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Identification and Valuation of Blue Economy Sectors in the Seribu Islands Regency Based on Economic, Social and Environment Performance

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Abstract

Resources contained along the coast and ocean play a significant part in fostering regional economic growth. Therefore, for the benefit of the community, both now and in the future, marine and coastal regions must be protected and used efficiently. Developing the blue economy sector is one promising way to promote economic growth in coastal and marine regions. One issue coming up has to do with the blue economy's governance and sustainability performance. The purpose of this study is to measure the sustainability performance of the blue economy and to identify the sectors that require development. Furthermore, this study aims to develop a governance model for the blue economy based on the TBL concept. Untung Jawa Island, located in Seribu Islands Regency - DKI Jakarta Province is the study area. FGD, questionnaires, in-depth interviews, and field observations were among the methods used to collect data. In order to address the research issues, this study uses the Interpretive Structural Modeling (ISM) and Blue Economy Valuation Toolkit (BEVTK) methodologies. According to the findings, four sectors might be developed: i.e., ship docking, aquaculture, port and sea transportation, and marine tourism. In this instance, ship docking performs the best in terms of environmental sustainability, port and sea transportation concerning social sustainability, and marine tourism as regards economic sustainability. Additionally, it was discovered that six factors: i.e., central and regional government policies, law enforcement and regulations, socio-cultural policies, community leadership, and economic capacity and viability are crucial to the growth of a sustainable blue economy.

Keywords: Blue Economy Sectors and Governance, Sustainability Performance, TBL, ISM Untung Jawa Island

1. INTRODUCTION

The Law of Indonesia states that coastal and marine areas are natural resources that must be protected and fully used possible for the benefit of the populace, both now and in the future. Because of the variety of natural resources found in marine and coastal areas, which are crucial for social, economic, cultural, and environmental development, they must be managed sustainably [1]. One of the fertile ecosystems and resources that can support economic development are marine and coastal regions. Coastal and marine environments and their resources do, however, have carrying capacities and limitations. As a result, it is important to use natural resources responsibly so that some of them do not jeopardize the resources' ability to grow and replenish themselves. Stated differently, it is necessary to manage marine and coastal regions sustainably [2]. Blue economic development is one of the many models of marine and coastal region development that have been put forth. Redefining the function of marine and coastal areas in sustainable development, the blue economy has become a powerful idea. The sustainable use of marine and coastal resources for economic expansion while preserving marine health is known as the "blue economy," according to the World Bank. The definition of the blue economy is still up for debate, but most definitions aim to balance social, economic, and environmental goals in line with the sustainable development goals [3]. Enhancing economic and social development to preserve the long-term sustainability of oceans and coastlines is the primary goal of the blue economy, which includes a few government and business sectors. Appropriate management techniques are required to safeguard marine and coastal resources for the development of a sustainable blue economy.

The sustainable use of marine and coastal resources for job creation, economic growth, and better livelihoods while preserving the health of marine ecosystems is known as the "blue economy" [4]. A number of international studys have shed light on the current use of the blue economy idea. Several characteristics of the blue economy are shared by these initiatives, such as the understanding that the ocean is a catalyst for national innovation and sustainable development, important concepts or goals like resilience, sustainability, and ocean health, and the crucial role that prerequisites and enabling conditions for blue economic development, like governance, play in achieving the various blue economy goals [5]. Furthermore, the blue economy is crucial to accomplishing the Sustainable Development Goals (SDGs). Two SDGs, conserving and responsibly managing marine resources for sustainable development and acting quickly to mitigate climate change, are directly supported by the blue economy [6]. The eradication of poverty, food insecurity, sustainable consumption and production, health, and education are among the other SDGs that the Blue Economy indirectly promotes. Furthermore, by promoting gender equality and empowering all women and girls, the Blue Economy also considers the position of women in coastal and marine tourism and fisheries [7]. The literature review's findings indicate that there is still a dearth of research on the blue economy's implementation in Indonesia as a revolutionary strategy for sustainable development. According to this study, the blue economy can thrive in practice if a more integrated governance approach to sectoral management is created, citing Sujiwo & Nurlaili [8]. If not, the blue economy might not be able to realize its full potential in promoting the integration of environmentally, socially, and economically sustainable aims. Eight economic sectors, aquaculture, seafood processing, seaports, shipbuilding and repair, offshore oil and gas, marine manufacturing and construction, marine business services, marine research and development, coastal tourism, and coastal flood defense, can be classified as blue economy sectors, according to Bappenas [9].
Despite their ongoing expansion, these sectors confront difficulties with triple bottom line performance. The components of the blue economy sector and their hierarchical structure are additional issues [10]. To assess these sectors' blue performance and create blue economy governance, a more analysis study is therefore required. To help blue economy sectors grow sustainably, this study is crucial. The study's specific objectives are to measure the sustainability performance of these sectors and suggest prospective blue economy sectors for development. Furthermore, this research endeavors to ascertain the components that are pertinent to the governance of the blue economy, the connections among these components, and construct a structural model for the governance of the blue economy.

2. METHODS

2.1. Research Area

The DKI Jakarta Province is home to the administrative regency known as the Seribu Islands Regency. Eleven of the 112 islands in this region are inhabited, while the remaining islands are deserted. Several of the eleven islands provide a variety of blue economy businesses, including shipyards, fishing and shrimp farming, and maritime tourism. This study will concentrate on blue economy activities on Untung Jawa Island to produce more targeted research findings. This island is situated in the Seribu Islands Regency's South Seribu Islands District, DKI Jakarta Province's Untung Jawa Island Village.

2.2. Data Collection Methods

This study employs a number of data collection methods, such as surveys, interviews, field observations, literature reviews, and focus group discussions. The goal of the literature review is to pinpoint the variables influencing the blue economy's growth. The purpose of the FGD is to confirm the blue economy components identified in the literature review and their applicability to the blue economy in Indonesia generally and the Seribu Islands Regency specifically. Various stakeholders involved in the Seribu Islands Regency's blue economy sector, such as the Regional Government, Services, Villages, blue economy industry participants, and community leaders will be surveyed and interviewed. The sustainability performance of the blue economy sectors is measured using questionnaires and interviews. To visualize the activity of the blue economy sectors, field observations will also be carried out. The time frame for the collection process is July through September of 2024.

2.3. Data Analysis Methods

The triple bottom line, or economic, social, and environmental performance of the blue economy sector must all improve to attain sustainability. These three factors must thus be considered when evaluating the blue economy sector's sustainability performance [11]. The metrics used to assess the blue economy sector's success are taken from the Blue Economy Valuation Toolkit and are displayed in Table 1.

Table 1. Performance indicators for the blue economy's sustainability

TBL dimensions	Item description
1. Economic	E1. increasing development funds E2. generating more jobs E3. increasing local community income
2. Social	S1. improving quality of life S2. increasing community pride S3. sharing fair roles between men/women, old/young S4. forming organizations that manage the community
3. Environmental	L1. local supporting capacity L2. increasing the urgency of conservation awareness L3. regulating waste disposal

Source: [12], [13]

Furthermore, a systems-based governance framework is required to facilitate the growth of a sustainable blue economy. According to this perspective, the blue economy sector's governance consists of several interconnected components [14]. To create a sustainable blue economy governance framework, this study will use interpretive structural modeling (ISM). In essence, ISM is a computer-based method that helps academics create graphical depictions of intricate systems [15]. The ISM technique employed in this investigation is depicted in Figure 2.

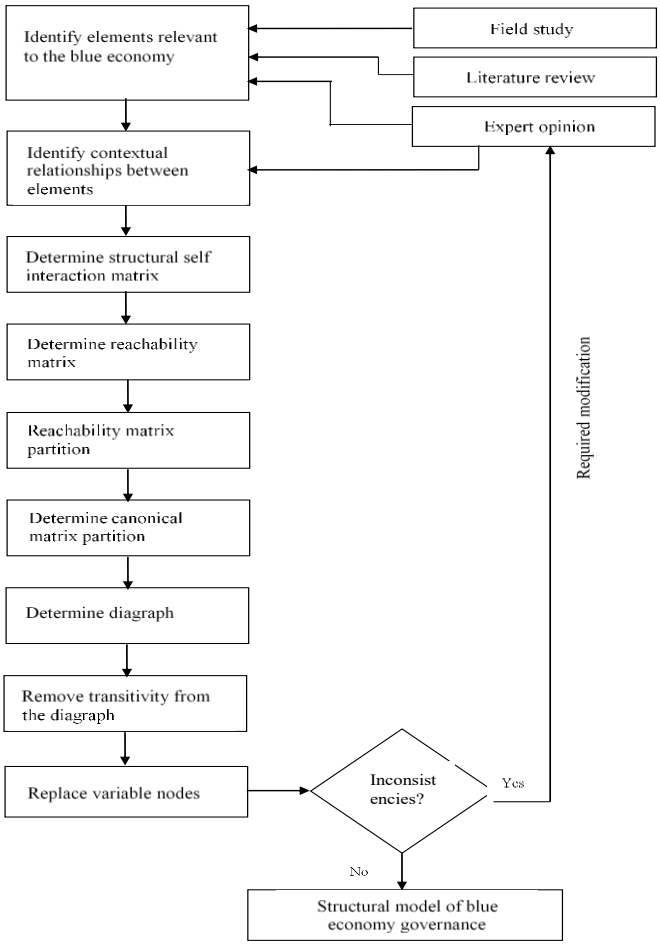

Figure 1. ISM methodology used in this study (adapted from [15])

3. RESULTS AND DISCUSSION

3.1. The blue economy sector's sustainable contribution to local community economic development

Three indicators, i.e. increasing development funding (E1), creating more jobs (E2), and raising local community income (E3), are used in this study to assess how the blue economy is affecting the sustainability of the Untung Jawa Island community's economic growth. The blue economy's performance score in terms of local community economic development sustainability is displayed in Figure 2. According to the study's findings, which are shown in Figure 1, the marine tourism industry (average score = 4.3) is the blue economy sector that makes the biggest contribution to the economic growth of local communities. The sectors of ship docking (average score = 3.4), aquaculture (average score = 3.5), and ports and sea transportation (average score = 3.9) come next.

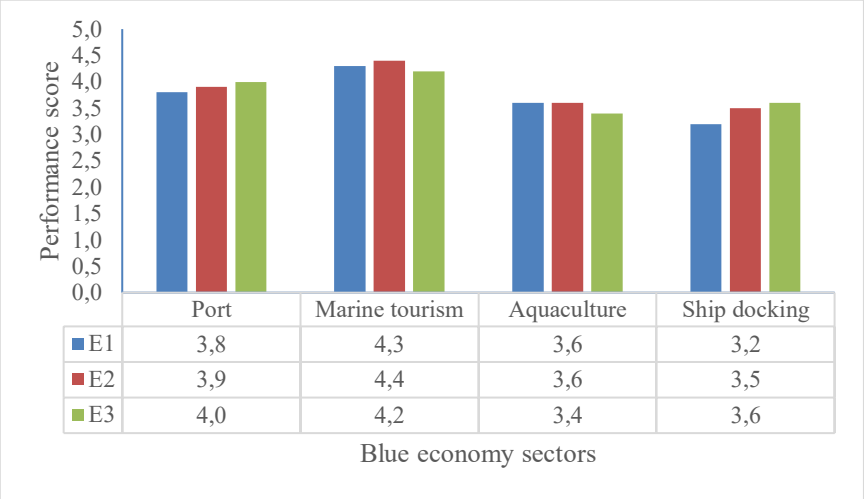

Figure 2. The blue economy sector's sustainability performance in terms of local community economic growth

3.2. The contribution of the blue economy sector's sustainability to the socio-cultural advancement of nearby communities

Four indicators are used in this study to assess how well the blue economy sector is contributing to the sustainability of the social development of the Untung Jawa Island community: enhancing the quality of life (S1), boosting community pride (S2), establishing equitable roles for men and women and the young and old (S3), and creating community management organizations (S4).

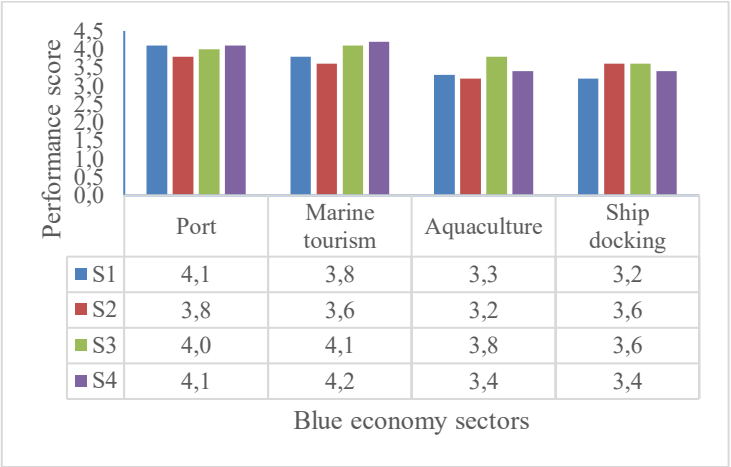

Figure 3. The blue economy sector's sustainability performance in relation to the sociocultural development of the local community

The blue economy sector's performance score in terms of the sustainability of local communities' social development is shown in Figure 3. The study's findings, which are depicted in Figure 3, show that the port and sea transportation sector (average score = 4.0) is the blue economy sector that makes the biggest contribution to the sustainability of local communities' socioeconomic development. The sectors with the highest average scores are aquaculture (average score = 3.4), ship docking (average value = 3.5), and maritime tourism (average score = 3.8).

3.3. The blue economy sector's contribution to regional environmental development

Three variables are used in this study to assess how well the blue economy sector is performing in terms of Untung Jawa Island's environmental development sustainability: trash disposal (L3), urgency of conservation awareness (L2), and local support capability (L1). The blue economy sector's performance score in terms of local environmental development sustainability is seen in Figure 4. According to the study's findings, which be viewed in Figure 4, the ship docking industry is the blue economy sector that makes the biggest contribution to the sustainability of regional environmental development (average score = 4.0). The sectors of aquaculture (average score = 3.6), port and sea transportation (average score = 3.9), and marine tourism (average score = 3.4) come next.

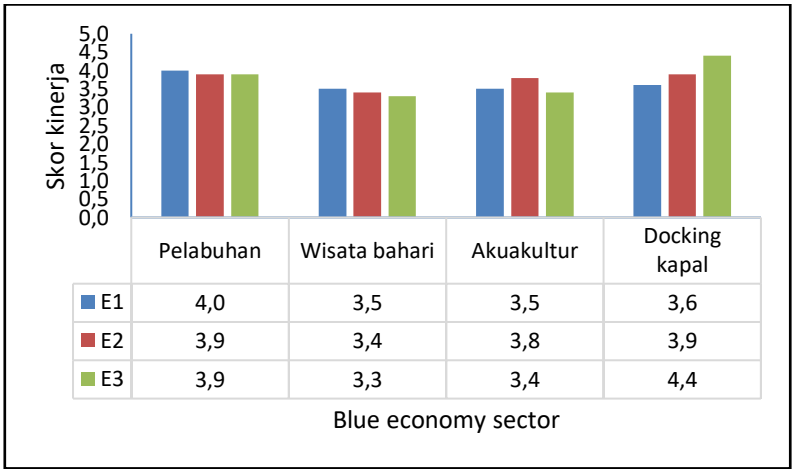

Figure 4. The blue economy sector's sustainability performance in terms of environmental preservation

3.4 Governance of the Blue Economy

With reference to [5], this study holds that a few factors, including effective resource governance, have an impact on the establishment of a sustainable blue economy and the ability to profit from products and services derived from marine resources. A set of beliefs, rules, and institutions that are utilized to regulate aspects of the blue economy so that its development can occur in a sustainable manner is known as blue economy governance, according to [8]. To accomplish the intended outcomes, a variety of governance models have been created to explain and characterize the structural arrangement and decision-making procedure. Every strategy has special advantages and is used contexts or decision-making scales [14].

This study suggests using Interpretive Structural Modeling (ISM) to build blue economy governance on Untung Jawa Island to meet its research goals. ISM is a technique used by the System of Systems (SoS), which focuses on comprehending and controlling complex systems by investigating the relationships and interdependence among system components. SoS is described by Teymourifar & Trindade [16] as a group of separate systems that cooperate to create a more sophisticated and expansive entity. While each system remains operationally independent, they work together to accomplish a shared objective. According to this study, this idea is highly relevant when creating intricate governance for the blue economy. Since the blue economy is a complicated system with numerous components, an integrated approach is necessary. An efficient approach to creating integrated and successful blue economy governance is made possible by SoS.

This study first identified 10 economic, 17 social, and 14 environmental factors that are pertinent to blue economy governance based on the literature review. Following validation and verification, this study identified

eight economic, twelve social, and eleven environmental factors that are pertinent to Untung Jawa Island's blue economy governance (Table 2). The study produced a structural model of governance to promote the establishment of a sustainable blue economy on Untung Jawa Island by adhering to the ISM approach as outlined [8] (Figure 5).

Table 2: Factors pertinent to the governance of the blue economy

Coding	Environmental aspect	Coding	Social
L1	Carrying capacity	S1	Socio-cultural policy
L2	Environmental purity	S2	Leadership
L3	Physical integrity	S3	Collaboration
L4	Natural resources	S4	Technology
L5	Environmental awareness	S5	Local control
L6	Nature protection	S6	Community welfare
L7	Ecosystems	S7	Social justice
L8	Development control	S8	Community participation
L9	Environmental policy	S9	Community knowledge
L10	Visitor management	S10	Infrastructure
L11	Environmental legislation	S11	Quality of life
		S12	Community behavior
Coding	Economic		
E1	Financing		
E2	Employment quality		
E3	Economic capacity		
E4	Regional prosperity		
E5	Nature of demand		
E6	Economic viability		
E7	Financial leakages		
E8	Economic opportunities		

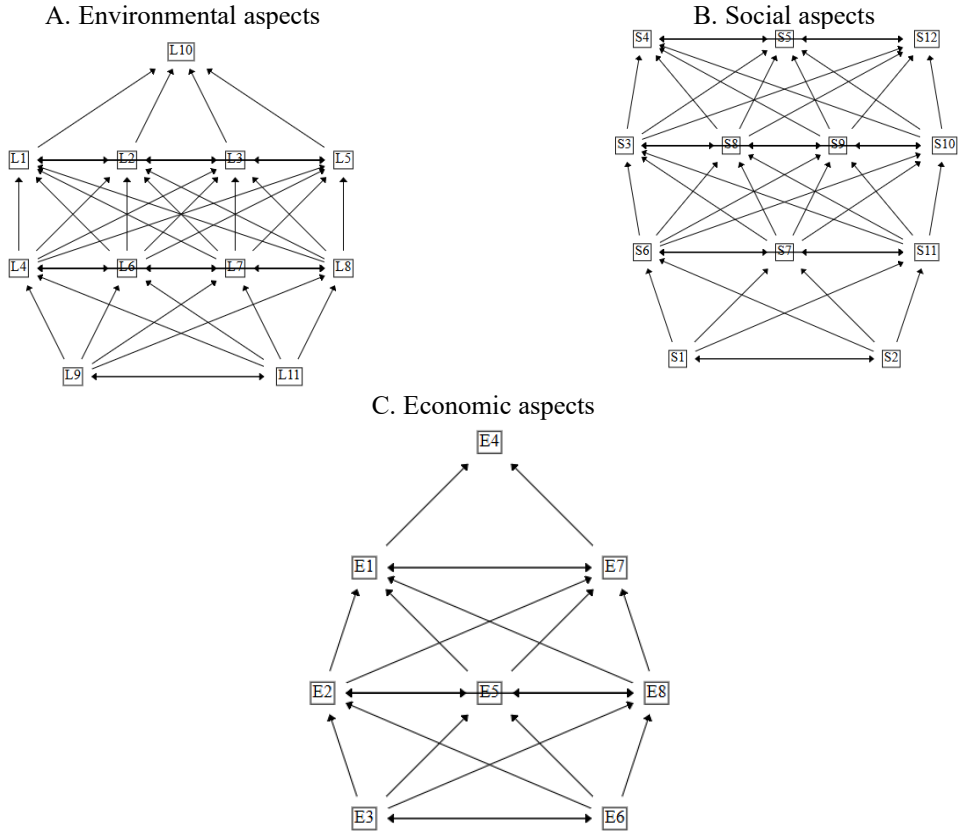

Figure 5. Structural governance model to support sustainable blue economy development

The components of central and local government policies (L9), as well as environmental management laws and regulations (L11), are essential components of sustainable blue economic governance in Untung Jawa Island, as shown in Figure 5A. These two components are essential to nature preservation, development management, and the sustainability of natural resources. The ISM model identifies two crucial components that are crucial to Untung Jawa Island's blue economic governance in the social and cultural sector (Figure 5B): socio-cultural policies (S1) and community leadership (S2). Social justice, quality of life, and community welfare are all directly impacted by these two factors. To ensure sustainable economic development in the blue economy sector, blue economic governance must control two fundamental factors: economic feasibility (E6) and economic capability (E1). These two factors significantly influence the improvement of employment quality, demand characteristics, and economic prospects in the blue economy sector, as illustrated in Figure 5C. The results of this study partially support those of studies [3] and [8], which concluded that blue economy-related laws and regulations are essential components and must serve as the cornerstones of sustainable blue economy governance. Stated differently, efficient implementation of blue economy laws and law enforcement is necessary for the development of the blue economy to be sustainable.

4. CONCLUSION

Since the ocean economy's contribution to sustainable development has been widely acknowledged, the idea of the "blue economy" has gained popularity in recent years. The suggested ideas have been applied in several industrialized nations for applications related to sustainable development. Managing a sustainable blue economy is one of the fundamental issues that needs to be resolved to meet sustainable development objectives and preserve the long-term well-being of island and coastal populations. By examining blue economy sectors in Untung Jawa Island that have the potential to grow and assessing how effectively they promote sustainable economic, social, and environmental development, this study seeks to close a portion of the gap in the literature on the blue economy. The interaction between economic, social, and environmental factors that are pertinent to the design of blue economy governance is also examined in this study.

According to the study's findings, Untung Jawa Island has the potential to grow its blue economy in four areas: ship docking, aquaculture, marine tourism, and port and sea transportation. The marine tourism industry has the best economic performance (4.3 points), followed by the port and sea transportation industry (3.9 points), aquaculture industry (3.5 points), and the ship docking industry (3.4 points). Port and sea transportation (4.0 points) is the blue economy sector with the best performance in terms of social aspect. It is followed by the marine tourism (3.8 points), ship docking (3.5 points), and aquaculture (3.4 points) sectors. The ship docking industry, on the other hand, has the best environmental preservation record of any blue economy sector (4.0 points). The sectors of aquaculture (3.6 points), port and sea transportation (3.9 points), and marine tourism (3.4 points) come next.

Regarding governance, the study puts out the idea that governance in the economic, social, and environmental domains must be a part of blue economy governapnce. Law enforcement and environmental management laws (L11) and central and regional government policies (L1) are the two fundamental components of environmental governance that need to be addressed first, according to the developed ISM model. The leadership of community leaders (S2) and socio-cultural policy (S1) are two essential components of social and cultural governance. In the meantime, the blue economy sector's economic feasibility (E6) and economic capability (E1) are important factors for economic governance.

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