Public Policy in the Concept of Blue Economy for Anticipating Disasters in Indonesia

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Abstract. The Blue Economy concept is an economic approach focused on sustainable management of marine resources that can be a solution to the disaster crisis in Indonesia. This study aims to evaluate public policy in the implementation of the Blue Economy concept in Indonesia to anticipate disasters. The research method used is qualitative with literature study as the main approach. The research findings show that existing policies related to the Blue Economy concept and disaster anticipation in Indonesia still need to be improved and strengthened in terms of application and coordination between sectors. The policy cycle in the Blue Economy concept is needed to formulate agendas, policy formulation, policy adoption and legitimacy, and policy assessment and evaluation. Challenges faced in the Blue Economy concept include the application of ecosystem principles, the development of environmentally friendly technology, increasing community involvement, and aligning government policies. In planning and implementing public policies in the Blue Economy concept, collaboration is needed between government, community, private sector, and academic institutions. Thus, synergy is created in building environmentally friendly economic sustainability and reducing disaster risks that impact human life and the surrounding environment.

1 Introduction

The Blue Economy concept is an economic approach that focuses on sustainable marine resource management to support sustainable economic development. In the context of Indonesia, the Blue Economy concept can be a solution to mitigate the disaster crisis caused by optimal and responsible use of marine resources [1], [2]. However, several conditions underlie the occurrence of public policy issues in implementing the Blue Economy concept in Indonesia, such as lack of community awareness of the potential of marine resources. Indonesians are still more familiar with natural resources on land than at sea because of the lack of education and socialization campaigns about the economic potential and sustainability of marine resources [3], [4]. This makes Indonesians less attentive to marine resources and potential, making it difficult to implement marine resource management policies. Then, there are consistent regulations for marine resource management in Indonesia; there are many regulations and laws related to marine resource management, but they are poorly implemented and not consistent in their application. This leads to business uncertainty for

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companies that want to invest in the use of marine resources, thus marine resource management policies are ineffective [5], [6].

Other problems have already occurred severe damage to marine environments, there is also irresponsible use of marine resources causing severe damage to marine environments in several areas in Indonesia, such as coral destruction, pollution, and overfishing. On the other hand, saving marine resources must be a priority, so there needs to be efforts to restore and rehabilitate to rebuild a healthy marine ecosystem. On the other hand, there are difficulties in accessing the necessary capital and technology, the application of the Blue Economy concept requires adequate technology and capital to innovate, research and develop technology for sustainable marine resource utilization [7]. However, many small and medium enterprises (SMEs) struggle to access the necessary capital and technology, making it difficult to implement policies in marine resource management. Therefore, collaboration is needed among all related stakeholders, such as the government, business community, academics, fishermen, and the community to build a blue economy in Indonesia and implement effective and sustainable public policies in marine resource management [8].

The reason for Public Policy Research in the Blue Economy Concept for Anticipating Disasters in Indonesia is important because Indonesia is a country with the second longest coastline in the world and has thousands of islands and abundant waters. Indonesia's marine and marine natural resources have great potential to develop the Blue Economy concept [9], [10]. However, the increasing human activities in the marine and fisheries sector, such as exploitation of marine resources, waste disposal, and climate change, can increase the risk of disasters at sea such as tsunamis, floods, and tidal waves. Therefore, the concept is needed to integrate economic and environmental aspects in managing marine and marine resources, so that it can help minimize disaster risks and improve community welfare [11], [12].

In this context, public policy research on the Blue Economy concept can help the government understand the importance of sustainable marine and marine resource management and determine the appropriate policies in disaster anticipation. This study can identify and evaluate existing policies and propose alternative solutions that are more appropriate to Indonesia's conditions [13], [14]. In developing the Blue Economy concept, it is important to involve various stakeholders, such as coastal communities, marine and fisheries stakeholders, as well as academics and governments. Public policy research can provide a comprehensive and integrated view of marine and marine resource management, thereby improving community welfare and reducing the risk of disasters in Indonesia.

Moreover, there are problems related to marine resource regulation and governance that have not been optimal. Constraints in monitoring and law enforcement in extensive marine areas make it difficult to maintain a healthy and sustainable marine environment. In addition, illegal fishing practices threaten the availability and sustainability of marine resources, which poses challenges that must be overcome. To overcome these issues, government and related stakeholders need to increase community awareness about the potential of marine resources and the importance of preserving marine environments. By implementing an effective and sustainable Blue Economy concept in Indonesia, a balance between economic development and marine resource conservation can be achieved, providing long-term benefits to society and the environment.

2 Research Methods

Qualitative research methods in literature studies are one of the approaches used to conduct research by further investigating and analyzing certain reading sources [15]. The qualitative research method in literature studies is carried out by collecting data through literature materials such as books, journals, articles, documents, and others related to the research topic to be explored [16]. After obtaining data from the literature, the researcher then evaluates and

analyzes the data using a qualitative approach. In literature studies, reading and understanding literature materials is an important skill. In addition, researchers must be able to conduct qualitative analysis by taking into account the social and cultural contexts related to the research topic. Thus, the qualitative research method in literature studies is useful for uncovering social and cultural phenomena related to the experiences, thoughts, and perspectives of the subjects observed. This method focuses on analyzing text content and allows researchers to understand and interpret information contained in the literature. This method can also help researchers understand the historical and cultural backgrounds of a topic, as well as identify trends or patterns that influence the subject experience [17]. Furthermore, the qualitative research method in literature studies can help researchers identify issues or gaps in previous research and provide a basis for further research. However, like any other method, this method also has weaknesses, such as lack of validity and reliability when not properly done. Therefore, it is important for researchers to carefully consider the application and interpretation of qualitative method results in their research.

3 Results and Discussion

3.1 Existing Policies in the Blue Economy Concept of Anticipating Disasters

The Blue Economy concept is a sustainable economic development approach that focuses on the sustainable use of marine and aquatic resources to achieve inclusive economic growth, social development, and environmental protection [18]. This approach is particularly relevant to anticipate disasters related to climate change, rising sea levels, and other natural disasters that can affect coastal and aquatic areas [19], [20]. Some existing policies that can be related to the Blue Economy concept to anticipate disasters are as follows:

- Coastal and Marine Area Management: Policies regulating coastal and marine area management are critical in the Blue Economy context. Good management can help protect marine and coastal ecosystems and reduce disaster impacts like flooding, erosion, and storms.
- Plastic Waste Management: Policies addressing plastic waste in the ocean are important in maintaining a healthy marine ecosystem and preventing environmental disasters caused by plastic accumulation.
- Tsunami Early Warning System: Indonesia, as a country with a high risk of tsunamis, needs an effective early warning system. This system can provide rapid warning to the communities when there is an earthquake in the sea that has the potential to cause a tsunami.
- Coral Ecosystem Conservation: Policies to protect and care for coral ecosystems are important in maintaining a healthy marine ecosystem. Good coral can serve as a natural protection from disasters such as large tidal waves.
- Disaster-Resilient Infrastructure Development: In planning economic development in the Blue Economy sector, it is important to consider disaster-resilient infrastructure. This can include building ports that are resilient to storms, creating settlements that are safe from floods, and other infrastructure that considers disaster risk.
- Fisheries Resources Management: Sustainable policies in fisheries resources management can help prevent overfishing and damage to marine ecosystems. It can also reduce the risk of hunger and ecosystem imbalance.
- Sustainable Technology and Innovation Development: The development and application of sustainable technology, such as renewable energy systems on islands, can help reduce greenhouse gas emissions and reduce climate change risks.

- Education and Community Awareness: Policies supporting education and community awareness on the importance of marine and coastal sustainability can help build a culture that is more caring for the environment and reduces damaging behavior.

The development and implementation of these policies must involve cross-sector collaboration, including government, private sector, and civil society. The Blue Economy approach can be a holistic approach to addressing disaster challenges related to water and the sea. The research findings show that, although the Blue Economy concept can be a solution for mitigating disasters in Indonesia, existing policies still need to be improved or added to strengthen the Blue Economy concept as an effort to mitigate and adapt disasters in Indonesia. Some policies in Indonesia such as the National Policy for Coastal and Marine Management, National Action Plan for Disaster Risk Reduction, and National Action Plan for Climate Change Adaptation already include some aspects of the Blue Economy concept but still need to be strengthened, especially in terms of application and coordination between sectors.

Furthermore, policies related to development planning such as Regional Spatial Planning and Coastal and Small Island Management Plans need to pay more attention to sustainability and disaster risk in the development of the coastal economy. Better coordination is also needed between government sectors, businesses, and communities in developing the blue economy to prevent inter-sectoral conflicts and strengthen resilience towards disasters. One of the efforts that can be made is to promote disaster risk reduction approaches in blue economy activities and increase community participation in decision making related to marine resource management. Overall, the research findings indicate that, although the Blue Economy concept can be a solution for mitigating disasters in Indonesia, improvements and strengthening of existing policies are necessary to ensure the optimal implementation of the Blue Economy concept in Indonesia.

3.2 Policy Cycle in the Blue Economy Concept of Disaster Anticipation

The policy cycle in the Blue Economy concept is vital to anticipate the disaster in the waters. Blue Economy is an economic development concept that uses marine and water resources wisely and sustainably. Policies made in this concept should not only consider economic aspects but also environmental and social aspects, in order to minimize the risk of disasters. The policy cycle uses Dunn's theory [21], which is described in four stages as follows:

3.2.1 Agenda Setting

The agenda setting stage in the policy cycle in the Blue Economy concept of disaster anticipation is an important process in developing effective action plans to prevent and manage disasters related to economic activities at sea [22]. Several steps in setting the agenda include:

- Problem identification: The first step in setting the agenda is to identify problems related to economic activities at sea and their impact on the environment and community safety. This can be done by conducting risk assessments for various economic activities carried out at sea.
- Goal setting: After identifying problems, the next step is to set goals to solve these problems. These goals must be specific, measurable, realistic, and achievable so that progress can be tracked during the policy implementation process.
- Strategy determination: After the goals are set; the next step is to determine strategies and tactics to achieve these goals. This includes identifying policies, programs, and projects that priority to solve identified problems.

- Schedule and priority setting: After determining strategies and tactics, the next step is to set schedules and priorities to execute the plans. This includes determining the timeline, resources required, and series of events that will be carried out.
- Monitoring and evaluation: The final step is monitoring and evaluating the implementation of the policies that have been set. This ensures that the policies are effectively achieving the determined goals, and feedback is obtained to improve the policies in the future.

In planning and running the agenda of the policy cycle in the Blue Economy concept of disaster anticipation, it is essential to consider multidisciplinary aspects like marine science, environment, and safety. In so doing, the policy formulated can be effective and sustainable in the long term. Marine aspects cover an understanding of the sea conditions, marine organisms, fishing and cultivation, also responsible and sustainable use of marine resources. Environmental aspects include understanding the impact of human activities on the marine environment, environmental damage and its restoration efforts, plastic waste management, and climate change adaptation. While safety aspects include evacuation and rescue, reducing disaster risk, and regulation and supervision of marine activities.

In planning for sustainable blue economy policy, there also needs to be an assessment of the policies' impact on coastal communities and the surrounding sea area. This will help identify the policy's success and drawbacks and expand investment opportunities to improve economic practices and asset potential for local people [23], [24]. Additionally, integration between public and private sectors is necessary, with the private sector providing input and support to Blue Economy development, such as investment, tech, and innovation. The public sector regulates and supervises activities to ensure sustainable marine resource exploitation.

3.2.2 Policy Formulation

The Blue Economy concept is an economic development concept that emphasizes sustainable marine resource utilization and preservation [25]. Policy formulation in the policy cycle in the Blue Economy Concept for disaster anticipation should pay attention to several things, such as:

- Disaster risk evaluation: Risk assessments need to be carried out to the marine and fishery sector. These assessments can determine the prevention and disaster management steps that can be measured and effective.
- Local community involvement: Local communities must be actively engaged in decision-making related to marine resource management, including in risk reduction efforts. Community participation can increase policy implementation effectiveness.
- Waste and pollution treatment: Marine waste and pollution can be the catalyst for serious environmental disasters. Therefore, it is necessary to have strict policies on waste management and pollution treatment implemented well.
- Increased capacity of communities and institutions: Increasing the capacity of communities and institutions in the field of marine resource management and disaster management is essential. This aims so that communities and institutions can take quick and appropriate preventative, preventive, handling, and quickly recover from disasters.

With structured policy formulation in the Blue Economy concept, it is expected to prevent disasters and reduce their impact on marine and fishery sectors, thus creating balanced economic development and environmental preservation. Furthermore, the Blue Economy concept can increase productivity in the marine and fishery sectors by optimizing sustainable marine resource utilization, building environmentally friendly infrastructure, and developing technology more efficiently in managing marine resources. In the long run, this will contribute positively to economic growth and the welfare of society in the marine and fishery sectors. By adopting Blue Economy, it is hoped that we can create new opportunities and

maximize the economic potential of marine resources while maintaining marine ecological sustainability and balance.

3.2.3 Policy Assessment and Evaluation

Policy assessment and evaluation are integral to the policy cycle in the Blue Economy Concept. The policy cycle consists of several stages, including policy formulation, implementation, monitoring and evaluation of the policy, and policy revision or updating [28]. In the policy formulation stage, risk assessment and uncertainty disaster must be part of the decision-making process to ensure policies minimize disaster impact and strengthen community disaster resistance. In this stage, risk assessment and economic feasibility must also be performed to ensure that policies not only mitigate disaster but also provide economic benefits to society. The implementation stage also requires special attention in terms of policy assessment and evaluation. Monitoring and evaluation of policy implementation must be carried out continuously to ensure policies are implemented effectively.

In the monitoring and evaluation stage, external evaluation is conducted on the implementation of policies to measure their effectiveness in achieving set goals and to gather useful feedback for the improvement of policies in the future [29], [30]. Evaluation also provides critical information for the public to understand whether the policies are successful or otherwise. Lastly, policy evaluation and assessment must also be carried out in the policy revision or upgrade stage to evaluate the effectiveness of old policies and provide input for better policy-making. In the Blue Economy concept of disaster anticipation, policy evaluation and assessment must consider the environmental, social, and economic aspects. This is to ensure policies taken not only are effective in mitigating the disaster but also provide economic benefits and increase the quality of life that benefits society.

3.2 Challenges of Blue Economy Concept in Disaster Anticipation in the Future

The Blue Economy concept is an economic development approach that prioritizes sustainable management of ocean resources to enhance human prosperity. In the context of anticipating future disasters, the Blue Economy concept faces challenges that need to be overcome for effective implementation, including:

- Application of Ecosystem Principles; The Blue Economy emphasizes the importance of sustainable management of ocean resources, involving the implementation of ecosystem principles. The main challenge is the lack of understanding and awareness of these principles among society and government, thus requiring better education and socialization efforts. In addition, collaboration among various stakeholders such as government, community, businesses, and research institutions is necessary, along with strong and clear policies and the application of environmentally-friendly technology and innovation to maximize sustainable use of ocean resources. Periodic evaluations of ocean governance and resource management are also necessary to improve shortcomings and adapt to changing times and societal needs.
- Technological Development; In implementing the Blue Economy, environmentally friendly and efficient technology is crucial. The challenge is the limited number of technologies that can be applied in fisheries, transportation, and renewable energy. However, ongoing development of more efficient and eco-friendly technology such as using UV rays rather than chemicals for fish preservation, hybrid ship engines, or solar power, and wind or wave power generators will help to minimize negative impacts on the environment and accelerate sustainable implementation of the Blue Economy. The role

of government and industry in supporting the development of these technologies is crucial to achieving sustainable and environmentally friendly Blue Economy goals.

- Increasing Community Involvement; The Blue Economy concept emphasizes community participation in managing ocean resources, thus requiring strong support and involvement from the public. The main challenge is increasing awareness and community participation in ocean resource management.
- Aligning Government Policies; One of the challenges in implementing the Blue Economy is aligning government policies and reaching a consensus with stakeholders, so that everyone can adopt the concept. Adoption of the Blue Economy requires changes in thinking and actions related to ocean resources and the environment. Good coordination between government, community, and the private sector is crucial in creating policies and implementing them effectively to achieve sustainable development goals. Additionally, differences in interests and goals among stakeholders are also challenges in aligning government policies.

The government needs to find solutions to overcome these challenges and work together with the public to realize the Blue Economy concept, which is expected to reduce future disaster impacts and enhance human welfare.

4 Conclusion

From the above discussion, it can be concluded that the Blue Economy concept can be used as a disaster anticipation strategy in Indonesia. Public policies that integrate the Blue Economy concept in development and management of ocean resources can minimize disaster risks, such as clean water crises, rising sea levels, and other environmental damage. One implementation of public policy in the Blue Economy concept is to increase understanding and awareness among society about the importance of maintaining the sustainability of ocean resources. Additionally, the government needs to strengthen regulations and oversight of economic activities in the marine and fisheries sectors to reduce negative impacts on the environment. Collaborative efforts between the government, community, private sector, and academic institutions are critical in planning and implementing public policies in the Blue Economy approach, creating synergy in building sustainable and environmentally friendly economies, and reducing disaster risks that impact human life and the surrounding environment.

In conclusion, the Blue Economy concept can serve as a foundation for public policy in anticipating disasters in Indonesia. This strategy can assist the government and the public in building a sustainable and environmentally friendly economy. However, planning and policy implementation are key to achieving these goals. To successfully implement the Blue Economy concept, Indonesia should prioritize education and awareness-raising about sustainable practices. This should be accompanied by the development of infrastructure and technology that supports renewable energy, environmentally friendly transportation, and waste management. Additionally, the government must work in collaboration with the private sector and local communities to ensure that economic growth does not come at the expense of the environment and the people.

Furthermore, the Blue Economy concept can also play a critical role in disaster risk reduction and mitigation. For instance, the establishment of community-based early warning systems and the deployment of eco-friendly infrastructure can prevent and mitigate the impact of disasters. Therefore, Indonesia should leverage the Blue Economy concept to strengthen disaster preparedness and resilience, especially in coastal areas that are highly vulnerable to climate change. Overall, the Blue Economy concept has the potential to transform Indonesia's economic landscape while protecting the environment, promoting

social equality, and reducing disaster risks. By embracing this approach, Indonesia can chart a sustainable and resilient path towards economic development and prosperity.

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