The Current Conditions of Social Institutions in the Environmental Changes and Modern Fishing

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An Analysis on the Local Institutions of Fisherman Communities of Two Ecological Types in the East Coast of North Sumatra

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Abstract-This article deals with two kinds of spesific coastal ecology namely swampy area and the region that has access to the coast and sea for the availability of river waterways. The first type is situated at the estuary with mangrove forest, many ditches and brackish water, whereas the second becomes a unity of cultural area in integrating the settlement, waterway, and the sea. The ecological differences result in the slightly distinct patterns in constructing the social institutions for regulating economic activities of fisheries. However, the two are facing similar oppressed conditions due to degradation of quality of environment in the coastal area, and modern instruments for fishing supported by intensive capital of the fishing enterprises.

Keywords—social institution, ecology, fisherman, community, coastal area

I. INTRODUCTION

The social institutions which exist and evolve in fisherman community have strategic advantages for sustainable marine-based development as an effort to increase the community's quality of life and wealth. This hypothesis has been found in many fishing communities such as in Visayas, Philipines (Polinac, R, Crawford B.R and Gorospe, LG, 2001) [1] and the Kenyan coast (McClanahan, Wamukota, A, 2010). [2] Those findings show strong roles and functions of social institution in general comunity. Normatively, these institutions are attitudal and behavioural guidance for the people in both social and ecological interactions. They are of regulative meaning from which any other regulations and mechanisms are agreed upon to manage the people's life. They also function as tools of social control and integration in economic attempts to exploit and ecological attempts to conserve the natural resources. Scott (1989) [3] stated that the community institutions are "hidden insurance" for conserving sustainability of life and are used to anticipate the social and economic problems in rural communities in Southeast Asia. It is in line with Giddens (in Scot, 2008) [3] who states that Social institution can make the comunnity and society live in peace.Uphoff (1986) [4] categorizes institutions into some levels such as individual, household, local, sub-district, district, regional, national and international. The individual and local institutions contribute much to improve the capacity and organization of fishing communities in the development of human resources, management of marine and coastal resources sustainably. The study and analysis of social institutions are useful as a data base and input to support government programs to increase living standards, to provide better fishing community development and to realize welfare from fishery and sustainable development of marine.

The social institution characteristics are affected by collectivity (*guyub*), reciprocity and trust. Hidayat (2009) [5] found that the improvement of fishermen's life by the governments of Bintan Island, Jepara regency, West Lombok and South Konawe depends on the process and implementation of the empowerment of the fishermen and the characteristics of social institutions in which the fishing communities exist. An interesting fact about the social institutions of fishing community on the east coast of Sumatra is the premise that the fishing community institutions are not only purely functional but it also has a useful value both theoretically and practically. Theoretically, exploration of social institutions is useful for the development of scientific treasures of maritime sociology, organizational sociology and the sociology of development. Practically, research of social institutions may increase a well-being, self-reliance and empowerment of fishing communities. The analysis of social institutions can provide social security and certainty in the community of fishermen who are constantly hit by economic uncertainty due to the life pattern or

subsistence determined by the direction of the wind, ocean tides, weather and climate.

This reseach describes and maps the fishing communities. There are some previous studies on fishing communities such as (1) Impact of Modernization and Social Relationship Patterns Fishermen Society (2003), (2) Marital Rape in Fishermen Society (2004), and (3) Mapping Social Potential Fishermen Society Institutional Economics (2009). This study is derived from the fact that few studies have been conducted to research social institutions of fisherman communities. Many empirical studies of the fishermen were mostly focused on aspects of technology and economy. In fact, the success of the empowerment and development of fishing communities are determined or at least influenced by social institutions in the community. This research aims to explore and analyze the social institutional forms in fishing communities along the eastern coast of Sumatra. This reasearch is expected to give additional data and information as well as an explanation of the social institutional forms in fishing communities along the area.

II. RESEARCH METHODOLOGY

Design, approach, and method used in this study are of qualitative naturalistic. It means description and analysis of data, information and social institutional phenomena on fishing communities are based on qualitative approach and in a social setting and natural. In this research, the researchers become research instruments. The social phenomena were observed and interpreted by *verstehen* concept and the researchers and society are involved in interactions and dialogues (Ritzer, & Douglas, 2004) [7] . The data and information from the field were analyzed using hermeneutic interpretive methods. The use of this method is based on the argument that the value and tradition of fishing communities is a blend of social reality which is "hidden" (Lopez, 2004) [8]. By using hermeneutic interpretive method it was expected that all social phenomena like sign and symbol which appeared in the society could be holistically constructed.

All informants in this research were selected purposively using snowball sampling technique. Informants were selected from diverse social backgrounds (fishermen, skipper, traders, village officials, government officials, community leaders and officials/NGO). Based on the criteria, as many as thirty people were selected as informants. They were from Selotong village of Secanggang sub-district and Perlis village of Pangkalan Brandan sub district; both of which are from the District of Langkat. The data collection in this research used PCRA approach (Participatory Resource Coastal Appraisal), Study Together Grassroots (STG) and Focus Group Discussion (FGD). With this technique, it was expected that the data and field information about the fishing community institutions could be identified comprehensively.

Furthermore, the data and information collected were processed using qualitative analysis, by which the data and description of the phenomena were identified into category and pattern qualitatively. The data analysis in this research referred to Mathew and Michael's model (1992) [6] which includes three stages: (1) comparing the events/phenomena suited to its category (2) integrating categories with its features, and (3) to formulate and construct a concept consistent with the relevant theory.

III. RESULT RESEARCH

According to Steward, the variety is resulted from the mutual relation between organism and their environment as an adaptation (Bohannan, 1988: 322) [9]. The different way in exploiting becomes an origin of differences of specific natural condition in the coastal area. Therefore, it means that the fisherman, means of exploitation, and environment are in an integrative context which establishes the way of life of the coastal communities. Such model of analysis is named 'cultural ecology' in which the three element above are considered as parts of the ecosystem. Thus, the ecosystem is not deemed as separated element with human, which results in unfinished controversy between human control for supporter of 'possibilism' and natural determination for 'anthropogeograhpy' party. For Geertz (1983) [10], both parts have a limitation in giving adequate explanation regarding cultural variations.

By ecosystem approach, there are two spesific types of ecology in the coastal area including landscape and its braid to food chain as well, formed by biotic and abiotic components in which the system of production and social norms in the processes of fishing are different too. As a spesific and united ecosystem in the coastal area, we will remark on the natural condition, social formation, and the social institution which are different from each other within two ecological types.

The first type is named 'swampy area', as a transition zone between the plain and the sea. Generally, in the east coast, the area is formed by combination of mangrove forest, salty water, and ditches as the up-down waterway *(paluh)* connected to many narrow canals resulted from trench from farming area, village, and town. It provides various resources from the forest and the water animals. The community surroundings usually harvest wood, nypa, honey, fish and other water animals. It is sited relatively far from coast and sea, either in the absolute distance or its accessibility due to ups and downs of the water significantly affecting the waterways. However the tide gives a chance for establishing a system of aquaculture, utilizing its fluctuation for watering the fishponds *(tambak)*.

The second type is 'unit area of coast and sea', in which a cultural unit of community hass a good access to the sea for there is a river as a waterway which is not affected by the tides of the sea. Even though a village is located relatively far from offshore, the waterway makes it more accessible for fisherman, instead of the area near the coast and sea. The second type is certainly different from the first. It includes landscape and species which form and integrate the area to settlement in forming the production system.

As an ecosystem formed by united elements of human and nature, it become a basis for sustainable livelihood for community. In an ecosystem, every elements of biotic and abiotic are interrelated in a interdependent relationship, exchange of energy, in which technology serves as mediator in the relation (Bohannan 1988, Geertz 1976) [9] [10]. In consequence, different natural components affect the pattern of adaptation, exploitation system and instruments. For Marx (1961:351) [11],"different communities find different means of production, and different means of subsistence in their natural environment". Therefore, technology and economic relations form a different structure of community as well, including the system of production, organizing work force, and marketing the commodities, (Mulyanto, 2011: 55) [12].

A. SOCIAL GROUPS

The economy of swampy area is formed by combination of fishing and aquaculture, which is structured by social groups as fishermen of the ditches *(nelayan paluh)* and fish farmer *(petani tambak)*. The first indicates an agent based on the area of operation, namely *paluh* in the swamp or mangrove forest as its area of operation. Its commodities are kinds of fishes and other animals in the salty water. The fishermen use the traditional properties limited only in the shallow water, 16 feet of canoe and fishing equipment. They hire several workers from groups who do not have properties, as a small team. As a result, it forms groups of workers called fishermen laborers *(buruh nelayan)* who serve as their partners in production processes and waged by profit sharing system which is coventionally enacted in the community.

Furthermore, the fish farmer is either owner or manager of fishpond *(umpang paluh)*. In this aquaculture system, their works in seeding fishes, controling, feeding, and harvesting, become the basis for naming them as fish farmer *(petani tambak)*. They have or rent a fishpond, which is operated by technology of sluice in controling entrance and exit of water which depends on the sea tides. The last group is boss or owner of a firm in renting means of fishing, buying and selling fish, known as *tauke*. The bosses play significant role as partners of fishermen and farmer, funding fishermens who are lacking operational cost. They also supply the fishing instruments as debt for fishermen, which is paid by installment. On the other hand, the bosses demand on buying fish from fishermen and fish farmers and set prices.

Whereas, economy in second type of ecology structured by several social groups such as the fishermen *(nelayan)*, the laborers *(buruh nelayan)*, the fishery entrepreneurs *(pengusaha)*, and bosses *(tauke)*. A fisherman often leads a group of fishing in a boat, as a skipper, called as *juragan* or *tekong*, either by the boat and tools belonging to them or rented from a boss. The skipper indicates the class in the social stratification as the skilled agent in fishing. In addition, the laborers who assist them are paid by profit sharing. They tend to choose their leader freely, and form the relation of work with relative and loose ties.

The entrepreneurs of fishery sector have a great capital with mechanical instrument for fishing, whose coverage areas of operation often intersect with ordinary fishermen. They employ the fishermen *(tekong)* and his crew as laborers. The *tauke ikan* is a term for small businesses that buy fish from fishermen, and also have boats and fishing equipment for rental by skipper. Thus, they are the entrepreneurs of low and middle levels. The term actually does not differ in the form, but differs in the two contexts, so each agent in the social and economic activities is regulated by social institutions.

B. THE SOCIAL INSTITUTIONS

The social institutions are institutionalized convention, serving to regulate the relationship between fishermen and farmers with the nature, fishermen and farmers with production tools/technology, and the fishermen/farmers with their neighbors or between groups. It ensures the position, rights, and responsibilities of the parties in the socio-economic relations. The social institutions discussed here are the six as following.

1) The Private Ownership of Fishing Instruments

The fishermen in the first ecological type recognize the private ownership of fishing equipment, consisting of the canoe *(sampan)* and fishing tools *(alat tangkap)*. They purchased the two from a provider, either by way of credit or cash. Most fishing gears can also be made, but the materials are purchased from the store. However, nowadays they can be obtained from the grant of social assistance from the government. *Paluh* fishing canoe is a small river craft measuring 16 feet, which can carry two canoe crew. It is purchased for 4 million rupiahs, excluding the engine. Fishing gear is a private property which is bought by fishermen, such as net (made of netting, round shape, 6-feet long, named *ambai* and *jaring*) and traps named *bubu* which can be used up to 6 months. The private ownership is a legitimized institution which determines the status and social class. For those who do not have these tools they can work as laborers.

The second ecological type is slightly different from the first. The ownership status can legitimize the power of the owner in the production system. They can organize workers (for fishermen who own fishing gear), set the fishermen or control the price (for the boss/employer). Some fishing gears used in fisheries production are boat and trawl or nets. The entire equipment was purchased from the manufacturer or market by cash or credit.

Fishing boats, measuring 20 feet (worth approximately Rp. 18 million) to 28 feet (worth approximately Rp. 32 million) were purchased from artisans boat, while other equipment such as engines, fans, axles, steering, floor and engine rooms were purchased separately with the total price reaching up to Rp. 15 million. Fishing gear consists of several types, which are distinguished by the size of the nets (called the eye, *mata*) that determine the type of fish that can be caught and their fishing areas. Fishermen usually have more than one type of trawl as an alternative to be used in certain fishing seasons.

2) The Patron-Client Relationship

In the first type of ecology, this relationship is found in the fishermen-laborers, and the fishermen-employer relations. The first relationship is formed by fisherman having fishing equipment and the laborer that have not. Since the *Paluh* fishermen can operate the canoe and net by themselves the relation with the laborer is not very strong and formed on volunteerism; the fishermen as the patron treat the laborer as client. In practice, the fishermen have power over their fishing gear and can be very strict, while the workers must be disciplined in time and have to adjust themselves with the patron. In a small group (2 to 3 crew), although it might seem like an equal partnership, the fishermen remain the leader that govern their workers. They determine departure time, installing gear (pulled over), dividing the roles between them, the time for returning home, while the workers follow the regulations.

The second relationship is established by the fishermen and the employer (*boss/tauke*). The fishermen who lack operating costs borrow money from the employer for buying oil, snacks (food supplies), and cigarettes. With this loan, the fishermen agree to sell their catches to the employer. The debt can accumulate if they fail, and the fishermen depend on the employer. They also must keep the agreement so they cannot sell their catches to other buyer. In other cases, the loan is initially given for repairing the canoe and fishing tools. Payments are made in daily installment as a fisherman obligation to the employer obtained from the sale of the catches in which the price decided by the boss.

In the second type of ecology, patron-client relationship formed by fishermen as a skipper with the workers, and fishermen with employer. As a patron, the skipper is responsible for the team consisting of 4 to 9 people in a boat. In practice, the skipper bears the operational costs and risk for failure and damages of fishing gear. The skipper is in need of workers whereas, on the other hand, the workers require a job. The mutual relationship maintained by keeping the institution for its continuity.

The second patron-client relationship is between fisherman and employer, which is built in an unbalanced position. In a part, the skippers have not a boat and trawler, absolutely dependent on the employer as owner of the equipment. As a client, the fishermen are waged by profit sharing regulations. In the pattern, the employer bears the operational coast, boat, trawler, and the entire risk of failure. The fishermen become client depending on the employer who could choose other employer, but could not do it freely as workers choose skipper because of social ethics applied amongst them.

In common case, despite the fact that the fishermen have a boat, they need the fishing equipment and operational cost, so that they cannot avoid the employer offering a loan with its terms of payment. The institution is relatively sturdy because fishing economy continues to face shocks due to marine uncertain results, while the fishermen and their wife also cannot manage the financial of the household. Instead, they tend to be consumptive from having a debt in spite of instability of income.

3) The Profit Sharing

In the swampy area, profit sharing is quite simple and easy as the norms are held and established by the parties. In fisheries, the shares for the catches include skipper, laborer, and fishing equipment; each is treated similarly (equally) after operational expenses are deducted. After the operating cost is incurred, the portions depend on the number of parties who 'work'. For example, the shares are distributed to the workers, skipper, and fishing equipment, each receives one portion. If there are two workers, the same results are divided by four. In the profit sharing, skipper to share equally with the workers, while the equipment belong to them, if it is considered as an advantage, quite appropriate as the depreciation of fishing gear with two years of future production, as well as compensation for the risk that the *Tekong* bears if they fail and break the tools.

The second pattern of profit sharing applied is the aquaculture or *umpang paloh*. In this type, a pond owner and a tenant are in a relationship upon the results, in which 30 percent of the harvest is given to pond owners, and 70 percent to the tenant. This rule applies in a condition that the entire capital, operational cost, maintenance of the pond, and risk are the tenant's responsibilities. Another alternative of this kind is farm leasing, which is widely adopted by farmers of fish and crabs. Farm land is leased from its owner in a village or from the nearby places without any standard rental prices (rates). The social relations and conditions of the parties may thus be the factors that determine the

flexibility of price. In a lease, the farmers bear the risk of failure, operating cost, including treatment of ponds during the rental period. The bargain of the rental prices is dependent upon the condition of the ponds whether the ponds are in good and safe condition or they need rehabilitation.

In the second ecological type, the profit sharing is more various than in the swampy area, in which provisions are made based on the type of trawl. Each trawler has its own agency that regulates the distribution of results for the skipper, the workers and the employer. The fishermen make a classification of the types of trawl system for the same result. Other provisions regulate the involvement of the owner of the equipment in the process of production that can change the amount of profit sharing. It indicates the connection between the ownership, the sort of tools, and role of the agents in the works. It seems more complex because the fishermen get different sharing if they work by their own instrument or by renting it. Only in this pattern, the type of trawl is considered significant in determining the profit sharing.

4) The Timing of Fishing

In the first type of ecology, fishermen of *Paluh* work in mangrove area and depend on the ditches as the only waterway to access the area that only can be traversed by canoe when filled with water. Generally, in the coast of Malacca Strait, the tides occur twice in a day (1 time in 12 hours). It takes about six hours until the tide reaches its peak *(penuh)* and another six hours to recede to farthest *(timpas)*.

Within a month, the water level follows the position of the moon. When it is in line with the earth and the sun (named 'opposition' and 'conjunction') the highest tide happens. When the position of the earth-moon-sun is perpendicular (quarter) the tide is very low (locals call lowest tide = *pasangmati*). It occurs at the age of 6-8 months and 22-24. By the two cycles of the highest and lowest tides in a month, the *Paluh* fishermen go fishing. Usually they go during the high water conditions and stay on the land during the lowest condition, or approximately 10 days in a month.

As the daily tidal conditions determine the working hours, the fishermen start out when the water starts to move to receding position (from the position of full post). They move from their port *(tangkahan)* to fishing area towards the latency ranges from half to one hour. The movement towards the fishing area is called the going downstream *(hilir)* or away *(pergi)*. Once arriving in the fishing area, they wait for the right water level, about as high as the net spread, then skipper instructs to install fishing gear (pulled over). They utilize the flow of the low tide, where the nets will be installed facing the direction of the water flow. During the low tide, the fish will be collected in the less water, shrinking the plot of water flow.

When the water recedes completely aground, fishermen and laborers raise the nets and release the fish. They use the time between subsequent tides and down to prepare and clean up all the equipment. It is only when the water is back moving high, they are settled to go home, or called turning back home *(mudik)*. There are only two cycles of these tides – up and down (high and low). Fishermen work only in one cycle, during the low tide; this is the time for *ilir* or going home. The time they choose is usually from afternoon to evening (the tides usually change in about 50 minutes each day).

In contrast to the second type of ecology, the fishermen do not pass through the ditches *(Paluh)* to access the ocean during their operation because they are at the beach settlement estuary or in other area where there is a river which is not affected by tide. The boat owners set the working hours that must be followed by the skipper and laborer. They determine the hours set out in accordance with the estimated travel time to arrive on time at the location of the operation, and the time of an hour to go back for the auction or sale of the catch. Every skipper and laborer must leave at 2 p.m. for operating in remote zones with the travel time of up to four hours. Some leave at 4 p.m. for operating in the more relatively closer zones. Usually it takes them 2 hours to get there, so it is estimated that they will arrive at the location at 6 p.m., and prepare to go back to the dock. The entire fishing activities are carried out during the night, starting at 7 p.m. Between the time of arrival and the start of work activities, they will have time to see a school of fish (called *bodong*, such as a school of fish to be caught).

Once the operation is completed, the fish are still attached to the trawl and they will be opened while moving back. Around midnight, usually between 11 p.m. and 1 a.m., they will arrive at the village. It is the time for them to sell the catches to the employer. Especially for *cincang rebung* fish, sales can only be done after the fish processing (splitting, cleaning, and drying) that is usually done by women. So, if the catch is abundant, they have to work early in the morning for splitting fish, drying them in the sun from morning to evening, and then sell them in the afternoon.

5) Control and Distribution of Fishing Areas

In the first type, the accuracy of prediction to depart and arrive at the location is important because high tide shifts in 50 minutes every day. It is therefore important for a proper timing to arrive and get free area chosen as the place by many fishermen to pull over before the others arrive. In principle, the area of fishing in mangrove areas not controlled by anyone, except when the activity time is ongoing when pulling over. To pull over and catch fish, a principle of area sharing is applied. It is based on the social norms that fishermen who first arrive in an area they can do their operation there. Other fishermen who come to the location later they will find it more difficult to get an area of operation, let alone to choose a desired location. Currently the

number of fishermen increases and the marsh areas decrease, which makes it more difficult to divide locations. There is no private ownership of fishing zones in the mangrove areas and the beach, except in a few cases in several villages. Such ownership, however, can be obtained by bribing the authorities.

In the second type, fishermen claim the fishing areas based on occupied zones. Anyone arriving at an area earlier than others he has the right to control the zone. Those who come later must take a distance of approximately 100 to 150 meters away from the others. A too close distance will trigger a conflict and sanctions can be imposed on them by other fishermen. Trawls are installed according to the applicable provisions, which must cross perpendicular to the wind, or perpendicular to the direction of ocean currents. Errors in directions could result in damage to another fishing trawler and will be penalized. Typically, to mark the locations, the trawl is installed with lights (*nong*) as a sign of the base of the trawl.

Occupying an area of operation can also be wider and further. However, the area is usually one that can be reached within four hours of travel time. According to the prevailing social conventions, as an institution this occupation is owned communally by the traditional fishing communities. Therefore, the presence of the fishermen with high technology (enterprises with capital intensive) operating in shallow zone could lead to conflict with traditional fishermen. The *gerandong* trawl, for example, works with a sweeping motion of the ocean to the bottom, which can damage the biotic and ecosystem at the base. Local fishermen's resistance to the use of this trawl triggered an incident in the fishing village of Perlis, Pangkalan Brandan, which caused casualties. It can be concluded that the acquisition of a territory seems clear though actually open sea area can be accessed by anyone.

6) .Fishermen's Organisation

It is doubtful whether the Paluh fishermen, as stated in the first ecological type, can be considered as fishermen since the formal fishermen's organisation and government consider them as "half-fishermen". It can be assumed that it is because of such aspects as the patterns of economic activities of *Paluh* fishing, limited operation only in swampy areas, and combining their fishing activities with other activities in agriculture and aquaculture. This situation makes the *Paluh* fishermen less recognized, even by big organizations such as the Fishermen Association of Indonesia (HNSI). Even though the organization exists in the coastal community of *Paluh* fishermen, it has not many roles except in facilitating the group of fishermen in proposing request for obtaining social assistance to the local government office. An organizational model that is more developed in the marsh area is groups of pond farmers. In the emerging issues, a group of fishermen and fish farmers more associated with mangrove rehabilitation project. By its position which is lack of formal recognition, *Paluh* fishermen are not intensively connected to the governments, organizations of fishermen, as well as fishermen right defenders or activists.

In the second ecological type, there are several types of fishermen's organizations, such as Contact of Farmers and Fishermen of Andalan (KTNA), the Indonesian Farmers and Fishermen Union (KTNI), Indonesian Traditional Fishermen's Association (PNTI) and the Fishermen Association of Indonesia (HNSI). All these organisations, though formally established, do not run well because most of the fishermen are too busy with their work. They consider the organisation important only when they receive social financial aids from the government, or when they are faced with serious problems like being detained in a neighboring country, conflict with fishing boats of enterprise, in which situation they need defenders. In fact, several fishermen's organisations in many places were initiated by one or two respected figures (the elder fishermen), seniors, activists, and mediators with a nongovernmental organizations working in the field of maritime affairs and fisheries. The figures in this case maintain the affiliation with the Non-Governmental Organization backing up the organization of local fishermen, for example, in many cases giving assistance to fishermen in the form of advocacy in resolving the cases by both formal legal and political means such as mediation and so forth (non-litigation).

IV. CONCLUSION

The social institutions described above are maintained by local communities to regulate the social and economic activities. They ensure the roles and responsibilities as well as rights of each agent in the process of fishing, balancing the relation between between one and another, and managing the sustainability of the coastal economic community. However, their existence is oppressed by two sides of power. The first is intruded by the change of ecology in which they are established. For the swampy areas, the environmental damage is caused by expansion of palm oil tree plantation to the marsh land by enterprises. This leads to deforestation of mangrove area as habitat for fishes and other water animals; the fertilizers applied in the plantation also pollute the area. Whereas, for the second type of ecology, the pressure comes from the more modernized fishing instruments used by the enterprises which damage the nature and claim the fishermen's area of fishing.

Even though they are in the middle of the two directions of oppressing powers, the fishermen have the social institution as a power to defend themselves from the two powers. In this case, the institution serves to distribute the income of fishing, maintain the social structure, guard the communal areas, support for subsistence, and oppose to the enterprises.

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