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A conflict analysis of management of fishery resources in Kalimantan, Indonesia

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Abstract

Fish resources are still considered as an open nature and a common property. It means that everyone has the same right to utilize the resources. The right issues of utilization involve not only to one party, local communities or fishermen, but also other parties such as businessmen and governments. Some parties who have an interest to manage a natural resource often clash and cause a conflict. The objective of the research is to analyze the existence of conflicts and conflict resolution strategies that occur in the Island of Borneo. The research method used is qualitative method by taking the case and doing field observation in each province. Data analysis done was based on functional structural theory and conflict theory. The results showed that the potential source of the conflicts originated from differences sources. Types of conflict consisted of vertical and horizontal conflicts. The most conflict resolution tends to be resolved by using local agreements.

Keywords: Fish resources, open nature, vertical and horizontal conflicts

1. Introduction

Marine fisheries resource use conflicts are increasingly becoming common especially in tropical areas of developing countries due to open access tenure. This is because the diversity of resources and livelihood opportunities in coastal areas attracts various extractive interests^[27] and most communities in these regions are highly dependent on the coastal and marine resources for livelihood^[19]. Conflict among the multiple users of tropical fishery resources have never been more pronounced as today. This stems largely from strong and mounting pressure on a rapidly dwindling resource base from a rising population, changing consumer preference towards fish and fish products, globalization, competition from coastal zone development (e.g., tourism, housing, infrastructure, aquaculture, agriculture, etc.), increasing fishing effort and number of fishers^[2].

A conflict is a universal phenomenon^[34] and it is inevitable in human interaction^[19] especially in the management of natural resources. The reason is simple, because many parties are interested in nature, while each party has perceived differences in issue positions between two or more parties at the same moment in time^[37] and it is also because fisheries resources are a major source of food especially as animal protein for humans and provide employment and economic benefits^[3]. The need for natural resources has increased with various stages and global demand for marine protein is growing^[6] but fisheries production has stagnated over the last 20 years^[45] that has led to social gaps in communities called conflict. "Conflict" is term used to mean a variety of things, in an assortment of contexts under the mantle of conflict are words such as, serious disagreement, incompatibilities, fight, argue, contest, debate, combat, clash and war etc.^[42]. Meanwhile Swansstrom and Weissmann said that conflict as perceived differences in issue positions between two or more parties at the same moment in time^[37]. It refers to disagreement between people or members of organizations. Such disagreement is inherent in relationships between all human beings^[38]. The other statement says it is because of the noncompliance with fishing rules and regulations and the attempts of coastal fishers to support their livelihoods by any means possible, result in increasing fishing pressure, use of destructive fishing methods and gears, and a tendency to fish whatever is available^[28]. This could eventually lead to overexploitation of the coastal fishery resources^[16] and also creates

conflict between fishers and other resource users ^[15].

Conflicts among stakeholders are often expressed in three scales: communities, coastal area, and individual communities ^[39]. The conflicts that occur among fishermen include two main characteristics, the first is conflicts between fellow fishermen themselves or internal conflicts, and the second is conflicts between fishermen and non-fishermen or external conflicts ^[21]. Conflicts among fisheries stakeholders arise due to differences in power, interests, values, priorities, and manner of resource exploitation ^[31]. Meanwhile global demand for marine protein is growing ^[6]. Conflicts also emanate from institutional failures in managing fisheries and enforcing laws and regulations ^[32].

Conflict is a fundamental social process ^[9], particularly in vulnerable regions that depend on fish for food security ^[7]. Conflicts over access and control of fisheries as well as aquatic resources are a global phenomenon ^[3] for fisheries stakeholders. However they have particular importance in developing countries where a significant portion of the population depends on capture fisheries for food and livelihoods ^[31]. Conflicts take place in fisheries when groups or individuals seek the same resource using different methods or try to utilize the same space for their activities with either party seeking dominant ^[44]. Then Andri Wahyudi says that conflicts will occur if there is a difference of understanding between two or more persons against the various disputes, tensions, difficulty between parties who are disagreeable ^[41]. Meanwhile, resource abundance and dependence may also aggravate grievances leading to conflict if a particular resource is controlled by only one group ^[43]. Furthermore, it is mentioned that a conflict originates from different places, from different sources occurring for varied reasons and in myriad forms such as, personal conflict, racial conflict, class conflict, political conflict, communal and non-communal conflicts, violent and non-violent conflicts, cultural conflicts, religious conflict, conflict of values and conflict of interests, social conflict, economic conflict and ideological conflict etc. It can be argued that conflict emerges in human society due to clash of interests and gains ^[42].

The potential of fishery utilization in Indonesia is still very large ^[10]. The Utilization of fishery resources in the sea may cause a competition between fishermen, both local fishermen and also with immigrant fishermen ^[44]. Utilization of fishery resources in the sea may cause a demand for fishery outputs, which has exceeded the capacity of near-shore areas to satisfy all of the demands instantaneously, is causing spatial conflicts among fishing gear operators. This leads to serious problems as overfishing, degradation of coral reefs and other important near-shore habitats, coastal and marine pollution, and others, which could challenge sustainable development at both regional and local scales.

The existence of natural resources as a system cannot be separated from one important factor which is a space where the natural resource system works. Because the space is an infinite resource, so many differences of interest (conflict interests) will encounter in the space where people live. Experts expect that global changes in our climate, food systems and oceans may spark or exacerbate resource conflicts ^[36]. Therefore, some policymakers are growing increasingly concerned about conflicts over fishery resources ^[11].

Dealing conflict in a constructive way will be crucial to bring the conflicting parties to have a cooperative process, to design practical and achievable cooperative systems to manage

differences constructively ^[24]. Management of natural resources, however, can also be a focus of cooperation – at times encouraged by stress – helping to build resilient institutions that can moderate and reduce the disruptive impacts of conflict and/or facilitate the work of post-conflict reconciliation and rebuilding ^[8]. Spatial management tools, such as marine spatial planning and marine protected areas, are playing an increasingly important role in attempts to improve marine management and accommodate conflicting needs ^[46].

Research on the role of natural resources in contributing to conflict and the potential for cooperation among states has been more thoroughly reviewed by Barnett and Adger which talked about Climate Change, Human Security and Violent Conflict ^[5]. Then Koubi et.al., talked about Renewable and Non-Renewable Natural Resources to the Onset, Intensity, and Duration of Intrastate as well as Interstate Armed Conflict ^[22]. Meanwhile Reuveny and Barbieri talked about The Role of Natural Resources in Civil Wars in Light of The Continuing Debate over Whether Resource Scarcity/Abundance Fuels Conflict ^[35].

Analyzing and tracing of further conflicts in order to know the potential of fishery conflicts, the types and characteristics of fisheries conflicts and the frequency of fisheries conflicts as well as finding alternative solutions of fisheries conflicts especially at Borneo in Indonesia are urgent to do in this research.

The results of this research are expected to provide an appropriate solution to prevent and resolve conflicts that occurred in the region of Borneo. It is such as providing targeted fishing licenses, expanded sole ownership, regulating territorial use rights in fisheries (TURFS), individual catch quota restrictions, and expansion of community fishing rights ^[30].

2. Methods

This research was conducted from February 6, 2017 to May 6, 2017, located at the Island of Borneo. The Location of data collection was done at some points which were representative of Borneo Island consisted of Coastal of Pemangkat District of West Kalimantan, Coastal of Kota Baru of South Kalimantan, Coastal of Balikpapan City of East Kalimantan and Coastal of Tarakan Island of North Kalimantan

The data collection was done by qualitative survey method in which it involves the systematic collection, organization, description and interpretation of textual, verbal or visual data ^[13]. It was done through triangulation technique which is essentially a multi-method approach conducted by researchers when conducting research, collecting, and analyzing data ^[20]. The objective is to increase confidence in the findings through the confirmation of a proposition using two or more independent measures ^[14].

The types of data collected were primary and secondary data. It collected through interview techniques, observation^[18] and literature study ^[23]. Primary data concerning types of conflicts, public perceptions of conflict, resource management rules of local agreement. While the literature study is intended to find data on the development of conflict theorization. Observations were made on the general circumstances of the research sites and supporting infrastructure, fishing operations, the general condition of fishermen community settlements. The observations was accompanied by in-depth interview. In this study, in-depth interviews were conducted to find out in depth the problems related to the research topic.

Along the course of the interviews, we used the paraphrasing technique and asked the respondents to add their own input on particular sub-topics. All interviews were videotaped. The interview used was an open questionnaire. It is because they are flexible, allowing in-depth analysis from a relatively small sample size and place the focus of research on the views of participants [47].

Analysis of data used as a reference in the study includes categories of data, display data and conclusions. The data collection and analysis usually proceed simultaneously; ongoing findings affect what types of data are collected and how they are collected also analysis. This is some steps for analysing the data:

A. Data reduction

All data in the form of documents is selected strictly to determine its validity. Incompatible data will be temporarily or permanently separated so the data that matches with the research question and objectives only are present.

B. Presentation of data

The presentation of data reduction result is presented in the form of narrative text, descriptive. There are several forms of

data presentation. Namely (1) narrative text in the form of field notes, so it is not practical. (2) matrices, graphs and charts. The forms combine some information arranged in a coherent form and easy to reach, so it makes easier to see what is happening and determine whether to draw the right conclusions or to continue to do the analysis.

C. Taking conclusion

Taking Conclusions in this case include verification of conclusions during the study by (a) rethinking during writing. (b) review field notes (daily). (c) review and exchange ideas with friends of one research theme. (d) make extensive efforts to place copies of the findings in other data sets.

3. Finding and Discussion

A. Kalimantan island

The territory of the island of Borneo within the territory of the Republic of Indonesia, located between 40 24` NL - 40 10` SL and between 1080 30` EL - 1190 00` LW is about 535,834 km2. It is directly adjacent to Malaysia (Sabah and Sarawak) in the north, whose border length is about 3,000 km from West Kalimantan to East Kalimantan.

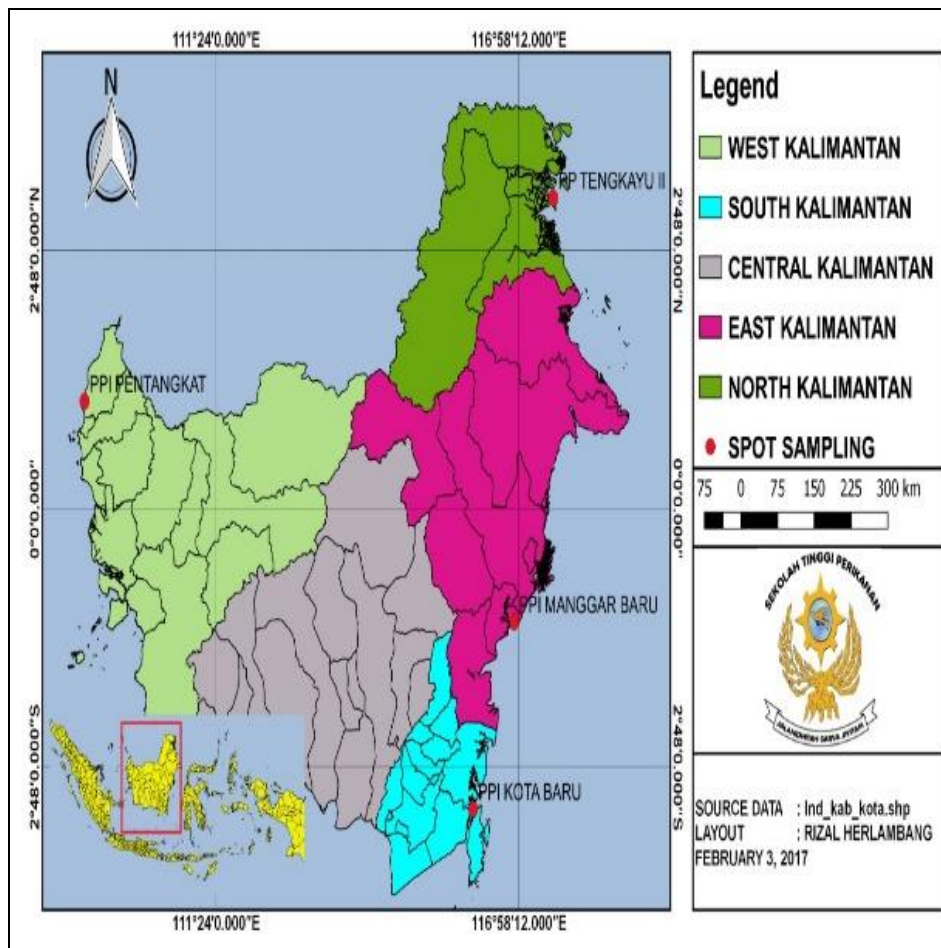


Fig 1: Map of research area

B. Conflict areas in kalimantan

1. Problems and potentials of conflict

The investigation results showed the potential for conflict in this region can be grouped basically into:

a. Conflicts due to zoning

Conflicts of this type occur when a group of fishers asserts

that their fishing operations and rights are negatively affected by the action of another group of fishers or stakeholders.

b. Conflict due to activities

Conflicts of this type relate to who determines the access, rights or entitlements of fishers to fish in a disputed area. Access issues are the root cause of this type of conflict.

C. Conflict due to destruction of ecological functions

Irregular utilization and regardless of the functions of coastal ecology result in the degradation or decline of a function of the ecology itself.

2. Conflict mapping

Some problems and potential conflicts that arose are determined by several factors including:

- a. Limited utilization area
- b. Degradation of an economic, social and ecological condition
- c. Increasing of Resource needs
- d. Regulation
- e. Coordination between agencies

3. Map of area utilization and actors

Table 1: Map of the area utilization and actors

No	Map of Area Utilization	Actors
Pemangkat Coastal Area West Kalimantan		
1	Pemangkat nusantara fishery port (PPN)	<ul style="list-style-type: none"> a. Local Government b. Law Enforcement Officials c. Community Leaders d. Fishermen
2	Fishery industry area	
3	Housing area	
4	Pond area	
5	Conservation areas	
5	Tanjung batu beach tourism area	
Kota Baru Coastal Area South Kalimantan		
1	Kota baru internasional fishery port (PPI)	a. Central Government
2	Fishery industry area	b. Local Government
3	Steel industry area	c. Community Leaders
4	Conservation Area of pulau laut barat selatan	d. Marine security agency (Bakamla)
5	Coastal laso tourism area	e. Marine Resources and Fisheries Supervision (PSDKP)
		f. Fishermen
Balikpapan Coastal Area-East Kalimantan		
1	Manggar baru internasional fishery port (PPI)	<ul style="list-style-type: none"> a. Local Government b. Anggota Legislatif c. Community Leaders d. Businessman e. Fishermen
2	Fishery industry area	
3	Oil and gas industry area	
4	Housing area	
5	Pulau laut barat selatan conservation area	
6	Pantai laso tourism area	
Tarakan Coastal Area East Kalimantan		
1	Fishery Port	a. Central Government
2	Fishery Industry Area	b. Local Government
3	Fishermen Residential Area	c. Community Leaders
4	Conservation Areas	d. Businessmen
5	Pond Area	e. Fishermen

4. Potential conflict and alliance

Table 2: Map of potential conflict and alliance

No	Potential Conflict and Alliance
Pemangkat coastal area west kalimantan	
1	Conflicts of Fishery Port of Nusantara and Tanjung Batu Beach Tourism Area, where the port activity pollutes the condition of waters at tourist area
2	Conflicts of nusantara fishery ports and conservation areas, where the port activities have an impact on ecosystem destruction as well as interfere the efforts of conservation activities
3	Conflict of conservation area and the housing area, where tourism activities on tanjung batu are disrupted by the presence of poorly unordered slum housing
4	Utilization of space for tanjung batu beach tourism has close and mutually beneficial relationship with conservation activities
5	The existence of pemangkat nusantara fishery ports has a close and mutually beneficial relationship with the activities of the fishery industry
Kota baru coastal area south kalimantan	
1	Conflicts occur between the steel industry and the conservation activities of the western and southeastern islands because of the activity of the steel industry causing negative impacts on the conservation zone in Kota Baru - South Kalimantan.
2	Spatial use for coastal tourist areas of lasso have close and mutually beneficial relationships with other activities
Balikpapan coastal area east kalimantan	
1	Conflicts that occur between ports and conservation activities, because of an improper spatial arrangement made by the local government resulting a decrease condition of a conservation area.
2	Conflicts between residential areas of fishermen and conservation activities, because the fishermen do not care about the surrounding environmental conditions.
3	The existence of manggar baru internasional fishery port has a close and mutually beneficial relationship with the activities of the fishery industry
Tarakan Coastal Area East Kalimantan	
1	Conflicts occur between industries and conservation activities, because industrial activity creates negative impacts on the extent of a

No	Potential Conflict and Alliance
	conservation zone in the coastal region of Tarakan - North Kalimantan.
2	The existence of fishery industry activities has a close and mutually beneficial relationship with the fisherman's residential area

5. Forcase and future condition

The conditions found in this research are:

- The occurrence of losses of waters resource that affect the environment, social and economic.
- The occurrence of horizontal and vertical conflicts

between the stakeholders.

6. Sample cases

The case data recorded in the research is as the table bellows:

Table 3: Types of cases occurring in Kalimantan based on location and type of conflict

No	Case / Year / Location	Description
South Kalimantan		
1	Andon ship, 2010; (Kota Baru of South Kalimantan)	Unlicensed Ships of Inter-Provincial Cooperation Entering the waters of South Kalimantan
2	Battom Net, 2010; (Kota Baru of South Kalimantan)	The use of a modified bottom net (a mini trawl) is considered to be overfishing and damaging gillnet fishing gear
3	Fishing Ground, 2011; (Kota Baru of South Kalimantan)	Plotting of fishing ground by traditional fishermen at the waters of Kota Baru
4	Purse Sein, 2015; (Kota Baru of South Kalimantan)	The use of Purse Seine by using 40,000 watts lamp by Central Java fishermen can attract many fish in Kota Baru but it is very detrimental to local fishermen
5	Trawl (Cantrang), 2016; (Kota Baru of South Kalimantan)	The use of trawl by Central Javanese fishermen which is unacceptable by local fishermen
West Kalimantan		
1	Purseine, 2011; (Pemangkat: West Kalimantan)	The Purseine vessel is off the fishing lane and the Placement of Fishing Equipment in Indonesian Fisheries Management Area of regulation of Minister of marine and fisheries affair (Minister decree of Ministry of Manrine and Fishery No.02 2011)
2	Fishing Ground, 2011; (Sambas: West Kalimantan)	Plotting of fishing ground by traditional fishermen around the waters of Sambas
3	Gill Net, 2012; (Pemangkat: West Kalimantan)	The use of gillnet that does not match with its designation
4	Bottom Net, 2013; (Pemangkat: West Kalimantan)	The use of a modified bottom net (a mini trawl) is considered to be overfishing and damaging gillnet fishing gear
5	Purse Seine, 2014; (Pemangkat: West Kalimantan)	The use of Purse Seine by using 40,000 watts lamp by Central Java fishermen can attract many fish in Kota Baru but it is very detrimental to local fishermen
6	Illegal Fishing, 2015; (Pemangkat: West Kalimantan)	The Utilization of Fishery Resources that are not in accordance with the rules or laws applied
7	Trawl (Cantrang), 2016; (Pemangkat: West Kalimantan)	The use of trawl by Central Javanese fishermen which is unacceptable by local fishermen
8	Destructive Fishing, 2016; (Pemangkat: West Kalimantan)	Fishing activity by using devastating device (bomb)
East Kalimantan		
1	Trawl (Cantrang), 2015; (Balikpapan: East Kalimantan)	Fishing Activities using prohibited tools
2	Bottom Net, 2015; (Balikpapan: East Kalimantan)	The use of a modified bottom net is considered over fishing and destroys gillnet fishing gear
3	Andon Ship, 2015; (Balikpapan: East Kalimantan)	Unlicensed Ships of Inter-Provincial Cooperation Entering the waters of East Kalimantan
4	Fishing Ground, 2015; (Balikpapan: East Kalimantan)	Plotting of fishing ground by traditional fishermen around the waters of East Kalimantan
North Kalimantan		
1	Illegal Fishing, 2013; (Nunukan, North Kalimantan)	The entry of foreign ships that utilize the fishery resources of Indonesia
2	Illegal Fishing, 2013; (Tarakan, North Kalimantan)	The entry of other provincial ships that do not have permission to utilize resources in northern Kalimantan
3	Trawl (Cantrang), 2016; (Tarakan North Kalimantan)	The use of trawl by Central Javanese fishermen which is unacceptable by local fishermen
4	Fishing Ground and Seaweed Farmers, 2016; (Tarakan North Kalimantan)	Plotting of fishing ground by traditional fishermen around the waters of North Kalimantan
5	Crab Case, 2016; (Tarakan North Kalimantan)	The occurrence of buying and selling crab less than 300 grams and carapace width of less than 15 cm

From the data recorded, the types of conflict that occur in Kalimantan consist of;

- The entry of unlicensed ships of inter-province or foreign into the local fishermen waters.
- The use of a modified bottom net (A mini trawl), trawl or purse seine is considered to be overfishing and damaging

gillnet fishing gear.

- Plotting of fishing ground by traditional fishermen at the local fishermen waters.
- The utilization of fishery resources that are not in accordance with the rules or laws applied.
- Fishing activity by using devastating device (Bomb).

- f. Fishing Activities using prohibited tools.
- g. Illegal crab trading.

7. Solution of the cases

No	Solution
South Kalimantan	
1	Local agreements made by related parties. a. Expulsion of fisherman and his boat. b. Sinking of the ship. c. Seizure of the ship and its contents.
2	Claim compensation.
3	Agreement on the arrangement of fishing lane by the installation of the boundary.
4	Complaints of the board of Saijaan fishermen association to the legislative about a. The division of fishing ground b. The ban to sail on the sea at Kapak island
West Kalimantan	
1	Traditional fishermen agreement of Jawai sub-district of fishing ground zone for 1 mile from shoreline of Dungun Laut village to Tanjung Village.
2	The traditional fishermen of the sub-district of South Jawai agree with the traditional fishing ground zone for 1 km from shoreline of Ramayadi village to Dungun Laut.
3	The bottom net fishermen of the sub-district of Pemangkat agree with the bottom net fishing ground zone for 1 km and for started from shoreline of South Jawai Sub-District area.
4	The socialization of decision would be carried out for one week after the installation of fishing ground zone boundary between traditional and bottom net fishermen.
5	Sanction for violate the boundary of the zone of fishing ground that has been established in accordance with the mutual agreement. a. Three time warning. b. Arrested and submitted to the authorities for further process.
East Kalimantan	
1	Periodic surveillance to avoid a fraud from the use of fishing gear and the sale of fish in formalin added.
2	The enforcement of strict sanctions.
3	Conducting weekly activities for cleanliness of ports and slums
4	Conducting supervision of industrial waste disposal
North Kalimantan	
1	Take coordination between across sectors.
2	The intensity of socialization.
3	Public consultation and stakeholder involvement in the preparation of spatial planning in a region.
4	Giving access to areas where statutory legislation is declared as public property

G. Settlement scenario

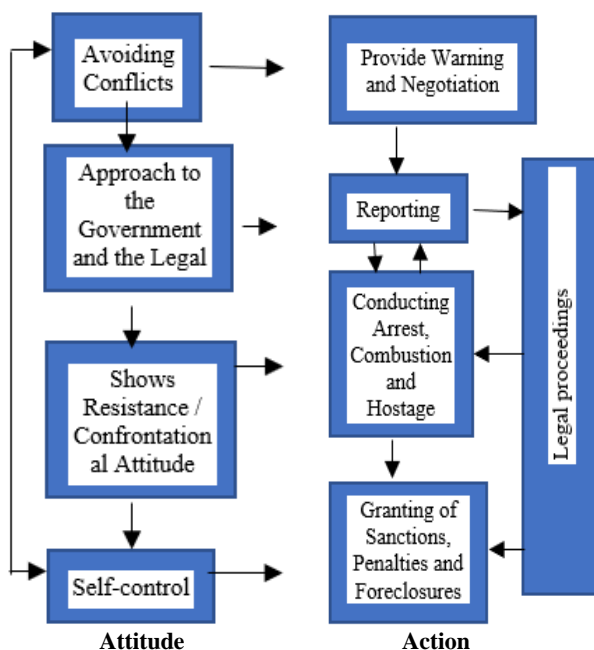


Fig 2: Conflict resolution based on attitude and action action in handling

movement toward more effective ways of managing conflicts and improve fisheries management. Representation and participation of users in the conflict resolution process and involvement of fishers in the implementation of decisions are important factors in legitimizing a management system and law enforcement is also another way to restrain and stabilize some conflicts and clashes between interest groups.

H. Frequency of conflict

The types of fishery conflicts that occurred within the last 5 years on the island of Borneo are as follows:

1. The conflict of ownership of resources.
2. The conflict of resource management.
3. The class conflict.

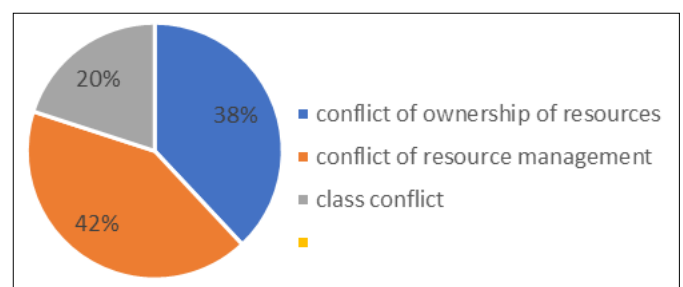


Fig 3: Frequency of conflict

The research showed that government and community partnerships as well as law enforcement can support

10. Conclusion

Potential conflict of fisheries in the coastal area of

Kalimantan is because of unlicensed ship operation, Plotting of fishing ground by local fishermen, The use of a modified bottom net/ trawl/ purse sein fishing gear and Fishing activity by using devastating devices.

Type conflict on the coast of Kalimantan consists of vertical and horizontal conflict. The frequency of marine fisheries resource use conflicts is 42% for management conflict, 38% for conflict of ownership of resources and 20% for class conflicts. Conflict solutions are mostly solved by seeking local agreements, although some are done formally.

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