

LOCAL WISDOM IN CAPTURE FISHERIES ACTIVITY IN SABANGAU AREA, CENTRAL KALIMANTAN

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ABSTRACT: Capture fisheries as part of the fishery sector has made a major contribution and has a great potential where the capture fisheries activity are greatly depended on the natural conditions and mechanisms implemented by the fishermen. The fascinating capture fisheries activity in the Sebangau area is impeccable to be studied in depth since the area has unique and exotic local wisdom and values that help to support environmental sustainability. This research aims to describe the local wisdom used in capture fisheries activity in Sabangau area. Based on the research needs, the approach method used is qualitative research method by conducting an interview with a questionnaire to 20 interviewees that directly engaged with capture fisheries activity in Sabangau area. The interviewees were chosen *purposively* by using a *snowball sampling* method. The result of the research was analyzed with *Model Miles* and *Huberman*, consisting of *data reduction* stage, *data display* stage and *data conclusion* stage. From the result of the research, it is found that in each aspect of capture fisheries activity in Sabangau area, the fishermen implement the local wisdom which was formed by the mechanism in capture fisheries activity as well as the culture or tradition from time to time. The local wisdom can be clearly seen from the terms used to name things or processes in an environment which refer to the rules imposed in the community.

Keywords: Local wisdom, Capture fisheries, Sabangau

1. INTRODUCTION

Sabangau in Central Kalimantan Province covers an area of 568.700 ha and was promulgated as a protected area of Sabangau National Park in 2004. The National Park is the part of 734.700 ha of domed peatlands which is the remains of peatland forest in Kalimantan. Moreover, it contains 2.3 Gt of Carbon. Sabangau area has a unique characteristic viewed from the structure or the type of the soil, topography, hydrology flora and fauna. The area significantly supports drainage basin of Sabangau and drainage basin of Kahayan which have the main role to distribute hydrologic function [1]-[2] for agricultural irrigation, fisheries, and drinking water supply in the area.

The people who live in the Sabangau area significantly depend on the natural resource in the area socially and culturally. It is caused by the relatively high economic values that the area owned. The local people of Sabangau work as farmers or fishermen, jelutong (*Dyera costulata*) trees tappers or rubber tappers, vegetable garden owners, rubber trees owners, and farm owners. Consequently, the people are highly dependent on natural resources in Sabangau. As a peatland forest, Sabangau is the resource of water and fisheries for three regions as follows: Katingan Region, Pulang Pisau Region and the city of Palangka Raya.

2. MATERIAL AND METHOD

2.1. Theory of Literature

In explaining capture fisheries, there are several principles [3]-[4] that may be the main part or essential such as the definition of fishing, fisheries or inland waterways, fish in inland waterways, fishing unit in inland waterways, fishing techniques in inland waterways and several factors related to fishermen, fishery household or industry of capture fisheries which will be described as follows.

According to Sadhori [5], fishing is catching fish activity in order to gather fish, counted since fishing boat leaving port and heading to the fishing ground, completing the fishing activity, and going back to the first fishing port. On the other hand, the Indonesian Law number 31 year 2004 which regulates fisheries, explains that fishing activity is an activity conducted in order to gather fish in the wild or not related to any ways or tools that used in farm fisheries, including the activity that uses any vessels to load, keep, freeze, control and process or preserve the caught fish.

According to Ministry of Marine Affairs and Fisheries Republic of Indonesia (2012), fisheries have been described as one of the economic

sectors in capture fisheries or farm fisheries and other aquatic animals as well as aquatic plants. In addition, capture fishery is described as an activity to capture fish or other aquatic animals that live in the wild or are not related to private farm fisheries [6]-[8]. In general, aquatic living resources allowed to capture are fish, other aquatic animals, and aquatic plants. The capture of shellfish is also included in the classification. For statistical purposes, capture fishery is classified as marine capture fisheries and inland waters capture fisheries.

Inland water is a public waterway that can be used by citizens who are controlled by the Laws of the country. However, the direct activities of the people in public waterways (river, lake, swamp) or indirect activities have given great impact to the change of ecology or environment which leads to the degradation of the potential of public waterways. Besides, human overpopulation and the misuse of technology also become the main cause of the degradation of the quality of ecology.

After that, related to the caught fish in public waterways, according to the Indonesian Law Number 31 the year 2004 which regulates fisheries, fish is defined as the whole kinds of organism that

has a life cycle in the water. Regarding fishing unit in inland waters, according to Ministry of Marine Affairs and Fisheries Republic of Indonesia (2012), the fishing unit is a technical unity in fishing operations which consists of a fishing boat and fishing tools. If there is a fishing boat operates with two different tools and at different times in a year, thus, it is counted as two fishing units.

A fishing boat is a boat directly used in fishing operations, including fish, other aquatic animals, and aquatic plants. The live fish carrier is not considered as a fishing boat. Therefore, a boat that is considered as a fishing boat is a boat that used to carry fishermen, fishing tools and fish caught by *began* (fishing net), *sero* (fishing trap) and *kelong* (a fishing tool made from bamboo). Fishing boat in public waterways is classified as follows: 1) Non-motorised boat, which consists of *Jukung* (a small wooden Indonesian outrigger canoe), wooden boat, small (the largest boat length less than 7 meters), medium (the largest boat length 7 meters to 10 meters), and large (the largest boat length up to 10 meters); 2) Outboard motor boat; and 3) Motor boat. Meanwhile, the standard of fishing gear used in public waterways is put into Table 1 below.

Table 1 Standard Statistical Classification of Fishing Tools in Public Waterways

Group	Statistical Categories	
	Terms in Bahasa Indonesia	Terms in English
1. Gill net	1.1 Jaring insang hanyut 1.2 Jaring insang tetap	Drift grill Set grill net
2. Lift net	2.1 Serok dan songko 2.2 Anco	Scoop net Shore lift net
3. Hook and line	3.1 Rawai 3.2 Pancing	Long line Hook and line
4. Trap	4.1 Sero 4.2 Jermai 4.3 Bubu 4.4 Perangkap lainnya	Guilding barrier Stow net Portable trap Other traps
5. Others	5.1 Jala tebar 5.2 Lainnya	Cast ne Otherst

Source: Ministry of Marine Affairs and Fisheries Republic of Indonesia

Matling [9] stated that fishing activity is all the efforts to catch fish in a particular area. Numbers of fish caught depends on the season and fish stock in waters. In addition, Sadhori [4] stated that the success of fishing activity is also affected by fishing gear such as fishing gear construction, skills and fishing gear material.

When doing a fishing activity, the basic fishing equipment, and advance fishing gear are needed. In general, the fishermen do not merely depend on one kind of fishing gear. The variety of the gear t used in public waterways is affected by the season as well [9].

Most fishermen in Indonesia still use traditional fishing gear and techniques. According to Ayodhya [3], this opinion may be ambiguous. If it is seen from the principal of fishing technique used by the fishermen, fish behavior utilization has given many benefits to fishing activity.

Then, this part is discussing artisanal fishery and commercial fishery. According to the Ministry of Marine Affairs and Fisheries Republic of Indonesia (2012), fishermen are a group of people that actively harvesting fish or other aquatic animals and aquatic plants. Fish net makers and loading crew are not included as

fishermen. However, engine mechanics and chef are included as fishermen although they do not directly participate in the fishing activity.

The fishermen are classified based on the numbers of work hours they used to catch fish. It describes as follows: 1) Full-time fishermen: The fishermen who use their work hours in fishing or catching other aquatic animals and aquatic plants; 2) Main part-time fishermen: The fishermen who use most of their work hours in fishing. Besides, fishermen from this category may have other jobs; 3) Temporary fishermen: The fishermen who use small numbers of their work hours in fishing.

The industrial fishery is incorporated economics unit which harvesting fish or other aquatic animals and aquatic plants for large-scale of commercial profit. Artisanal or household fishery is the activity of harvesting fish or other aquatic animals and aquatic plants for small-scale profits and local consumption. Artisanal fisheries activity can be conducted by members of the household or with the help of labor workers or merely conducted by conducted by labor workers. Thus, artisanal fisheries are regarded as economics unit. In the way of writing, both economics units mention as household or commercial fisheries.

2.2. Research Methodology

Based on the research needed, qualitative research method conducted through an interview with a questionnaire to 20 interviewees that known as people who directly involved in fisheries in Sabangau. The interviewees are chosen by purpose using a snowball sampling method. The result of

the research was analyzed with Miles and Huberman Model which consist of data reduction, data display and data conclusion.

3. RESULTS AND DISCUSSION

In relation to the fisheries in Sabangau (read Sabangau, sometimes it is written as its pronunciation), known with the term *oloh Sabangau* (Sabangau people) and *sungei Sabangau* (Sabangau River). Dayak Ngaju fishermen regard Sabangau River (including the swamps, lakes and tributaries) and the forests as a place to make a living or in local language, it is called *eka satiar*. On the other hand, their village in Kereng Bangkirai is called *lewu eka melai* meaning settlement. The two zonations have different concepts.

In the dry season, the water level of Sabangau River will be lower. On the other hand, the water level of the river will rise and flood the riversides up to the residential areas on the outskirts of the river. Sabangau River supports the water transport vessels such as cargo ships such as Passenger ships and fishermen boats.

In the local language, the fishing ground is called *eka satire malauk* by Dayak Ngaju fishermen. *Eka satiar* is temporary and not permanent. Thus, the fishermen build temporary shack which is called *pasah dukuh* in the local language. *Lewu eka melai* is a permanent settlement, the place where the fishermen reside. Therefore, the fishermen build permanent residence or fixed structure house that is called *huma* by the Natives.

Ground fishing areas may be described as follows:

Table 2 Terms and Descriptions of *Eka Satiar Malauk* Categories

No.	Terms of <i>Eka Satiar Malauk</i> Categories	Descriptions
1.	The main river (<i>batang danum</i>)	The main river. Sabangau river is the main river (<i>batang danum</i>)
	a. The riverbank (<i>saran batang danum</i>)	Riverbank is overgrown by trees.
	b. Midstream (<i>bentuk batang danum</i>)	The middle part of the river
	c. River bed (<i>palempang</i>)	Soil from a river bed
	d. River bottom	The deepest part of the river. The most important part for the fishermen since it is the place where the particular fish can survive during the dry season.
	e. Bay (<i>luwuk</i>)	Part of the water where the land curves inward
	f. Cape (<i>bereng</i>)	Part of the land which extends into a body of water
	g. Main river branch (<i>sungei</i>)	It is also called Batang/Bapa Sungei; a small river that empties into the main stream or empties into the main branch.
	h. River branch (<i>sampang sungei/anak sungei</i>)	Branch or the main intersection of a small river, also known as tributary

	i. Natural channel (<i>saka</i>)	Smaller stream that formed naturally. It is called <i>esun sungei</i> or literally translated as the grandchild of the river.
	j. Tatas/Saka Tatas	The artificial canal that made for transport line or to connect one place to another.
	k. Parit	Smaller version of canal or <i>tatas</i> .
2	Swamp (<i>petak randah</i>) and its kinds	Swamp or shallow waters that still has the structure of the soil
	a. Flooded swamp (<i>padang napu/padang ayap</i>)	The swamp that inundated with freshwater during rainy season so that becomes fishing ground. It is sometimes called <i>luwau</i> in the local language. Thus, it is called <i>luwau napu</i> .
	b. Flooded swamp forest (<i>datah</i>)	It is called flooded swamp forest because it is covered by forest or plants. It is also inundated with freshwater during the rainy season and becomes fishing ground.
	c. Baruh	It is also called <i>talaga</i> ; a lake in the middle of the forest or formed naturally at the riverbank and becomes the place where the fish gather.
	d. Ruak	Natural overdraft groundwater that forms a pond or a small well and becomes fishing ground in a dry season.
	e. Embankment	The highest part of the land that is not flooded by water even in rainy season.

Source: Processed Primary Data, 2015.

In some scientific literature, *eka satiar malauk*, Dayak Ngaju fishermen use this term for swamp peat land swamp peat, non-tidal marsh or lowland swamp. Mac Kinnon et al. [10] named it as floodplain lakes that have a larger bed than rivers in general and inundated with freshwater from the main rivers. Moreover, the puddle is also caused by local rainfall or flood.

Ardinor and Gumiri [10], stated that the term used by Dayak community for swamp is *Luwau Napu*. This type of river and swamp flood has a characteristic, different water fluctuation between rainy season and dry season. In the rainy season, the river floods and inundates most of the area, except for the higher ground area (*pamatang or kereng*). On the other hand, in the dry season, the level of river water is lower and most of the area is dry except the part which includes the main river, tributaries, *ruak*, *baruh*, and *talaga*.

Naturally, there is a pattern of power to manage fishing ground ownership area that set and obeyed by the fishermen in Sabangau River. In the pattern, the *property right* regulated as the right to own, to access and to use the fishing ground.

Related to the pattern of power and fishing ground ownership, local regulations and mechanisms related to the utilization of natural resource are identified as follows: 1) Communal or family area is known.; 2) Public communal area such as the Main River or swamp flood/swamp flood forest area that connected to the main river. It is owned by all fishermen. Although it is

communal, still, there are norms that regulate the procedures of fishing; 3) Communal area is limited for fishing only, thus, other people are allowed to pass through the area freely.; 4) On the other hand, the family area is closed and private in order to protect the sustainability of family livelihood. The Ownership belongs to the family. Other people may pass through the area under control of the family.

The river fishermen build settlements in dispersal patterns in groups such as Ules, Rasau, Timba, Karanen, Selowati, Mangkok, Bangah and Baluh. Almost all those settlements are near or around the mouth of small rivers, for instance, Bakung river, Rasau river, Bangah river, Mitra river and Bandera river. At the back of the settlements, there is a paddock low or low-lying area which is accessible from Sabangau river through the trenches or small rivers. Meanwhile, in front of the houses, there is the main river, Sabangau River.

Since the water is inundated throughout the year, thus, the houses or huts built on stilts. The houses are connected by footbridges. The pattern of settlements was built linear pattern forming longitudinal rows in watersheds border, both right and left sides, fishing gears and other tools placed at the rear of the houses. When flooded by water, motor boat or *alkon* is placed under the house. The riverbank, which is located in front of the houses, used as a place to put the floating cages for keeping and raising fish. In

the front house, there is a wood raft used to moor motorboats as well as for showering, washing and toileting.

The houses and shacks are temporary, semi-permanent and permanent. Temporary shacks or huts were built simply and plain, with pools and round wood floors. The walls and the roofs are made from palm trees. On the top of that, some of the shacks have the skin of melaleuca cajuputi wood as the walls and the roofs. Some of the roofs of the buildings are leaked. When it is raining, the water is draining into the shacks. Consequently, the roofs have to be covered with tarpaulin. Semi-permanent shacks were built in order to be used longer. Therefore, the solid woods are necessary for making the poles. The people normally search fallen Belangiran woods caused by fire or that buried in a long period of time. The people dig the buried Belangiran woods and they take the core rod, cut it and make it as the shack poles. However, some fishermen use young Belangiran woods for making poles. They call it Belangiran Roundwood. The floors and the walls were made from thin wooden boards that they purchased in Kereng Bangkirai Village. The roofs were made from palm trees. Then, permanent houses or huts are the residences of the fishermen. Since the fishermen live there every day, thus, they built more solid and better buildings. The poles were made of Belangiran woods or iron wood, the floors and the walls were made of thick wooden boards and the roofs are zinc roofs.

For the fishermen, the houses or huts they built are not merely a place for living. Those buildings were built to show the accessibility and the ownership of the resources in the estuary and headwaters near their residences (fish, woods, gemor woods, rubber woods, hacking, nature, katiau). The huts are also “the sign” that the swamp flood or the lowland around the hut is already owned. It is also strengthened by the fishing gear owned by the owner of the hut that scattered around the area. Fig. 1 is an example on settlement of Fisherman.



Fig. 1. An Example on Settlement of Fishermen

On the captured fish, the fishermen categories the captured fish into two categories: *lauk malisen* and *lauk batisik*. *Lauk Malisen* literally means “slippery fish” which is fish without scales such as *tampahas* fish and catfish. *Lauk Batisik* literally means “fish with scales”: *Behau*, *Karandang*, *Tahuman*, *Mihau* (all the fish are kind of snakehead fish), *Bapuyu*, *Sasapat*, *Kakapar*, *Patung*, *Tabakang*, *Puhing*, *Saluang* (local fish of Kalimantan)

Economically, the fishermen divide it into two categories: *lauk barega* and *lauk dia barega*. *Lauk barega* is the category of fish that have high economic value. In other words, both fresh and salted fish are in high demand. The kinds of fish include in this category are *Tampahas*, *Tahuman*, *Behau*, *Patung*, *Tabakang*, *Karandang*, *Mihau*, *Kakapar*, *Pentet* and *Puhing*.

Lauk dia barega is the category of fish that are not able to sell which makes it has low economic value (*dia barega*). it is because the fish are not consumable for the local fishermen, for instance, *Jajili* fish or the fish that have not reach spawning size while capturing. This category of fish is commonly used to feed farmed *Tahuman* fish or duck. The fish is chopped or mashed in a blender then put into the fish cage. It is also used as a bait for catching *banjur* and *rawai* fish. The fish that include in this category are *Tantawun*, *Jajili*, *Pantik* (baby *Baung*), *Pentet* (baby *Pentet*), *Patung* (baby *Patung*), *Puhing*, *Saluang*, *Sasapat* (baby *Sasapat*).

Low economic value fish is one of the factors that force the fishermen to raise *tahuman* fish and ducks as the way to accommodate the low economic value fish. Fishermen in Sabangau river do not have any restrictions on the fish they can or they cannot catch, both in terms of the types or sizes. It appears that all types of fish that enter their fishing traps are owned by the fishermen.

3.1 Sabangau Capture Fisheries Unit

The fishing gears used by fishermen in Sabangau are traditional equipment that moved by human power. Some are passive gears that are not moved during the fishing activity, for instance, *tampirai*, *salambau*, *takalak*, *pangilar*, *kalak*, *rengge*, *rawai buwu*, *tampirai*, *banjur*. Active fishing gears are fishing gears that have to be moved during the fishing activity such as *lunta* and *pasat*. Fishermen of Dayak and Banjar ethnics call their fishing gear with the term *pakarang*.

The techniques of making fishing gear and fishing techniques that the fishermen have are based on knowledge passed down from parents, from fellow fishermen and from personal experience. The development of fishing techniques

has to pay some attentions to some principles as follows: 1) Water level fluctuation (*surung-rintak*); 2) The motion of water flow. Fish generally swim with the flow of water.; 3) Natural condition that filled with swamps and trenches and the level of ground surfaces; 4) The temperature near before dry season, the water temperature in *ayap* area is rising, thus, the fish migrate to the river; 5) The habit of consuming fish (carnivore or omnivore); 6) Periodic fish migration patterns from the river to flood swamps and vice versa. Fig. 2 presents some *tampirai* as a kind of traditional fish trap.



Fig. 2. Some *Tampirai*, a kind of traditional fish trap

3.2. Artisanal Fisheries in Sabangau

Fishermen in Sabangau River are categories themselves and fellow fishermen in two ways. The first way is by the origin and the second way is by the work patterns.

By the Origin: based on their origin, the fishermen in research area are divided into two categories: the natives and the non-natives. The native fishermen are from Kereng Bangkirai. People of Kereng Bangkirai consider Sabangau river as a heritage. Then, the non-native fishermen are the fishermen who initially did not live and stay in Sabangau river or Kereng Bangkirai Village. They came from outside Kereng Bangkirai area. On top of that, the fishermen came from outside Central Kalimantan Province. Those who came later, they came at the top of *illegal logging* era, then turned to be fishermen since illegal logging is forbidden. Non-native fishermen may be categorized into two large groups: 1) Fishermen from Central Kalimantan area such as from Katingan River (Keruing village), from Kahayan area (Garong, Gohong, Pulang Pisau and Bahaur). They come and stay permanently or seasonally; 2) Fishermen from outside of Central Kalimantan area including the fishermen from South Kalimantan and Java. They come and stay permanently or seasonally.

By the Work Patterns: based on the work pattern, the group of fishermen community in Sabangau River may be divided into three categories: permanent fishermen, seasonal fishermen and *nyambulang*. Permanent fishermen are the fishermen who spend almost the whole year in fishing grounds. Seasonal fishermen are the fishermen who come to the fishing grounds at the peak of fishing season. *Nyambulang* fishermen are the fishermen who live in Kereng Bangkirai (*lewu leka melai*), however, they go to the fishing area or the workplace (*leka satiar*) every morning and return to their village every afternoon.

River fishermen of Dayak Ngaju ethnic call their profession as *palauk*, literally means “fish hunter”. In addition, the river fishermen of Banjar ethnic call their profession as *paiwakan*, literally means “fish hunter”. The fishing activity is called *maiwak*, which means “fish hunting”. Fig. 3 presents the fishermen families in Sabangau.



Fig. 3. Fishermen Families in Sabangau

3.3. Sabangau Capture Fisheries Activity

The work patterns of fishermen depend on the fishing gear used. The term *nindan* and *marukui* are used for fishing trap and fishing rod. *Nindan* is the activity of installing the fishing trap such as *bubu* and *tampirai*. Those fishing gear is placed for the certain amount of time, depends on the fishing season. In fishing season, the fishing gear is placed for 12 hours. If it is placed in the afternoon, the fishermen check the trap in the following morning. In non-fishing season, the fishermen normally check the trap in two or three days. Fig. 4 presents a fisherman who is going to set up (*Mimdan*) his fish trap.

Then, *manikui* is the activity of fishermen while checking and harvesting the fish. In the next period, *manukui* activity is followed by *nindan* activity since the fishermen do not only check the gear but also pull up the gear and harvest the fish. The fishermen also put new bait and set up the fishing gear, it can be at the same fishing ground or at different fishing ground. Generally, fishing

activity is conducted at the daylight. It starts from 06.00 or 07.00 in the morning. Then, the fishermen take a rest at noon, have lunch and return to their work until 18.00 in the afternoon.



Fig. 4. A Fisherman is going to set up (*Nindan*) his fish trap

After *manukui*, the fish are going to be divided into two types: Most valuable fish and less valuable fish. The less valuable fish will be prepared as bait, duck food or farmed fish food. The most valuable fish, the fresh fish, are placed in floating net as a temporary storage of fresh fish.

If the fishermen have already had large amount of fish, then the fish are sold to fish collectors which are known as *panyambang* by the local people. The fish collectors directly approach the fishermen in their village, conduct a transaction and sell the fish in other areas. Besides selling the fish to the *panyambang* in their village, some fishermen directly bring the fish to Garong, Pulang Pisau and Palangka Raya. They sell the fish to the fish collectors in these areas at higher price than to the *panyambang* in their village.

According to fishermen in Sabangau River, the fishing activity in Sabangau river may be divided into four seasons or *wayah* such as *wayah surung layap*, *wayah danum manahan*, *wayah danum manahan*, *wayah marintak* and *wayah pandang*, which is summarised as follows: a) *Wayah Surung Layap* is when the level of water is slowly starting to rise. It happens at the beginning of rainy season (October – November) at its peak in December. When the water starts rising, the water of the river is overflowing and inundating the swamp forest in Sabangau area. Meanwhile, the fish are migrating to *padang ayap*, small rivers, *baruh talaga* and lakes for spawning. Thus, the fishing activity is conducted by blocking path of migratory fish; b) *Wayah danum manahan* is when the water reaches its highest level. At this time, the water stops flowing and covers *padang ayap* and tributaries (January to March). In this season, more efforts and skills are needed to catch the fish since the fish swim separately. Consequently, the fishermen

harvest is less; c) *Wayah marintak* is when the level of the water is slowly starting to fall or small fluctuating water levels. It happens in March until June. In *marintak* season, the fish move following the flow that leads it into deeper basin. Consequently, the fishermen are able to catch the fish with less effort.

The fisherman reported that the water temperature in *padang ayap* raised and the fish swim into the deeper water which has lower temperature. According to the fishermen, if the fish is starting to leave *padang ayap* area and heading to small rivers or the main river, it is the sign that the dry season is coming soon or local people call it *wayah pandang*. The fishermen add that catching fish in *marintak* season is undemanding since the water is no longer spreads. The large of *tayap* is becoming smaller, the water is available in certain areas. Consequently, the fish are able to catch with less effort; d) *Wayah pandang* or *wayah danum surut* is when the dry season is at its peak. It happens in July until September. It is the lowest tide, *padang ayap* is severely dried. The water is available at tributaries and the main river. The harvest is scarce and the fishermen cannot rely on fishing. Consequently, many fishermen search for another opportunity.

4. CONCLUSIONS

The result of this research shows that in each aspects of fishing activities in Sabangau, the fishermen apply the local wisdoms formed of the mechanism in the fishing activities which also formed by the culture or tradition from time to time. The local wisdoms can be seen from the terms used by the fishermen when they named the environment processes and it refers to the regulations that set by the community.

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