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Article

Deciphering blue economy for SMEs in Malaysia: A dual approach through scoping review and stakeholder conversations

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Abstract: The expanding blue economy, marked by its focus on sustainable use of ocean resources, offers enormous opportunity for Small and Medium-sized Enterprises (SMEs). However, for SMEs to properly integrate and succeed in this economy, they must first have a thorough awareness of the sector's challenges and prospects. This research used a scoping review and a qualitative study to identify the challenges and opportunities facing SMEs operating in the blue economy. The study discovered recurring themes and gaps in the existing literature by conducting an extensive examination of scholarly publications. The key challenges identified include complicated regulatory frameworks, restricted access to funding, infrastructure restrictions, talent deficiencies, government support, and market outreach. In-depth interviews with Malaysian SME leaders, industry stakeholders, and policymakers were conducted to decipher these findings. The results of interviews confirmed the relevance of the regulatory framework, infrastructure restrictions, talent deficit, and market access challenges in the Malaysian context. In particular, the study revealed emerging opportunities for Malaysian blue SMEs in sectors such as renewable energy, sustainable fisheries, marine biotechnology, and ecotourism. The study emphasizes the importance of an encouraging policy framework, knowledge-sharing platforms, and capacity building activities. It finishes by underlining the ability of SMEs to drive a sustainable and thriving blue economy, if challenges are systematically handled, and opportunities are appropriately capitalized.

Keywords: blue economy; SMEs; scoping review of literature; dual approach

1. Introduction

The vast and mesmerizing realm of the oceans, which encompasses more than 70% of the Earth's surface, has perpetually served as a subject of interest, a reservoir of resources, and a provider of sustenance for the human population (Sikhunyana and Mishi, 2023). However, in the current global context, where issues of sustainability, climate resilience, and economic progress intersect, the concept of the blue economy emerges as a promising prospect (Phelan et al., 2020). The term "blue economy" encompasses various economic activities related to water bodies and oceans, such as aquaculture, coastal tourism, and marine tourism, regardless of their sustainability status (Keen et al., 2018). Oceans are a primary source of income, accounting for 3%–5% of global GDP. It is projected that ocean-based jobs will increase by 120% between 2010 and 2030. Besides that, fisheries and aquaculture support the livelihoods of 10%–12% of the world's population (World Bank Group and European Commission, 2021). In 2023, the global ocean economy is projected to double from the 2010 estimate of USD 1.5 trillion to USD 3 trillion (Sumaila et al., 2021).

According to Pauli (2009), the concept of the blue economy encompasses an economic framework that leverages technological advancements to deliver cost-effective goods, foster local employment prospects, and uphold environmental sustainability, while maintaining competitiveness in the market. In 2012, the United Nations acknowledged the importance of the blue economy, placing special emphasis on the imperative of sustainable resource utilization (Martínez-Vázquez et al., 2021). The foundation of this approach lies in the sustainable utilization of ocean resources, with the aim of stimulating economic growth. The subject under discussion is not merely a constituent of the global economy, but rather an embodiment of a deeper commitment to harmonizing human well-being with the health and sustainability of our marine ecosystems (Midlen, 2021).

The blue economy offers significant advantages. It aims to promote the sustainable extraction and utilization of natural resources in order to protect and preserve fragile marine and coastal ecosystems (Pauli, 2009). Simultaneously, the objective is to ensure equitable and unbiased economic benefits for all stakeholders engaged in the value chain. The concept of the blue economy not only facilitates the reduction of emissions but also ensures the preservation of economic development and the equitable distribution of benefits. Additionally, it promotes inclusive and fair treatment. According to Phelan et al. (2020), the authors argue that the enhancement of the overall sustainability of marine and coastal tourism can be accomplished by focusing on improving the overall health of ecosystems. Despite the widespread recognition of the benefits associated with the blue economy, certain businesses have encountered challenges in effectively aligning their operational strategies with this agenda, particularly SMEs (SMEs) (Paredes-Coral et al., 2021).

SMEs, widely acknowledged as vital elements of many national economies, exhibit distinctive attributes that make their participation in the blue economy both indispensable and intricate (Nurunnabi, 2020). The combination of agility, extensive local knowledge, and inclination towards innovation enables them to effectively serve specific and specialized segments of the market. Therefore, it is crucial to fully understand the dynamic relationship between SMEs and the blue economy. SMEs should be acknowledged for their potential advantages and the challenges they may encounter. Such comprehension holds significant importance not only for the enterprises themselves but also for policymakers, investors, and the wider global community (Appiah et al., 2023; Dijkstra et al., 2022).

The existing literature has predominantly focused on the macroeconomic aspects of the blue economy. These discussions often revolve around global policy frameworks, comprehensive infrastructure initiatives, and strategies implemented at the national level (Campanati et al., 2022; Filbee-Dexter et al., 2022; Novaglio et al., 2022; Tirumala and Tiwari, 2022; Stuchtey et al., 2023). While acknowledging the undeniable significance of these factors, it is important to note that they often overshadow the experiences of SMEs. These enterprises frequently operate at the grassroots level, thereby augmenting their capacity to comprehend and address local conditions, community needs, and ecological considerations (Das et al., 2020; McCamley and Gilmore, 2017). The strategies, challenges, and successes of these entities offer valuable insights that can contribute to the development and implementation of broader policies and practices in the field of the blue economy. In

the Malaysian context, there is a lack of comprehensive perspectives regarding the present state of the blue economy, encompassing both its challenges and opportunities (Mustapha and Sorooshian, 2019; Setiyowati et al., 2022).

A comprehensive understanding of the Malaysian context is imperative in the analysis of this discourse. Malaysia exhibits a strong interest in the blue economy owing to its advantageous geographical location between the Indian and Pacific Oceans, as well as its expansive coastline (Krishnan, 2020; Millar, 1969). These ecosystems play a crucial role in supporting the country's ports and shipping sectors, mining operations, and offshore oil and gas extraction (Ridzuan et al., 2022). The Blue economy makes a significant contribution of 23 percent to Malaysia's GDP (Azam et al., 2023). Malaysia is positioned as the fourth largest economy in the East Asian Seas region in terms of its oceanic size, following China, Indonesia, and Thailand (PEMSEA 2021). Despite the significant economic contributions made by marine and ocean ecosystems to Malaysia (Zaideen and Ramli, 2022), there remains untapped potential in the form of various activities related to ecosystem services. Such as offshore renewable energy, seabed mining, marine biotechnology, and bioprospecting (Academy of Sciences Malaysia, 2023). The rich marine biodiversity of the country has given rise to various marine businesses. In light of the growing focus on sustainable development, it is imperative to analyze the challenges and opportunities encountered by small and medium-sized enterprises (SMEs) in the blue economy. As Malaysia is a country where SMEs account for a significant role in the economy (Nurunnabi, 2020), it is crucial to comprehend how these businesses handle the challenges and opportunities presented by the blue economy. This understanding is essential for harnessing the advantages that Malaysian SMEs can offer.

The inadequate comprehension of challenges and opportunities has the potential to undermine the performance of small and medium-sized enterprises (SMEs) as it results in a lack of competitiveness, reduced innovation, and decreased productivity (Vedachalam et al., 2019). The potential for environmental degradation, particularly in coastal and marine areas, poses significant consequences for the ecology, fisheries, and tourism sectors (Ertor and Hadjimichael, 2020). The potential decline of these sectors could significantly impact the local communities that depend on them for their livelihoods (Nham, 2022). Therefore, it is imperative to enhance the understanding of the challenges and explore potential opportunities for Malaysian SMEs to effectively harness the benefits of the blue economy. This would be critical in highlighting the importance of innovation, technology transfer, and collaboration among stakeholders. By adopting this approach, Malaysian small and medium enterprises (SMEs) can effectively harness the benefits of the blue economy, while simultaneously ensuring the sustainable utilization of its resources.

Hence, it is imperative to acknowledge and rectify this knowledge gap and acquire a comprehensive understanding of the challenges and opportunities at hand. The objective of this study is to examine various research areas related to small and medium enterprises (SMEs) in Malaysia's blue economy. This will be achieved through a scoping review of existing literature and conducting in-depth interviews with stakeholders associated with SMEs. The research questions that will be addressed are as follows: 1) What are the main challenges and opportunities faced by SMEs in

the global blue economy? 2) How do these challenges and opportunities relate to small and medium-sized enterprises (SMEs) operating within the Malaysian blue economy?

By answering these questions, this study intends mapping out the state of challenges and opportunities for SMEs in the blue economy through scoping review of current literature. Secondly, this research will include in-depth interviews with stakeholders to provide a contextual understanding of the challenges and opportunities, identified in the scoping review, pertaining to SMEs operating within the Malaysian blue economy. The findings will stimulate a new paradigm for the researchers to shed light on the varied experiences of SMEs, stitching together a narrative of stakeholders that is often dispersed across numerous sources. Secondly, it will benefit policymakers, business executives, and academics with a comprehensive understanding of the challenges and opportunities of the blue economy agenda, as well as how it may be harnessed to ensure the long-term viability of SMEs.

The present study makes a theoretical contribution to the existing knowledge on the blue economy by providing valuable insights into the challenges and opportunities faced by SMEs in their adoption of the blue economy. It proposes possible products and services that could be developed to support the advancement of sustainable economic development. The knowledge that is obtained has the potential to make valuable contributions to the advancement of future research endeavors and the development of policies within the relevant field. Additionally, the selected research methodology holds considerable implications for future inquiries. The utilization of a scoping study and conducting in-depth interviews (Paschoalotto et al., 2023) with stakeholders yields a comprehensive understanding of the challenges and opportunities faced by SMEs. This approach exhibits promising potential for application in future business research, enabling the exploration of various sectors and industries.

2. Methods

The study employed a scoping review methodology (Arksey and O'Malley, 2005), which is known for its qualitative approach, distinguishing it from bibliometric or meta-analysis methods that primarily rely on quantitative measurements of research (Paschoalotto et al., 2023). The study utilized the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) extension for Scoping Reviews (PRISMA-ScR) (Tricco et al., 2018) to collect qualitative data on the challenges and opportunities faced by SMEs operating in the blue economy. The process encompasses several stages, namely resource identification, application of selection criteria, resource screening, and content analysis. The study employed a qualitative research methodology, consisting of two primary components, as described by Paschoalotto et al. (2023). Firstly, a scoping review of the existing literature was undertaken to systematically identify and classify the various challenges and opportunities faced by global SMEs operating within the blue economy. Secondly, stakeholders from the Malaysian SME in the blue economy were engaged in in-depth interviews. These interviews yielded valuable insights and perspectives from individuals directly engaged in these enterprises. The researchers employed a deductive qualitative technique to establish a connection between the categories derived from the scoping

review and the insights obtained from interviews conducted with pertinent stakeholders (Saulnier et al., 2022).

2.1. Scoping review of literature

2.1.1. Literature processing

The study employed a scoping review methodology (Arksey and O'Malley, 2005), which is known for its qualitative approach, distinguishing it from bibliometric or meta-analysis methods that primarily rely on quantitative measurements of research (Paschoalotto et al., 2023). The study utilized the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) extension for Scoping Reviews (PRISMA-ScR) (Tricco et al., 2018) to collect qualitative data on the challenges and opportunities encountered by SMEs operating in the blue economy. The process encompasses the identification of resources, the application of selection criteria, the screening of resources, and the analysis of content.

The process of resource selection and advanced search was conducted in August 2022. The advanced search function did not impose any specific restrictions on the subject area, year of publication, or geographical region of publication. To conduct a comprehensive search for scientific papers, we employed the search terms "blue economy" AND "SMEs" OR "small" OR "small medium enterprises" within the web of science (WoS) and SCOPUS databases. Both databases demonstrate a broader scope, improved precision, and more extensive inclusiveness in comparison to alternative databases (Falagas et al., 2008). The inclusion criteria for publications in this study were limited to those that had undergone a rigorous peer review process and were published in the English language. Consequently, book chapters, conference proceedings, editorial reviews, and notes were excluded from consideration.

A total of 592 articles were identified in the search. After excluding duplicate articles (n = 79), reports and review articles (n = 26), and publications in languages other than English (n = 05), a total of 482 articles were examined to determine their relevance to the blue economy and SMEs in relation to challenges and opportunities. Four independent researchers conducted a thorough examination of the titles and abstracts of 482 publications in order to eliminate studies (n = 375) that were not pertinent to the objectives of our study (**Figure 1**). The final analysis comprised a total of 107 papers (**Table 1**).

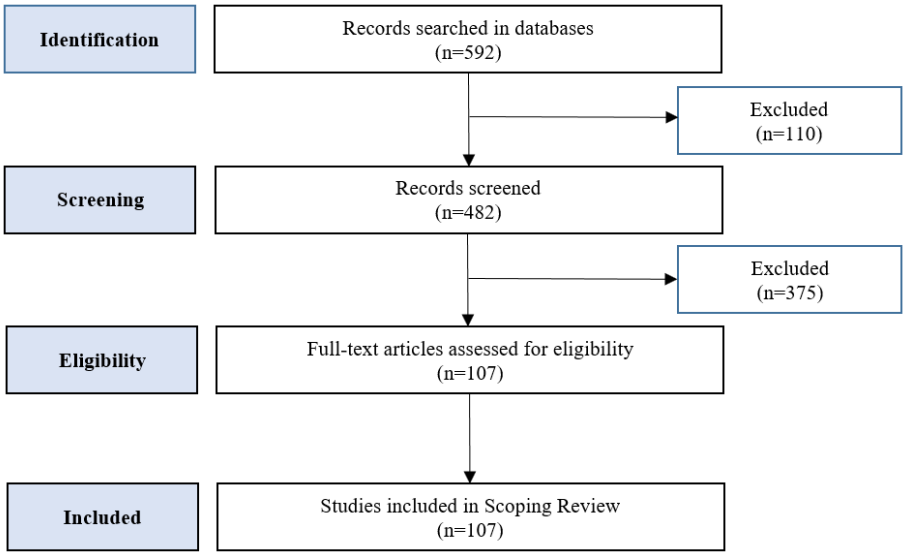

Figure 1. Literature selection process.

Table 1. Summary of 107 articles.

No.	Author (s) & Year of Publication	Country	Sector
1.	Agius and Briguglio (2021)	Malta	Coastal Tourism
2.	Ahmed et al. (2022)	Bangladesh	Blue Biotechnology
3.	Arias et al. (2022)	Sweden	Fisheries
4.	Avtar et al. (2021)	India	Fisheries
5.	Babb (2015)	Barbados	Coastal Tourism
6.	Bennett (2019)	NA	Marine Conservation
7.	Bennett et al. (2021)	NA	Marine Conservation
8.	Bennett and Nathan (2022)	NA	Marine Conservation
9.	Bethel et al. (2021)	China	Coastal Tourism
10.	Blythe et al. (2021)	Spain; Sweden	Fisheries
11.	Bohle et al. (2019)	Belgium	Seabed Mining
12.	Booth et al. (2022)	UK	Coastal Tourism
13.	Brennan (2022)	Ireland	Fisheries
14.	Bueger and Wivel (2018)	Seychelles	Seaweeds
15.	Carrà et al. (2017)	Italy	Fisheries
16.	Carvajal-Arenas (2022)	Chile	Fisheries
17.	Cassar et al. (2021)	Malta	Shipping
18.	Cheng et al. (2021)	Taiwan	Fisheries
19.	Christ et al. (2020)	Seychelles	Fisheries
20.	Cohen et al. (2019)	Seychelles	Fisheries
21.	Contreras and Thomas (2019)	Seychelles	Seaweeds
22.	Crisie et al. (2020)	Mexico	Fisheries
23.	D (2015)	Taiwan	Maritime Security
24.	Dalton et al. (2019)	NA	Wave Energy
25.	Dornan et al. (2018)	Australia	Maritime Security
26.	Engen et al. (2021)	Norway	Coastal Tourism

Table 1. (*Continued*).

No.	Author (s) & Year of Publication	Country	Sector
27.	Ertör-Akyazi (2020)	Turkey	Fisheries
28.	Farmery et al. (2021)	NA	Fisheries
29.	Farran (2018)	UK	Coastal Tourism
30.	Filbee-Dexter (2022)	NA	Seaweeds
31.	Ganseforth and Sonja (2021)	Japan	Fisheries
32.	Garza et al. (2021)	Spain	Coastal Tourism
33.	Ge et al. (2022)	Japan	Infrastructure
34.	Giron et al. (2021)	NA	Fisheries
35.	Grafeld et al. (2017)	USA	Fisheries
36.	Hamilton et al. (2021)	USA	Wave energy
37.	Hampton and Jeyacheya (2020)	NA	Coastal Tourism
38.	Hassanali (2020)	Sweden	Coastal Tourism
39.	Jentoft and Chuenpagdee (2022)	NA	Marine Living Resources
40.	Jones et al. (2018)	Australia	Research and Education
41.	Kabil et al. (2021)	NA	Coastal Tourism
42.	Keen et al. (2018)	Australia	Fisheries
43.	Kishor and Agarwala (2019)	India	Desalination
44.	Louey (2022)	Australia	Maritime Security
45.	Luhtala et al. (2021)	Sweden	Shipping
46.	Malcolm and Murday (2017)	UK	Maritime Security
47.	Mallin (2018)	Kiribati	Maritime Security
48.	Martínez et al. (2021)		Maritime Security
49.	Maisie et al. (2018)	South Africa	Research and Education
50.	Methratta and Elizabeth (2021)	NA	Renewable Energy
51.	Meyer (2021)	Estonia	Port Activities
52.	Nash et al. (2020)	NA	Fisheries
53.	Neto et al. (2021)	Brazil	Fisheries
54.	Niisie et al. (2021)	NA	Maritime Transport
55.	Nisa et al. (2022)	NA	Coastal Tourism
56.	Nugraha et al. (2022)	Indonesia	Ocean Energy
57.	O'Callaghan et al. (2019)	UK	Infrastructure
58.	O'Callaghan et al. (2019)	NA	Research and Education
59.	Odoli et al. (2019)	Kenya	Fisheries
60.	Oikonomou et al. (2021)	Portugal	Ocean Energy
61.	Okafor et al. (2022)	Nigeria	Fisheries
62.	Okafor et al. (2020)	Nigeria	Fisheries
63.	Pauly (2018)	NA	Fisheries
64.	Phelan et al. (2020)	Indonesia	Coastal Tourism
65.	Philipp et al. (2020)	Estonia	Research and Education
66.	Praptiwi et al. (2021)	Indonesia	Coastal Tourism
67.	Qi et al. (2020)	China	Research and Education

Table 1. (*Continued*).

No.	Author (s) & Year of Publication	Country	Sector
68.	Rahman and M (2017)	Bangladesh	Shipbuilding and Repair
69.	Robinson and Butchart (2022)	USA	Research and Education
70.	Rubilar and Cardozo (2021)	NA	Aquaculture
71.	Said and MacMillan (2020)	Malta	Fisheries
72.	Salpin et al. (2018)	Fiji	Research and Education
73.	Sandhya et al. (2018)	India	Wave Forecasting
74.	Schutter et al. (2021)	Seychelles	Research and Education
75.	Senaratne et al. (2021)	Seychelles	Research and Education
76.	Serpetti et al. (2021)	UK	Renewable Energy
77.	Serri et al. (2017)	Italy	Renewable Energy
78.	Shamsuzzaman and Islam M (2018)	Bangladesh	Marine Living Resources
79.	Silver et al. (2015)	Canada	Fisheries
80.	Somoebwana et al. (2021)	Kenya	Fisheries
81.	Song et al. (2021)	Philipines	Mangroves
82.	Sulanke et al. (2021)	Iceland	Fisheries
83.	Techera (2018)	India	Fisheries
84.	Techera and Erika (2019)	Seychelles	Maritime Security
85.	Terorotua et al. (2020)	France	Research and Education
86.	Tirumala and Tiwari (2022)	NA	Research and Education
87.	Topper et al. (2021)	USA	Research and Education
88.	Tsiouvalas et al. (2022)	Norway	Research and Education
89.	van and Drazen J (2021)	NA	Deep Sea Mining
90.	Voyer et al. (2021)	NA	Research and Education
91.	Zhisie et al. (2020)	NA	Wave Energy
92.	Akomolafe et al. (2022)	Nigeria	Marine Living Resources
93.	Bari and Abdullahel (2022)	Bangladesh	Research and Education
94.	Chowdhury et al. (2022)	Bangladesh	Seaweeds
95.	Harlis et al. (2022)	Indonesia	Marine Living Resources
96.	Joseph and Imelda (2022)	Bangladesh	Fisheries
97.	Keyombe et al. (2022)	Kenya	Marine Living Resources
98.	Ktari et al. (2022)	Tunisia	Seaweeds
99.	Lee et al. (2022)	NA	Research and Education
100.	Nurein and Saheed (2022)	Kenya	Research and Education
101.	Raheem and Shefiu (2022)	Nigeria	Research and Education
102.	Ramos et al. (2022)	Portugal	Research and Education
103.	Shaika et al. (2022)	Bangladesh	Blue Biotechnology
104.	Weerawat et al. (2022)	Thailand	Fisheries
105.	Natalie et al. (2014)	Canada	Blue Biotechnology
106.	Raymond (2015)	NA	Research and Education
107.	Ridzuan and all (2022)	Malaysia	Fisheries

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2.1.2. Content analysis

The researchers performed a qualitative content analysis on the chosen articles in order to identify recurring patterns, trends, or themes (Guo et al., 2022). In line with established scholarly principles (Bengtsson, 2016; Krippendorff, 2018), this research undertaking employed a comprehensive content analysis methodology to determine the reliability (e.g., accuracy in categorization or coding) and validity of the findings. To address the possibility of bias, a qualitative evaluation of qualifying papers was conducted by four content evaluators (**Table 2**) in a manner that ensured the independence of the assessors. The selection process for the content assessors was conducted with great care, ensuring that they possessed the necessary expertise in the subject matter, had a thorough understanding of the research inquiries, and strictly adhered to the content analysis framework. Following the completion of the initial individual content analysis, the content evaluators participated in a series of discussions aimed at exchanging and debating their respective findings. Throughout the course of these discussions, the assessors actively engaged in the process of monitoring and documenting any points of contention, with the ultimate goal of reaching a common consensus.

Table 2. Evaluators profile.

EVALUATOR	QUALIFICATION	EXPERISE	RESEARCH AREA
Evaluator 1	PhD in Environment and Development	• Biodiversity • Sustainability	• Indigenous people • Emission measurement • Greenhouse Gas Protocol
Evaluator 2	PhD in Finance and Strategic Management	• Accounting and Finance • Strategic Management • Information Management	• Corporate Finance • Valuation • Blue Economy
Evaluator 3	PhD Industrial Engineering	• Data Analytic • Systematic Literature Review • Bibliometric Analysis • Measurement	• Management practices and economics • Strategic management of Industry
Evaluator 4	Master in Business Mathematics	• Data Analytic	• Artificial Intelligence • Stochastic Analysis

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2.2. Field interviews

2.2.1. Participants and data collection

A total of 21 participants were interviewed, as the point of saturation in the emergence of new themes was observed after the 21st participant (Boddy, 2016). The participants consist of representatives from diverse stakeholder groups within small and medium enterprises (SMEs) operating in the blue economy sector of Malaysia. The interviews were carried out during the period from December 2022 to February 2023. The stakeholders (Appendix 1) comprised individuals from diverse entities, including government agencies, policy makers, businesses and industries, financial institutions, non-governmental organizations, and academics. These individuals were selected using chain referral approaches (Bagheri and Saadati, 2015; Penrod et al., 2003). The participants were contacted via the office phone number provided on their company's official website in order to extend an invitation to join and obtain their

consent to participate. The participants possessed a significant volume of comprehensive data pertaining to the blue economy SMEs. This knowledge was obtained through their extensive engagement and close association with the subject matter over a substantial duration.

2.2.2. Content processing

The data collection and analysis process took place simultaneously, wherein the interviews were promptly audio-recorded and transcribed to serve as a textual foundation for analysis. The triangulation process involved a systematic comparison between the data collected from in-depth interviews and the descriptions of challenges and opportunities identified through the findings of a scoping study.

3. Results

3.1. Descriptive

The scoping review of 107 papers reveals that scholars have demonstrated an increasing interest in SMEs within the blue economy since 2014. The analysis of trends reveals that in the year 2021, there has been a significant increase in the number of publications pertaining to SMEs in the blue economy. This proportion accounts for 30.8% of all publications (**Figure 2**). The year 2022 closely follows this. The Marine Policy journal has been identified as the predominant literature source, accounting for 15.9% of the total (**Table 3**). **Table 4** provides a compilation of the most influential papers, ranked according to their citation counts. Among the articles under consideration, the study conducted by Silver et al. in 2015 stands out as having the highest level of influence. The statistical data, when categorized by region, demonstrates a notable variation among nations, encompassing a total of 35 countries. Nevertheless, it is noteworthy that the countries with the highest number of publications are Bangladesh, Seychelles, and the United States of America (**Table 1**). However, it is worth noting that among the total number of publications, 24 of them do not explicitly specify a specific country. This statement implies that certain research endeavors may have been conducted on a global scale or without a specific geographical focus.

It is noteworthy to mention that certain countries with extensive coastlines and marine ecosystems, such as Brazil, Chile, and Mexico, demonstrate a relatively low number of publications. This observation may suggest disparities in research capacities, funding opportunities, and research agendas. This observation suggests the necessity for increased attention and rigorous scholarly inquiry in these areas. Conversely, it is worth noting that certain countries with minimal coastal areas, such as Estonia and Malta, demonstrate a comparable trend of having two publications each. This observation implies a significant focus on issues related to ocean governance and sustainable development within the relevant jurisdictions. Malaysia has published only one document addressing the topic of oceans governance and sustainable development.

Figure 2. Trend analysis.

Table 3. Top publishing journal.

Journal	Number of Article
Marine Policy	17
Frontier in Marine Science	11
Sustainability	8
One Earth	3
Ocean & Coastal Management	2

Table 4. Top influential articles.

Article	Journal	Citations
Silver et al. (2015)	Journal of Environment and Development	299
Cohen et al. (2019)	Frontiers in Marine Science	211
Keen et al. (2018)	Marine Policy	136
Ban et al. (2014)	Conversation Letters	128
Clémençon (2015)	Journal of Environment and Development	107

The scoping review identified two distinct clusters within the blue economy sectors (OECD, 2016). The first cluster comprises of well-established industries, whereas the second cluster is characterized as an emerging sector within the blue economy (**Table 5**).

Table 5. Classification of blue economy sector.

Established	Emerging
1) Capture Fisheries	1) Marine aquaculture
2) Seafood Processing	2) Deep-and-ultra-deep water oil and gas
3) Shipping	3) Offshore wind energy
4) Ports	4) Ocean renewable energy
5) Shipbuilding and Repair	5) Marine and seabed mining
6) Offshore oil and gas (shallow water)	6) Maritime safety and surveillance
7) Marine manufacturing and construction	7) Marine biotechnology
8) Maritime and coastal tourism	8) High-tech marine products and services
9) Marine business services	9) Other
10) Marine R&D and education	
11) Dredging	

Source: (OECD, 2016).

The marine living resources sector accounted for the largest proportion of articles (68%), followed by coastal tourism (23%), among the established sectors. Subsequently, the contribution of marine transport to the overall literature accounted

for 5% of the total. Additionally, port operations and shipbuilding and repair each made a 2% contribution (**Table 6**). The literature tends to place a greater emphasis on the first two sectors, which can be attributed to their long-standing presence.

Table 6. Sectorial distribution of articles.

Sectors	Percentage of Articles
Marine Living Resources	68
Coastal Tourism	23
Marine Transport	5
Port Activities	2
Shipbuilding	2

3.2. Challenges identified through scoping review

The analysis of 107 articles utilizing content analysis has revealed six key challenges that are encountered by SMEs (**Table 7**). The issues encompassed within this context pertain to governance, infrastructure, investment, talent, government support, and market access. (Christ et al., 2020; Midlen, 2021; Phelan et al., 2020; Reiss et al., 2021; Thompson, 2022; Tirumala & Tiwari, 2022).

Table 7. Challenges from scoping review.

Assessment of Challenges	Key Areas	Percentage of Articles
Governance	1) Regulations, 2) Policy Support, 3) Licensing, 4) Quota and Territorial Rights	41
Government Support	1) Lack of Government Support, 2) Restricted Finance, 3) Absence of R&D facilities, 4) Inability to address sustainability issue	33
Infrastructure	1) Transportation and Storage, 2) Energy Infrastructure, 3) Waste Management Facilities, 4) Adoption of Digital Technologies.	23
Investment	1) Access to Finance, 2) Absence of Incentive, 3) Absence of Collateral, and 4) Unpredictable Regulatory Framework.	20
Market Support	1) Lack of Market Information, 2) Lack of Financing from Banking Institutions, 3) Lack of Collaboration, and 4) Risk of Reliance on Industry Players.	17
Talent	1) Shortage of Skilled Force, 2) Attracting Skilled Force, 3) Retention of Skilled Force.	16

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3.2.1. Governance

The literature highlights governance as the primary challenge, as indicated by 41% of articles identifying it as a significant barrier for their respective firms. The blue economy, encompassing sectors such as fisheries (Christ et al., 2020), aquaculture, maritime transport, and ocean energy (Oikonomou et al., 2021), often encounters a plethora of international, national, and local regulations (Okafor-Yarwood et al., 2022). This complex regulatory landscape can pose challenges for small and medium-sized enterprises (SMEs) in terms of understanding and adhering to these regulations, thereby impeding their growth and competitiveness (Said and MacMillan, 2020). Regulatory obstacles, insufficient policy support, and difficulties in obtaining necessary permissions and licenses are some of the challenges faced in this context (Okafor-Yarwood et al., 2022). Furthermore, the implementation of governance

systems that foster sustainability necessitates significant operational adjustments, which can be financially burdensome for SMEs (Phelan et al., 2020). When contrasted with larger enterprises possessing greater resources and influence, small and medium-sized enterprises (SMEs) encounter difficulties in obtaining quotas, permits, or territorial rights to maritime resources (Said & MacMillan, 2020).

3.2.2. Infrastructure

The issue of infrastructure emerged as the second most significant challenge, as evidenced by 23% of the articles reviewed. One of the challenges encompassed within this specific category pertains to issues related to transportation, storage, and other logistical factors (Nikčević and Škurić, 2021; Reiss et al., 2021). Furthermore, the establishment of energy infrastructure to guarantee a reliable and uninterrupted energy supply (Oikonomou et al., 2021), the provision of waste management facilities for proper waste disposal in the shipbuilding and fisheries sectors (Nikčević and Škurić, 2021), and the integration of digital technologies present noteworthy obstacles for SMEs operating within the blue economy (Pace et al., 2022).

3.2.3. Investment

Twenty percent of the surveyed articles identified access to finance and funding as a notable obstacle for blue economy SMEs. The blue economy sectors, such as aquaculture, marine biotechnology, and ocean renewable energy, require significant upfront investments in terms of technology, equipment, and infrastructure (Shan et al., 2022; Tirumala and Tiwari, 2022). Nevertheless, entrepreneurs encounter the challenge of motivating potential investors to contribute financial resources, primarily due to a heightened perception of risk (Thompson, 2022). Additionally, the prolonged duration necessary for achieving a return on investment, the lack of collateral available for emerging businesses (Nham, 2022), the unpredictable nature of regulatory frameworks, and the competition faced from well-established industry players further exacerbate this challenge (Thompson, 2022).

3.2.4. Talent

The scoping review of the subject articles also identified talent as a significant challenge, as reported in 16% of the articles. These articles highlight concerns regarding the limited availability of skilled labor in the blue economy and the difficulties associated with attracting and retaining highly skilled individuals (Pinto et al., 2015). The sectors encompassed by the blue economy, such as marine biotechnology, ocean energy, and sustainable aquaculture, frequently require individuals with specialized expertise (Phelan et al., 2020). Identifying personnel who possess the requisite knowledge can present difficulties, especially for SMEs that do not have extensive recruitment expertise (Graziano et al., 2022).

3.2.5. Government support

Another significant challenge that emerged during the scoping review pertains to the insufficient governmental support for SMEs within the blue economy sector. Because 33% of the articles found that the lack of assistance from the government is a barrier to advancement for SMEs in the blue economy (Jentoft and Chuenpagdee, 2022). The blue economy encompasses key sectors such as fisheries, maritime transport, tourism, ocean energy, and marine biotechnology, which often engage with

public policy as a result of the interconnected and delicate character of marine resources (Midlen, 2021). Hence, in the absence of governmental assistance, SMEs encounter challenges related to regulatory uncertainties, restricted financial resources, market accessibility, research and development capabilities, sustainability concerns, and the inability to effectively address environmental and market crises without government support (Bennett et al., 2019).

3.2.6. Market support

Market support poses a significant challenge for SMEs, as 17% of the articles examined in the study identified that blue economy SMEs face difficulties in obtaining market support to sustain their operations (McKinley et al., 2019). Specifically, these SMEs encountered challenges in engaging in negotiations with stakeholders in order to secure the essential support. The limited understanding of the blue economy among market participants poses a significant obstacle for small and medium-sized enterprises (SMEs) in accessing financial support from banking institutions (Thompson, 2022). In addition to the aforementioned factors, enterprises encounter challenges in the establishment of collaborative partnerships (Chen and Shih, 2021), adoption of technological advancements and innovations, and mitigation of risks associated with dependence on dominant industry players (Vedachalam et al., 2019).

3.3. Opportunities identified through scoping review

Opportunities in the blue economy pertain to the strategic advantages that are believed to exert a positive impact on society. These opportunities encompass potential goods and services that SMEs can leverage (Yerlikaya and Erzurumlu, 2021). Consequently, the opportunities within the blue economy have been classified into three distinct categories. Firstly, there are opportunities that possess the potential to exert an influence on society. Secondly, there are opportunities that offer avenues for the provision of novel services. Lastly, there are opportunities that enable the development of innovative goods.

3.3.1. Society

The results of the scoping review reveal that a considerable percentage (more than 41%) of the analyzed articles emphasize the potential for SMEs in the blue economy to make noteworthy contributions towards sustainable development. This discovery holds significant importance as it represents a profound recognition of the pivotal role of social sustainability in the progression of the blue economy (Choudhary et al., 2021). The key determinants impacting society can be observed in various domains such as the creation of employment opportunities (Campbell et al., 2021), the implementation of sustainable aquaculture and mariculture practices to foster sustainability (Bennett et al., 2019), the active engagement of local communities to ensure fair distribution of advantages (Lee et al., 2020), and the improvement of global food security (Odoli et al., 2019). The societal impact of the blue economy is evident, as highlighted by the World Bank's report indicating that it contributes to the creation of over 350 million direct employment opportunities (Zaideen and Ramli, 2022). In Malaysia, the blue economy accounts for more than 4% of the total employment opportunities (Sumaila et al., 2021).

3.3.2. Services

The second category of opportunities identified is related to the field of services. A significant percentage, specifically 33%, of the examined articles have indicated that SMEs within the blue economy exhibit numerous opportunities for introducing innovative avenues of service. This statement potentially pertains to the development of novel and innovative services associated with the marine ecosystem (Okafor-Yarwood et al., 2022). Some examples of these types of services encompass ecotourism (Phelan et al., 2020), marine conservation (Salpin et al., 2018), and sustainable fisheries management (Bennett et al., 2019). In the context of Malaysia's blue economy, the service sector plays a significant role, with ecotourism being the primary contributor, valued at USD 3.07 (Academy of Sciences Malaysia, 2023). The provision of these services has the potential to generate additional economic benefits for both local communities and businesses operating within the blue economy (Lee et al., 2020).

3.3.3. Product

The third category of opportunities pertains to the introduction of novel products, constituting 26% of the overall findings. This passage refers to the production of novel products derived from the marine ecosystem (Salpin et al., 2018). These products include renewable energy sources (Sarker et al., 2018), medicines (Mezzelani et al., 2018), cosmetics (Ktari et al., 2022), and biodegradable plastics (Ktari et al., 2022). These products possess the potential to generate financial profits and contribute positively to the growth of the blue economy (Bennett et al., 2019).

3.4. Opportunities & challenges identified through in-depth interviews

The results obtained from the scoping review have provided a basis for conducting in-depth interviews, with the objective of understanding the challenges and prospects encountered by SMEs in the blue economy. To offer a comprehensive understanding of the challenges and opportunities, this study conducted interviews with a total of 21 stakeholders. The objective of these interviews was to acquire valuable insights into the current landscape and propose potential strategies for effectively addressing the identified issues. The results obtained from the interviews revealed that a substantial majority of the participants (95.2% of the respondents) recognized that the existing governance framework of the Malaysian blue economy poses a significant challenge for (SMEs. A significant proportion of respondents (52%) expressed that the private sector demonstrates hesitancy in offering support to SMEs in the blue economy sector. The primary reason for this reluctance is the lack of essential infrastructure, as indicated by 42.8% of the participants. Furthermore, a significant barrier identified by 33.3% of participants was the lack of human capital, whereas 28.5% mentioned insufficient government support. Furthermore, 23.8% of participants highlighted the difficulties they faced in terms of accessing capital and fulfilling investment requirements (see **Table 8**). In regards to the potential opportunities, it is noteworthy that all 21 participants reached a unanimous consensus on the three overarching categories of opportunities, as outlined in the scoping study. These categories encompass opportunities to have a significant impact on society, as

well as the potential to introduce innovative products and services. For instance, a participant responded that:

SMEs in Malaysia have lot of opportunities. They [SMEs] take advantage of aquaculture, marine tourism, logistics [maritime transport], offshore oil and gas, developing the aquaculture (P2).

Table 8. Findings from in-depth interviews on challenges.

Participant	Challenges					
	Talent	**Infrastructure**	**Investment**	**Governance**	**Government Support**	**Market Support**
P1						√
P2	√			√		√
P3				√		√
P4	√		√	√		√
P5	√	√		√		√
P6	√			√		
P7		√		√		
P8	√	√		√		
P9		√		√		
P10	√	√		√		√
P11	√		√	√		√
P12				√		√
P13				√		√
P14		√	√	√		√
P15				√		
P16				√	√	
P17		√	√	√	√	
P18		√		√	√	
P19				√	√	
P20				√	√	
P21		√	√	√	√	√
Ratio	33.3	42.8	23.8	95.2	28.5	52.3

√ = Supported findings from the scoping review

However, it was observed that the majority of the participants held the opinion that the renewable energy sector presents a promising opportunity for SMEs in Malaysia's blue economy to penetrate niche markets at this particular moment. Potential strategies for harnessing renewable energy sources in maritime environments encompass a range of options, such as the establishment of offshore wind farms, the implementation of tidal energy systems, the deployment of floating solar panel installations, and the development of biofuels derived from marine organisms. The accounts provided by the participants have confirmed the validity of the concept that the opportunities outlined in the literature are relevant to SMEs in Malaysia's blue economy. This observation suggests a notable tendency to transition towards energy sources that are more environmentally friendly and sustainable. The aforementioned

action carries substantial implications for Malaysia's energy security and its efforts to address climate change.

An intriguing aspect of these opportunities is their notable focus on sustainability and conservation, as evidenced by the significant attention given to the preservation of blue carbon, mangroves, and seaweed. This observation indicates a growing acknowledgement of the importance of environmental conservation within the framework of economic progress. However, it is important to note that certain opportunities that have been identified, such as the growth of the aquaculture industry and the exploration of offshore oil and gas reserves, may pose environmental risks if not carefully managed. Therefore, it is crucial to prioritize the pursuit of these possibilities in a sustainable manner, placing emphasis on the mitigation of negative environmental impacts.

The data presented in this study suggest that Malaysian SMEs have a tremendous opportunity to participate in the blue economy, particularly in sectors related to sustainability and renewable energy. The aforementioned findings are supported by the responses obtained from interviews, which indicate an increasing recognition of the potential of the blue economy in Malaysia. Moreover, there is a notable dedication among numerous stakeholders to foster its development. The involvement of government agencies, commercial industries, and international organizations serves as a positive indication of growing interest in this field, suggesting significant opportunities for economic growth and environmental sustainability in the future.

4. Discussion

The primary objective of this study is to identify and analyze the challenges that serve as major barriers to the growth of SMEs in the blue economy sector in Malaysia. Furthermore, the primary aim of this research is to identify untapped opportunities for the growth and advancement of SME). To achieve the stated objectives, this study employed a hybrid research design, which encompassed a scoping review of the existing literature and a qualitative methodology (Paschoalotto et al., 2023). Throughout the course of the scoping review, the study has successfully identified six notable challenges that impede the growth and progress of SMEs within the blue economy. These challenges encompass various aspects such as governance, infrastructure, investment, talent, government support, and market support (Oikonomou et al., 2021; Okafor-Yarwood et al., 2022; Said and MacMillan, 2020). In the Malaysian context, the qualitative research study investigated the main obstacles encountered by SMEs operating in the blue economy sector. The challenges that were identified include the governance structure, market support, availability of infrastructure, and skilled labor. The qualitative study delved deeper into the issue and found that, in contrast to global SMEs, Malaysian SMEs face fewer challenges in terms of government support and access to financing facilities.

Much of the research has indicated that the primary obstacle for SMEs to function in the blue economy is the current governance framework of the blue economy sectors (Oikonomou et al., 2021; Okafor-Yarwood et al., 2022; Said and MacMillan, 2020). The reason for this is the diverse and ever-changing nature of the laws and regulations that constitute a governance system. A variety of factors influence them,

encompassing environmental considerations, international regulations pertaining to marine affairs, and national economic priorities. Small and Medium Enterprises (SMEs), frequently constrained by limited financial resources, encounter challenges in responding to regulatory modifications, complying with stringent environmental and safety standards, and obtaining necessary operational permits and licenses. This assertion is supported by the findings of a qualitative study, wherein over 95% of participants concurred that Malaysian blue SMEs are confronted with the challenge of a governance framework that favors major industrial entities.

Another challenge that has been identified through a scoping review of the existing literature is the inadequate infrastructure necessary for SMEs to operate effectively within the blue economy (Oikonomou et al., 2021; Pace et al., 2022). The rationale behind this issue stems from the fact that the majority of infrastructure facilities are owned and operated by multinational corporations and large organizations. They derive advantages from economies of scale. Nevertheless, due to the limited financial resources of small-scale economics, SMEs are at a significant competitive disadvantage in terms of infrastructure investment. Despite the vast potential of the blue economy, SMEs are currently unable to fully capitalize on its advantages (Reiss et al., 2021). Similarly, the findings from the in-depth interviews indicated that a significant challenge encountered by Malaysian (SMEs) is the inadequate infrastructure within the blue economy sector.

Another challenge encountered during the scoping review was a lack of market support. This implies that SMEs have insufficient access to market knowledge, limited visibility and customer accessibility, and a lack of platforms that facilitate their integration into larger, potentially global, marketplaces (McKinley et al., 2019). According to Chen and Shih (2021), the performance of small and medium-sized enterprises (SMEs) is at risk due to a lack of market support in the blue economy. This industry is distinct and expanding, requiring specific distribution channels, customized marketing strategies, and informed customers who appreciate the goods and services offered by the blue economy. With their greater access to extensive resources and well-established networks, larger firms or multinational corporations may exert dominance over the available market channels, thereby overshadowing SMEs. This finding holds significant implications for SMEs functioning within the blue economy sector of Malaysia. A majority of the participants, more than 50%, have identified the lack of market support as a significant

A skilled workforce is a cornerstone of the success of any organization (Marchiori et al., 2022). The evaluation of 16% of the publications identified the lack of a trained workforce with specialist skills and expertise as a hindrance to the operations of blue economy SMEs (Graziano et al., 2022; Pinto et al., 2015; Phelan et al., 2020). SMEs sometimes find themselves in competition with larger organizations or industries for a limited pool of talent. Due to resource constraints, SMEs may face challenges in offering competitive remuneration, comprehensive training programs, and opportunities for career advancement. Furthermore, due to the dynamic nature of the blue economy, small and SMEs have a disadvantage in terms of improving the skills of their employees. This is especially crucial for Malaysian blue economy SMEs, as respondents have indicated that the inability to attract and retain skilled labor hinders the success of SMEs.

According to the scoping analysis of existing literature, one of the challenges that blue economy SMEs face on a global scale is the absence of government support. Because governments are critical in providing the legal, regulatory, and infrastructure foundations that allow companies to grow (Jentoft and Chuenpagdee, 2022). Inadequate government support may appear in the form of complex regulatory environments, a lack of financial incentives, and inaccessible support services for SMEs, impeding their ability to thrive and contribute to the blue economy (Midlen, 2021). However, given the Malaysia setting, the participants in the in-depth interviews did not perceive it as a major issue for blue economy SMEs. This is supported by the research of Arzaman et al. (2023), who observed that the Malaysian government has implemented specific plans and initiatives for SMEs in recognition of the immense potential of its marine resources and coastal regions. These plans have been incorporated into the national economic plans. These initiatives include facilitating access to financing through specialized loan schemes, providing tax breaks for sustainable marine-related ventures, and offering training and capacity-building programs to enable SMEs to capitalize on blue economy opportunities in a sustainable and profitable manner (Ashari et al., 2023).

Similarly, in the context of government support, SMEs in Malaysia do not encounter significant investment challenges. Despite being identified as a global concern for small and medium-sized enterprises (SMEs) in the blue economy by the scoping review (Shan et al., 2022; Tirumala and Tiwari, 2022), there are several issues that need to be addressed. The qualitative research findings revealed that participants perceived securing funding from investors as the least arduous aspect. One possible explanation for this phenomenon is that the Malaysian government, in its efforts to promote the growth of the small and medium enterprises (SMEs) sector within the blue economy, is likely to also consider the financial needs associated with this initiative (Khin et al., 2019).

4.1. Conclusion

The findings from the scoping review and qualitative research align in terms of identifying opportunities for SMEs in Malaysia's blue economy. Renewable energy, innovative financial instruments, goods based on circular economy-based goods, deep-sea fishing, mariculture, and port operations are some of the potential opportunities (Ktari et al., 2022; Mezzelani et al., 2018; Salpin et al., 2018; Sarker et al., 2018). The aforementioned findings are supported by interview data, which indicate an increasing awareness of the potential benefits of the blue economy in Malaysia. Moreover, there is a notable dedication among many stakeholders to promote its development. The involvement of government agencies, commercial industries, and international organizations serves as a positive indication of growing interest in this field, suggesting significant opportunities for economic growth and environmental sustainability in the future. One intriguing facet of these prospective opportunities lies in the focus on sustainability and conservation (Ertor and Hadjimichael, 2020). This suggests that people are becoming more conscious of the crucial role of environmental conservation in the context of economic growth (Novaglio et al., 2022). Another notable aspect pertains to the prioritization of

renewable energy, which has garnered significant attention from government entities and energy suppliers focused on this area. This observation indicates a significant inclination towards transitioning to sustainable and environmentally friendly energy sources. The aforementioned findings suggest that Malaysian SMEs have a significant potential to participate in the blue economy, particularly in sectors associated with sustainability and renewable energy.

4.2. Implications for policy and practice

The research findings hold significant implications for blue economy sector, as well as for regulators, policymakers, and other relevant stakeholders. The study provides industry participants with a more comprehensive comprehension of the challenges they encounter in executing their operations. Only four out of the six main challenges have been recognized as relevant to Malaysian blue economy. These challenges include governance structure, market support, infrastructure, and trained workforce (Christ et al., 2020; Midlen, 2021; Phelan et al., 2020; Reiss et al., 2021).

Navigating these challenges will divert managers' focus from crucial business strategies and mitigations (Agostini and Filippini, 2019). They may encounter difficulties in equipping their workforce with the necessary skills and competencies, thereby hindering their overall success. Managers can proactively implement preventive measures to equip their SMEs in anticipation of such challenges, drawing upon the insights derived from the outcomes of this research. To mitigate the challenges associated with governance structure, managers may consider forming a consortium with other SMEs to facilitate the exchange of information, resources, and best practices. To tackle the issue of market support, SMEs may expand their market presence by actively engaging with consumers and stakeholders through community outreach initiatives and educational programs. Attending industry conferences, seminars, and trade shows presents an alternative approach to addressing the challenges associated with market support. In conclusion, the identification of challenges presents an opportunity for SMEs management to devise effective solutions.

In a similar vein, the current study has identified multiple opportunities in which SMEs can establish a prominent position. These encompass a range of sectors, such as renewable energy, eco-tourism, innovative financial instruments, products aligned with circular economy principles, deep-sea fishing, mariculture, and port activities (Salpin et al., 2018). To maximize the potential benefits presented by these opportunities, it is advisable for SMEs to establish both local and international partnerships and collaborations. Collaboration with local communities has the potential to yield authentic eco-tourism experiences, while international partnerships can contribute to scientific advancements in aquaculture or ocean energy. Leveraging government incentives, when they are available, can provide both financial relief and assistance in research and development. With the association of Southeast Asian nations (ASEAN) market in close proximity, it is imperative for managers to carefully consider the potential for regional expansions facilitated by the digital sphere. This includes leveraging online sales platforms and virtual experiences. Continuous learning, staying abreast of global blue economy trends, and actively engaging in

regional conferences and expositions will enable organizations to enhance their strategic positioning in harnessing the potential of Malaysia's blue economy.

The identification of challenges faced by small and medium-sized enterprises (SMEs) due to their external environment has significant implications for regulators and policymakers (Hickmann et al., 2021). The justification for government intervention lies in the development of a simplified and supportive regulatory framework that facilitates compliance and reduces operational barriers for blue economy SMEs. Policymakers can benefit from gaining a comprehensive understanding of the challenges faced by SMEs. By doing so, they can develop more effective policies that address these challenges, including the streamlining of regulatory requirements and the provision of tax advantages. For instance, the complexity of the regulatory framework suggests that it is imperative for the government to reassess and streamline methods of compliance. The existing regulatory and permit framework may pose a daunting challenge for SMEs. This emphasizes the importance of implementing regulations that are open, simplified, and conducive to SMEs, thereby reducing bureaucratic red tape. Infrastructure challenges highlight the necessity for focused governmental investment in maritime infrastructure, encompassing ports, transportation, storage, and research facilities. The insufficiency of skilled workforce in specialized blue economy sectors is indicative of a shortage of education and training (Graziano et al., 2022). Policymakers may consider the possibility of establishing training institutes or forming partnerships with pre-existing institutions in order to equip the workforce with specialized skills relevant to the blue economy. Importantly, in the pursuit of establishing themselves in the global market, SMEs must be supported by authorities to foster international cooperation. This support is crucial in enabling SMEs to meet international standards and gain access to new markets.

On the contrary, the profusion of prospects within Malaysia's marine industries, encompassing renewable energy, sustainable fisheries, and marine biotechnology (Ridzuan et al., 2022), implies that the nation stands to gain significantly from policies that foster innovation and sustainable practices. Policymakers have the potential to establish innovation centers with a specific focus on marine-related initiatives. Additionally, they can develop training programs in collaboration with educational institutions and create global platforms for collaboration. The implementation of clear, eco-certified criteria has the potential to elevate Malaysia's blue economy to a global platform, thereby enhancing export capabilities and attracting foreign investments. Additionally, in light of the global market's increasing emphasis on sustainability, it is imperative to establish regulations that not only protect marine habitats but also promote the development of sustainable business models. In conclusion, the juxtaposition of challenges and opportunities suggests that Malaysia's policy framework needs to strike a harmonious equilibrium between providing supportive aid to SMEs and ensuring sustainable utilization of its vast blue economy resources.

4.3. Limitation

Similar to previous scholarly inquiries, this specific study is not immune to certain limitations. One notable limitation stems from the inherent characteristics of

scoping reviews, as highlighted by Yuriev et al. (2020). Academic literature reviews serve the purpose of offering a comprehensive synthesis of existing scholarly works, encompassing a wide array of research and publications. Nevertheless, the comprehensive nature of the topic can occasionally compromise the level of meticulousness (Yuriev et al., 2020). Although the review offers a comprehensive analysis of broad themes and patterns, it does not delve deeply into the technical intricacies or methodological rigor of individual studies. As a result, this may result in a generalised overview that, although beneficial, lacks the specific observations necessary to formulate precise and actionable recommendations.

Additionally, it is important to recognize that in-depth interviews may face certain limitations inherent to qualitative research, as they are inherently subjective and contingent upon the specific context (Creswell, 2014). The insights obtained from interviews offer significant and comprehensive viewpoints, although they can be influenced by the specific individuals or circumstances involved (Creswell, 2014). The unique perspective provided by this insight raises concerns regarding the generalizability of the findings to a broader context (Creswell, 2014). The generalizability of findings derived from a limited sample of stakeholders in blue economy SMEs stakeholders in specific regions of Malaysia is constrained, thereby precluding its extension to encompass the entire population of SMEs. This constraint emphasizes the importance of exercising caution when implementing the findings on a large scale.

The blue economy is characterized by its dynamic and evolving nature, which imposes a temporal limitation on its challenges and opportunities. This is because they are susceptible to change as a result of factors such as technological advancements, policy shifts, and environmental changes. While a scoping review and qualitative study can offer a limited overview of the blue economy during a particular period, they may not comprehensively encompass ongoing or future advancements (Paschoalotto et al., 2023). Additionally, it is important to consider that the outcomes of a scoping review can be susceptible to publication bias, which occurs when studies with noteworthy or positive results are more likely to be published. This bias has the potential to introduce distortion in the findings of the review, as it may result in the exclusion of unpublished studies or "grey literature" that could provide alternative or supplementary perspectives (Yuriev et al., 2020).

4.4. Avenue for future research

The results obtained from the scoping review and qualitative study conducted on SMEs in Malaysia's blue economy have identified a multitude of potential avenues for further research. First and foremost, it is imperative to acknowledge the dynamic disposition of the blue economy (Nurunnabi, 2020). In order to comprehensively understand the emerging challenges and opportunities within this sector, longitudinal studies that can track and analyze these developments over time are necessary. This research has the potential to shed light on the long-term viability of current business strategies, the effectiveness of policy interventions, and the adaptability of SMEs in response to evolving economic, environmental, and regulatory conditions. A comprehensive examination would also document the impacts of technological

advancements and global market movements on Malaysia's blue economy, thereby capturing a holistic understanding of the sector's development over time.

Second, while the initial qualitative research provided valuable context-specific insights, it also highlighted the challenge of generalizability (Creswell, 2014). Future research endeavors may employ mixed-method approaches, which integrate qualitative depth and quantitative breadth. Large-scale surveys may be undertaken in order to quantify the identified challenges and opportunities, thereby providing statistical significance to qualitative findings. Furthermore, conducting comparative studies on the small and medium-sized enterprise (SME) environment within the blue economy sector across different ASEAN nations could yield valuable insights into optimal strategies, shared challenges, and unique regional nuances. Such a comparative study can assist policymakers in implementing strategies that have proven effective in similar geographical contexts.

Finally, the research emphasized the significance of enabling infrastructure, regulatory frameworks, and skill development in SMEs' performance in the blue economy. Future study might go deeper into these areas, looking at particular infrastructure requirements, the effectiveness of present policies, and the skill shortages impeding SME development. Specialized research might also look at new funding structures, the effects of digital transformation, and the possibilities of sustainable tourism in the blue economy. Researchers may give focused advice by branching out into these specialized areas, building a knowledge base that can aid SMEs, policymakers, and investors in realizing the potential of Malaysia's blue economy.

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Appendix 1: Participant's profile

Participant Code	Position	Experience	Stakeholder Group	Scope
P1	Deputy director	25	Policy makers	Monetary and Finance
P2	Director	27	Policy makers	National Economic Development
P3	Deputy Secretary General	23	Policy makers	Trade and Industry Development
P4	Deputy Undersecretary	23	Policy makers	Fisheries
P5	Executive Director	25	Policy makers	Investment Promotion
P6	Deputy Undersecretary	20	Policy makers	Climate Change
P7	Principal Asstt Secretary	20	Policy makers	Energy Policy
P8	Deputy Director General	28	Policy makers	Maritime Enforcement
P9	Deputy Director	22	Policy makers	Energy Regulator
P10	Chief Executive Officer	20	Policy makers	Renewable Energy
P11	Deputy Director General	29	Policy makers	Productivity and Competitiveness
P12	General Manager	20	Policy makers	Capital Market Regulator
P13	Director	23	Policy makers	Trading Market Platform
P14	Managing Director	20	Industries	Energy Provider
P15	Senior Vice President	22	Industries	Sovereign wealth fund of the Government
P16	Under Secretary,	23	Policy makers	Transport
P17	Head (Strategy & Regulation)	23	Industries	Oil and Gas
P18	Chief Executive Officer	27	Industries	Technology Solution Provider
P19	Marine Policy Manager	20	International Organization	NGO on Nature and Environment
P20	Acting Secretary	25	International Organization	Energy Research
P21	Researcher	15	Academia	Research

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