

Review Article 02

Advancing the Blue Economy in Sri Lanka: A Systematic Review on Maritime Sector Development

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Abstract

The concept of blue economy has emerged as a vital factor that contributes to the maritime sector and economic growth of island nations like Sri Lanka that vastly depends on the maritime industry, which supports employment, trade, fishing, and tourism. However, due to environmental degradation, insufficient infrastructure, and poor governance, Sri Lanka has not fully benefited from its blue economy despite its potential. Existing literature on the Sri Lankan blue economy and maritime industry has largely focused on certain factors like fishing and shipping, leaving a gap for a critical and comprehensive assessment of the overall growth, barriers, and drawbacks of the blue economy in Sri Lanka. The main purpose of this study is to examine the impact of the blue economy on the development of the maritime sector in Sri Lanka. The methodology used in this study is a systematic literature review conducted using Scopus, Web of Science, ProQuest, and Google Scholar by using a sample of 60 articles published from 2000 – 2024 in this context. The inclusion criteria were the publication in English, the topic of the study was the blue economy or maritime sector in Sri Lanka, and it had to discuss the economic, environmental, social, or governance dimensions. The findings indicate that rich marine resources and aquaculture, the strategic location of the island, and government initiatives have driven Sri Lanka towards a blue economy. However, environmental degradation, limited infrastructure, climatic risks and socioeconomic factors have been identified as barriers to adopting the blue economy in Sri Lanka. According to the findings, the study presents the positive impacts, such as the growth of fisheries and aquaculture, the development of marine tourism, the promotion of renewable energy, and the empowerment of coastal communities. Despite the significance of the blue economy, this study also illustrates the drawbacks of blue economy frameworks, such as economic disparities, conflicting ideas with locals, overexploitation of marine resources and coastal pollution. Moreover, by offering evidence-based insights and policy recommendations for policymakers, industry stakeholders, and scholars, this study contributes to the broader discourse on sustainable maritime development.

Keywords: Blue economy, fisheries management, marine conservation, maritime industry in Sri Lanka, sustainable development

Introduction

The blue economy has emerged as an essential concept in sustainable economic growth, especially for islands like Sri Lanka, which has an expansive Exclusive Economic Zone (EEZ) that is about 8 times of their land area (Naveenan, 2018). This concept is always significant as a strategic approach to utilize maritime resources sustainably while encouraging economic progress of the country. The maritime industry is an important aspect of Sri Lankan economic growth, which includes fisheries, shipping, tourism, aquaculture, renewable energy and marine biotechnology (De Silva, 2008). Blue economy framework is included to these maritime activities to enhance the livelihoods and protect marine ecosystems (Ekanayake & Galdolage, 2024). The nation has an enormous opportunity to use blue economy for environmental sustainability, employment and economic diversification due to its ideal location along major international shipping routes wealth of marine resources (Hewawasam, 2024). However, Sri Lankan maritime industry still remains underutilized despite its various policy initiatives and international partnerships. Barriers such as, ineffective regulations, environmental degradation, lack of technology adoption and inadequate infrastructure investments are hindering the sector from expanding (Gunawardena et al., 2024).

Although Sri Lanka has acknowledged the significance of blue economy, the country has failed to fully realize the potential of this sector. Overfishing, marine pollution, poor port infrastructure and inconsistencies of the government have hindered the sector's ability to operate sustainably (Kumara, 2017). Furthermore, Sri Lanka falls behind other nations in incorporating advanced technologies like artificial intelligence, big data, and green breakthroughs in their maritime sectors (Melnik et al., 2023). To address these shortcomings, a thorough assessment of the existing strategies and how they drive the expansion of the sustainable maritime industry are necessary.

The existing literature discusses the theoretical aspects to blue economy and maritime industry such as, Eco – system based management (Marwan, 2024), circular economy principles (Okumus et al., 2024), Marine spatial planning (Marwa et al., 2024) and Blue biotechnology (Economy et al., 2014). Despite an increasing number of studies related to the blue economy of Sri Lanka, the current literature is rather fragmented as most of the research is based on isolated elements of the maritime sector, such as fisheries, shipping or tourism, rather than providing an overall assessment of the industry. Moreover, findings from previous literature are presented descriptively, without integrating them into an integrated framework that offer insights into policy and practice. Additionally, research frequently highlights the economic contributions without emphasizing on sustainable issues and technological advancements that are necessary for long – term success. By systematically analyzing current literature, the study aims to close these gaps and offer a thorough understanding of the current situation and the potential of maritime industry while focusing on blue economy.

The study is significant for policymakers, industry stakeholders and scholars as it provides an analytical evaluation on Sri Lankan maritime industry in the context of larger blue economy framework. The study is to support technical innovation, environmental preservation, and sustainable economic growth in the industry by identifying important issues, efficient

practices, and policy recommendations. Additionally, the findings of the study serve as a platform for future research and tactical decision – making ensuring that Sri Lanka maximizes its maritime potential while adhering global sustainable development goals (SDGs).

Research Objectives

1. To synthesize existing literature on the significance of maritime industry in Sri Lanka within the broader blue economy framework.
2. To assess how previous studies have discussed the benefits and drawbacks of Sri Lankan blue economy framework.
3. To review and critically analyse the documented opportunities and challenges to blue economy in Sri Lanka.
4. To discover instances of convergence, divergence and unexplored themes in the literature, thus, directing future research and policy directions.

Literature Review

Significance of the Maritime Sector in Sri Lanka

Because of the Sri Lanka's advantageous location in the Indian ocean, maritime industry is vital to nation's economic growth. Recent data indicate that, Sri Lankan maritime sector which include fishing, boat manufacturing, marine tourism and port operations, accounts for around 2.5% of the nation's GDP. (Hewawasam, 2024). Fisheries are the primary component of the maritime sector in Sri Lanka providing livelihood for significant number of households in the country. According to the data from Ministry of Fisheries, Aquatic and Ocean resources, 223,720 fishermen are employed in marine fisheries sector (Ministry of Fisheries, 2024). The fishing sector not only benefits local communities but also influences in food security and exports profits (Athukorala & Amarasinghe, 2020). Studies mention that sustainable fishing methods are crucial in Sri Lankan fisheries industry in order to avoid over exploitation and guarantee the long – term sustainability of marine resources. Research reveals that incorporating appropriate management practices can boost the production and sustainability of fisheries, and that will benefit both the economy and the environment (Justice et al., 2020).

In addition to fishing, Sri Lankan economy depends heavily on shipping and maritime trade. The port of Colombo, one of the finest ports in south Asia, is one of the country's many important ports. By facilitating trade, the port acts as a interchanging point for goods bound for other areas, thus boosting the national economy (Munasinghe, 2021). Strategic efforts such as China's belt and Road initiative which aim to strengthen the connectivity and infrastructure of the area, further increase the maritime sector's contribution to economy including investments in Sri Lankan ports (Gunawan & Napitupulu, 2023). Such investments not only increase trade but also create investment opportunities and economic growth.

Marine tourism is another vital component of the maritime industry. With millions of visitors annually attracted to Sri Lanka by its breathtaking beaches, coral reefs, and abundant marine life, marine tourism creates job opportunities, foreign income and it supports the overall economy of Sri Lanka (Deyshappriya et al., 2019). However, studies suggest that marine tourism needs a sustainable management approach that minimizes the environmental impact to attract much more tourists (Anandasayanan et al., 2020).

Additionally, the geopolitical stability and national security of the Indian Ocean region is heavily dependent on the maritime industry. Due to its precise location, Sri Lanka serves as the hub for marine trade routes, which affects the dynamics of regional security (Careem, 2022). Sri Lanka's partnerships with maritime nations of the region, including India and China, reflects its significance in the geopolitical landscape (Babar, 2024). It is clear that maintaining an effective maritime sector not only contributes to the economy of the country but also to safeguarding the country's interests and maintaining cooperation with other nations.

In essence, fisheries, shipping, marine tourism, and key geopolitical considerations are all part of Sri Lanka's crucial maritime industry. To maximize the sector's economic contributions while maintaining environmental protection, effective management of marine resources and the construction of maritime infrastructure are essential. The marine industry will continue to be a vital component of Sri Lanka's strategic and economic initiatives as it navigates the intricacies of the global maritime environment.

Conceptualizing Blue Economy

The new concept of "Oceans economy" or "Blue economy" developed during the United Nations Conference on Sustainable Development in Rio de Janeiro in 2012. Various authors defined blue economy in numerous ways. Most of the researchers refer the term Blue economy as the sustainable use of ocean resources for economic advancements, improved livelihoods and job creation without harming the well – being of the ocean ecosystem (Marwan, 2024). It includes a broad range of efforts, such as biotechnology, renewable energy, marine tourism, aquaculture and fisheries. All these components have been intended to encourage economic growth while maintaining ocean environment sustainably (Ahmadi et al., 2024). Furthermore, many authors suggest that blue economy is not just a business model, it is paradigm change that acknowledges ocean as a key resource that can sustain numerous communities (Ali & Sulistiyono, 2025; Youssef, 2023). However, some authors argued that the term blue economy lacks an universal definition that results in contrasting interpretations and leads to difficulties when implementing policies and regulations (Bennett et al., 2019).

Studies have identified various characteristics of blue economy. The blue economy's focus on inclusivity and sustainability is one of the distinguishing characteristics. It aims to strike a balance between commercial interests and ecological integrity by encouraging the measures that stop over utilization and deterioration of marine resources (Mahadiansar et al., 2023). For example, countries have deployed sustainable fisheries management practices which is crucial to maintaining fisheries stocks and guaranteeing food security (Booth et al., 2021). Furthermore, marine protected areas (MPA) are essential for preserving biodiversity and boosting economic resilience (Mahadiansar et al., 2023). Furthermore, most nations are starting to integrate technological innovations into the blue economy (Sarker et al., 2019). They believe that technology can boost resource efficiency and minimize environmental impact. Thus, it will support to the long – term success and vision of marine industry in the world (Miassi & Dossa, 2024). For instance, modern maritime industries use artificial intelligence, big data analytics and machine learning to transform aquaculture and fisheries by making proper farming methods that maximize resource use and minimize waste (Dhar et al., 2021). Moreover, these technologies are used to forecast weather and climatic conditions which is essential for fishermen to avoid any uncertainties and difficulties (Sarkar et al., 2021).

The global blue economy is significant as it touches on more general global concerns such as sustainable development goals (SDGs) of UN. It is becoming more widely acknowledged as a way to address global issues such as reducing poverty, ensuring food security and mitigating the effects of climatic changes (Liang et al., 2022). The blue economy can help achieve several

SDGs, especially those pertaining to equality, sustainability of the environment, and economic growth, by encouraging sustainable practices and fair access to marine resources (Montemayor et al., 2021).

However, the blue economy is not without difficulties. Implementation of blue economy may be hindered by issues such as policy inconsistency, competing stakeholders' interests and the requirement for efficient government mechanisms (Voyer et al., 2018). For example, a case in Panama highlights the significance of designing integrative ocean policies that match current governance frameworks to increase the efficacy of blue economy initiatives (Ycaza et al., 2024). Furthermore, the conflicting discourses around the blue economy can result in misinterpretations and misalignments of aims as different actors may emphasize different facets of ocean usage and conservation (Hicks & Childs, 2019; Nash et al., 2020).

It is clear that the concept of blue economy represents a transformative approach to maritime resource management with the focus on economic growth of countries while preserving the ocean environment. As nations and communities have a growing interest on blue economy, it will play a crucial role in future sustainable development (Bennett et al., 2019).

Drivers and Barriers for Sri Lankan Blue Economy

Not only in the global context, but also in the Sri Lankan context, blue economy has become a growing and necessary concept because of rising sustainability issues of Sri Lankan maritime sector. Blue economy in Sri Lanka presents both drivers and challenges that impact on its development and sustainability.

The main driver of Sri Lankan blue economy is identified as the rich marine biodiversity and resources. Many studies have shown that Sri Lanka encompasses wide range of marine resources such as fisheries, aquaculture and marine tourism which provide opportunities for sustainable resource utilization (Ekanayake & Galdolage, 2024). One important export-oriented industry in Sri Lanka that demonstrates the potential for economic growth through sustainable practices is the blue swimming crab (*Portunus pelagicus*) fishery (Haputhanthri et al., 2021). Furthermore, authors demonstrate that numerous marine animals can be found in island's coastal waters which attract ecotourism and research opportunities (Priyadarshana et al., 2016).

Strategic geographical location is another factor that influences blue economy in Sri Lanka. Sri Lanka been the transaction hub for the major shipping routes across Indian ocean. The port of Colombo one of the most significant ports in south Asia, facilitates maritime trade and developing maritime sector of Sri Lanka (Uluwaduge, 2022). In addition to increasing trade, its advantageous location enables opportunities for foreign direct investments (FDI) in maritime infrastructure (Kumari, 2020).

Government policies and initiatives also act as drivers of the blue economy. Studies mention that the government of Sri Lanka is actively enforcing regulations for sustainable marine resource management as it understands the value of the blue economy. A healthy blue economy depends on initiatives to improve marine conservation, fishery management, and ecotourism development (Drean, 2022). The goal for sustainable practices in the maritime sector is further strengthened by incorporation of blue economy provisions, which are aligned with sustainable development goals (SDGs) (Export Development board, 2023).

Furthermore, increasing global demand for sustainable maritime products also drives Sri Lanka towards blue economy. Studies have identified that demand for sustainably sourced seafoods and eco – tourism is rising at a rapid pace (Gu & Hong, 2013). Thus, Sri Lanka may take the benefit of this trend to establish itself as a pioneer in environmentally friendly marine

operations, drawing in foreign investors and markets (Deyshappriya et al., 2019). Ecotourism's potential, especially for whale viewing, has been identified as a major growth sector (Priyadarshana et al., 2016).

Despite the growing trends and other potential drivers to Sri Lankan blue economy, studies also have assessed the challenges for implementing blue economy in Sri Lankan context. One of the major barriers is environmental degradation and overfishing. Despite having abundant maritime resources, overfishing and ocean pollution are rising concerns in Sri Lanka. The long-term sustainability of fisheries and marine biodiversity are under risk due to unsustainable fishing methods (Manage et al., 2022). These issues affect harmfully to sustainable marine resources and hamper the blue economy expansion. Climatic changes and natural disasters are identified as another barrier in this context. Impacts of climate changes such as rising sea level and increase in the frequency of extreme weather conditions pose a significant risk to ocean ecosystems and coastal communities (Sivakumar & Stefański, 2010). Studies illustrate that Sri Lankan coastal ecosystems and maritime sources have more tendency to be impacted from adverse weather conditions because of its presence as an island (Samaraweera et al., 2024).

Moreover, socioeconomic factors can be a challenge for Sri Lankan blue economy. Studies suggest that poverty of communities who live in coastal lines of Sri Lanka is relatively high. Thus, unsustainable fishing methods might result from poverty and unemployment in coastal communities as people look for short-term financial relief (Ekanayake & Galdolage, 2024). Additionally, studies further argued that, the effective deployment of blue economy efforts may be hampered by a lack of public understanding of the significance of sustainable marine resource management (Rathnayake, 2022).

Due to its strategic location and richness of marine resources, Sri Lanka has enormous potential for sustainable economic growth in the blue economy. However, achieving this potential necessitates overcoming numerous barriers, such as socioeconomic issues, infrastructure deficiencies, regulatory obstacles, and environmental deterioration. Sri Lanka can successfully negotiate the intricacies of the blue economy and advance a sustainable future for its marine resources by encouraging cooperation among stakeholders, raising public awareness, and putting good management measures into practice (Alharthi & Hanif, 2020).

Impact of Blue Economy on the Sri Lankan Maritime Sector

The blue economy has a complex effect on Sri Lankan maritime industry including economic, social and environmental aspects. The blue economy framework provides a mechanism to increase the maritime sector's contribution to national development as Sri Lanka seeks to utilize its marine resources sustainably (Wuwung et al., 2022).

South Asia countries, particularly island countries like Sri Lanka may have numerous economic benefits of blue economy due to their precise location and rich marine resources (Mondal et al., 2024). Studies mention that blue economy practices often lead to the growth of fisheries and aquaculture. Blue economy promotes sustainable fisheries and aquaculture, which are the most vital factors for the livelihood of coastal communities in Sri Lanka. Furthermore, these resources not only ensure food security but also major drivers of Sri Lankan exports revenues (Ekanayake & Galdolage, 2024). Studies reveal that, by utilizing sustainable means of fishing and aquaculture, countries can boost their fishery productivity while maintaining long – term health of marine ecosystems (Kusdiantoro et al., 2020). This shift towards blue economy may enhance the income level of Sri Lankan fishermen and other related industries, thus develop the local economy. Another positive impact of blue economy is expansion of nation's marine tourism. Sri Lankan attractive beaches and rich biodiversity

draw large number of local and foreign tourists annually. One major impact of blue economy is growth of whale watching, especially in areas such as Trincomalee and Mirissa (Bandara & Bandara, 2019). Studies have identified that due to this growth in marine tourism, high amount of foreign revenue may come into the country and numerous job opportunities has been created for local communities which help to develop Sri Lankan maritime industry and ultimately the local economy (Ekanayake & Galdolage, 2024). Furthermore, studies have demonstrated that blue economy practices encourage investments in maritime infrastructure including ports and shipping facilities. Improving port infrastructure and logistics can boost economic growth by drawing foreign direct investments and increased trade competitiveness, which also increase the demand for Sri Lankan maritime facilities among other nations (Cooray et al., 2013). Also, this development of maritime infrastructure is vital in understanding the full potential of Sri Lankan maritime industry.

Addition to the economic impact, blue economy serves as a driver to enhance environmental impact in the maritime sector. The blue economy paradigm highlights the significance of preserving marine ecosystems and biodiversity. Important habitats like coral reefs and mangroves, which are necessary to preserve ecological balance, can be protected with the support of sustainable fishing and tourism practices (Loureiro et al., 2022). By prioritizing these conservation efforts Sri Lanka can strengthen their marine ecosystems' resistance to climatic challenges and other environmental pressures, which results in boosting overall maritime industry in the country. Furthermore, the blue economy promotes behaviors that mitigate marine pollution, like using less plastic and managing waste responsibly. Marine habitats can be considerably improved by putting laws in place to reduce pollution from shipping and coastal activities (Priyadarshana et al., 2016).

Moreover, the social impact of blue economy framework is also highlighted by some studies. Raising public awareness of the benefits of blue economy is essential to gain their support and involvement. Local communities can benefit from educational programs that increase awareness of sustainable practices and the value of marine conservation (Ekanayake & Galdolage, 2024). Through these sustainable awareness programs, countries can have a future generation who seeks to protect marine resources (Ridzuan et al., 2022).

However, some studies have identified various shortcomings of blue economy. Studies have found out that blue economy concepts sometimes might be conflicting with local communities, particularly, when their traditional fishing grounds get affected by various commercial activities (Evans et al., 2023). For instance, the growth of commercial whale watching in places like Mirissa has positively impacted the local economy, but it has also raised concerns about conflicts with traditional fishermen and the possibility of disrupting local whale populations (Anderson & Alagiyawadu, 2019). Another drawback is that the blue economy may increase economic inequalities even though it aims to improve the livelihood and employment opportunities. Studies illustrate that local communities may not fully receive the equitable share of the profit from marine resources as majority of the profit may divide between larger firms and outside vendors (Germond-Duret et al., 2022). Furthermore, studies have illustrated that, although Sri Lankan government take initiatives to enhance the adoption of blue economy (Sakhuja, 2015), there is still lack of proper regulatory framework to mitigate coastal pollution and illegal fishing (Rathnayake, 2022). Moreover, economic activities related to blue economy such as, marine tourism, increased shipping traffics and overexploitation of marine resources can cause oil spills, marine pollution and habitat destruction (Russell et al., 2020). These environmental impacts and marine biodiversity impacts are identified as negative effects of blue economy.

According to the existing literature, it is understandable that blue economy often impacts

positively to Sri Lankan maritime industry through productive fishery practices, increased marine tourism, enhanced international trade and public awareness, which results overall boost in the country's economy. However, a few studies have identified the negative consequences of blue economy such as, effects to local communities, economic inequalities and harmful effects to marine ecosystem. Thus, a perspective with balancing economic development with environmental protection and social equity is a necessity to utilize blue economy to its fullest potential. Additionally, the global community has identified the significance of blue economy in attaining sustainable development goals (SDGs).

Research Methodology

This study employed a Systematic Literature Review (SLR) approach to evaluate how the blue economy contributes to the development of Sri Lanka's maritime sector. The methodology followed the PRISMA 2020 guidelines (Page et al., 2021), ensuring transparency, rigor, and replicability. The review protocol was developed using the PEO framework (Population–Exposure–Outcome). The population was defined as studies on the Sri Lankan maritime sector, the exposure was the blue economy and its associated drivers, barriers, and impacts, and the outcomes of interest included economic, environmental, social, and policy implications. Studies were eligible if they were published between 2000 and 2024, written in English, and reported findings on Sri Lanka's maritime or blue economy sector, including primary studies, policy reports, and systematic or scoping reviews. Studies unrelated to Sri Lanka or without empirical or conceptual relevance to the maritime blue economy were excluded.

Literature was systematically searched in Scopus, Web of Science Core Collection, ProQuest, JSTOR, and Google Scholar for supplementary coverage. Additionally, Sri Lankan institutional repositories such as those of the University of Sri Jayewardenepura, University of Colombo, and Central Bank of Sri Lanka were consulted. Grey literature including government reports, NGO reports, and conference papers were also included to minimize publication bias (Paez, 2017). The main search strategy combined keywords and Boolean operators. For example, in Scopus the search string was: *("blue economy" OR "ocean economy" OR "maritime economy") AND ("Sri Lanka") AND (fisheries OR shipping OR tourism OR aquaculture OR "marine resources" OR sustainability)*. Search strings were adapted for other databases with controlled vocabulary adjustments.

Two independent reviewers screened all records at title/abstract and full-text levels. Disagreements were resolved by discussion, and inter-rater reliability was calculated using Cohen's kappa, which achieved 0.82, indicating substantial agreement. A pre-piloted data extraction form was used to collect information including bibliographic details (author, year, source), study type (empirical, review, policy report), sectoral focus (fisheries, aquaculture, shipping, tourism, governance), drivers, barriers, and impacts of the blue economy, geographical and temporal scope, and funding or conflicts of interest when available.

To assess quality, the Critical Appraisal Skills Program (CASP) checklist (CASP, 2022) was applied for qualitative and policy-oriented studies, while the Joanna Briggs Institute (JBI) appraisal tools were used for mixed-methods studies. Quality scores were reported for each study, and sensitivity analyses were conducted to assess the robustness of the synthesis. Given the heterogeneity of study designs and outcomes across the included literature, a quantitative meta-analysis was not feasible. Thus, the findings were synthesized using a thematic synthesis approach (Thomas & Harden, 2008). Codes were developed deductively from the PEO framework and inductively from the literature, then organized under economic,

environmental, social, and governance dimensions of the blue economy. Vote-counting of study frequencies was also used to support the narrative synthesis.

The search identified 428 records, of which 376 remained after deduplication. After title and abstract screening, 142 studies were retained for full-text review. A total of 60 studies met the inclusion criteria and were included in the final synthesis. The PRISMA 2020 flow diagram illustrates each stage of the review.

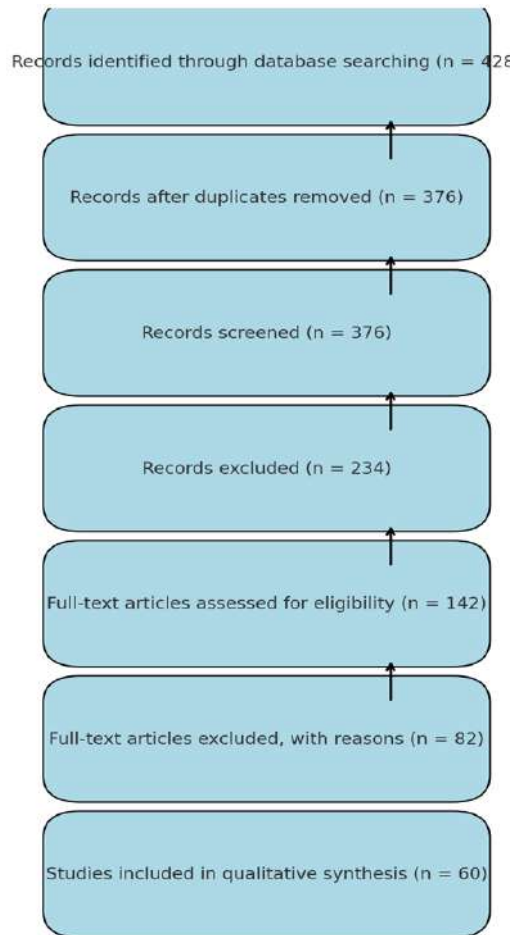


Figure 1. PRISMA 2020 Flow Diagram

The above flow diagram showing the stages of your systematic review:

- 428 records identified
- 376 after duplicates removed
- 376 screened
- 234 excluded
- 142 full texts assessed
- 82 excluded with reasons
- 60 included in final synthesis

Results and Interpretations

The purpose of this paper was to review the role of blue economy in the maritime sector of Sri Lanka in its economic, environmental, social and governance dimensions. The analysis, based on a systematic literature review of 60 articles, is compelling evidence that blue economy can be key in helping to boost maritime development in Sri Lanka. The frequency counts were applied to emphasize the frequency of occurrence of some themes in the 60 studies. For instance, infrastructure constraints being referenced in 28 papers, overfishing, and depletion of marine resources in 24 papers, marine tourism opportunity in 21 papers and regulatory fragmentation in 19 papers. Such numbers show what problems the literature is saturated with and where there is agreement or disagreement.

The major purpose is to determine whether national economic growth can be achieved through the blue economy. The results affirm that maritime sectors (especially shipping, fisheries, and tourism of the coast) are a major source of foreign exchange revenue and job opportunities in Sri Lanka (De Silva and Yamao, 2007; Hettiarachchi, 2020). The port system and the Port of Colombo, in particular, is a key hub in South Asia, whereas the fisheries sector is a key source of employment, food security, and foreign exchange earnings (Attanayake, 2021). Marine tourism also enhances economic contribution through the existence of high revenue flow. But unless these industries are managed sustainably, there is a risk of overexploitation of marine resources, which will destroy long-term economic potential. This highlights the necessity of integrating sustainability into all blue economy plans, and this is in accordance with international best practices (World Bank, 2017).

The societal and community-level social impacts of the blue economy were also reviewed. Small scale fisheries and coastal tourism were discovered to greatly improve local livelihoods. However, most of the coastal populations are marginalized as places lack adequate infrastructure, unequal distribution of resources, and lack policy support (Amarasinghe, 2014; Siriwardana et al., 2019). This imbalance shows that even though the blue economy holds promise to reduce poverty and generate jobs, inclusive governance and more vigorous policy interventions are needed to achieve fair results.

The concept of environmental sustainability was observed as an impetus and an obstacle in the studies under review. The coastal and marine ecosystems of Sri Lanka are on the brink of extinction due to the effects of overfishing, pollution, and climate change that include sea-level rise (Weerakoon et al., 2020). The blue economy offers renewable energy and sustainable aquaculture opportunities on the positive side. Nonetheless, laxity in regulation is a great limitation. It is the better governance and greater adherence to global goals like the UN Sustainable Development Goals (UN, 2018) that would achieve the environmental goals of Sri Lanka.

Another very important dimension is governance and institutional structure. The existing policy surroundings in Sri Lanka are uncoordinated, and there is a lack of integration between the economic, environmental, and maritime sectors due to overlapping roles that individual ministries possess (Fernando, 2019). Other developing countries have provided comparative evidence that strong institutional coordination, coherent policies, and working partnerships between the public and the private are fundamental to ensuring blue economy benefits are maximized (Voyer & van Leeuwen, 2019). Enhanced governance and involvement of the stakeholders will then be the major focus in ensuring that the full potential of maritime in Sri Lanka is realized.

Conceptualization of the blue economy has been described in the global context as the sustainable utilization of marine resources as a way to promote economic growth, better livelihoods, and health of ocean ecosystems (Smith-Godfrey, 2016). Although it is popular common-sense, it is also observed by scholars that there is no standard definition, and this makes harmonization of global policy difficult. Digital solutions are also becoming more popular among advanced economies, like AI, big data, and machine learning, to improve maritime operations (Raza et al., 2023). The introduction of these technologies in Sri Lanka would enhance the efficiency and make practices more sustainable.

The review was also able to determine drivers and barriers to the implementation of principles of the blue economy in Sri Lanka. Major drivers are the strategic geographic positioning of the country, high level of marine resources and increasing awareness of sustainability (McKinley et al., 2020). Nevertheless, environmental degradation, regulatory inefficiency, insufficient infrastructure and socio-economic inequality are some of the major obstacles.

The blue economy has many effects. Economically, fisheries, aquaculture, and marine tourism growth lead to increment in revenues and enhanced livelihoods (Marwa et al., 2024). The blue economy contributes to the protection of biodiversity and reducing pollution as an environmental policy (Priyadarshana et al., 2016). Socially, it increases the number of jobs and builds sustainability awareness. However, some of the adverse effects exist as well, such as environmental stresses caused by high shipping traffic, lost opportunities to local populations due to the desire to use the resources, and unequal distribution of profits. These results underscore the relevance of moderated policy frameworks to maximize the benefits and minimize the risks.

Taken together, the results confirm that the blue economy presents an opportunity of the maritime sector development in Sri Lanka. However, to achieve this potential, there should be a tradeoff between economic growth, environmental sustainability, and social inclusion. As the literature shows, there are opportunities but there are also weak points in governance and the dangers of overexploiting resources. These problems require policymaking that is evidence-based, investing in sustainable technology, and being more focused on international standards, including the SDGs.

This discussion not only confirms the objectives of the study but also provides the key gaps in which the research and policy need to be filled. Specifically, future studies ought to be dedicated to the economic appropriateness of marine ecosystem services and how digital technologies and innovation can promote the blue economy of Sri Lanka.

Conclusion and Recommendation

In the context of the blue economy, this report offers a systematic literature review of Sri Lanka's maritime industry, highlighting its opportunities, difficulties, and development paths. The results show that Sri Lanka has several maritime advantages, including its strategic location, large Exclusive Economic Zone (EEZ), and variety of marine resources. Countries with successful blue economy strategies, like Singapore, Norway, and the European Union, have put in place integrated policy frameworks, cutting-edge maritime technologies, and strict environmental laws to ensure long-term sustainability, according to a comparison with global best practices. In contrast, Sri Lanka needs to make significant progress in these areas if it hopes to successfully grow its blue economy.

Due to its richness in marine sources and aquaculture, strategic location and government intervention, Sri Lanka has taken a move towards blue economy which will positively affect to the development of maritime sector and the economy of the country by developed maritime

infrastructure an enhanced marine tourism. However, it is found that blue economy employment in Sri Lanka may bring some shortcomings like conflicts with local population, economic differences and marine pollution. In order to achieve sustainable blue economy in the maritime industry, Sri Lanka needs to take a more coordinated and progressive approach, combining economic growth with environmental preservation and technical innovation and sustainable fishery management.

Based on the findings, the study aims to provide recommendations for various parties related to maritime sector in Sri Lanka. Policymakers are recommended to expand and modernize port infrastructure in Sri Lanka in Colombo and Hambantota by adopting digitalization for more efficient port operations. And the government must enforce an effective policy and regulatory framework against illegal and unsupported fisheries. Furthermore, Sri Lanka needs to expand the number of Marine Protected Areas (MPAs) to protect biodiversity and enforce stronger laws against habitat loss and coastal pollution. Moreover, it is recommended to improve environmental monitoring and maritime operations, promote investment in big data analytics, artificial intelligence, and Internet of Things-based monitoring systems. Also, companies related to maritime services and marine tourism need to conduct public awareness campaigns on blue economy and provide the necessary knowledge on significance of blue economy to the community.

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