

# The application of the blue economy concept for traditional fisheries

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# The application of the blue economy concept for traditional fisheries management in a conflict zone

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**Abstract.** Bidayani E, Reniati, Priyambada A. 2023. The application of the blue economy concept for traditional fisheries management in a conflict zone. *Indo Pac J Ocean Life* 7: 143-147. The blue economy refers to an environmentally friendly management concept to ensure the sustainability of fish resources, considered an effective method in minimizing conflicts of interest in coastal areas. This study focused on one of the conflict zones in the Province of the Bangka Belitung Islands, located on the coast of Kebintik Village and Batu Belubang Village, Pangkalan Baru Sub-district, Central Bangka Province, Indonesia. This study aims to: (i) Analyse the implementation of the blue economy principles and (ii) Analyse the traditional capture fisheries management in conflict zones for sustainable fish resources. The research was conducted from June to July 2022. The population in this study includes traditional fishermen who have operated for more than one year in coastal areas, as many as 30 people and 30 people affected by the community's conflict. The research method of this study was survey, while the data collection was conducted using census techniques and focus group discussions, generating both primary and secondary data. Primary data collection was conducted using a questionnaire, observation, and documentation. Meanwhile, secondary data collection was conducted through a literature study. The data analysis method used in this study is the descriptive method. The conclusions of this study are: (i) Implementation of blue economy principles, including resource efficiency, zero waste, social care, production cycle systems, investment, innovation, and adaptation, ranging from 86% - 100% or high category; and (ii) Traditional capture-fisheries management in conflict zones for sustainable fish resources which is considered as a compromise.

**Keywords:** Bangka, blue economy, conflict, fishermen, management

## INTRODUCTION

In Indonesia, capture fisheries are dominated by small-scale fisheries. More than 78% of fishing fleets are under 10 Gross Tonnage (GT), and around 95% use outboard motorboats and non-motorized boats with simple fishing gear (Rahim et al. 2019; Nababan 2020; Patawari et al. 2022). The small-scale fisheries' role is very dominant, with more than 80% of capture fisheries production in Indonesia derived from small-scale fisheries' contribution (Adhuri et al. 2016).

However, the sustainability of small-scale fisheries-based livelihoods is vulnerable to shocks and sudden changes. They face challenges ranging from various factors and processes, such as weak governance, insecure tenure, weak access to tenure and average incomes, and political and market powerlessness (Barr et al. 2019). In addition, small-scale fisheries are also faced with various risks from fishing activities and economic risks stemming from natural disasters such as climate change (Sari and Muslimah 2020).

Generally, fishermen have limited resources, but on the other hand, fishermen also want to increase their fishing effort. Therefore, fishermen must consider the production factors in efficiently running their capture fisheries business (Sukiyono and Romdhon 2016). Increasing

fishermen's catch skills depends on the production inputs used. Further, information regarding the effect of production inputs is required, which results in optimal fishing efforts by applying effective and efficient production inputs to increase catches and fishermen's income (Alhuda et al. 2016). However, the effectiveness and efficiency of fishing gear and the use of other production factors are still not optimal. This situation affects the income and level of welfare for fishermen. The current suboptimal production in the fisheries sector is mainly due to the low productivity of fishermen (Yonvitner et al. 2020).

In addressing the situation mentioned above, the present authors propose the concept of the "Blue economy," which is an environmentally friendly management concept to ensure the sustainability of fish resources. This concept is an economic development that relies on marine resources associated with sustainable resource management and focuses on three perspectives: economic, ecological, and social factors. The blue economy emphasizes innovation more to meet fishermen's needs through increasing added value at every stage, thus requiring innovation skills (Bidayani and Priyambada 2022). However, economic activities in the coastal area of Batu Belubang Village, Pangkalan Baru Sub-district, and Central Bangka District can cause conflict due to unconventional tin mining

activities and limited capture fisheries in the village area (Bidayani 2022). Through this study result, it is hoped that conflicts in coastal areas can be managed by applying a blue economy concept approach and creating justice for all regional stakeholders.

According to Saefullah (2012), the emergence of conflict is motivated by a mismatch of goals. Moreover, according to Ni'mah (2016), the characteristics of conflict include antagonistic interactions, differences in conflicting and disturbing goals, and the presence or absence of open resistance. In addition, Fisher (2001) pointed out that conflict resolution becomes an attempt to deal with the causes of conflict by establishing new and long-lasting relationships among hostile groups. Further, Wirawan (2010) asserted that conflict resolution is achieved in two ways: self-regulation by the conflicting party and the intervention of a third party. Furthermore, compromise can also be used to manage conflicts. According to Kreitner and Kinichi (2014), conflict management styles include integrating (problem-solving), obliging (smoothing), dominating (forcing), avoiding, and compromising. Furthermore, managing conflict is motivated by many factors, such as the economy and social strata in the organization, emphasizing that every involved individual can understand the conflict and know how to manage it (Mulyani et al. 2020). Elaborating, effective communication is required to encourage the creation of appropriate conflict resolution (Wianti et al. 2020).

## MATERIALS AND METHODS

4 The research was conducted in Kebintik Village and Batu Belubang Village, Pangkalan Baru sub-sub-district, Central Bangka Province, Indonesia from June to July 2022. The location selection technique was considered intentional (purposive sampling), including the conflict zones for unconventional mining and capture fisheries. The method used in this study was a survey method, in which the main source of data and information is obtained from respondents as research samples using a questionnaire as a data collection instrument. The sampling method was purposive, including 30 traditional fishermen in Kebintik Village and 30 people (non-fishermen) affected by the conflict-affected in the Batu Belubang Village community.

Data collection methods in this study were primary data and secondary data. Primary data collection was conducted through interviews to analyze the implementation of the blue economy principle and Focus Group Discussion (FGD) to analyze traditional capture fisheries management. FGD empowerment persons from the Regional Development Planning, Research and Development Agency (BAPPEDA) of Bangka Belitung Islands Province and the Head of Batu Belubang Village. Meanwhile, secondary data collection was conducted through a literature study. The data analysis method used in this study is the descriptive method. Therefore, the data analysis method used is the descriptive method, which describes the situation that occurs systematically and factually to describe and solve research problems. The blue economy

principles (or concept) include resource efficiency, carelessness, social care, production cycle systems, investment, innovation, and adaptation. Data analysis applies the percentage formula (Azwardi 2018), which is as follows:

$$P = f/N \times 100$$

Where:

P: percentage number;

f: frequency sought by the percentage

N: number of frequencies used as data

Each indicator is measured through statements using three scores: 1 disagree, 2 doubtful, and 3 agree. The formula for making class intervals (Prabawa 2020) is as follows:

$$NR = NST - NSR$$

$$PI = NR : JIK$$

Where:

NR : value range

NST : highest score score

NSR : the lowest score

PI : interval length

JIK : number of class intervals

The percentage value of the interval in this study is:

Percentage interval criteria

77.9-100% high

55.6-77.8% enough

33.3-55.5% low

## RESULTS AND DISCUSSION

3 The blue economy principles (or concept) include resource efficiency, zero waste, social care, production cycle systems, investment, innovation, and adaptation. The fishing effort of traditional fishermen in the productive seasons, which are in March, May, June, August, and October, indicates that all respondents (100%) are efficient. Meanwhile, in the bad season (besides the peak/productive seasons), 57% of fishermen break even ( $R/C = 1$ ), 33% ( $R/C < 1$ ) are inefficient, and 10% ( $R/C > 1$ ) are efficient. This study's results align with the research of Nainggolan et al. (2021) reporting that the income of traditional fishermen in the productive fishing season is around IDR 65,000/day or IDR 980,000/month. Meanwhile, in the bad season, the income of traditional fishermen is IDR 13,000/day or IDR 205,000/month. The implementation of the principle of resource efficiency is presented in Figure 1.

Referring to the study of the zero waste principle, the catch of traditional fishermen can provide economic benefits wholly. As many as 86.67% of fishermen stated that their catch provided economic benefits (sellable), while 13.33% of fishermen stated that the fish not sold was typically consumed by themselves. Moreover, fishermen can process fresh fish into various processed products to increase income. This finding/statement is reinforced by Nainggolan et al. (2021), denoting that the government can

provide fish processing training to fishermen to increase their added value.

Social care in this study (as the third principle under the Blue Economy concept) is defined as a traditional capture fisheries business that can create another informal job. The results reported that their family members assisted 16.7% of fishermen, and 83.3% of fishermen ran a business assisted by friends, with the majority assisting just one person. According to Sujarno (2008), the need for a workforce must be adjusted to the capacity of the operated ship to manage efficient fishing costs. The implementation of zero waste and social care principles is presented in Figure 2.

The production cycle system indicates that the traditional capture in fisheries business continuously runs while conflict exists. Bidayani and Reniati (2021) reported that as many as 90% of fishermen can still conduct fishing activities by changing locations, particularly in conflict zones. The fishermen experience difficulty in getting fish, which encourages them to change the catching location.

The willingness attempts of traditional fishermen to invest in business include innovating to increase productivity and adapting in conflict zones. All fishermen (100%) are willing to invest in the business by increasing the number of fishing gear and adding bait variations to increase productivity as a form of adaptation in conflict zones. According to Nainggolan et al. (2021), the government can provide financial support for procuring fishing facilities and infrastructure. The implementation of the blue economy concept, production, investment, innovation, and adaptation cycle system is presented in Figure 3.

In this study, the analysis of traditional capture fisheries management in conflict zones for sustainable fish resources was based on the blue economy concept. This concept includes village government policies related to activities in coastal areas, approaches used in conflicts of interest, efforts to create peace in the community, appropriate empowerment programs to help fishermen, and stakeholder expectations for sustainable fish resources.

The policy implemented by the Batu Belubang Village Government related to activities in coastal areas, especially for fishermen, includes: increasing the capacity of Human Resources, providing facilities and infrastructure (cold storage, fishing gear assistance, counseling, good fishing training, additional facilities such as Fish Auction Places, and assisting in pier extension. Meanwhile, policies for tin mining include: setting up mining zones, encouraging licensed tin mining, prohibiting mining in fishing areas, and controlling illegal tin mining activities. According to Nainggolan et al. (2021), the strategy to increase fishermen's income is considered an aggressive strategy, including forming fishing groups and using modern fishing gear.

In this study, deliberation is the approach used if there is a conflict of interest in the coastal area. Efforts to create peace in the community are by setting operational areas, not interfering between tin miners and fishermen, and demanding compensation from mining activities in fishing areas. According to Bidayani and Hartoko (2019),

compromise can be used to manage conflict. Appropriate empowerment programs to assist fishermen include training and mentoring fishermen and fish processors and facilitating other fishermen's needs. Apart from the fishermen dimension, stakeholders expect that fish resources are sustainable, including setting up marine space utilization zones, using environmentally friendly fishing gear, and maintaining the cleanliness of the marine surrounding. According to Nainggolan et al. (2021), the government should routinely conduct outreach and training for fishermen to process fish and preserve sustainable marine and coastal resources.

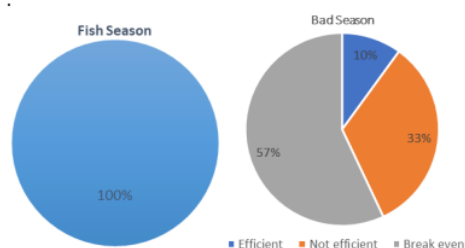


Figure 1. The implementation of the principle of resource efficiency

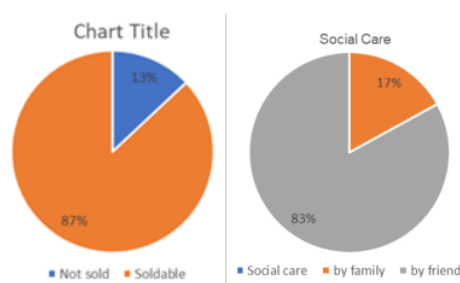


Figure 2. Implementation of zero waste and social care principles

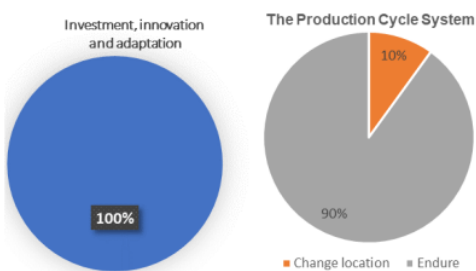


Figure 3. Investment, innovation, and adaptation

## Discussion

Conflicts in coastal areas between traditional fishermen and unconventional tin miners have put pressure on traditional capture fisheries. Therefore, the blue economy concept is expected to provide a policy direction for developing sustainable traditional capture fisheries. Based on the result of this study, the conclusions of this study are: 3) Implementation of blue economy principles includes resource efficiency, zero waste, social care, production cycle systems, investment, innovation, and adaptation ranging from 86% - 100% or high category; and 2) Traditional capture fisheries management in conflict zones for sustainable fish resources is a compromise.

Based on the finding of this study, utilization of coastal areas at the same time and space tends to cause trade-offs for the users. Furthermore, as users, small fishermen are vulnerable due to experiencing the most pressure from the impact of the trade-off (Mardiyani and Lindawati 2021). This study also revealed that the allocation of coastal and marine space on Bangka Island, which is dominated by mining activities, has caused various problems, especially for capture fisheries activities (Nurtjahya and Agustina 2015; Manik 2018; Pratama 2018; Bidayani and Hartoko 2019; Bidayani and Kurniawan 2020; Bidayani et al. 2020; Ramadona et al. 2020; Bidayani and Reniati 2021; Bidayani and Priyambada 2022). In addition, the existence of a marine Mining Business Permit (IUP) adjacent to the location of the fishing area (DPI) causes conflicts with local fishermen (Ibrahim et al. 2018; Sulista et al. 2019). Therefore, the causal factors indicate conflicts that exist due to environmental damage are the practice of one party that harms fishermen included in the type of environmental conflict (Satria 2015). In addition, conflicts of interest between fishermen and miners present a major problem for the sustainability of the two sectors: capture fisheries and tin mining (Ramadona et al. 2020).

In sum, 3) implementing the blue economy principles, including resource efficiency, zero waste, social care, production cycle systems, investment, innovation, and adaptation, is expected to be a solution for managing traditional-scale capture fisheries resources. In addition, this study suggests setting up marine space utilization zones, using environmentally friendly fishing gear, and empowering fishermen programs to increase income.

## ACKNOWLEDGEMENTS

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