forest in Sagara Anakan from 15,551 hectares in 1974 to 8,506 hectares in 2003 (Sagara Anakan Area Management Agency /BPKSA, 2006). The shrinkages of Sagara Anakan area and the mangrove forest result in a decline of a number of fish species. In 1985, there were 45 fish species, while in 1999 there were 18 left and 15 new species (Boesono, 2008).

The reports show that Sagara Anakan Lagoon has a social function in the community life, because some members of the community earn their livelihoods in the area, which has ecological function in supporting fishery productivity. This means that if the waters have ecological roles, the community should be engaged in the management. For the community to be engaged, the waters have to give benefits for them, demanding involvement of various parties. Razali (2004) argued that people's position before the government and businessmen is very weak. On the other hand, ocean and seashore fishery conservation (ecological benefits) is only made possible if people are involved optimally so that their prosperity will improve (economic benefits).

A number of the community members rely on the sea and the lands for their lives, such as farmers, traders, service providers, and the like. Members of the community who meet their needs by utilizing the lands are farmers. To improve inhabitants' participation, extension can be done in order to make them understand the significance of the environment, so that they can maintain the quality of lands and waters and land resources for land sustainability and conservation (Mendoza, Perz, da Silva, Brown, and Soares Pinheiro, 2014). The shallowing causes shipwrecks and a decrease in the waters' potentials, causing fishing activities to decline. The decrease in the potentials and activities there results in the less optimal fulfillment of the community needs. On the other hand, the formed deltas present difficulties to be made agricultural land because of their properties that are not appropriate for agriculture. Some of the obstacles are water salinity, concave land forms, and inundation and flooding during the tide. The conditions will remain, resulting in the lowering ability of the community to meet their needs. To ameliorate the environmental damage, management of natural resources is needed, including genetic resources, both on lands (forests) and seas (Supriharyono, 2008). Hence,

efforts to restore Sagara Anakan Lagoon and changes in livelihood orientations should be made. It is highly indicated that the attempts of rehabilitating Sagara Anakan Lagoon have to be made through conservation. According to the Law of the Republic of Indonesia no. 32 of 2009 concerning the Main Principles of Environmental Management, it is stipulated that Environmental preservation is achieved through conservation, because conservation is an attempt of sustainable maintenance and protection of resources existing in the watershed and Sagara Anakan Lagoon. The environment is a totality of space with all materials, resources, situations and creatures, including human and their behavior that influence the nature, continuation of livelihood and human welfare as well as other creatures. In line with that, Sugandi (2014) stated that environmental sustainability has to support the sustainability of life and development. Hence, conservation must be done to support the attempt of preserving the sustainability of the ecosystem. Thus, an integrated conservation must be done, by involving the inhabitants, the private and public institutions. Conservation is an attempt of protecting, conserving, and utilizing the environment so that it will be beneficial. According to Moeljarto, there are three models of development focused on meeting the basic necessities, namely: 1) The majority of poor communities do not have productive assets besides their physical power, a desire to work, and basic intelligence. Asset maintenance depends on improvement of public services, such as education, health, clean water provision, etc.; 2) An increase of poor people's earnings may not improve their life standards if the goods and services commensurate with their needs and income level are not available; and 3) Improved life standard of the poorest class among the poor through the improvement of their productivity requires a very long time, and in certain conditions and situations, they often are unable to work.

The environment will be beneficial as long as the community is empowered through conservation. Conservation program should be concerned with the socio-economic condition, because of the fulfillment of residents' necessities (Sugand, 2013). It has to ensure the existence of fish resources along with their protection, conservation, and utilization by improving the value quality and fish resource variety sustainably. Such a conservation program can improve the community's ability socially and economically.

Kampung Laut District is located in the south of Cilacap Regency. This district is peculiar in that its area consists of waters and lands. The lands inhabited by the community are as a result of sedimentation in the forms of deltas, which are separated by narrow straits. Because the lands were initially swamps turned into deltas, the surface has a concave shape with a height of < 1 meter above the seawater. The shape and height of the lands cause inundation and flooding. In addition, community activities in managing the lands for

agriculture are based on the ebb and tide of seawater. Changes in livelihood orientations, from being fishermen to farmers, require the community's time, knowledge, and skills. Meanwhile, environmental rehabilitation needs conservation. Both orientation change and conservation require community empowerment. Community empowerment has to consider the community's main activities so as not to interfere with them. Based on the explanations above, the issue that will be probed in this research is: "How are the efforts of Community Empowerment made in Kampung Laut District?"

The research problems proposed is formulated into the following questions:

- i. How are conservation efforts made in order to improve the community life of Kampung Laut District?
- ii. How does the livelihood orientation of the communities living in Kampung Laut change?
- iii. How are the efforts of community empowerment appropriate to the condition of the territory of Kampung Laut District?

The research objectives depart from the fact that the territory of Kampung Laut District consists of lands and waters. The waters provide benefits for the community living on the lands. Shallowing and sedimentation have decreased the potentials of the waters, affecting the fulfillment of their necessities. The decrease in the potentials requires efforts of community empowerment; therefore, the objectives of this research are to:

- i. Analyze conservation efforts to improve the community life of Kampung Laut District.
- ii. Analyze changes in livelihood orientations of the community living in Kampung Laut.
- iii. Analyze the efforts of community empowerment appropriate to the condition of the territory of Kampung Laut District.

Research outcomes are expected to provide a description on territorial change due to shallowing and sedimentation that causes a decline in the community life. Hence, to restore the community life, efforts of community empowerment are needed. The efforts, in turn, demand improvement in the knowledge and skills through empowerment and livelihood orientation. The empowerment of Kampung Laut District community can give the following benefits:

- i. Development of appropriate theories to develop territories through community empowerment and coastal conservation.
- ii. Suggestions concerning land management and development of Kampung Laut community life for site and regency planners, ultimately Department of Marine and Natural Resource Conservation of Sagara Anakan.

RESEARCH METHODS

The research was conducted in order to study the efforts of community empowerment. It is important to be done because there have been environmental changes in Kampung Laut District. The environmental changes have consequently forced for environmental rehabilitation and changes in livelihood orientation. This change of orientation has to be done through community empowerment and coastal conservation, in order to restore the community's ability to meet their needs. Community empowerment is related to the socio-economic condition of the community, such as income level, knowledge, livelihood, and land form.

The territory of Kampung Laut District with straits and Sagara Anakan waters separating its villages and kampongs has the potentials of natural resources beneficial for community life. In addition, it serves as an area for various activities, such as fishery, transportation services, tourism, sport, and trade. To maintain the function of this territory, community empowerment is needed.

The method used in this research was survey, because the territory is under the governance of one district, namely Kampung Laut District, consisting of four administrative villages, which are Ujunggagak, Ujunggalang, Klaces, and Panikel. The method requires that survey is done in each representative region; therefore, the four administrative villages were surveyed. Meanwhile, there were four stages in this research, namely: 1) Preparation, 2) Survey, 3) Analysis, and 4) Reporting.

The area under research is Kampung Laut District territory, consisting of four administrative villages, namely Klaces and Ujung Alang that are situated in the southeast, Ujung Gagak in the west and Panikel in the north. The name of Kampung Laut itself is derived from the communities living and earning their livelihoods on the waters that separate the four administrative villages, known as Sagara Anakan Lagoon. Now, its appearance on the map is no longer above the sea.

The area population of this research is Kampung Laut territory, consisting of lands as residence and Sagara Anakan Lagoon as the place to meet the necessities of the residents. The sample consisted of the community inhabiting Kampung Laut District, comprising of four administrative villages. Hence, the respondents were the people living in the four villages. The variables analyzed were Coastal conservation efforts, Changes in livelihood orientation, and Community empowerment efforts. The means employed to gain data from the community were as follows: 1) Field observation to see directly the socio-economic condition of the community; 2) Documentary study, needed to support the research by gathering data from previous research; 3) Survey to gain primary data from the community and the land condition using guided interview and checklist as the

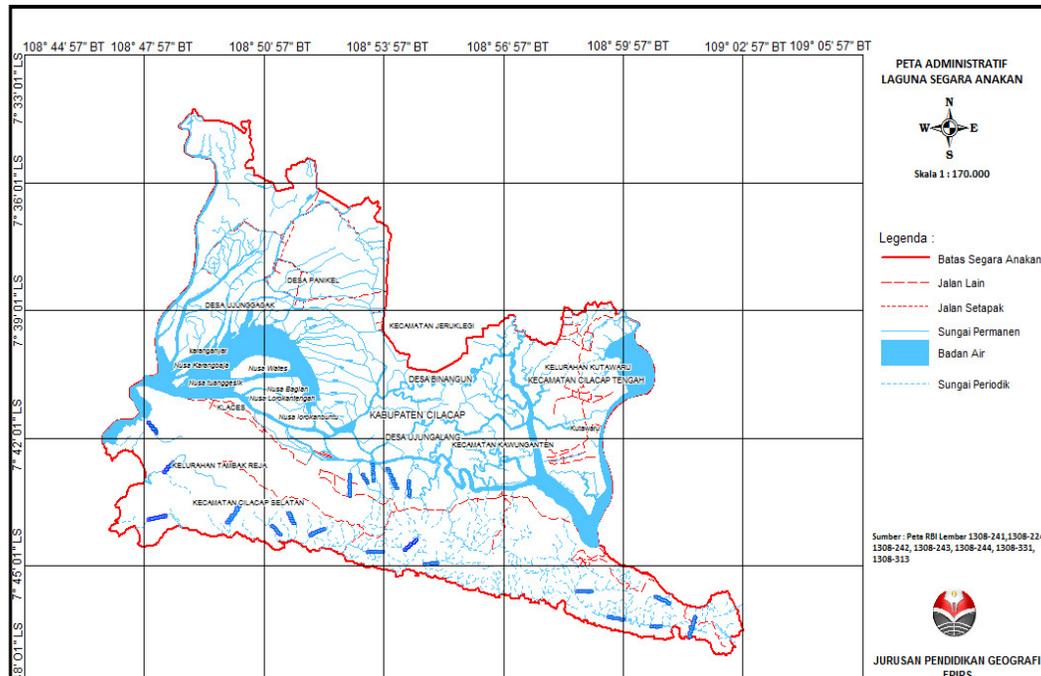


Figure 1. Study area.

tools; and 4) Literary study, namely collecting data from various textbooks to support the theoretical framework on which the issues studied are based. The factors directly observed were land form, slope steepness, land utilization, income, and livelihood. These factors were to determine the community's socio-economic abilities, the forms of land of Sagara Anakan and the waters, and the efforts to be made to develop the potentials of Kampung Laut area.

RESULTS AND DISCUSSION

Kampung Laut is a district in the south of Cilacap Regency. The territory consists of lands and waters separating villages and the central regency government. It is formed due to sedimentation forming deltas that are later on inhabited by the communities. The district comprises of four administrative villages separated by Sagara Anakan straits and waters. Geographically, it is located on the coordinates of $108^{\circ} 45' \text{ EL} - 109^{\circ} 10' \text{ EL}$ and $7^{\circ} 35' \text{ SL} - 7^{\circ} 50' \text{ SL}$ (Sugandi, Jupri, and Trianawati, 2008).

The area is a delta separated by waters; consequently, the community's livelihoods are affected by the existence of the waters. The community has various livelihoods, and the majority of them rely on the potential resources of the waters, such as for fishing, transportation, trade, and tidal agriculture. This translates as the livelihood sustainability of the community in the district being affected by the area's potentials. A decline in the function of Sagara Anakan Lagoon has to be anticipated by

various parties, as it affects the community life. The area of Kampung Laut District under research is shown in Figure 1.

Physical Condition

The average weather prevailing in an area in the span of ten years is called climate. In determining climate type, classification can be made based on weather elements, such as rainfall, temperature, moisture, latitude, and vegetation as well as geographical location of an area. Furthermore, climate is classified according to the interest of the object being studied. Based on its geographical location, the area has a tropical climate with the characteristics of average annual precipitation ranging from 1,248-3,397 mm/year and high temperatures with the average of 24.1°C - 31.3°C (Hydrology, Bureau and Water System, 2009). According to Department of Agriculture and Livestock and the Large River Basin Organization (2011), the area has a mean annual rainfall of 2,219 mm/year. This is proved by the large number of tropical plants that keep growing all season. Data of the rainfall in Cilacap Regency are provided in Table 1.

According to the classification made by Center for Soil Research, the soil in the area under research is alluvial as shown by the 1:250,000 scale soil map (1957, in Hardjowigeno, 2003: 209). Alluvial soils are formed due to deposition of parent materials derived from higher grounds on the mainland of Java brought by Ci Tanduy and Ci Beureum. These soils are generally formed in

Table 1. Data of the 2000 – 2009 Rainfall in Cilacap Regency.

Year	Month												Total
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
2000	274	254	364	338	247	94	24	35	48	649	523	297	3147
2001	316	195	379	293	95	261	79	0	46	847	481	196	3188
2002	302	175	173	213	69	25	14	20	10	18	337	335	1691
2003	367	339	338	125	176	51	43	0	44	236	405	488	2612
2004	226	224	336	87	224	80	111	16	35	74	516	797	2726
2005	381	246	330	288	172	147	109	32	232	165	417	408	2927
2006	390	273	279	227	114	40	28	0	0	24	74	311	1760
2007	118	405	253	262	211	104	99	23	35	242	793	803	3348
2008	175	326	412	235	156	17	2	58	98	425	840	0	2744
2009	468	537	370	301	185	91	15	4	40	446	569	372	3398
Average	302	297	323	237	165	91	52	19	59	312	495	401	2754

Source: Department of Agriculture and Livestock, Ci Tanduy Large River Basin Organization, 2011.

areas with the morphology of sloping lands and their development is affected by other materials and the local condition. The underlying rocks are Qa and Qf, which are formed by material deposition (Simanjuntak and Surono, 1992), while slope level is categorized into class 1 with a slope gradient of around 0 – 8%. The materials range from soft to hard.

The underlying soils are formed by sedimentation from the lands forming deltas on Sagara Anakan Lagoon. Because the territory's latitude is close to the sea level, its properties are affected by the ebb and tide of the sea and the climate, so that in the dry season the water is brackish, while during rainy season the area is inundated and flooded. The physical condition, the season, the ebb and tide, the morphology and the soil type only allow for wet agriculture, namely rice field that can only be harvested once a year. Moreover, during rainy season, Sagara Anakan waters have a high turbidity level that the fish resources dwindle. In the dry season, Sagara Anakan waters recede, making them shallow and creating new deltas that cannot be passed by fishermen's boats.

Social Condition

Based on the 2011 survey and District Monograph, the land covers in Kampung Laut District consist of residential area, tidal agriculture, bushes, and mangrove forest.

i. Residential area, the land utilized for residences is spread in four administrative villages, namely Ujungagak, Ujunggalang, Klaces dan Panikel. When the area of Sagara Anakan Lagoon was still large, stilt houses were dominant because the lands were frequently puddled and flooded, and currently the houses change their shapes by being built on the ground.

ii. Rice fields, in the four administrative villages they can only be harvested once a year due to the concave-shaped lands that are often inundated, so that planting is done prior to dry season, namely from March to June, and irrigation relies on the rainfall.

iii. Mangrove forest, growing on the coast. The trees serve to reduce abrasion and block the deposited mud that will eventually form deltas.

iv. Bushes, not cultivated by the community, proving that the land is less productive.

The population distribution of Kampung Laut District in the four administrative villages is shown in Table 2.

Table 2 shows that even though Ujunggalang has a larger population, totaling to 5,177, compared to that of Ujunggak, with a total of 4,785, the number of fishermen in Ujunggalang is only 770, smaller than that in Ujunggak, which has 1,525 fishermen. The village with the largest population is Panikel, as many as 5,485, with 192 fishermen, and Klaces has the lowest number of population, with only 1,392 people. In total, the number of fishermen is 2,762, while the number of farmers is 1,458. Meanwhile, the average income of the community is IDR 933,750. Income intervals are demonstrated in Table 3.

For family necessities, such as drinking water, water for shower and washing, the people have to buy from Nusa Kambangan Island, because the ground water is brackish.

Located in the tropical area with high rainfall, temperature, and wind, the activities of the district community are highly affected by climate, ultimately the fishermen who are much affected by wind and rainfall.

The communities do various activities to meet their needs by utilizing the potential resources in the area. Their livelihoods include fishing, agriculture, sea transportation, and trade. Fishing and sea transportation rely on Sagara Anakan Lagoon, but shallowing and sedimentation negatively impact these two activities.

Table 2. The Population of Kampung Laut District

No	Administrative Village	Situation			
		Population	Fishermen	Head of the family	Land Owner
1	Ujung Gagak	4,785	1,525	1,194	764
2	Ujunggalang	5,177	770	1,185	426
3	Klaces	1,392	275	380	200
4	Panikel	5,485	192	1,461	681
	Jumlah	16,839	2,762	4,220	2,071

Source: Kampung Laut District Monograph, 2011

Tabel 3. Income Interval Class.

No	Income Interval	Number of Respondents	Percentage
1	IDR 300,000 - < IDR 600,000	66	27.50
2	IDR 600,000 - < IDR 900,000	148	61.67
3	IDR 900,000	26	10.83
	Total	240	100

One of the impacts is frequent shipwreck. This decline of Sagara Anakan Lagoon function should be anticipated because it caters to the needs of the community. Based on rainfall distribution, rice agriculture is only done once a year by considering the right time for planting and harvest. Rainy season starts from October to May, while dry season from June-September. Because during rainy season the agricultural land is flooded, and during dry season there is drought and the water becomes brackish, rainfall needs to be taken into account for planting, namely in the transition from dry season for planting, while harvest is done in the beginning of dry season. It means that agriculture can be practiced from March to June, because in March rainfall begins to cease, transitioning to dry season.

During rainy season, rainfall from the lands is flowed through Citanduy, Ci Beureum, Ci Konde, and other small rivers while carrying materials from erosion. The river flow is blocked by Nusa Kambangan Island and the flow from the Indian Ocean. Hence, the river flow circles around Sagara Anakan waters, causing the waters to be turbid. This turbidity, in turn, affects the survival of natural resources, so that during this season fish resources dwindle. Meanwhile, in the dry season, Sagara Anakan waters lack water supply from the lands, making the sea shallow and the materials from erosion brought by the river flow are deposited and eventually form deltas. The shallowing and sedimentation cause the fishermen's boats to be unable to pass the waters and the natural resources decrease.

The physical conditions show that both in the dry and rainy season, the natural resources are scarce, causing a decline in the activities of fishing, transportation, and trade. Meanwhile, agriculture is only done towards the dry season. It means that the community whose

livelihood relies on fishing cannot do their activities. To change profession from fishermen or transportation service providers to farmers requires knowledge, skill and time, not to mention the fact that the agricultural lands are frequently flooded. The physical conditions affect the social-economic conditions, impacting on the decrease in the community life standard.

From the average income of IDR 933,750,- and with the condition of brackish water, fresh water for the needs of the family should be purchased by boat with a cost of IDR 30,000 – IDR 50,000/boat, which could be used for 2-3 days. Transportation to school by boat costs IDR 5,000/person. In sum, the total expenditure of a family for clean water and transportation of two children going to either junior or secondary school is IDR 650,000. Fortunately, children attending primary school do not have to use boats, as there is one primary school in each administrative village. The same does not apply for junior and secondary schools, which are located only in one place. This situation will continuously negatively affect community's purchasing power and the ability to participate in the development. In turn, it will impact on the sustainability of the community life that will become an obstacle for the sustainable development of the area.

Shallowing and sedimentation in the waters and rivers have caused the activities of Kampung Laut community to slacken, so too their need fulfillment. The impeded activities of the fishermen, transportation service providers, and traders are followed by a decrease of purchasing power. To develop the community's ability demands rehabilitation of the waters. Normally functioning waters will automatically allow for water transportation and the increasing number of natural resources flowing in from the Indian Ocean. Efforts of rehabilitating the waters can be made through conservation. The type of

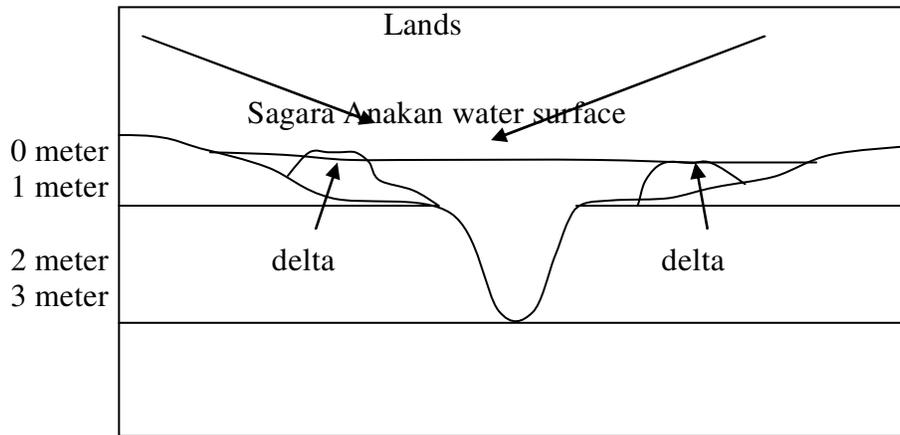


Figure 2. Shallowing and Sedimentation.

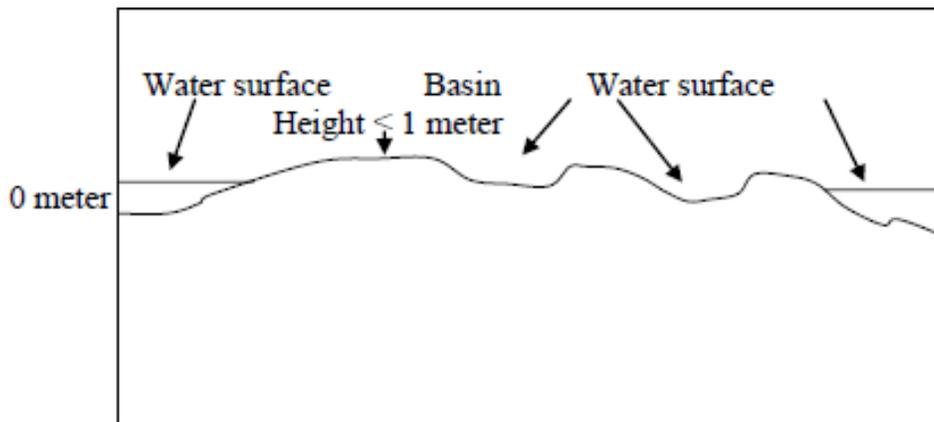


Figure 3. Deltas and basin.

conservation implemented has to be appropriate to the condition of the area in order to create sustainable resources to cater to the community needs. Coastal conservation, where the land surface is almost equal in height to the sea surface, while the waters experience shallowing and sedimentation (Figure 2) should apply the following means:

i. Dredging shallow waters, because the more shallow, the lower the potentials for resources. With dredging, the waters will be able to facilitate the development of fishing, transportation, trade, and tourism activities.

The shallow waters as a result of sedimentation inhibit water transportation and frequently cause shipwreck. Hence, ferries and *compreng* (small boats with a capacity of 50 passengers) have stopped operating since 2004.

ii. Irrigation for agricultural land, because during dry season it can be utilized to increase the community income through the livelihoods of agriculture and livestock.

During the rainy season and high tide, the sea surface rises and floods the basin. It is difficult for the water to return to sea because the water is brackish. The basins need to be filled and irrigated for agriculture because during rainy season they are inundated, and during the high tide flooded.

Delta formation causes the waters to shallow and shrink in size. The deltas formed are concave-shaped, causing the agricultural lands on them to be puddled and flooded (Figure 3). As a result, the community's livelihoods of fishing and transportation service shift into farming by utilizing the lands formed through sedimentation. The basins that are inundated and flooded during high tide and rainy season and the brackish water often cause harvest failure. Change of livelihood orientation of the community from being fishermen to farmers is posed with difficulties because the basins are not appropriate for agriculture. Development efforts for such lands should be done by filling-up the lands so that they become flat, and flood will not occur during high tide. Meanwhile, for the agricultural irrigation, the rivers

can be dammed.

Changes in livelihood orientations require appropriate coastal conservation. Conservation, in turn, demands new knowledge and skills to replace the ones already acquired. Community empowerment becomes very significant, as it relates to needs fulfillment. The empowerment can be done through training and extension programs on agriculture and conservation. It is not only concerned with knowledge and skills; more importantly, the empowerment should motivate and encourage the community to act. Motivation and encouragement will be the triggers for the community to maintain, protect, and cultivate the sense of belonging for the area that caters to their needs. Sustainable environment will automatically increase community's income. In addition, community empowerment needs to be supported by various parties, because it involves sustainable development of the place in which the communities live and gain sustainable benefits from.

Conclusions

The community members of Kampung Laut District are engaged in the activities to meet the necessities of life by utilizing the resources of Sagara Anakan waters and lands. Unfortunately, the waters experience shallowing and sedimentation, where the waters become shallow and deltas are formed. Shallowing and sedimentation also cause a decline in the potentials of the waters.

i. With the impaired functioning of the waters, the livelihoods as fishermen, transportation service providers, and traders are negatively affected, so that orientation of community livelihoods has changed. Changes from being fishermen and transportation service providers to farmers in the formed deltas with brackish water have not been sufficiently supported by agricultural knowledge and skills.

ii. To develop the community's ability, the functions of the lands and waters should be improved through conservation. Conservation of Sagara Anakan coastal areas can be done through dredging, because the waters serve as the place to cater to the needs of fishermen and to facilitate transportation service. Land conservation can be done by filling up the basins, so that rainfall or high tide can return to the waters. Irrigation on lands is needed because the water from Sagara Anakan Lagoon is brackish.

iii. Physical and social changes have caused the community's ability to participate in development to decrease; hence, efforts to improve their ability through empowerment have to be made. Empowerment has to be in line with the territorial condition, because it is concerned with life necessities. Community empowerment can be done through training and extension of knowledge and skills on the efforts of coastal conservation and livelihood orientation. It is expected that the community will gain benefits and a sense of belonging

from the empowerment. With the gained benefits, the community of Kampung Laut will develop sustainable life and development, so that they have a sense of belonging for the area.

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