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Cantrang and environment protection: Policy analysis of handling the risk of implementation of the Ban in Lampung Bay

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Abstract. Cantrang is a trawl net and has been banned from use in Indonesian territory because it impacts environmental sustainability. Research is based on overfishing and exploitation that endanger ecosystem sustainability. The use of cantrang is illegal, unreported, and unregulated (IUU) fishing that damages marine resources and ecosystems. The research location was in Lampung Bay (Lempasing Fishery Port) Bandar Lampung, carried out for four months, from January to April 2019. This study aims to analyze the risk of implementing the cantrang ban. Data collection techniques with documentation study, interviews, observation. Cantrang prohibition is reviewed with a management approach to impact risk. The study results identified risks, namely political conflicts between stakeholders, fishermen's social unrest, horizontal conflicts between fishermen and environmental damage, a decline in fishermen's economy, and a high implementation budget to address risks. Risk analysis is an option that can be used by local governments in responding to central policies by taking into account the following aspects of marine ecosystem preservation; and the sustainability of fishermen's economic resources in Lampung Province.

1. Introduction

One of the fishing gear that is currently prohibited from being used is the cantrang fishing gear. Cantrang is a fishing gear in the form of a net which, when seen from its shape, resembles a payang fishing gear, but the size of each part is small. When viewed from its function and catch, the cantrang resembles a trawl [1,2]. The cantrang is used to capture demersal fish that usually live and eat on the seabed and lakes (the demersal zone), which has resulted in the destruction of coral reefs that disrupt the underwater ecosystem [2,3] and is an Illegal activity, unreported, and unregulated (IUU) fishing [4,5,6]. This condition requires responsible management, with a long-term orientation (sustainable), the current generation, and future generations [7].

The research was based on the existence of problems in the fisheries sector in the form of damage to Indonesia's aquatic ecosystems, especially in Lampung Bay. One of the reasons is the lack of monitoring of fishing practices using non-environmentally friendly fishing gear and the relatively high poverty rate in Lampung Bay. Lampung Bay is an area where fishermen use cantrang as a fishing tool. In 2016 the number of cantrang fishermen was 18 boats, and every year it continues to grow. Anticipating this, the Government of Indonesia has issued a policy to prohibit dangerous fishing gear through Regulation of the Minister of Marine Affairs and Fisheries (Permen KP) Number 71 of 2016 concerning Fishing Routes and Placement of Fishing Tools in the Fisheries Management Area of the Republic of Indonesia. This policy is a policy issued by the government as a revision of Permen KP



No.2 of 2015 concerning the Prohibition of Using Trawl and Seine Nets in the Republic of Indonesia's Fisheries Management Area, which was stipulated on January 8, 2015. Both policies are a form of control carried out by the government to protect the existing resources in Indonesian waters, including in the Bay of Lampung, from fishing gears that destroy fishery resources [8].

Several studies have shown that the prohibition's purpose is the preservation and availability of fish resources in the waters. Therefore it is necessary to maintain a balance between the number of fish or marine resources caught and their growth rate and preserve fishery resources for the future [3,4]. The prohibition of using trawl fishing gear by fishermen, especially cantrang fishing gear, impacts ecology and socially, economically, and politically. Many studies reveal that the cantrang prohibition policy impacts widespread unemployment, decreased welfare, and low fish production obtained by fishermen [9].

The cantrang ban policy getting a strong reaction from the fishing community, including the local government. From 2018, demonstrations took place across Indonesia, including in Lampung Bay, against the cantrang ban policy [10, 11,12]. Several studies have been conducted (showing that the cantrang prohibition policy has decreased fishermen's income because the fishing gear of the cantrang is a mainstay for fishermen and the welfare of fishermen who depends on their daily fish catch has decreased [9, 13,14]. The study of several alternatives and revision of policy implementation is needed to anticipate possible policy failures and provide great benefits to society in the future [14, 15].

This study focuses on efforts to improve public policies that require a good public policy-making process. Various policy implementations will have an impact and are sometimes difficult to predict, while the quality of policies occupies a strategic position to answer community problems [15]. Several studies conducted stated that five aspects caused the low quality of policies: inadequate problems, lack of consideration of alternative policies, lack of assessment of relevant policies, lack of stakeholder involvement and lack of human resource capacity [16]. The low is also caused by not being smart, unwise, and not providing solutions [15]. Most public policies are determined by an intuitive approach, a political and technical approach, all of which can experience deterioration and policy failure [17]. The three approaches cannot avoid risks that are not factually possible. Based on the assumption that public policy is made today to be implemented tomorrow or the future, and reaches into the future itself. The future is uncertain and contains a major risk element, so linking the quality of public policies with risk management factors in the public policy becomes strategic [15,17].

Several previous studies have examined a lot of risk analysis in the project feasibility studies approach, which is a very business approach so that many neglect non-business and non-economic activities. In contrast, several other approaches use a very qualitative model, using expert panels, such as the Delphi method [15,17]. However, it is still limited to see using non-economic models. Risk Management Analysis (RIA) is a risk dimension analysis model in public policy comprehensively through four things: economic, legal or legal, political, and social [15]. Based on the correction of the Risk Management Analysis model [15], revised the policy risk assessment using the Impact Approach Risk Management (IARM) model. This model is based on the political understanding of a public policy as the central premise. The IARM sequence analyzes the risks of analyzing the political impact, social impact, environmental impact, and economic impact.

The research objective is to analyze the risk of implementing the cantrang prohibition policy in Lampung Bay using the IARM model. As it is known, the existence of the central government policy regarding the prohibition of the use of cantrang equipment in all Indonesian marine waters also has an impact on the Lampung Province regarding the same thing. To improve the quality of public policies, in particular the response to the policy on the prohibition of using cantrang this research recommends that the Lampung Provincial government should use the risk analysis includes the following aspects: a) preservation of marine ecosystems; and (b) the continuity and sustainability of economic resources for fishermen cantrang in Lampung Province. The policy-making process needs to be pushed towards developing transparency, building public accountability, and reducing local government transaction costs.

2. Methods

The study was conducted in Lampung Bay, to be precise at the Lempasing Beach Fishing Port, Bandar Lampung City with an implementation time of 4 months, from January to April 2019. The method used is a qualitative method. The types of data collected are qualitative data, especially those from primary sources; Meanwhile, quantitative data only supports secondary sources. The technique of collecting the necessary data is done through observation, interviews and documentation study. Interviews were conducted with 17 people, consisting of: Civil Servants of the Office of Marine Affairs and Fisheries of Lampung Province (5 people), ship owners (5 people), ship managers (3 people), skippers (2 people) and universities (2 people). The data were processed and analyzed using the Impact Approach risk management technique [15], to map policy risks based on possible future consequences consisting of 4 mutually reinforcing processes, namely: (a) Political impact analysis, with a focus on whether the policy to prohibit the use of cantrang has the potential to lead to political conflict (elite) and conflict among fishermen; (b) Social impact analysis, looking at the possibility of social unrest and the development of horizontal conflicts in people's lives; (c) Environmental impact analysis, oriented towards environmental (ecosystem) safety; and (d) economic impact analysis, to explain future economic benefits and the need for future policy budgets.

3. Result and Discussion

3.1. Research Location Conditions

The coastal area of Lampung Bay is located in Bandar Lampung City, South Lampung Regency and Pesawaran District. It was recorded that in the coastal area of Lampung Bay there were 2,336 fishery households (RTP) in 2007, most of the fisheries households were in Teluk Betung Barat and Teluk Betung Selatan Districts. Bandar Lampung City. A total of 1,760 FHH (55% from Lampung Bay). In 2018 there were 3,653 FHs with the highest number of FHs in South Lampung Regency, namely 1,589 FHs or 43.49% [18]. The study conducted described the total area of waters in the bay as covering an area of 161,178 ha. This area is a place of residence and a source of livelihood for fishermen and fish cultivators [19]. Various types of fish are available in the waters of Lampung Bay, including 7,072 individuals from 31 ethnic groups and 162 types of fish, 40 of which are target fish (food). The "major fish" category consists of 22 tribes with 160 species [18].

The fishing fleet that operates is 2,500 units. The operation classification consists of small motorized vessels (<5 tonnes and 5-10 tonnes) which dominate the operation of fishermen (artisanal), and generally go to sea in only one day; larger vessels (10-20 tonnes and > 20 tonnes), operate outside the Bay of Lampung (Teluk Semangka, Sunda Strait, West and East Lampung waters, or to the Java Sea), and the coastal area of Lampung Bay is only a landing and just stay (fishing base). Data for 2019 shows cantrang ships operating around Lampung Bay measuring under 30 GT with a total of 28 units. The composition of the ship consists of a captain and the head of the engine room (KKM), the number of crew members (ABK) is around 10-15 people. Activities in the form of loading and unloading of the Lempasing Beach Fishing Port, Bandar Lampung City. It can be seen that the catch of fish does not enter the Fish Auction Place (TPI), but is directly sold at the loading dock so that the capture fisheries production data is not recorded and there is no PAD (Regional Original Income) [18].

3.2. Risk Management Analysis of the Cantrang Prohibition Policy

Rejection of the cantrang prohibition policy requires risk management. Risk Management Analysis is a standard for identifying policy risks as well as developing management to anticipate and address risks that arise during implementation. Policy risks are seen from the political impact, social impact, environmental impact, and economic impact [15]. The study conducted explains that failure to manage these four aspects can result in policy failure and result in environmental damage [8,14,17]. Based on table 1, it illustrates risk identification from 4 aspects, root causes and recommendations for risk management.

Table 1. Detailed Model Risk of the Cantrang prohibition policy

Identified Risk	Root Causes	Recommendation
Political Impact Political conflicts and legal debates between stakeholders	With the current direct election system, any government policy will be vulnerable to criticism from the public. Then political opponents will criticize and provide support for cantrang fishermen.	Conducting surveys and studies of fishing gear deemed to be damaging to marine ecosystems and handling the conservation of damaged ecosystems. Furthermore, for the smooth implementation of government policies, it should always take a dialogue/ socialization-socialization approach with fishermen in various regions.
Social Impact Fishermen's social unrest and horizontal conflicts between fishermen	Fishermen will lose their livelihoods because they are not ready to switch to other fishing gears. Meanwhile, all this time fishermen who obey not wearing cantrang feel threatened by the presence of cantrang fishermen who often enter their fishing waters.	Disseminating fishermen about the importance of preserving the environment, especially the sea and providing new environmentally friendly fishing gear.
Environment Impact National and global environmental damage	The cantrang that is permitted is not allowed to use weights, not long nets, and be pulled by human hands. However, nowadays the cantrang actually has a net that can reach tens to hundreds of kilometers, using a ballast, and being pulled by a machine. Of course this will damage the marine ecosystem. However, cantrang fishermen are adamant that the damage to the marine ecosystem is not due to cantrang alone.	More intensively carry out dialogue with representatives of fishermen, academics, observers of nature, marine natural resource conservation organizations and the Government so that in setting policies they can work together and not ignore one another.
Economic Impact Decreasing community economy and high policy implementation budget	The community, especially the cantrang fishermen, think that this policy is hampering them in terms of their livelihoods. Then cantrang fishermen still expect environmentally friendly fishing gear to be provided free of charge by the government.	The government, in this case the Ministry of KP must sit down with the ministries and related institutions to find the best solution in improving the fishermen's economy as well as looking for alternative policies so as not to significantly increase state budget expenditures for policies.

The cantrang prohibition policy in the concern of natural resource conservation (IUU Fishing) is a description of an arena of competition between three paradigms which can be described as a paradigm triangle consisting of the conservation paradigm, the rationality paradigm and the social / community paradigm. Policies that are oriented towards preserving resources will use a conservation perspective, policies that orient economic growth and productivity will be very close to the rationalization paradigm, and policies aimed at community welfare and the achievement of equality [3]. The three paradigms will continue to be in tension in order to maintain a balance between the three, policies that are too inclined to one or two paradigms will certainly disarm the other. The battle between the paradigms above is determined by the objectives of the policies that underlie them [7,20]. Looking at the context of the cantrang ban, the regulations issued by the Ministry of Maritime Affairs and Fisheries were analyzed using the above analysis tools. In the context of resource conflicts, a policy that is extreme or has the potential for major conflicts and has the potential to cause risks is a policy that is skewed on one side [12, 20].

The cantrang prohibition policy in reality illustrates the government's concern for the degradation of the Indonesian sea as a result of excessive and unwise extraction in the past so that several water

areas, including Lampung Bay have been over-exploited and their habitat is in a damaged condition [8,11]. Several studies illustrate the reasons the government tends to use a conservative perspective that views the long-term sustainability of fish stock availability, the main enemy of market rationalization, fishermen are seen as pursuing personal gain, the government needs to control and restrict [20,21]. Degradation of the Indonesian sea as a result of excessive and unwise extraction in the past so that several water areas are declared to have been over-exploited and their habitats in damaged condition, increased production as ecological destruction. A study conducted has shown that the loss of national assets due to IUU fishing is estimated to be 25% stolen by foreign vessels, while production is increasing. The contradiction between production and resource degradation is an important reason for the prohibition of cantrang [7].

The national policy regarding the prohibition of using cantrang in the factual context of its implementation in Lampung Province does not show any significant difference, even the pattern seems uniform and the same as what the central government concentrates on. Hence, there are several drawbacks in implementing the cantrang prohibition policy that requires risk management, including: implementation of a top down policy, considering fishermen as enemies and targets of surveillance, the central government and local governments running independently [8,15,21,22].

The root cause of all of these is conventional policies, which see policy implementation as a daily routine of government operations, and are top down [8]. The study conducted describes the cantrang ban policy with this pattern, has created a long-standing conflict, has even shifted the issue from horizontal conflict between fishermen to vertical conflict between fishermen and the government [10]. Several studies conducted show conflicts between fishermen and the government regarding how to produce, consultation in policy implementation and law enforcement. Changing the locus of this conflict from operational level to management level certainly requires deeper studies and aspects that must be considered so that a good policy can be realized [23,24,7].

Evaluation is carried out by emphasizing the improvement of political, economic, environmental and social aspects [15]. This top-down policy caused socio-economic impacts, including dissatisfaction with the fishing community, because government policies were not accompanied by solutions for steps to improve the socio-economic conditions of the people who had used cantrang [21]. Cantrang fishermen income is lost, which has an impact on poverty and social insecurity [7,13]. Policies without a community approach (bottom-up) only cause vertical conflict between the government as the policy maker and the fishing community as the policy maker [21,10]. Several typologies of conflict that require analysis of political improvement occur in: First, fisheries jurisdiction, this type of conflict usually occurs around issues of the role of government, territorial boundaries, access to shipping, and other policy planning functions (this conflict usually occurs at the policy level). and planning; Second management mechanism, this conflict occurs at the management level regarding short-term fisheries implementation plans, catch conflicts, licensing processes or fisheries law enforcement; Third, internal allocation, is conflict that occurs at the operational level between fisheries actors regarding fishing permits, conflicts fishing gear, conflicts between fishermen and entrepreneurs, or between other actors; Fourth, external allocation, at this operational level conflict is between domestic fisheries actors and fishermen from other countries, other sectors and with the wider public [20]. Looking at some of the conflict resolution options above and a description of the type of conflict and the current level of conflict intensity, it is necessary to improve and manage the regulatory aspects.

4. Conclusion

Analysis of risk management policies is needed for the achievement of environmental conservation. The implementation of the cantrang prohibition policy in Lampung Bay requires strengthening of the four dimensions of risk analysis. Policy evaluation by involving stakeholders who are directly or indirectly related to the prohibition of cantrang is the first step to stop the opposition. Efforts to realize good policy through basic policy formulation will provide positive lessons for the successful implementation of the cantrang prohibition policy.

Recommendations are: (a) Revoke Permen KP No 02/2015 and Permen KP No. 62/2016 to provide an opportunity to reform norms or regulations to regulate destructive fishing gear; (b) Reopening

multi-stakeholder consultations in the process of formulating public policies responsibly to remap dilemmas and options for rehabilitating Lampung Bay while providing social and economic support for fishermen in Lampung bay; (c) Assessment and testing of replacement fishing gears (d) Assisting replacement of fishing gear.

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