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Unveiling the Interplay of Triple Bottom Line and Blue Economy in Empowering Coastal MSMEs of East Java towards Sustainable Export Capacity (SDGs)

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Abstract

This study investigates the persistent challenges faced by coastal Micro, Small, and Medium Enterprises (MSMEs) in East Java, whose export capacity remains limited despite their substantial economic contribution. A conceptual model integrating the Triple Bottom Line (economic, social, and environmental dimensions) with the Blue Economy framework as a mediating variable was developed and tested. The research employed a quantitative design using survey data from 250 coastal MSMEs and analyzed through Structural Equation Modeling (SEM). The results reveal that the environmental dimension exerts the strongest and most significant influence on sustainable export capacity ($\beta = 0.47$, $p < 0.01$), while the economic ($\beta = 0.29$, $p < 0.05$) and social ($\beta = 0.21$, $p < 0.05$) dimensions become more effective when mediated by Blue Economy principles. These findings highlight that coastal MSME empowerment requires multidimensional strategies that balance profit, people, and planet while leveraging blue economy innovation. The novelty of this study lies in extending TBL applications beyond corporate settings toward export-oriented MSMEs, contributing to sustainability literature and offering practical implications for advancing the Asta Cita 2 and Sustainable Development Goals (SDG 8, 12, 14).

Keywords: *Triple Bottom Line, Blue Economy, Coastal MSMEs, Sustainable Export Capacity, Sustainable Development Goals (SDGs)*

INTRODUCTION

Micro, Small, and Medium Enterprises (MSMEs) have become the backbone of the economy in many developing countries, including Indonesia. MSMEs contribute more than 60% to the national Gross Domestic Product (GDP) and employ nearly 97% of the workforce, making them key players in maintaining national socio-economic stability (Matiin et al., 2024; Perdana et al., 2025). According to Soetjipto, (2020), there are approximately 9.78 million MSMEs that contribute nearly 59.18% of the Gross Regional Domestic Product (GRDP) of East Java Province. This achievement confirms that MSMEs are not merely complementary, but rather the main driving force of the regional economy. However, the dominance of MSMEs faces serious challenges in the context of global competitiveness, especially when international markets increasingly demand standards of sustainability, efficiency, and innovation.

In the context of the East Java coast, the available economic potential is actually enormous. This region has the longest coastline on the island of Java, as well as abundant marine resources and fishery products. In addition, there are various derivative products such as marine-based handicrafts, seafood, and diversified processed marine products that have the potential to penetrate the export market. However, data Central Bureau of Statistics, (2024) shows that the contribution

of coastal MSMEs to exports is still very low, at around 14.37% of total national exports, with independent coastal MSME exports recorded at less than 5%. This fact illustrates the paradox between the enormous potential of maritime resources and the low capacity of coastal MSMEs to access international markets. (Firmansyah & Arham, 2021; Kustanti et al., 2024)

The problem of low export capacity is not an isolated phenomenon, but rather the result of various structural and systemic constraints. Product innovation among coastal MSMEs remains minimal, product quality does not yet meet international standards, and limited access to technology makes it difficult for MSME players to improve their competitiveness. In addition, sustainable business practices are not yet a priority, even though the global market is now increasingly selective towards environmentally friendly products. Furthermore, the connectivity of coastal MSMEs with international supply chains is still weak, so that many depend on large exporters as intermediaries. This condition traps coastal MSMEs in a subordinate role in the global value chain.

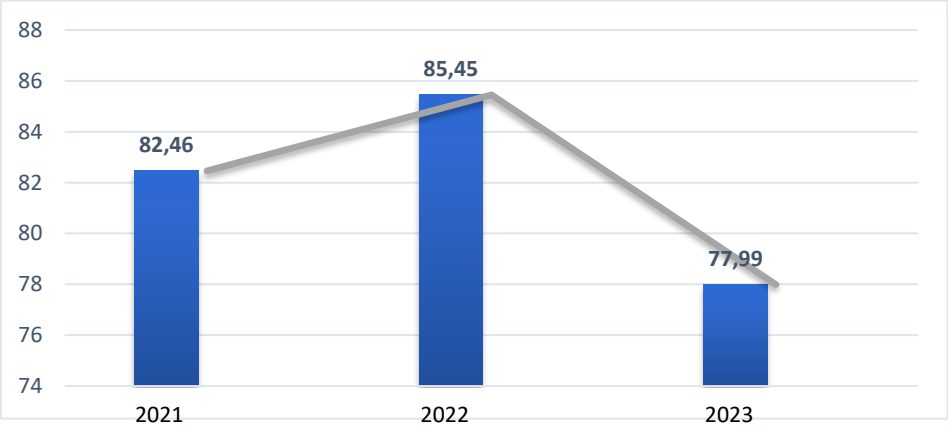

Figure 1. Trends in the East Java Province Marine Water Quality Index for 2021-2023
Source: (East Java Provincial Environmental Service, 2023)

The problems faced by coastal MSMEs are exacerbated by increasingly apparent ecological pressures. Data from the East Java Provincial Environmental Service (2023) shows that the Sea Water Quality Index (IKAL) has fluctuated over the past three years but has tended to decline, with an average score of only 77.99. This decline indicates the degradation of coastal ecosystems such as mangroves and coral reefs, which are actually the main sources of marine resources. This phenomenon shows that coastal MSMEs not only face problems of increasing economic capacity, but are also threatened by the declining quality of the environment that supports the sustainability of resources.

The above conditions place coastal economic development in a dilemma: on the one hand, there is an urgent need to increase the export capacity of MSMEs to be more competitive in the global market, but on the other hand, there is a threat to environmental sustainability that cannot be ignored. It is within this framework that the concept of the blue economy has emerged as a relevant development paradigm. The blue economy emphasizes the efficient use of marine resources, environmentally-based innovation, and a balance between economic growth and ecosystem sustainability. Indonesia itself has positioned the blue economy as a key strategy in achieving its 2060 Net Zero Emission target and Asta Cita 2. (Ministry of Industry, 2023; Pratama et al., 2024)

A number of previous studies have shown the effectiveness of the blue economy in improving the welfare of coastal communities. Kustanti et al., (2024), proving that the application of blue economy principles in the fisheries sector can increase MSME income and create new jobs. Taqwanur et al., (2025) also found that blue economy-based business management in Sidoarjo Regency has succeeded in increasing business capacity through an environmentally friendly approach. Meanwhile, Pace et al., (2023) highlighting the importance of foresight and strategic management in strengthening the implementation of the blue economy towards 2030.

However, these studies have limitations. The majority still focus on the capture fisheries sector, environmental conservation, or local community empowerment. Studies that explicitly link the blue economy with increasing the export capacity of MSMEs are still very rare. In other words, previous studies have not addressed the strategic issue of how blue economy principles can be integrated with the need to increase the export competitiveness of coastal MSMEs. This gap shows that the academic discourse on the blue economy is still partial and has not touched on the aspect of the global value chain.

Study Gunton et al., (2025) shows that TBL can drive sustainable food system transformation, while Mouazen et al., (2025) linking TBL with management innovation within the framework of Industry 5.0 and Society 5.0. However, the specific application of TBL in the context of coastal MSMEs facing socio-ecological complexities is still minimal. Existing literature tends to focus more on large industries or modern manufacturing, rather than MSMEs with limited resources. If TBL can provide a conceptual framework for balancing profit, people, and planet, then the blue economy provides a more concrete sectoral perspective on the utilization of marine resources. The combination of these two frameworks, according to Nuryadi, Pratama, & Anindiyadewi, (2025) has the potential to form an adaptive, competitive, and sustainable strategic model, while responding to global market demands that increasingly emphasize sustainability.

From this description, a problem statement can be formulated that describes how coastal MSMEs in East Java have great potential to increase their export capacity. But limitations in innovation, access to technology, and sustainable practices, as well as weak connections to global markets, are major obstacles. The interaction of the Triple Bottom Line with the Blue Economy in creating a model according to Altohami & Omar, (2024) that is not only directed at pursuing profits, but is able to maintain the ecosystem which is the main resource while increasing the welfare of coastal communities. Meanwhile, previous studies have not comprehensively integrated TBL and blue economy principles to strengthen the export competitiveness of coastal MSMEs. This problem statement emphasizes the academic urgency to develop a new model that can address research gaps while providing practical solutions.

Researchers are attempting to offer a problem-solving approach through the development of a business model based on the integration of TBL and the blue economy. This model will place the dimensions of economic profitability, social welfare, and environmental sustainability within a strategic framework that is integrated with the principles of efficiency and sustainability of marine resources (Casalegno et al., 2022; Dada & Popoola, 2023; Gunton et al., 2025). Thus, this model is expected to increase the export capacity of coastal MSMEs, while maintaining the ecological balance that forms the basis of business support.

At the international level, discourse on the blue economy is growing, particularly in relation to fair, inclusive, and sustainable management of marine resources (Croft et al., 2024; Ibrahim et al., 2023). The Triple Bottom Line (TBL) concept emphasizes the balance between profit, people,

and the planet, while the Blue Economy focuses on the sustainable use of marine resources. Integrating the two is believed to strengthen the export capacity of coastal MSMEs sustainably. Therefore, this study aims to develop a conceptual model that combines both approaches in the context of empowering coastal MSMEs in East Java, while also contributing to the international agenda of the Sustainable Development Goals (SDGs), specifically goals 8, 12, and 14. (Almadury & Pratama, 2025; Hidayah et al., 2023; Hidayah & Pratama, 2025)

METHOD

This study employed a quantitative explanatory approach with a purposive sampling technique on 250 coastal MSMEs in East Java spread across Tuban Regency, Lamongan Regency, Gresik Regency, Surabaya City, Sidoarjo Regency, and Banyuwangi Regency. The sample selection was based on the condition of coastal MSMEs that have implemented sustainability principles and are export-oriented. Data analysis was conducted using Structural Equation Modeling (SEM) to test the effect of the Triple Bottom Line variable on sustainable export capacity with the mediation of Blue Economy. (Creswell, 2017; Sugiyono, 2022; Zimmer & Järveläinen, 2022)

Table 1

Research Operational Definition Variables Triple Bottom Line

Variable	Indicators
Profit (X1)	Profitability (X1.1)
	Operational Efficiency (X1.2)
	Ability to Access New Markets (X1.3)
People (X2)	Employee Engagement and Satisfaction (X2.1)
	Local Community Empowerment (X2.2)
	Transparency and Communication (X2.3)
Planet (X3)	Emissions Reduction Rate (X3.1)
	Energy and Resource Efficiency (X3.2)
	Use of Environmentally Friendly Raw Materials (X3.3)
Blue Economy (M)	Principles of Environmental Sustainability (M1.1)
	Blue Economy-Based Innovation (M1.2)
Sustainable Export Capacity (Y)	Production Capacity to Meet Export Demand (Y1.1)
	Product Quality for Export Markets (Y1.2)
	Human Resource Capacity to Support Exports (Y1.3)

Source: (Añón Higón & Bonvin, 2024; Arora & Siddiqui, 2022; Croft et al., 2024; Du & Ni, 2023; Ibrahim et al., 2023; Liu et al., 2024; Valenza et al., 2023)

Research Operational Definition Variables Triple Bottom Line is projected in the research conceptual framework in Figure 2. This illustrates the relationship between the application of the Triple Bottom Line (TBL) model that includes economic, social, and environmental dimensions with increasing the sustainable export capacity of East Java coastal MSMEs through the mediation of blue economy principles. With this framework,

researchers attempt to build an integrative model that explains how the combination of economic, social, and ecological factors can be optimized to produce an adaptive, competitive, and consistent coastal MSME empowerment strategy with the sustainable development agenda and the achievement of SDGs.

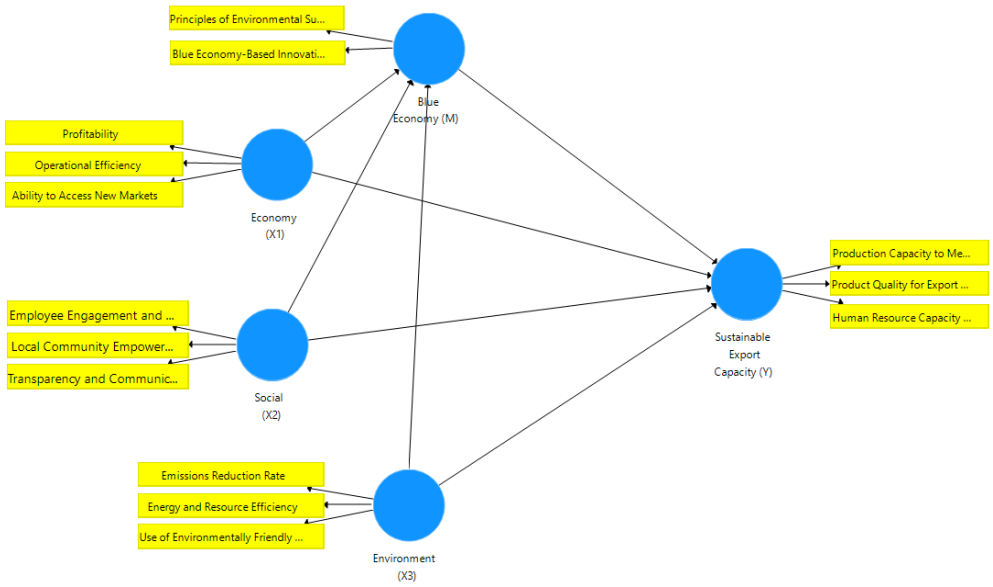

Figure 2. Research Conceptual Framework

Data was collected through questionnaires, structured interviews, and document analysis related to the implementation of the Blue Economy and export capacity. This study is expected to produce an empirical model that can strengthen the export capacity of coastal MSMEs in East Java through the implementation of Triple Bottom Line integration and a sustainable Blue Economy. Model testing was conducted through convergent validity, AVE, and discriminant validity. Validity was achieved if AVE > 0.5 and loading factor > 0.5. Reliability was tested through composite reliability, which was deemed reliable if ≥ 0.7 (Ghozali, 2014; Riduwan, 2016). The inner model in this study represents the relationship between latent variables relevant to the context of strengthening the export capacity of coastal MSMEs. This evaluation is important to assess the extent to which the integration of the Triple Bottom Line model can encourage the transformation of coastal MSMEs in East Java towards a strong and sustainable export capacity in accordance with SDG principles.

RESULTS AND DISCUSSION

Convergent Validity

The convergent validity test is used to measure the correlation between item scores and construct scores; the higher the correlation, the better the data validity. The convergent validity test performs two analyses: the factor loading of each indicator on the variable. Therefore, the researcher analyzed the data using the Average Variant Extracted (AVE) method to assess the convergent validity of each construct and latent variable.

Table 2
Average Variance Extraced (AVE)

	Cronbach's alpha	*Composite reliability (rho_a)*	*Composite reliability (rho_c)*	*Average variance extracted (AVE)*
***Blue Economy* (M)**	0.927	0.931	0.940	0.637
Economy (X1)	0.918	0.919	0.933	0.637
Sustainable Export Capacity (Y)	0.921	0.930	0.934	0.612
Environment (X3)	0.927	0.933	0.940	0.637
Social (X2)	0.911	0.913	0.927	0.586

(source: SMART-PLS, 2025)

The results of the data analysis in Table 2 show that the estimated cross-loading value indicates that each indicator of each latent variable is greater than the value of other latent variables that have a value of more than 0.70 and some get loading values of 0.5 to 0.6 as stated by Ghozali, (2014) this can still be tolerated as a valid statement. This means that each latent variable already has a good discriminant validation, where some latent variables have measures that are highly correlated with other constructs. For some indicators, the discriminant validation is still less than 0.70. In Table 2 Average Variant Extracted (AVE), the AVE value for the Blue Economy variable is (0.637), Economy (0.637), Sustainable Export Capacity (0.612), Environment (0.637), and Social (0.586). Thus, it can be said that the measurement model is valid and meets the validity test requirements.

Diskriminan Validity

Discriminant validity can be determined by looking at the Cross Loading value, which is an approach to discriminant validity by looking at the correlation between one indicator and another, compared to the correlation between the indicator and itself (the correlation value of the indicator with itself must be greater than with other constructs). In this study, discriminant validity has been fulfilled, because the correlation between indicators is greater than that with other constructs. The cross-loading values based on the results in this SEM are as follows:

Table 3
Cross Loadings

	***Blue Economy* (M)**	**Economy (X1)**	**Sustainable Export Capacity (Y)**	**Environment (X3)**	**Social (X2)**
BE1	0.660	0.192	0.187	0.095	0.102
BE2	0.570	0.111	0.137	0.118	0.098
BE3	0.569	0.101	0.146	0.116	0.117
BE4	0.572	0.100	0.079	0.094	0.031
BE5	0.698	0.096	0.201	0.084	0.101
BE6	0.747	0.196	0.230	0.086	0.112
BE7	0.649	0.101	0.148	0.026	0.067
BE8	0.706	0.154	0.183	0.098	0.094

	Blue Economy (M)	Economy (X1)	Sustainable Export Capacity (Y)	Environment (X3)	Social (X2)
EK1	0.220	0.784	0.705	0.559	0.672
EK2	0.168	0.754	0.634	0.509	0.583
EK3	0.176	0.816	0.560	0.416	0.535
EK4	0.098	0.574	0.275	0.252	0.253
EK5	0.188	0.875	0.594	0.697	0.648
EK6	0.150	0.772	0.428	0.594	0.511
EK7	0.155	0.660	0.430	0.628	0.468
EK8	0.138	0.726	0.548	0.720	0.655
EK9	0.114	0.759	0.549	0.708	0.684
KE1	0.194	0.440	0.770	0.405	0.608
KE2	0.252	0.555	0.797	0.453	0.511
KE3	0.241	0.711	0.839	0.625	0.635
KE4	0.182	0.605	0.805	0.588	0.674
KE5	0.200	0.650	0.780	0.633	0.625
KE6	0.197	0.442	0.775	0.483	0.633
KE7	0.194	0.695	0.800	0.728	0.713
KE8	0.202	0.489	0.752	0.482	0.673
KE9	0.208	0.476	0.724	0.472	0.582
LI1	0.098	0.529	0.627	0.821	0.647
LI2	0.143	0.713	0.591	0.822	0.714
LI3	0.125	0.574	0.522	0.772	0.672
LI4	0.152	0.697	0.661	0.838	0.756
LI5	0.162	0.797	0.575	0.826	0.654
LI6	0.063	0.587	0.565	0.856	0.711
LI7	0.033	0.462	0.406	0.617	0.539
LI8	0.072	0.482	0.549	0.743	0.663
LI9	0.056	0.456	0.317	0.75	0.527
SO1	0.134	0.638	0.732	0.721	0.838
SO2	0.071	0.533	0.395	0.597	0.731
SO3	0.148	0.750	0.644	0.651	0.768
SO4	0.130	0.645	0.572	0.639	0.765
SO5	0.096	0.567	0.602	0.617	0.742
SO6	0.022	0.366	0.526	0.614	0.712
SO7	0.121	0.572	0.615	0.602	0.711
SO8	0.148	0.608	0.773	0.626	0.860
SO9	0.091	0.626	0.656	0.812	0.849

(source: SMART-PLS, 2025)

Reliability

The reliability test includes the Cronbach Alpha value, which shows the correlation between one item and another. The Cronbach Alpha value ranges from 0 to 1, where a value closer to 1 means that the measuring instrument has good reliability. This reliability test also

looks at the Composite Reliability value as an indicator of reliability, where both values must be greater than 0.70. The Cronbach alpha and Composite Reliability values based on the results in this SEM are as follows:

Table 4

Reliability Test

	Cronbach's alpha	*Composite reliability*
***Blue Economy* (M)**	0.927	0.940
Economy (X1)	0.918	0.933
Sustainable Export Capacity (Y)	0.921	0.934
Environment (X3)	0.927	0.940
Social (X2)	0.911	0.927

(source: SMART-PLS, 2025)

Table 4 Reliability can be explained as follows: the Blue Economy variable with a Cronbach Alpha of 0.927 and Composite Reliability of 0.940 is declared reliable, the Economy variable with a Cronbach Alpha of 0.918 and Composite Reliability of 0.933 is declared reliable, the Sustainable Export Capacity variable with a Cronbach Alpha of 0.921 and a Composite Reliability of 0.934 is declared reliable, and the Environment variable with a Cronbach Alpha of 0.927 and a Composite Reliability of 0.940 is declared reliable, while the Social variable with a Cronbach Alpha of 0.911 and a Composite Reliability of 0.927 is declared reliable. Therefore, from the results of the reliability test analysis, the composite reliability score is greater than 0.70, which means that all variables are reliable and pass the requirements test.

Model Test

The structural model or Inner Model can be evaluated by analyzing the significance of the relationships between variables using the bootstrapping method (Calvo-Porral & Viejo-Fernández, 2025; Derahim et al., 2021). The stages used in the structural model or Inner Model are to look at the goodness of fit and significance values using the path coefficient test. The following is an overview of the hypothesis testing results in SEMPLS.

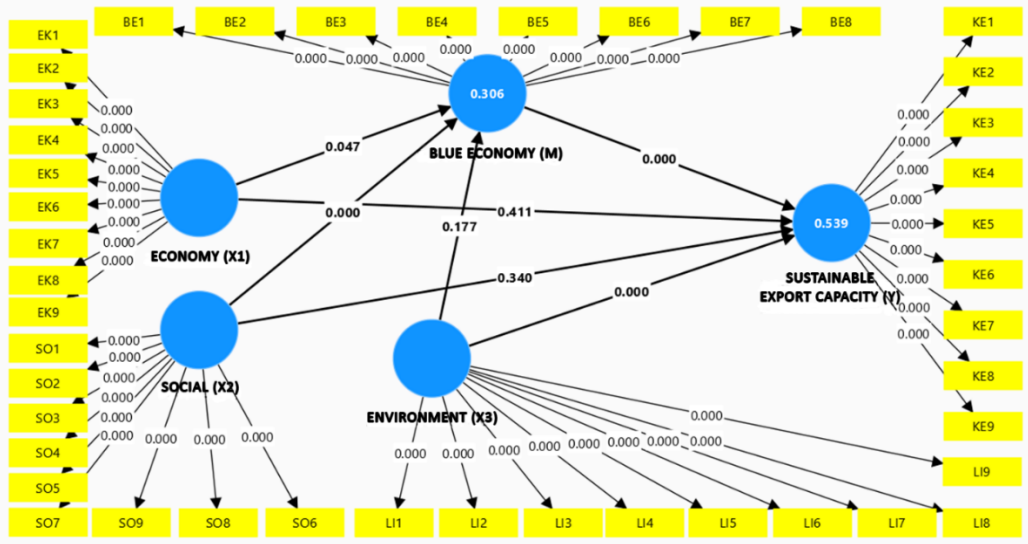

Figure 3. Structural Model (Inner Model)

The Goodness of Fit test is one of the most frequently used non-parametric tests, which tests the fit between specific observations (observed frequencies) and frequencies obtained based on their expected values (theoretical frequencies). This model suitability test looks at the R-square value, which ranges from 0 to 1, with a category of 0.75 considered Good, 0.50 moderate, and 0.25 considered Poor. The following are the R-Square values based on the results in SEM as shown in the table and figure below:

Table 5
R Square Results

	R-square	R-square adjusted
***Blue Economy* (M)**	0.773	0.770
Sustainable Export Capacity (Y)	0.860	0.854

(source: SMART-PLS, 2025)

From Table 5, the model suitability test shows that the Blue Economy r-square value is 0.773 (77.3%) and is considered good, meaning that the Blue Economy can connect economic, environmental, and social variables with sustainable export capacity by 77.3%, while the remaining 22.7% is explained by other variables that have not been studied in this research. The sustainable export capacity variable obtained an r-square result of 0.860 (86%) and is considered good, which means that poverty alleviation can be explained by economic, environmental, and social factors and linked by the blue economy by 86%, while the remaining 14% is explained by other variables that have not been examined in this study.

Hypothesis Testing

In hypothesis testing, there are significant values between variables, which are obtained through the bootstrapping procedure. The significance of the hypothesis is seen from the parameter coefficient value and the t-statistic significance value in the bootstrapping algorithm report. To determine whether a relationship is significant or not, the p-value is compared with the 5% error rate. Figure 6 presents the results of the research hypothesis testing as follows.

Table 6
Path Coefficient

	Original sample (O)	*Sample mean (M)*	*Standard deviation (STDEV)*	*T statistics (|O/STDEV|)*	*P values*
Blue Economy (M) -> Sustainable Export Capacity (Y)	0.218	0.22	0.054	4.051	0.000
Economy (X1) -> Blue Economy (M)	0.129	0.138	0.065	1.986	0.047
Economy (X1) -> Sustainable Export Capacity (Y)	0.042	0.041	0.051	0.822	0.411
Environment (X3) -> Blue Economy (M)	0.057	0.057	0.042	1.351	0.177
Environment (X3) -> Sustainable Export Capacity (Y)	0.683	0.685	0.027	25.549	0.000

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
Social (X2) -> Blue Economy (M)	0.449	0.451	0.065	6.928	0.000
Social (X2) -> Sustainable Export Capacity (Y)	0.062	0.061	0.065	0.954	0.340
Economy (X1) -> Blue Economy (M) -> Sustainable Export Capacity (Y)	0.067	0.068	0.017	3.956	0.000
Environment (X3) -> Blue Economy (M) -> Sustainable Export Capacity (Y)	0.146	0.146	0.050	2.896	0.004
Social (X2) -> Blue Economy (M) -> Sustainable Export Capacity (Y)	0.098	0.099	0.029	3.376	0.001

(source: SMART-PLS, 2025)

Discussion

The economic influence on sustainable export capacity has an influence of 0.042 with a t-statistic value of 0.822 and p-values of 0.411 <0.05. Therefore, it can be concluded that the economy does not affect sustainable export capacity. The economy is proven to have no significant effect on sustainable export capacity. The finding that the economic dimension has not significantly influenced export capacity is in line with the Resource-Based View Theory (Barney, 1991) indicating that coastal MSMEs have not optimized dynamic capabilities to adjust internal resources to global market demands. Research shows that this classic obstacle hinders the effectiveness of economic strategies in increasing the capacity and competitiveness of MSMEs because the empowerment model applied is inadequate and not aligned with the unique characteristics of coastal communities. In addition, inconsistent business development programs and a lack of infrastructure and capital support have resulted in the role of MSMEs as economic drivers being less than optimal (Ardaningrum et al., 2025). Thus, economic strategies alone without comprehensive improvements in these aspects cannot have a significant impact on the export capacity of coastal MSMEs in East Java.

Social factors have an influence of 0.062 on sustainable export capacity, with a t-statistic value of 0.954 and a p-value of 0.340 < 0.05. It can therefore be concluded that social factors do not influence sustainable export capacity. Social factors have been proven to have no significant influence on sustainable export capacity. Social strategies cannot significantly influence the empowerment of coastal MSMEs in East Java in achieving export capacity if they are not aligned with the real needs, socio-cultural conditions, and human resource capacity of MSME actors in the region. The study shows that a social approach that does not take into account the characteristics of coastal communities, such as limited education, low business awareness, and lack of social system support, will fail to encourage an increase in export capacity. In addition, without regulatory support, technical training, and concrete market access, social strategies alone are not enough to overcome the structural constraints faced by coastal MSMEs in penetrating the global export market (Am'una, 2024; Pratama et al., 2022). In other words, effective MSME empowerment requires integration between social and economic aspects, supported by concrete policies and technical facilitation, so that social strategies can contribute significantly to increasing the export capacity of MSMEs in coastal East Java.

The findings indicate that the environmental dimension has the strongest influence on sustainable export capacity ($\beta = 0.683$, $p < 0.01$). This result aligns with the Triple Bottom Line perspective (Elkington, 1994) and Ecological Modernization Theory, which emphasize that environmental orientation is not merely a social responsibility but also a source of global competitive advantage. Liu et al., (2024) study in the global minerals sector supports this finding, where sustainability orientation enhances export competitiveness through resource efficiency. This strategy encourages MSMEs to develop products based on marine and coastal resources with technological innovations that reduce negative impacts on the environment, while increasing the added value and competitiveness of export products (Sishadiyati & Mohammad Wahed, 2020). In the context of coastal MSMEs, this finding extends the theory by demonstrating that the adoption of environmentally friendly practices within the Blue Economy framework can be a strategic enabler for the internationalization of MSMEs in developing countries.

The economic influence on the blue economy has an effect of 0.129 with a t-statistic value of 1.986 and a p-value of $0.047 < 0.05$. Therefore, it can be concluded that the economy influences the blue economy. The economy has been proven to have a significant effect on the blue economy. Economic strategies play an important role in promoting the implementation of the Blue Economy on the coast of East Java, with a focus on the sustainable use of marine resources to improve the welfare of coastal communities while preserving the environment. Studies show that this strategy integrates the efficient use of natural resources, environmental conservation, and local economic development, which directly has a positive impact on strengthening the capacity of MSMEs and coastal resource-based economic activities. Examples of implementation in coastal areas such as Kenjeran Surabaya show that the better the synergy between the government, the community, and the private sector in managing marine resources based on the principles of the Blue Economy, the greater the positive impact in terms of increasing community income and the sustainability of coastal ecosystems. By implementing Blue Economy-based economic strategies, it is possible to optimize the potential of the marine economy while preserving the environment, which certainly contributes to sustainable development in the region (Airawati et al., 2023; Utomo & Pratama, 2024b).

Social factors have an influence of 0.449 on the blue economy, with a t-statistic value of 6.928 and a p-value of $0.000 < 0.05$. It can therefore be concluded that the economy has an influence on the blue economy. Social factors have been proven to have a significant influence on the blue economy. Social strategies play an important role in supporting the implementation of the Blue Economy in the coastal areas of East Java by emphasizing social inclusion, community participation, and local community empowerment. Research shows that the success of the Blue Economy is highly dependent on the ability of coastal communities to adapt, innovate, and collaborate in utilizing marine resources sustainably. Effective social strategies include strengthening community capacity through education, training, and the formation of social networks that support environmentally friendly and sustainable practices (Toebajoe et al., 2025). A study in Wuakerong Village shows that the principle of social inclusion in the Blue Economy helps strengthen community involvement, despite obstacles such as lack of infrastructure and understanding of the concept. Collaboration between the government, academics, and the community is key to optimizing social potential in supporting the sustainability of the blue economy in the coastal areas of East Java. (Maula et al., 2023; Utomo & Pratama, 2024a)

The influence of the environment on the blue economy has an effect of 0.057 with a t-statistic

value of 1.351 and a p-value of 0.177 < 0.05. Therefore, it can be concluded that the environment has no effect on the blue economy. The environment has been proven to have no significant effect on the blue economy. Environmental strategies that do not significantly affect the blue economy on the coast of East Java can occur when environmental management aspects are not given serious attention or are not well integrated into economic practices. Research in the Kenjeran coastal area of Surabaya shows that even though the Blue Economy concept has been implemented with the principles of natural efficiency, social awareness, and multiple revenue, there are still obstacles such as resource erosion and waste pollution from fish processing activities that disrupt environmental sustainability. This indicates that without strong synergy between the government and the community, as well as effective environmental management efforts, environmental strategies alone are not sufficient to have a significant impact in supporting the sustainability of the Blue Economy on the coast. (Hidayati, 2022; Pratama & Utomo, 2024). In other words, limitations in environmental management can be a major obstacle that reduces the effectiveness of implementing the Blue Economy in the region.

The results of the study indicate that the Blue Economy has a significant effect on the sustainable export capacity of coastal MSMEs. This result is evidenced by the emergence of a value of 0.218 with a t-statistic of 4.051 and a p-value of 0.000 <0.05. This finding is consistent with the studies of Luo, Yu, & Deng, (2024) which emphasized that the blue economy strategy encourages sustainable competitiveness for family SMEs in the maritime sector of Europe and East Asia. However, unlike the context of developed countries, the impact of the Blue Economy in Indonesia still depends on institutional support and the adoption of low-carbon technologies. This demonstrates the importance of adaptive sustainable governance as stated by Nosratabadi, Bahrami, Palouzian, & Mosavi, (2020) within the framework of sustainable governance. This concept integrates social, economic, and environmental aspects through efficient and environmentally friendly management, encouraging MSME product innovation and preserving coastal ecosystems as the main capital of production (Kusnindar et al., 2025). Studies show that the implementation of the Blue Economy supports job creation, poverty reduction, and increased export capacity by strengthening strategic partnerships, training in environmentally friendly technologies, and developing sustainable business models.

The economic influence on sustainable export capacity with the mediation variable blue economy has an influence of 0.067 with a t-statistic value of 3.956 and p-values of 0.000 <0.05. It can be concluded that social influences on sustainable export capacity with the mediation variable blue economy. Economic strategies involving indicators of profitability, operational efficiency, and the ability to access new markets are very influential on efforts to empower coastal MSMEs in East Java in achieving export capacity. With the mediation of sustainable Blue Economy (SDGs) because Blue Economy provides a framework that facilitates efficient and environmentally friendly management of marine resources, which increases the competitiveness and innovation of MSMEs. This is supported by Ecological Modernization Theory (Oviatt & McDougall, 2005) the integration of Blue Economy principles into an eco-innovation strategy that encourages the internationalization of MSMEs through sustainable product differentiation. The Blue Economy encourages environmentally friendly technological innovation, human resource capacity building, and collaboration between the government, the private sector, and local communities, enabling MSMEs to expand export market access in a sustainable and inclusive manner (Perdana et al., 2025). This study demonstrates how the synergy between sustainable marine resource

management and MSME empowerment increases the competitiveness of export products while preserving the sustainability of the coastal environment.

Social influence on sustainable export capacity with the blue economy as a mediating variable has an effect of 0.098 with a t-statistic value of 3.376 and a p-value of 0.001 < 0.05. It can therefore be concluded that social factors influence sustainable export capacity with the blue economy as a mediating variable. Social factors have been proven to have a significant effect on sustainable export capacity with the blue economy as a mediating variable. Social strategies involving indicators of employee engagement and satisfaction, community empowerment, as well as transparency and communication influence the efforts to empower coastal MSMEs in East Java in achieving export capacity with sustainable Blue Economy mediation (SDGs) because the Blue Economy optimizes the active participation of the community and MSME actors in the sustainable management of coastal resources. This approach strengthens social networks, improves skills and environmental awareness, and builds trust through transparency and good communication, so that MSMEs are not only able to increase productivity and the quality of export products, but also maintain the sustainability of coastal ecosystems, which are the main source of livelihood (Am'una, 2024; Pratama & Muhlisin, 2023). Studies in the coastal areas of East Java show that social empowerment integrated into the Blue Economy can improve community welfare while supporting the sustainable export capacity of MSMEs.

The effect of the environment on sustainable export capacity with the blue economy as a mediating variable has an effect of 0.146 with a t-statistic value of 2.896 and a p-value of 0.004 < 0.05. Therefore, it can be concluded that the environment affects sustainable export capacity with the blue economy as a mediating variable. The environment has been proven to have a significant effect on sustainable export capacity with the blue economy as a mediating variable. Environmental strategies with indicators such as emission reduction levels, energy and resource efficiency levels, and the use of environmentally friendly raw materials have a significant effect on efforts to empower coastal MSMEs in East Java to achieve export capacity mediated by the sustainable Blue Economy (SDGs) because the Blue Economy emphasizes sustainable and environmentally friendly marine resource management as the foundation for coastal economic development (Rochida et al., 2025). This approach motivates MSMEs to adopt more efficient production practices with minimal negative impact on the environment, thereby increasing the competitiveness of export products while preserving coastal ecosystems for long-term sustainability. Support from Nuryadi & Pratama, (2025) also indicates that the implementation of Blue Economy-based environmental strategies helps MSMEs improve the quality and sustainability of their businesses. As a result, export capacity can grow in a responsible and sustainable manner.

CONCLUSION

This study concludes that integrating the Triple Bottom Line (TBL) model with the principles of the Blue Economy provides an effective strategic framework for strengthening the sustainable export capacity of coastal MSMEs in East Java. The results of empirical model testing show that the environmental dimension has the most significant influence in driving export competitiveness, while the economic and social dimensions become more meaningful when mediated by the Blue Economy. These findings confirm that the successful empowerment of

coastal MSMEs cannot be achieved through partial economic or social approaches alone, but requires multidimensional integration in line with the global sustainability agenda. The novelty of this research lies in the development of a conceptual model that not only links TBL with the internal sustainability of MSMEs but also extends its application to the context of the global value chain through a blue economy-based export orientation. This fills a gap in the literature, which has tended to focus on large corporations or the capture fisheries sector, and has rarely highlighted the role of MSMEs as key actors in achieving the SDGs, particularly goals 8 (decent work and economic growth), 12 (sustainable consumption and production), and 14 (life below water). Thus, this research not only offers a theoretical contribution in the form of integrating the TBL and Blue Economy frameworks into the perspective of SME empowerment, but also provides a practical contribution in the form of a sustainability-based empowerment model that can be replicated in other coastal areas, while strengthening Indonesia's position in the global research map on the blue economy and sustainable development.

SUGGESTION

Based on these findings, implementation steps need to focus on three main stakeholders. Local governments need to evaluate the effectiveness of existing coastal MSME empowerment policies, strengthen green regulations and incentives, and establish Blue Economy Clusters involving academics and business actors to accelerate the adoption of sustainable innovations. MSMEs need to improve production efficiency and environmental management, utilize supply chain digitalization, and build collective export networks through coastal business associations. Academic and research institutions are expected to play an active role in applied research, the development of MSME sustainability measurement tools, and adaptive technology assistance to strengthen global competitiveness. From a policy perspective, short-term priorities are directed at improving environmental governance and green financing; medium-term priorities are focused on strengthening innovation capacity and cross-sector collaboration; and long-term priorities are focused on formulating a national blue economy framework based on TBL principles. Furthermore, regular evaluations of existing policies are needed to identify implementation gaps that can be bridged by this research model. Further research is recommended to broaden the context of the study through inter-provincial comparative studies or the application of the model to non-coastal MSMEs to test the consistency and generalizability of the findings. With these steps, the results of this study are expected to not only strengthen the academic literature but also provide realistic, measurable, and relevant policy direction for the sustainability of MSME exports in Indonesia.

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