Integrating aquatic ecosystem services into economic models for sustainable coastal tourism development

Abdulkhamid Akbarov[1*]; Dilnoza Islomova[2]; Bakhodir Khoshbakov[3]; Nasiba Safarova[4]; Gulnoza Salixova[5]; Jaloliddin Narziyev[6]; Ugiloy Yunusova[7]

Received: 25 August 2025; Revised: 17 October 2025; Accepted: 15 November 2025; Published: 20 December 2025

Abstract

Sustainable development of coastal tourism requires incorporating aquatic ecosystem services into economic models. This paper examines the feasibility of integrating ecosystem services (water quality, biodiversity, and coastal protection) into economic models to advance long-term, sustainable tourism practices. The idea of natural capital is taken as the starting point, with the focus on the intrinsic worth of the coastal ecosystem as a contributor to tourism and local livelihoods. The research objectives include assessing the economic significance of aquatic ecosystem services, determining their role in coastal tourism, and developing a framework for incorporating them into economic decision-making. Some methods involve a mixed-methods approach, economic valuation, ecosystem services evaluation, and stakeholder consultation to collect both quantitative and qualitative information. The findings suggest that coastal tourism depends heavily on aquatic ecosystems, which are often underappreciated, as they provide essential services to the tourism sector, such as habitat for marine organisms, shoreline stabilization, and water purification. Nevertheless, the study also finds that the services are often undervalued by conventional economic approaches, resulting in excessive use of coastal resources. The paper suggests the following recommendations for integrating ecosystem

1*- Senior Lecturer, PhD Researcher, Tashkent State University of Economics, Andijan, Uzbekistan. Email: abdulhamidullo97@gmail.com, ORCID: https://orcid.org/0000-0002-6478-8293
2- Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, National Research University, Tashkent, Uzbekistan. Email: dilnozaislomova050510@gmail.com, ORCID: https://orcid.org/0009-0004-7551-1224
3- University of Economics and Service, Termez, Uzbekistan. Email: baxodir_xushbakov@tues.uz, ORCID: https://orcid.org/0009-0006-7566-6976
4- National Pedagogical University of Uzbekistan named after Nizami, Tashkent, Uzbekistan. Email: nasibasafarova1975@gmail.com, ORCID: https://orcid.org/0009-0006-6221-5375
5- Uzbekistan National Pedagogical University named after Nizami, Tashkent, Uzbekistan. Email: shirinkhon.1805@gmail.com, ORCID: https://orcid.org/0009-0009-5891-4466
6- Tashkent State University of Economics and Tourism, Tashkent, Uzbekistan. Email: jalalitdinnarziyev@gmail.com, ORCID: https://orcid.org/0009-0003-5103-5828
7- Senior Teacher, Research Center, Scientific Foundations and Problems of the Development of Uzbekistan's Economy, Under Tashkent State University of Economics, Tashkent, Uzbekistan. Email: ubolkiboyeva@bk.ru, https://orcid.org/0009-0005-9018-8960
*Corresponding author
DOI: 10.70102/IJARES/V5I2/5-2-73

services into tourism planning, emphasizing the need for a policy that supports ecological protection alongside economic development.

Keywords: Aquatic ecosystem services, Economic models, Coastal tourism, Sustainable development, Natural capital, Ecosystem valuation

Introduction

Coastal tourism is an important industry worldwide, generating substantial revenue and providing sustenance for millions of people. It incorporates various activities such as beach holidays, recreational boating, scuba diving, and environmental tourism; all based on sound aquatic life ecosystems such as coral reefs, mangroves and coastal marshlands. These ecosystems, characterized by natural beauty and biodiversity, are also dependent on the health of the marine and coastal environment, as millions of tourists visit these areas every year. Yet the same ecosystems that support tourism are prone to destructive human interventions, such as pollution, overfishing, habitat destruction, and climate change. This reliance on healthy aquatic ecosystems necessitates an integrated tourism development methodology that can guarantee the long-term sustainability of the environment and the economies of host countries that depend on it Reddy and Sailesh, 2024. According to (Lopes and Videira, 2013), incorporating participatory frameworks into ecosystem service valuation is important for managing coastal resources in a manner that is mutually advantageous to tourism and environmental well-being.

The inclusion of ecosystem services in economic models is essential for ensuring the sustainability of tourism growth and environmental conservation. The purification of water, carbon sequestration, coastal defence, and support for biodiversity are ecosystem services that bring significant value to the economy, yet are frequently ignored in conventional economic frameworks (Bakari, 2018). Including the cost of these services allows for a more realistic economic evaluation that captures the true costs and benefits of tourism. This not only identifies the need to maintain healthy ecosystems, but also ensures that natural capital is preserved for future generations. As noted by Zhao *et al*., 2024, coastal cultural ecosystem services are essential to narrowing the gap between natural and social ecosystems to ensure sustainable development (Saidova *et al*., 2024). Coastal tourism will be self-destructive if it fails to factor in the long-term economic and environmental degradation of these facilities (Badashtiani, Talaei and Habib, 2025).

This research aims to examine how tourism impacts the health of aquatic environments, determine the economic benefits of healthy aquatic environments in tourism-dependent societies, and offer ways to incorporate ecosystem services into tourism development models. The paper is important because it focuses on the growing desire for a more sustainable, modern approach to coastal tourism. (Dvarskas, 2017) proposes dynamically connecting economic models and ecological conditions, especially in sustainable tourism planning, so that growth does not compromise

environmental health. The current models pay little attention to the long-term environmental and social impacts of tourism expansion, which may lead to unsustainable activities and environmental degradation. The research would enable a balanced approach to tourism by offering practical recommendations for policymakers, tourism operators, and local communities interested in managing the environment and ensuring economic growth by considering ecosystem services throughout the value chain. Phelan, Ruhanen and Mair, 2020 also emphasize the need to adopt an ecosystem services approach to develop a just and sustainable blue economy. (Basconi *et al*., 2023) have demonstrated the role of ecosystem services in the management of coastal and marine resources, which could serve as a useful model for the Mediterranean region and, hence, other countries worldwide. Mehvar *et al*., 2018 also underline the economic value of coastal ecosystem services, underscoring the need to properly quantify these services in the tourism development context. The results will contribute to the overall discussion of sustainable development and open new avenues for the development of coastal tourism, bringing long-term benefits to both nature and humanity.

Conceptual Framework

Eco fabrication: Aquatic ecosystem services refer to the benefits humans derive from healthy marine and coastal ecosystems. Such services are generally divided into four key categories: provisioning, regulation, support, and culture. The provisioning services are the physical products of aquatic ecosystems, such as fish, shellfish, and freshwater, which local people and the tourism sector demand. The regulation of services entails how the ecosystem controls environmental processes, such as storm protection, water purification, and carbon sequestration through blue carbon ecosystems like seagrasses and mangroves. The essential ecological processes that facilitate other services include nutrient cycling, primary production, and habitat provision for marine species to thrive. Cultural services refer to non-material services derived from ecosystems, including recreational, aesthetic experiences, and cultural values, which play a central role in coastal tourism. These services form the core of the appeal of the coastal tourism destinations, which are part of activities such as scuba diving, boating, and ecotourism. The significance of the ecosystem services approach in tourism planning has been underscored by Sholeha and Sumarmi, 2025 in their study on sustainable tourism management at Perawan Beach in East Java, Indonesia.

The natural capital concept describes the inventories of natural resources in the world that have natural resources like land, air, water, and biodiversity, which deliver ecosystem services that are vital to human well-being. In the context of coastal tourism, natural capital should be considered as an element of the development models that will support sustainable tourism practices. The ecosystem approach to tourism development emphasizes the need to ensure that marine and coastal ecosystems are healthy, enabling long-term tourism benefits. The principle of

this approach is the conservation of biodiversity and the sustainable utilization of natural resources, so that tourism activities do not exceed the ecosystems' ability to regenerate and deliver the necessary services. (Melikh, Voit and Archybisova, 2019) underline the role of aquaculture in the recreational tourism sector in promoting the sustainability of coastal lands, thereby underscoring the importance of maintaining natural capital in tourism planning.

Although the provision of ecosystem services is obviously important in coastal tourism, most economic models currently in place do not adequately value these services (Huy, 2018). The framework of traditional economic models often views natural resources as free or extraneous to the economic system, failing to account for their contribution to tourism activities. The article by (Ferreira, Marques and Seixas, 2017) discusses the combination of marine ecosystem protection and economic accounting, and the necessity of integrating ecosystem services into coastal area management to develop coastal areas sustainably. On the same note, Elliff and Kikuchi, 2015 maintain that the ecosystem service approach is a useful mechanism for integrated coastal management that can address gaps between conservationist and tourism goals. These loopholes in existing models highlight the importance of a stronger, more comprehensive method for incorporating ecosystem services into economic decision-making to make coastal tourism development long-term sustainable. Another fact Hay Mele, Russo and D'Alelio, 2019 state is that integrating marine ecology with the economy is key to developing a coherent framework for sustainably developing coastal tourism and conserving key ecosystem services.

Objectives of the Study

The main aim of this paper is to determine the economic value of aquatic ecosystem services to tourism in the coastal region. Evaluating the economic value of key ecosystem services, including water purification, coastal protection, and biodiversity support, the study will shed further light on the services' importance to the tourism industry. This will be through an analysis of tourism revenue based on activities reliant on healthy aquatic ecosystems, such as scuba diving, beach tourism, and ecotourism. The research aims to highlight the value of maintaining ecosystem health to conserve tourism in coastal areas.

The other important goal is to suggest ways to incorporate ecosystem services into prevailing economic models. Current economic models often fail to account for the true value of natural resources, leading to overexploitation and ecosystem degradation. This paper shall address approaches to incorporate the value of marine biodiversity, coastal protection, and cultural services into economic planning. The research will help ensure my contribution to more sustainable tourism development in coastal regions by modifying existing economic models to capture the role of ecosystem services.

The third goal is to establish a framework that will facilitate sustainable use of tourism along coasts. This framework will inform policymakers,

tourism operators, and local communities on how to strike a balance between tourism development and the sustainability of the aquatic ecosystems. The framework will aim to enhance environmental friendliness in tourism, protect the coastal ecosystem, and sustainably utilize natural resources. It will also seek to integrate community-based conservation and ecotourism activities, which will generate economic benefits and preserve environmental health. Lastly, the research will be used to identify policy implications for promoting ecosystem conservation in tourism planning. The study will provide policy implications of adopting ecosystem services in tourism policies and management practices. These policies will aim to provide incentives to protect coastal ecosystems, secure sustainable tourism certifications, and establish public-private agreements to restore and manage the ecosystem. In addressing the policy implications, the study will help establish a regulatory environment that promotes economic growth and environmental sustainability in coastal tourism.

Methodology

This research aims to assess the sustainability of tourism in the coastal areas with reference to how the aquatic ecosystem services contribute to economic gains and environmental conservation. This research paper will be carried out in Zanzibar, an island off the coast of Tanzania, East Africa, where marine biodiversity and tourism are flourishing. The Zanzibar economy depends heavily on coastal tourism, and some of the most popular activities include scuba diving, beach tourism, and eco-tours, which have attracted millions of tourists annually. Marine Protected Areas (MPAs) are also present on the island, which is why it is an optimal sample for examining the relationship between economic growth through tourism and ecosystem protection.

This research will use various data collection methods to determine the economic and environmental effects of tourism. The techniques of ecosystem service valuation will be used to measure the contribution that marine ecosystems make to tourism, including provisioning services (e.g., fish and seafood), regulating services (e.g., coastal protection), and cultural services (e.g., recreational opportunities and aesthetic value). The economic value of these services will be estimated using techniques such as contingent valuation and willingness-to-pay surveys, with local communities and tourists considered.

In addition to ecosystem service valuation, economic modeling will be employed to measure the economic impact on tourism in Zanzibar. This will incorporate the input-output model to approximate the direct, indirect, and the induced impacts of tourism expenditure on the domestic economy. The local tourism agencies, government reports, and interviews with the tourism operators will yield key economic indicators, including the tourism revenue, employment, and business investments.

The stakeholder interviews will also entail key stakeholders such as the members of the local community, tourism operators, government officials, and conservation organizations. These interviews will provide qualitative data

on how tourism is perceived to affect local livelihoods, cultural values, and the ecosystem's health. The information gathered through these interviews will be used to identify where current policies have not succeeded and to provide a framework for incorporating ecosystem services more effectively into tourism development strategies.

To incorporate ecosystem services into economic models, an analytical framework will be developed using a systems approach to determine the Sustainability of tourism. This model will integrate economic modeling and environmental analysis, ensuring the value of ecosystem services is considered in the decision-making process. The framework will take into account the economic contributions tourism makes, as well as the marine ecosystem's ability to regenerate and sustain those contributions. Maps will be used to analyze tourism trends and ecological sensitivity in Zanzibar's coastal regions, using tools such as Geographic Information Systems (GIS).

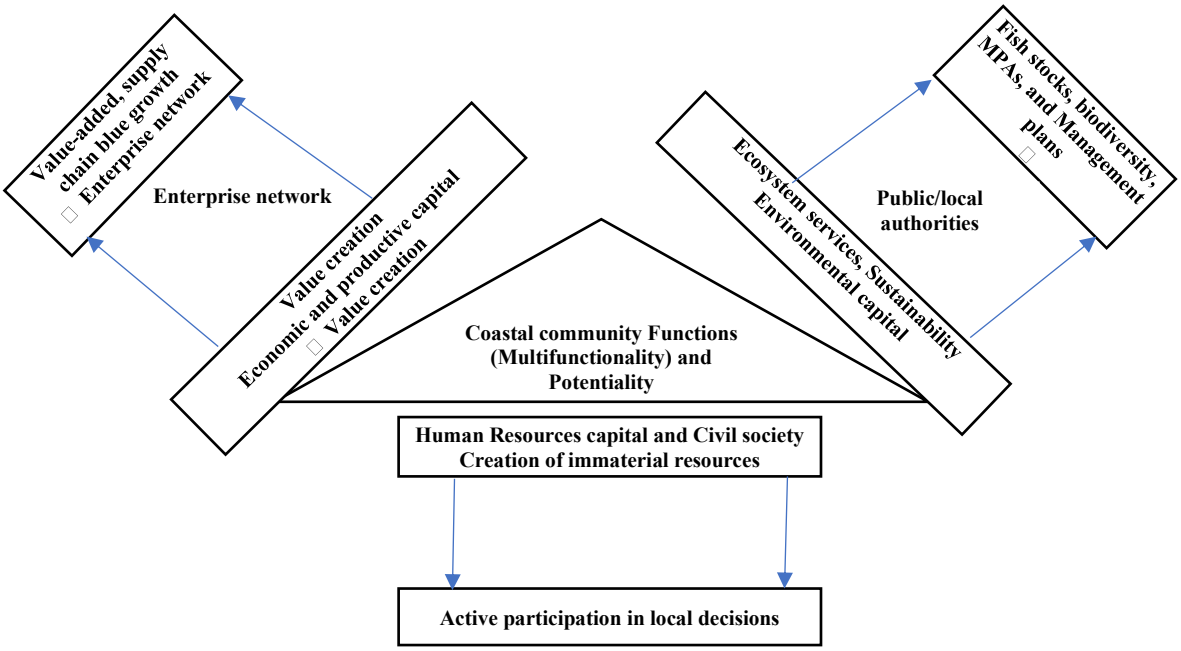

Figure 1: Integrating coastal community functions and ecosystem services into sustainable tourism models.

Figure 1 demonstrates the complexity of a coastal community's functions and the role they can play in sustainable tourism development. It reinforces the interrelation between economic capital, environmental capital, and human resources as a means of ensuring sustainable coastal tourism. The model highlights the importance of a balanced view of tourism by combining ecosystem services such as biodiversity and fish stocks with economic growth in terms of value creation and network of enterprises. It highlights the importance of active community and local government participation in ensuring that development is sustainable with respect to environmental concerns and the long-term economic well-being of coastal regions.

To sum up, this methodology will provide an extensive analysis of the correlation between tourism and

ecosystem services and, consequently, offer practical guidance on how to promote sustainable tourism in Zanzibar's coastal area. The research will integrate quantitative information from economic models and ecosystem valuation methods with qualitative information from stakeholder interviews to develop a robust framework for sustainable tourism planning. The GIS and input-output models will be used to ensure that economic and environmental aspects are incorporated into the analysis, and to provide an overall picture of the sustainable development of coastal tourism.

Table 1: Data collection methods overview.

Method	Description	Purpose
Ecosystem Service Valuation	Contingent valuation and willingness-to-pay surveys to assess the economic value of ecosystem services.	To quantify the value of marine ecosystems (provisioning, regulating, and cultural services) to the tourism sector.
Economic Modeling	Input-output model to assess direct, indirect, and induced economic impacts of tourism.	To measure the economic contributions of tourism to the local economy, including job creation, revenue, and investments.
Stakeholder Interviews	Semi-structured interviews with local communities, tourism operators, government, and conservation groups.	To gather qualitative data on the socio-cultural impacts of tourism and local perspectives on ecosystem conservation.
GIS and Spatial Analysis	Use of Geographic Information Systems (GIS) to map tourism patterns and ecological vulnerability in coastal regions.	To assess the spatial relationship between tourism intensity and ecosystem health, aiding in sustainable planning.

Table 1 presents the data collection methods used in this research to assess the sustainability of coastal tourism. Contingent valuation and willingness-to-pay surveys are used in ecosystem service valuation to estimate the economic value of marine ecosystems and services to the tourism sector. An input-output model is used in economic modeling to evaluate the overall economic effects of tourism, such as job creation and revenue generation. The interviews with stakeholders provide qualitative data on the socio-cultural effects of tourism and locals' attitudes toward the conservation of the ecosystem. Finally, GIS and spatial analysis help map patterns in tourism and ecosystem vulnerability, providing data for sustainable planning.

Results and Discussion

This study demonstrates that aquatic ecosystem services have high economic value for sustainable coastal tourism. Coastal protection, water quality control, and biodiversity are among the key ecosystem services that are critical to ensuring the sustainability and attractiveness of coastal tourism destinations. Natural hazard protection (such as storms and erosion) in coastal zones offers indirect economic value (principles) by protecting tourism infrastructure, which tends to be highly clustered along the coastline. Another important factor that directly determines the appeal of coastal areas for activities such as swimming, snorkeling, and scuba diving is water quality. Last but not least, marine biodiversity, including coral reefs, mangroves, and seagrasses, is important for attracting tourists and sustaining sustainable fishing, which are vital to most coastal economies.

An evaluation of Economic Models reveals many loopholes in the valuation of these services in existing models. Conventional economic approaches can

fail to measure the non-market value of ecosystem services, including coastal protection and biodiversity support, leading to a partial recognition of their significance to the tourism industry. For example, models that consider only direct revenues from tourism activities (e.g., hotel stays, entrance fees, or transport services) tend to ignore the importance of ecosystems in supporting tourism. In this light, this paper recommends a shift in economic models to account for the full value of coastal ecosystems and their contribution to long-term tourism income.

Case studies of different regions of the coastline evidence the successful implementation of ecosystem services in tourism planning. An example of such a case is the Great Barrier Reef in Australia, where ecosystem-based management has led to sustainable tourism practices that support both local economies and the conservation of the marine environment. Likewise, Zanzibar has embraced a community-based management strategy, where the value of marine ecosystems has been incorporated into tourism policies, ensuring that both economic development and marine biodiversity are maintained. These are just a few examples of how the ecosystem service valuation can be used in decision-making and produce sustainable tourism models that would benefit not only the environment but the local communities as well.

Nevertheless, it has its own issues and trade-offs in balancing between economic development and environmental protection. Economic pressures often drive rapid tourism development, which may lead to the overexploitation of coastal resources. In other situations, overtourism results in long-term environmental harm despite short-term benefits, which is detrimental to the ecosystem on which tourism relies. For example, the destruction of coral reefs due to unregulated diving activities will degrade the ecosystem, leading to a decrease in biodiversity and a decline in the region's tourist attractions, which will eventually impact the local economy. In this way, the economic growth against the conservation of ecosystems should be well managed so that the development of tourism is integrated with the concept of sustainability.

The table 2 below provides a summary of the main results of the given study, which allows visualizing the economic importance of the main ecosystem services and spotting the aspects in which economic models are still not able to consider the given services:

Table 2: Economic value of ecosystem services in coastal tourism.

Ecosystem Service	Economic Value	Current Model Gaps
Coastal Protection	Prevents property damage, protects tourism infrastructure (e.g., resorts, ports).	Not included in economic assessments, leading to the undervaluation of coastal resilience.
Water Quality Regulation	Supports recreational activities (swimming, snorkeling), attracts tourists.	Often ignored in economic models that focus on direct tourism revenue.
Biodiversity (Marine)	Attracts tourists for ecotourism, scuba diving, and snorkeling.	Economic models primarily focus on direct tourism revenue, ignoring biodiversity's long-term value.

Table 2 presents the economic worth of some of the major ecosystem services offered by the coastal ecosystems, including coastal protection, water quality control, and marine biodiversity, which are directly linked to the sustainability of coastal tourism. It also highlights the loopholes in existing economic models, which mostly do not include these services, thereby undermining them. For example, coastal protection is rarely considered in economic analyses, and biodiversity is often ignored in models that prioritize direct tourism income. The policies can improve sustainable tourism planning and policy development by addressing these gaps.

It has been argued that incorporating ecosystem services into economic models would yield a more realistic assessment of the economic contribution of coastal tourism. The strategy can be used to align tourism planning to conservation objectives to ensure sustainability in the long run. Nevertheless, challenges such as policy resistance, insufficient data, and conflicting economic interests, among others, should be addressed when implementing these models. The need to develop economically and to preserve ecosystems is a critical issue in coastal tourism development. This paper highlights the importance of comprehensive policies that would bring ecosystem services into the economic system, so that the Sustainability of economic gains and ecosystem preservation can coexist.

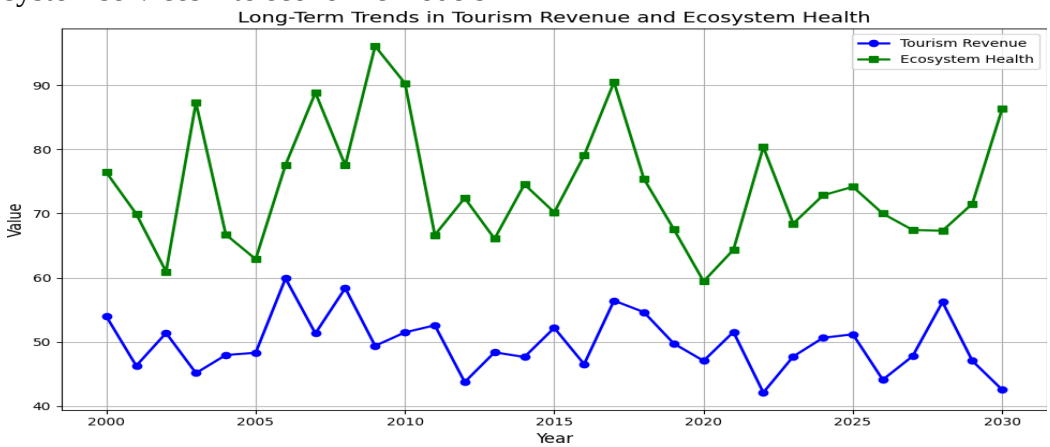

Figure 2: Long-term trends in tourism revenue and ecosystem health.

Figure 2 shows that in the long run, tourism revenue (blue line) and ecosystem health (green line) are expected to have a positive correlation, although it is more likely to be negative. The values of each variable are represented by y-axis and the number of years by x-axis. The growth rate of tourism revenue is stable, with few fluctuations, whereas ecosystem health is more prone to highs and lows, suggesting possible stressors such as over-tourism or environmental conservation activities. This analogy indicates the necessity of striking a balance between economic development by tourism and environmental care of coastal ecosystems to have long-term benefits on both the environment and communities.

Conclusion and Recommendations

The paper also underscores the importance of aquatic ecosystem services on the economy of coastal tourism as it

reveals the important roles of coastal protection, control of water quality and biodiversity in promoting tourism activities. The findings reveal that the existing economic models do not take into consideration these services and as such the ecosystems that directly contribute to the tourism industry are undervalued. This gap necessitates an incorporation of ecosystem services in the policy and planning systems to create a sustainable balance between economic growth and environmental conservation. As a measure to ensure Sustainability, it is advisable that policymakers embrace frameworks that appreciate the combined worth of ecosystem services in the development of tourism. Some of the guidelines that should be incorporated to government, tourism operators and local communities are the application of eco-friendly practices, the support of conservation activities, and involving communities in the ecotourism activities. The cooperative activities will assist in balancing economic gains with environmental conservation which will make it viable in the long run. The future studies must aim at the establishment of more precise models of economic value of ecosystem services in coastal tourism, especially in the area of sophisticated methods of valuation and the concept of biodiversity as part of the tourism planning. This will give more detailed data to aid tourism sustainability plans and policy formulation, a blue economy that will be able to support both the environment and the human being.

References

Badashtiani, F.E., Talaei, A. and Habib, F., 2025. Clarifying the effect of educational and educational environment in the development of skill-based education with the approach of environmental protection. *Journal of Animal Environment, 17*(2), pp.155-164.

Bakari, S., 2018. Impact of exports and imports on economic growth in Canada: Empirical analysis based on causality. *International Academic Journal of Innovative Research, 5*(1), pp. 17–29. https://doi.org/10.9756/IAJIR/V5I1/1810003

Basconi, L., Rova, S., Stocco, A. and Pranovi, F., 2023. Ecosystem services for supporting coastal and marine resources management, an example from the Adriatic Sea (Central Mediterranean Sea). *Ocean & Coastal Management*, *235*, p.106486. https://doi.org/10.1016/j.ocecoaman.2023.106486

Dvarskas, A., 2017. Dynamically linking economic models to ecological condition for coastal zone management: Application to sustainable tourism planning. *Journal of environmental management*, *188*, pp.163-172. https://doi.org/10.1016/j.jenvman.2016.12.014

Elliff, C.I. and Kikuchi, R.K., 2015. The ecosystem service approach and its application as a tool for integrated coastal management. *Natureza & Conservação*, *13*(2), pp.105-111. https://doi.org/10.1016/j.ncon.2015.10.001

Ferreira, A.M., Marques, J.C. and Seixas, S., 2017. Integrating marine ecosystem conservation and ecosystems services economic valuation: Implications for coastal

zones governance. *Ecological Indicators*, *77*, pp.114-122. https://doi.org/10.1016/j.ecolind.2017.01.036

Hay Mele, B., Russo, L. and D'Alelio, D., 2019. Combining marine ecology and economy to roadmap the integrated coastal management: a systematic literature review. *Sustainability*, *11*(16), p.4393. https://doi.org/10.3390/su11164393

Huy, D.T.N., 2018. Tax rates effects on the risk level of listed Viet Nam real estate firms during global economic crisis 2007-2009. *Economics, Management and Sustainability*, *3*(2), pp.29-41. https://doi.org/10.14254/jems.2018.3-2.3

Lopes, R. and Videira, N., 2013. Valuing marine and coastal ecosystem services: an integrated participatory framework. *Ocean & Coastal Management*, *84*, pp.153-162. https://doi.org/10.1016/j.ocecoaman.2013.08.001

Mehvar, S., Filatova, T., Dastgheib, A., De Ruyter van Steveninck, E. and Ranasinghe, R., 2018. Quantifying economic value of coastal ecosystem services: a review. *Journal of marine science and engineering*, *6*(1), p.5. https://doi.org/10.3390/jmse6010005

Melikh, T., Voit, D. and Archybisova, D., 2019. Aquacultural integration in recreational tourism: Features of development and management of coastal territories. *Baltic Journal of Economic Studies*, *5*(5), pp.84-89. https://doi.org/10.30525/2256-0742/2019-5-5-84-89

Phelan, A., Ruhanen, L. and Mair, J., 2020. Ecosystem services approach for community-based ecotourism: towards an equitable and sustainable blue economy. *Journal of Sustainable Tourism*, *28*(10), pp.1665-1685. https://doi.org/10.1080/09669582.2020.1747475

Reddy, K. and Sailesh, B., 2024. Integrating marine tourism into the blue economy framework. *Journal of Environmental Management & Tourism*, (3), pp.501-520.

Saidova, K., Madraimov, A., Kodirova, M., Madraimov, A., Kodirova, K., Babarakhimov, T., Urinova, S. and Zokirov, K., 2024. Assessing the impact of invasive species on native aquatic ecosystems and developing management strategies. *International Journal of Aquatic Research and Environmental Studies*, *4*, pp.45-51. https://doi.org/10.70102/IJARES/V4S1/8

Sholeha, A.W. and Sumarmi, S., 2025. Managing sustainable tourism of perawan beach, east Java, Indonesia based on the coastal ecosystem service (ces) approach. *Geo Journal of Tourism and Geosites*, *58*(1), pp.78-88. https://doi.org/10.30892/gtg.58107-1392

Zhao, Y., Han, Z., Zhang, C., Wang, Y., Zhong, J. and Gao, M., 2024. Coastal cultural ecosystem services: A bridge between the natural ecosystem and social ecosystem for sustainable development. *Land*, *13*(9), p.1352. https://doi.org/10.3390/land1309135