

Subsection 5A

Chapter 4

Tourism

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Key points

- Coastal and ocean tourism can support all pillars of sustainable development.
- Coastal and ocean tourism relies heavily on ocean and marine ecosystem health while also contributing to various negative impacts on natural and cultural resources. Sustainable tourism remains difficult to achieve due to data gaps concerning the hidden costs of tourism and the value of natural and cultural capital.
- Visitor arrivals create opportunities for data collection, dissemination of information regarding sustainability, and the harnessing of tourists' willingness to contribute to sustainable outcomes.
- Transitioning the tourism sector towards a more sustainable paradigm will require significant political will and leadership to shift away from the prioritization of low-cost mass tourism and towards the adoption of a more holistic view of tourism success that promotes reinvestment into the local community, culture and environment.

1. Introduction

The purpose of the present chapter is to provide an overview of the scope and extent of coastal and ocean tourism, highlight the pressures and impacts of tourism on ecosystems and human well-being and provide alternative pathways for improved governance and more sustainable outcomes. Travel and tourism comprise one of the largest economic sectors in the world. Despite the severe impacts of the coronavirus disease (COVID-19) pandemic on the sector (see subsect. 5B, chap. 7) from 2020 to 2022, travel and tourism contributed \$10.15 trillion to global gross domestic product (GDP) (9.2%) and accounted for approximately 330 million jobs (10% of the global workforce) in 2023. Supported by strong tourism demand across regions, the global economic contribution of travel and tourism is estimated to have reached an all-time high of \$11.1 trillion (10% of global GDP), supporting 348 million jobs in 2024 (World Travel and Tourism Council (WTTC), 2024). In the future, the travel and tourism sector is expected to grow faster than other sectors of the global economy, contributing \$16 trillion to global GDP (11.4%) and accounting for 450 million jobs (12.2% of the global workforce) by 2034.

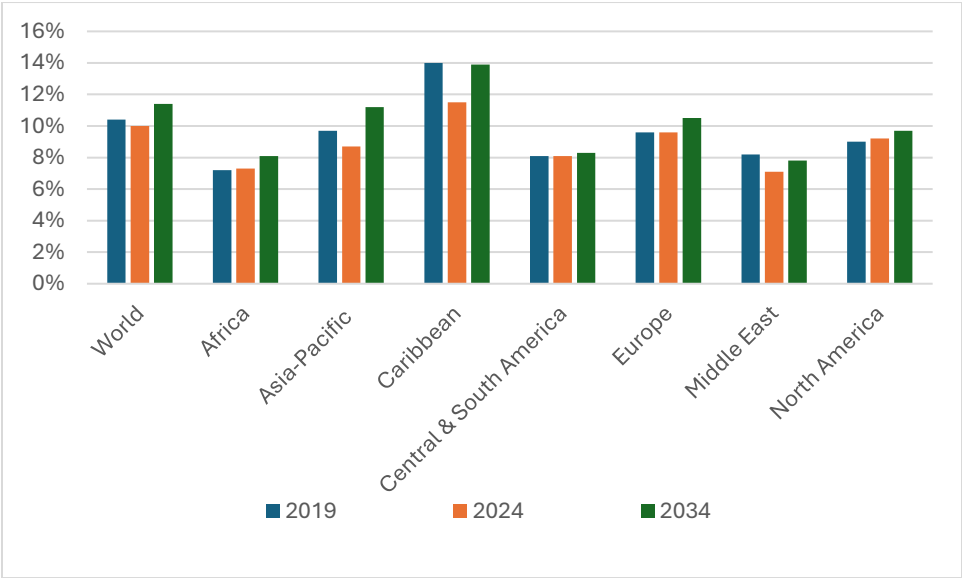
As made clear in prior *World Ocean Assessments*, identifying the contribution of coastal and ocean tourism to the overall size of global tourism is challenging. Recent estimates by Northrop and others (2022) suggest that coastal and ocean tourism comprises at least 50% of all tourism spending, thereby accounting for more than \$5.5 trillion (5% of global GDP) and employing roughly 174 million people. Importantly, coastal and ocean tourism is growing at a faster rate than international tourism as a whole and is expected to surpass offshore oil and gas as the largest sector of the ocean economy by 2030 (Organisation for Economic Co-operation and Development (OECD), 2016). In small island, archipelagic

and coastal States, coastal tourism is often the predominant form of tourism and has a pronounced impact on economic activity (Pratt, 2015; Mcelroy, 2003).

As shown in the figure below, the Caribbean remains the most tourism-dependent region in the world. In 2019, tourism accounted for approximately 14% of the region’s GDP, 16% of employment and more than 20% of export earnings (WTTC, 2024). Tourism’s share of employment in the Caribbean is forecast to increase over the next decade to 18%, supporting nearly 1 in 5 jobs in the region. The Asia-Pacific region is also heavily dependent on tourism; the industry accounted for 11.2% of GDP and 12.5% of employment in the region in 2024.

Figure

Total contribution of travel and tourism to GDP



Source: Prepared by the writing team.

The World Travel and Tourism Council forecasts that, by 2034, the travel and tourism sector will have grown by 3.7% per year, outpacing the expected 2.4% annual growth in the broader global economy, and contributing \$16 trillion (11.4%) to global GDP, 101 million new jobs and employment for 449 million people (roughly 12.2% of the global workforce). Between 2024 and 2034, the Asia-Pacific region is expected to experience the fastest growth in travel and tourism (6.1%), with China projected to surpass the United States of America with the largest absolute contribution of tourism to GDP (WTTC, 2024). Significant gains are also expected in India and Saudi Arabia.

Given its cross-cutting nature, importance to economic activity and human well-being, and critical dependence on environmental and cultural assets, tourism is uniquely positioned to contribute to all sustainable development pillars. However, when not properly managed, tourism can damage and degrade natural systems, deplete local resources and dilute culture, potentially diminishing destination appeal and offsetting economic gains from visitor spending. Strains on natural and cultural capital imposed by tourism can exacerbate vulnerability to climate change and economic shocks, leaving coastal communities increasingly at risk.

To balance the often competing needs of economic, environmental and community health and well-being (see subsect. 5B, chap. 3), it is necessary not only to make investments that target market-based economic returns from tourism, but also to invest in the protection of natural and cultural amenities and heritage and equitable outcomes for local people. Contrary to the current trend towards mass tourism, evidence suggests that marine ecotourists spend more time and money at destinations than traditional tourists (Ressurreição and others, 2022; Topelko and Dearden, 2005).

Justifying public investment in natural and cultural capital is inherently challenging. While the economic value of tourism is relatively easy for policymakers to observe and appreciate in terms of arrivals and employment, the value to tourism of healthy coastal and marine environments and culture, and the economic costs that tourism creates remain largely hidden and underappreciated due to their indirect, non-market nature. The future sustainability of coastal and marine tourism will depend on closing the gap between science and policy through targeted use of data and analytics to understand the links between tourism, the environment and human well-being and communicating those connections to decision makers, investors, travellers and coastal communities. The links between tourism, coastal and ocean resources and socioeconomic outcomes are outlined below and information is provided about alternative avenues for targeted investments to promote a more sustainable tourism sector.

2. Pressures and impacts

Coastal and ocean tourism is highly dependent on the health of natural resources, including beaches (see sect. 4, subchap. 5A), reefs (see sect. 4, subchap. 5D), mangroves (see sect. 4, subchap. 5H), marshes (see sect. 4, subchap. 5I), seagrasses (see sect. 4, subchap. 5G), seawater and numerous forms of wildlife, including birds (see sect. 4, subchap. 4G), fish (see sect. 4, subchap. 4D), sea turtles, pinnipeds and cetaceans. The health of these assets and their ability to attract visitors and contribute to economic activity and human well-being (see subsect. 5B, chap. 3) are under threat from an array of local and global pressures and impacts (Mafruhah, Supriyadi and Rahman, 2020; Mehvar, Khosravi and Zare, 2018; Mejjad, Rossi and Pavel and others, 2022).

Coastal tourism infrastructure, shoreline maintenance and protection

As pointed out in the first and second *World Ocean Assessments*, the increasing use of the coastal zone for leisure has transformed many of the world's coastlines (see subsect. 5A, chap. 9), making them more accessible for tourism and recreation, but also reducing their aesthetic appeal and the quantity and quality of ecosystem services that are vital to economic value and human well-being (see subsect. 5B, chap. 3). Compounded by sea level rise (see sect. 4, chap. 3), many coastlines are receding (see sect. 4, chap. 6, and subsect. 5B, chap. 4) (de Schipper and others, 2021). To counter the loss of beaches and protect coastal real estate, many destinations have engaged in active shoreline maintenance and protection, including beach nourishment through sand replacement or the installation of shoreline armouring structures (see sect. 4, chap. 6) such as jetties, seawalls and groynes (Griggs, 2024; Hill, 2015; de Schipper and others, 2021). These changes can affect water flow, diminish water quality and cause the loss of valuable ecosystem services (Cooper, O'Connor and McIvor, 2020; Henderson and others, 2020; Liu and others, 2023). In addition, coastal tourism development can create issues of environmental justice when privatization of coastal lands, crowding and physical impediments imposed by built structures inhibit residents' access to and enjoyment of the coastline.

Solid waste

Tourism can generate large volumes of solid waste from lodging and leisure activities (Yusoff and others, 2022). Coastal tourism is the main source of plastic litter (see sect. 4, chap. 6) on beaches (Garcés-Ordóñez and others, 2020; Khadanga and others, 2022), the most common being food packages from beachgoers (Lamb and others, 2018). Solid waste management poses a challenge to small island destinations with tourism-based economies that have poorly developed waste infrastructure, have limited land area and are geographically isolated (Almroth and Kershaw, 2024). Islands are heavily dependent on imported goods but have little control over imported waste by-products. In addition, many must accept solid waste from cruise ships. This can lead to waste production exceeding management capacity, leaving few options other than landfills and incineration (Wang, Lee and Mokhtar, 2021). Poor solid waste management can have a negative effect on destination image and tourists' choices (Chaudhry and Sachdeva, 2021; Koliotasi and others, 2023).

Sewage and water pollution

Urbanization caused by tourism leads to water pollution (see sect. 4, chap. 6) through sewage or septic effluent and nonpoint source pollution from rain, storm water or snowmelt run-off. Polluted water that enters the ocean adds nutrients and induces excessive plant and algae growth, which can lead to hypoxia or “dead zones” in the water. Some algae are known to produce harmful toxins, which can create negative impacts on tourism visitation in coastal destinations (Berdalet and others, 2022; Yan and others, 2022; Nilsson and Gössling, 2013). In Florida, United States, for example, a bloom of the dinoflagellate *Karenia brevis* in 2018 caused \$2.7 billion in economic losses to tourism-related businesses (Alvarez and others, 2024). Discharge of sewage and run-off also reduces seawater quality, leaving local and visitor populations vulnerable to illness (Rangel-Buitrago, Galgani and Neal, 2024).

Greenhouse gas emissions

The energy produced to meet the demands of coastal and ocean tourism generated an estimated 1.57 billion tons of carbon dioxide equivalent (CO₂ e) emissions in 2023, representing 3% of global greenhouse gas emissions. Of these estimated 1.57 billion tons, 50% stems from supply chain sources (referred to as scope 3 emissions), 25% from direct emissions from sources owned or controlled by an organization, such as domestic transport (referred to as scope 1 emissions), 7% from indirect emissions from purchased energy (scope 2 emissions) and 19% from international transport (WTTC, 2024b). In many industrialized nations, the climate impact from long-distance travel (one-way trips exceeding 100 km) is greater than that from short-distance travel. Aviation is the major emitter in this sector, generating 2.4% of global anthropogenic CO₂ emissions in 2017 (Åkerman and others, 2021). Cruises are a particularly carbon-intensive type of travel. While two of the major cruise liners report 2% annual improvements in carbon intensity in recent years and aim to continue improving at that rate (Royal Caribbean Group, 2021; Carnival Corporation & PLC, 2022), these figures refer to scope 1 and 2 emissions only, and a 2% reduction in carbon intensity is likely to be cancelled out by the expected 6–7% passenger growth (Hoegh-Guldberg and others, 2023).

Interactions with wildlife

Opportunities for wildlife-based recreation can yield significant benefits to tourists and local communities. For example, ecotourism based on marine megafauna is one of the fastest growing sectors of ecotourism (Guidino and others, 2020). In Semporna, Malaysia, shark-diving tourism provided more than \$9.8 million in direct expenditures per year (Vianna and others, 2018). Shark and ray tourism in

Indonesia produces an estimated \$22 million in direct expenditures annually, equivalent to at least 7% of the \$1 billion in revenue from marine tourism in the country (Mustika, Ichsan and Booth, 2020). Recent evidence suggests that the popularity of shark diving could double in the next 20 years (Cisneros-Montemayor and others, 2020). However, interactions between tourists and wildlife, including noise and physical disturbance caused by human visitors, can affect the behaviour and fitness of animals by causing changes in foraging, migration and aggregation patterns, and displacement from preferred habitat, negatively affecting wildlife populations (Niella and others, 2023; Cattano and others, 2021; Shamir and others, 2019; Pavez and others, 2015). Populations that are spatially constrained or food-limited are most sensitive to tourism pressures and impacts (New, Lusseau and Harcourt, 2020). Beyond recreation, tourism can be an important driver of food systems and can lead to an increased demand for seafood (see subsect. 5A, subchaps. 1E and 1F), which has been associated with increases in fishing effort and unsustainable harvest practices (Miller, 2022). Touristic vessels are also a known pathway for the introduction of non-native species (see sect. 4, chap. 6) into marine environments and may have a disproportionate effect on the risk of introduction into marine protected areas (MPAs) (Parretti and others, 2020; Slišković and others, 2021). As highlighted in the second *World Ocean Assessment*, Antarctic and Arctic tourism have been growing rapidly in recent years. Coupled with heightened pressures on native biodiversity caused by the increasing pace of environmental change in polar regions, the seasonal timing of human presence in these regions increases the chances of direct human-wildlife conflicts, adverse impacts on endemic fauna and flora and the establishment of non-native species (see sect. 4, chap. 6) (Tejedo and others, 2022).

Mass tourism

The arrival of large amounts of visitors, although a means of economic activity and diversification, can negatively reshape local economies by increasing the cost of property and the overall cost of living (Garza and Ovalle, 2019), potentially leading to crowding out of locals (Zanini, 2017). Such trends can also hasten change in the skills necessary to prosper, which can be to the detriment of the resident workforce and may impact equitable access to essential services (Albaladejo and Bel, 2010; Milano, Novelli and Cheer, 2019). Tourism's rapid recovery from the COVID-19 pandemic (see subsect. 5B, chap. 7) exacerbated problems associated with tourist volume and overtourism. Following the pandemic, there was a marked increase in tensions between tourists and residents and in pushback by locals on the impacts of overtourism on housing prices and availability, public services and degradation of natural areas and cultural sites (Amrhein and Langer, 2025; Milano, Novelli and Russo, 2024; Stojčić, Vizek and Galurdić, 2024; González-Reverté and Guix, 2024). Protests calling for limits on tourism were held in popular coastal destinations in Greece, Italy and Spain and several locations in the United States, including New York, San Francisco, Los Angeles and Oahu. Several coastal destinations in Europe and Asia have imposed bans or restrictions on short-term rental platforms to mitigate tourism impacts on housing prices and availability (Wessel, Schmidt-Kessen and Hukal, 2024). Destinations in China, France, Italy, Spain and the United States have implemented economic incentive policies such as tourist fees to quell crowds (Choi, Jeon and Asperin, 2024). More radical proposals include complete or partial bans on cruise ships in port destinations such as Amsterdam in the Kingdom of the Netherlands, Barcelona in Spain, Dubrovnik in Croatia, Mykonos and Santorini in Greece, and Venice in Italy to offset the negative impacts of tourist crowding (Nepal and Nepal, 2021).

As the top destination for coastal and ocean tourism for millions of tourists, islands are particularly vulnerable to the impacts of mass tourism but are also dependent on visitor spending (Lagarias, Stratigea and Theodora, 2023; Butler and Dodds, 2022). However, the cost of managing tourism frequently outpaces the revenue generated and retained. Small islands often accumulate public debt as tourist arrivals rise (Peterson, 2023; Peterson and DiPietro, 2021). In Maldives, for example, tourism grew to represent 80% of the economy, while public account balances fell, leaving the nation in debt. Such “operational externalities” generated by costs on public infrastructure can leave nations with insufficient financing to manage tourism impacts (Epler Wood, Milstein and Ahamed-Broadhurst, 2019). An example of the scale of tourism that many small island developing States face is the Caribbean island of Aruba, which has a population of 105,000 and a land area of around 178 square km, yet hosted over 1 million tourists in 2017 (Hampton and Jeyacheya, 2020).

Cruise tourism

Despite comprising less than 3% of all travel, the cruise industry is one of the fastest-growing sectors of tourism, with approximately 40 million passengers expected by 2027, supported by a fleet of over 330 cruise ships (Cruise Lines International Association (CLIA), 2024). It is one of the most common forms of mass tourism and is the dominant form of tourism in many coastal and ocean destinations (Bresson and Logossah, 2011; Domènech, Gutiérrez and Anton Clavé, 2020). North America and Europe remain the largest source markets for cruises, accounting for 57% and 26% of passenger volume, respectively, with the Caribbean and Mediterranean the most popular cruise destinations, receiving roughly 44% and 19% of travellers, respectively. For some island destinations in the Caribbean, the annual number of cruise passengers far exceeds the local population (World Tourism Organization, 2023). Although the impacts of cruise passenger spending are the subject of debate due to the short length of stay, limited spatial movement of passengers on shore (Spalding and others, 2023) and availability of onboard services and amenities (Gouveia and Eusébio, 2019), cruise ship arrivals can generate positive economic impacts for coastal communities (Chen and others, 2019; Artal-Tur, Navarro-Azorín and Ramos-Parreño, 2021). Large volumes of temporary visitors also create pressures on local water, food and waste disposal resources and produce large volumes of emissions, solid waste, sewage, greywater and oily bilge water (Lloret and others, 2021). The cruise industry releases 300,000 gallons of sewage, 8 tons of solid waste and 25,000 gallons of bilge water weekly, along with other by-products, at destinations and into national waters, causing a multitude of stress on marine ecosystems (Epler Wood, 2017; Kotrikla, Zavantias and Kaloupi, 2021; Lloret and others, 2021). Despite comprising less than 1% of the merchant fleet (CLIA, 2024), cruise ships release up to 25% of all fleet waste (Butt, 2007). Other impacts from cruise tourism include modification of nearshore ecosystems to accommodate cruise ships (Lester and others, 2016), damage from anchoring (Forrester and others, 2015; Rogers and Garrison, 2001; Small and Oxenford, 2022) and breakdown of the sociocultural make-up of destinations (Hoarau-Heemstra and others, 2023).

Recent estimates of carbon intensity based on annual reports from the three largest cruise lines (Carnival, Royal Caribbean and Norwegian) (Hoegh-Guldberg and others, 2023) suggest that the global cruise sector emitted approximately 60 Mt CO_{2e} in 2018, which is comparable to the annual emissions of many countries. With expected growth of 6% per year, emissions of 40 Mt CO_{2e} (scope 1 and 2 emissions) or 80 Mt CO_{2e} (scope 1, 2 and 3 emissions) are expected by 2030, trends that stand in stark contrast to global ambitions to halve emissions by 2030 (Hoegh-Guldberg and others, 2022).

3. Social components

The social and cultural sustainability of coastal and ocean tourism is also of considerable importance (Leposa, 2020). Opportunities for recreation and access to blue spaces drive travel to coastal and ocean locations and contribute to visitors' mental health, physical activity, enhanced psychological connection to the natural world (see subsect. 5B, chap. 2) and pro-environmental behaviours (Gascon and others, 2017; White and others, 2020). Evidence suggests that sustainable tourism initiatives can also generate significant social capital for coastal populations through economic diversification, cultural and natural heritage preservation and educational infrastructure development (Papageorgiou, 2016; Bennett and others, 2017). Tourism revenues can be harnessed as a means of boosting employment and addressing core issues relating to poverty (Zhang, Wang and Yang, 2023). Marine ecotourism can also empower community members to serve as environmental stewards, finance and expand MPAs and promote ocean literacy and citizen science (Bushell and Bricker, 2017; Cusack and others, 2021; Morse and others, 2024; Ressurreição and Giacomello, 2013). It can also facilitate the transmission of traditional ecological knowledge, thereby reinforcing place-based cultural identities (Pomeroy and others, 2017).

However, there are sociocultural challenges associated with ocean tourism development, particularly regarding power asymmetries between external stakeholders and local populations, and adverse effects on residents' well-being from the pressures and impacts outlined in part 3 above. The phenomenon of cultural commodification is a documented concern, wherein culturally significant marine practices undergo transformation into commercialized experiences for tourist consumption (Mostafanezhad and Norum, 2019). Other adverse socioeconomic impacts from tourism such as congestion, higher prices, seasonal unemployment, economic leakage, distributional inequality and dilution of culture can induce negative host attitudes toward tourism and restrain the sustainable development of the sector (Canavan, 2016; Fan, Liu and Qiu, 2019; Frent, 2016). Dissimilarities between the social and cultural norms of visitors and host communities can also create tensions, resentment, irritation and conflict (Lehto, Davari and Park, 2020). This will be evidenced in the coming years with the entry into coastal tourism development of countries like Saudi Arabia. Returns from their recent and significant investments in tourism may hinge on accommodating visitors in a culturally sensitive manner and blending tourism development with the sociocultural norms that reflect the country's religious heritage (Ghaderi and others, 2024; Zamani-Farahani and Henderson, 2010).

4. Sector-relevant governance

The tourism industry is highly fragmented, comprising a variety of product and service markets, including transportation, accommodation, attractions, nightlife, recreation and food and beverages, and is intrinsically connected to other economic sectors and the broader macroeconomy. Coastal and ocean tourism involves public and private goods, asymmetric power across stakeholder groups and a coupling of dependence and impact between the economy and the natural environment.

Owing to these challenges and complexities in governance, progress towards sustainable coastal and ocean tourism requires policy coherence across numerous private and civil society stakeholders operating at the local, national, regional and international levels, and clear and accurate understanding of the magnitude and direction of change (Leotaud and others, 2024; Dwyer, 2003). Increased interest in new forms of governance for sustainable tourism has been driven in recent years by heightened sustainability awareness, smarter tourism development and management for both tourists and residents, a rising call for

social inclusion, new technologies, a growing need for resilience and increasing governmental interest in destination governance and stewardship (Imbsen and others, 2021; Reinhold and others, 2023). Prerequisites include a unified vision and organization at the destination, national and regional levels, the effective use of data and information, and clear communication and cooperation across a range of stakeholder groups (Scott, 2013).

Current research advocates for governance frameworks characterized by collaborative decision-making mechanisms that allocate substantive authority to local actors regarding marine tourism development trajectories (Milne and Ateljevic, 2001; Kelly and others, 2018). Such community-forward frameworks necessarily encompass equitable labour standards, support for local enterprise development, and protocols for cultural exchange predicated on community-determined parameters (Asker and others, 2010; Jackson, 2025). There is also an imperative to integrate Indigenous knowledge systems as foundational elements within sustainable tourism paradigms rather than as peripheral considerations (Nurse-Bray and Rist, 2009). Engaging local communities in the visioning, planning and co-management of sustainable tourism initiatives can generate and renew knowledge, awareness and pride in local ecosystems, history and traditions, foster local ownership, stimulate interest and investment in preservation and ensure that tourism practices align with ecological and cultural values (Bichler, 2021; Kuba, Kuba and Sani, 2024; United Nations Educational, Scientific and Cultural Organization (UNESCO), 2021).

The integration of environmental, social and governance principles into tourism business models has increased in recent years in response to consumer and investor pressure to engage in responsible practices and to build organizational resilience against environmental and social risks in an increasingly volatile global context (Gössling, Scott and Hall, 2020). Environmental, social and governance practices can improve operational efficiency related to environmental impacts associated with agriculture, water and waste management systems, while enhancing community engagement and advancing the fair treatment of employees (Back, 2024). While research into the impact of corporate environmental, social and governance strategies on financial returns is limited, preliminary evidence suggests that engaging in corporate social responsibility activities can yield positive returns for tourism and hospitality firms in terms of performance and market value and that factors related to governance and stakeholder engagement are critical components of success (Ionescu and others, 2019; Legendre, Ding and Back, 2024).

At the destination level, the creation of a central tourism management organization taking into consideration private and public sector tourism interests and involving community leaders can be effective in coordinating goals across the complex and multi-stakeholder nature of the sector and ensuring open and inclusive participation (Bichler and Lösch, 2019; Waligo, Clarke and Hawkins, 2013). To assist destinations in advancing inclusive destination governance, the World Travel and Tourism Council has not only a destination stewardship governance diagnostic framework that provides alternative destination stewardship scenarios, but also a diagnostic tool to identify triggers and barriers to effective destination stewardship, assess different aspects of destination governance and identify priority areas for improvement (WTTC, 2021).

Modes of regional governance can provide many benefits to coastal and ocean tourism destinations, including opportunities for capacity-building, improved access to data and resources, risk-sharing and efficiency gains from economies of scale (Tausch, 2016). Establishing regional coordination through governance mechanisms can also help to minimize price competition between locations, which can induce

a “race to the bottom” in terms of sustainability (Dwyer, 2003; Grydehøj, 2017). International cooperation and collaboration can be enhanced through the formation of regional clubs designed to promote shared values and understanding across diverse tourism actors and unite economic and social interests. Coordination of environmental policies between countries (e.g. standards for cruise ships, tourist fees earmarked for conservation, environmental tax rates) can address the concerns of domestic industries that may be vulnerable to international competition (Coste and others, 2018).

5. Sustainable pathways

The future of coastal and ocean tourism will be shaped by global economic conditions such as the availability of disposable income and leisure time, the costs of energy and travel, information technology, demographics and global environmental change. Ocean acidification and rising sea temperatures (see sect. 4, chap. 3) are expected to have continued detrimental impacts on nearshore ecosystems (Guild and others, 2024; von Schuckmann, Minière and Cheng, 2024), affecting destination appeal and leaving coastal destinations increasingly vulnerable to the effects of a changing climate (Hoegh-Guldberg and others, 2007; Ward and others, 2016). Despite commitments by Member States at the twenty-eighth session of the Conference of the Parties to the United Nations Framework Convention on Climate Change and noticeable progress since the adoption of the Paris Agreement, a large climate action gap remains and appears unlikely to close soon (World Economic Forum, 2024), suggesting that coastal and ocean destinations should anticipate continued impacts from changes in temperature and rainfall, warmer seas, rising sea levels (Cazenave and Mitchum, 2024) and hazardous weather events (Catalano, Forni and Pezzolla, 2020).

Younger and wealthier travellers, a larger middle class, low transportation costs and increasing demand for experiential travel suggest that tourism volume will continue to grow and “overtourism” will continue, bringing continued pressures and tensions between visitors and local populations. As with all economic sectors, the tourism sector will be characterized by increasing access to richer and more comprehensive data, indicators and processing power, including machine learning and artificial intelligence tools, providing unprecedented opportunities for visitor engagement and improved understanding of tourist preferences, behaviours and impacts (Spalding and others, 2023).

Transitioning towards a more sustainable future will involve investments to mitigate dependence on tourism and build resilience to the pressures and impacts outlined above, while safeguarding the economic viability of the sector by restoring and regenerating the natural and cultural capital that attracts visitors and supports local communities (Gounder and Cox, 2022; Northrop and others, 2022; Richardson and Witkowski, 2010). Given the diverse array of coastal and ocean destinations across the globe and the complex and highly contextual relationships between tourism and economic, environmental, social and cultural outcomes, there is not a one-size-fits-all prescription for the future of the sector (Brida, Gómez and Segarra, 2020; Nunkoo and others, 2020).

Four complementary pathways for reorienting coastal and ocean tourism towards more sustainable outcomes are set out below. These pathways assume that other ocean sectors (e.g. capture fisheries (see subsect. 5A, subchaps. 1A and 1B), shipping (see subsect. 5A, chap. 6) and extraction of energy resources (see subsect. 5A, subchap. 3B)) will continue and that unfettered market forces will not provide efficient investment in protection and regeneration of ecosystems and cultural resources (Schuhmann, 2020).

Each pathway addresses the array of environmental and social impacts created by tourism outlined above and relies on purposeful planning and investment. A key challenge in achieving investments in environmental and social capital is that the associated returns are often not observable in terms of traditional economic indicators and may only be apparent over a time frame that is longer than election cycles. Most nations have limited fiscal space for long-term investments with unclear returns. Key elements of sustainable pathways across destinations therefore include improved access to financial resources to support investment in natural and social capital, enhanced data collection and analysis to illustrate economic returns from that investment and the creation of inclusive governance frameworks to support policy and legislation that incentivize information-sharing and private sector investment in sustainable outcomes (World Economic Forum, 2024).

Investment in data collection, publication and analysis to understand linkages between tourism and natural and cultural resources and the full costs and benefits of tourism

Many of the amenities that attract visitors to coastal and marine destinations are open-access public goods, generating no direct economic impacts, but serving as key drivers for market-based activities that generate income and employment (National Oceanic and Atmospheric Administration, 2023). A deep body of research illustrates that maintaining or enhancing the quality of coastal and ocean ecosystems allows for significant contributions to economic growth, employment and poverty reduction while enhancing resilience to climate change, natural disasters and economic shocks (Patil and others, 2016). Damage to coastal and ocean systems entails real economic costs. Eroded or littered beaches (see sect. 4, subchap. 5A and chap. 6), degraded reefs (see sect. 4, subchap. 5D) and polluted seawater (see sect. 4, chap. 6) are known to be less attractive to tourists (Qiang, Shen and Xie, 2020; Schuhmann and others, 2016) and loss of coastal ecosystems puts tourism assets at risk (Barbier, 2015; Spalding and others, 2014).

Despite these well-known findings, coastal and marine ecosystems continue to be modified, damaged and degraded by human activities associated with market-based returns (Atwood and others, 2017; Riegl and others, 2009). Part of this dichotomy lies in the fact that market-based metrics such as arrivals, spending, jobs and revenues are widely publicized and easily understood, while measures of ecosystem health and function lack clear and appropriate monetary signals, creating a situation where private and public interests are naturally inclined to prioritize market values. This information gap inhibits sustainable management, as policymakers must operate with incomplete understanding of connections between traditional economic activity and natural and cultural capital (Thorburn, Milne and Deuchar, 2021).

Measuring the impacts of tourism on natural and cultural resources is an integral part of monitoring and controlling those impacts (Papathanassis, 2023). Investments in the comprehensive collection and analysis of economic, social and environmental data can facilitate empirical assessments of the relationships between market activity and environmental and cultural sources of human well-being (see subsect. 5B, chap. 3), such as ecosystem health and extent, maintenance of local knowledge and traditions, and equitable distribution of the economic benefits from tourism. Avenues for data collection to support the enhanced monitoring, assessment and prediction of ecosystem health include advanced mooring systems that facilitate the collection of real-time data on seawater quality, biodiversity, climate variability and ocean hazards. Smart tourism apps can help to measure and manage ecological footprints and carrying capacities, assess visitor satisfaction, enhance operational efficiency and reduce waste (Pencarelli, 2020; Wang and others, 2016; Yu, Zhang and Wang, 2018). Smart technology can also

facilitate the bidirectional exchange of information with visitors, further engaging them in destination sustainability by guiding and informing decisions regarding purchases, experiences and movement. An example of the power of digital tools and improved access to data is the use of mandatory global navigation satellite system trackers to monitor local seafood in the tourism sector in Jamaica, where consumers are increasingly demanding supply chain transparency and traceability (Northrop and others, 2023). Digital data-gathering mechanisms like apps empower local fishers (see subsect. 5A, subchap. 1B) while giving consumers confidence in premium-priced, sustainably labelled seafood (see subsect. 5A, subchap. 1E).

Coupling traditional measures of economic impacts from tourism with measures of non-market impacts, such as waste generation, water and energy use, crowding, ecosystem health and qualitative forms of information such as visitor and resident satisfaction, can form the foundation for education and capacity-building programmes designed to help policymakers, tourism operators and civil society to understand the real economic value of natural and cultural resources and redefine the notion of tourism success (Frantzeskaki and others, 2019; Schuhmann, 2020). Beyond the provision of a clearer view of tourism's impacts on ecosystems and communities, the measurement and mapping of ecosystem service stocks, flows and values can support evidence-based decision-making (Schumacher and others, 2020; Spalding, Burke and Fyall, 2021) for investment planning and for designing policies that direct resources towards their highest and best use (Papageorgiou, 2016; Schuhmann, 2020). Empirical evidence regarding the economic losses created by tourism can also help destinations to negotiate and implement tourist fees (e.g. cruise passenger fees) commensurate with costs imposed on local resources and infrastructure.

Echoing the recommendations of the Ocean Decade Vision 2030 (Calewaert and others, 2024) and the Intergovernmental Oceanographic Commission (IOC-UNESCO) *State of the Ocean Report 2024* (O'Brien and others, 2024), this pathway may require increased investment in data literacy, information technology readiness, the updating and modernization of national statistical offices and systems, data collection and data-sharing, and analysis efforts that span disciplinary and geographical boundaries. Natural capital accounting methods such as the System of Environmental-Economic Accounting and ocean accounts¹ provide structure for such data using a framework that is compatible with traditional national income accounts used by statistical offices and finance ministries. Creating and maintaining such accounts can foster and improve collaboration and coordination across government entities, help to identify gaps and deficiencies in data and statistics related to national priority issues (e.g. energy efficiency, water use, emissions and protected area management), help to measure and manage risks and opportunities related to nature, and improve stakeholder engagement (Fenichel and others, 2023; Ingram and others, 2024; King and others, 2024; Perkiss and others, 2022). By mapping tourism's linkages with coastal and marine ecosystems, ocean accounts also demonstrate the sector's vested interest in supporting ocean conservation, safeguarding its own future prosperity, and can be used to identify sustainable scenarios and pathways (Gacutan and others, 2022).

High-quality, immersive nature-positive and authentic community-based tourism

¹ Ocean accounts are integrated, standardized records that provide a comprehensive view of a country's environmental conditions, economic activities and social conditions related to ocean resources. Ocean accounts facilitate tracking of economic progress, allowing countries to go "beyond GDP", measuring not just market output but also the value of ecosystem services, the condition of natural assets and the impact of human activities on the ocean environment. For more information, see www.oceanaccounts.org.

A broad body of empirical evidence shows that immersion in nature and culture can stimulate place attachment, sustainable behaviours and willingness to return (Chen and Rahman, 2018; Kil and others, 2012; Wilkins and de Urioste-Stone, 2018; Zhang and others, 2023) and that tourists are willing and able to give back (Adam, 2021; Wearing and McGehee, 2013). Developing and promoting opportunities for high-quality, immersive nature-positive and authentic community-based tourism experiences can foster connections between visitors and marine environments, attract longer-staying visitors who spend within the local economy, strengthen visitor awareness of local conservation issues and enhance resiliency by counteracting tourism seasonality, while creating opportunities for employment, entrepreneurship and economic empowerment (Leotaud and others, 2024; Lewis-Cameron and Brown-Williams, 2022; Vergori and Arima, 2020). Well-designed experiences can cultivate visitors' ocean literacy and environmental consciousness that extend beyond the travel period (Ballantyne and others, 2018), generating ripple effects as tourists return home with new perspectives on ocean conservation, potentially influencing consumption patterns and political support for marine protection (Zeppel and Muloin, 2008; Walker and Moscardo, 2014). For coastal communities facing climate threats, sustainable tourism initiatives can serve as a vehicle for climate adaptation education, helping both residents and visitors to understand changing ocean conditions while building collective resilience against environmental uncertainties (Sheller, 2021; Cinner and others, 2018).

Examples of nature-positive community-based opportunities include the sustainable community tourism initiative in the Dominican Republic, which links communities with tourists emphasizing proper management of natural resources, appreciation of cultural heritage, equitable distribution of benefits from tourism and local community development through empowerment, entrepreneurship and self-management.² Tourist scuba divers in Fiji can join with local non-profit organizations and engage in citizen science or participate in more active pursuits such as coral restoration, creating a triple win: improved data and knowledge, action that advances conservation, and enhanced tourist satisfaction and willingness to return.³ Blue Safari Seychelles is a company that allows visitors to help to protect marine ecosystems through data collection of encounters with species, tree planting, beach clean-ups and underwater debris collection.⁴ Travelers pay a daily conservation charge of \$25, earmarked for ecological programmes and initiatives (Thorburn, Milne and Deuchar, 2021). Other examples are shown in the table below.

Opportunities to inform visitors regarding the importance of environmental and cultural assets and the purpose of sustainability initiatives can further engage visitors and stimulate responsible behaviour (Aini and Syuraini, 2023; Downs, Cruz and Remengesau Jr., 2022; Leotaud and others, 2024). Codes of conduct, such as the Palau Pledge,⁵ incentivize tourists to interact with the local community and culture and participate in regeneration projects (Herrmann, 2022; Levitan-Haffar, 2022). The Palau Pledge is stamped in all tourists' passports, which they must sign before passing through customs (Levitan-Haffar, 2022). An emerging area is improving access to information regarding the environmental impacts of trip decisions and enabling tourists to make carbon-offset contributions to blue carbon investments such as

² See www.godominicanrepublic.com.

³ See www.fijimarinas.com/citizen-science.

⁴ See <https://bluesafari.com>.

⁵ See <https://palaupledge.com>.

mangrove restoration or choose lower-emitting flights and accommodation using carbon calculators and carbon data transparency initiatives, such as Skyscanner and Google.

Challenges to implementing nature-positive and community-based tourism include: scaling due to reliance on small enterprises and carrying capacities of sensitive cultural sites and ecosystems; maintenance of natural and cultural integrity; and avoiding the commodification of culture and heritage. To ensure long-term success and community buy-in, it is essential for residents to be fully engaged in the co-development of such initiatives. Inclusive capacity-building and training in sustainable practices targeting local management and/or ownership of commercial tourist enterprises can further empower residents.

Table

Nature-positive and community-based tourism initiatives

| | |
|--------------------------------------|--|
| Active | |
| Preservation | Shoreline and marine clean-up efforts; invasive species removal |
| Regeneration | Mangrove planting; seagrass propagation; coral restoration; tree planting; dune restoration; marsh restoration; restoration of tidal flows and natural hydrology |
| Citizen science | Encounters with species; species counts; water quality or clarity assessments; litter counts |
| Nature- and culture-based adventures | Wildlife and habitat viewing; fishing; diving and snorkelling; cooking and cuisine |
| Passive | |
| Tours and visits | Museums; coastal ecosystems; historic and heritage sites; visual and performing arts |
| Local goods and services | Markets for local arts and crafts, products and services; health and wellness |
| Non-intrusive access to nature | Boardwalks, bridges, wildlife viewing structures; species identification and other interpretive signage |
| Immersive learning experiences | Cultural interpretation of natural environments and species, storytelling, history and heritage; importance of ecosystems; endemic biodiversity |

Source: Adapted from Thorburn, Milne and Deuchar, (2021) and Leotaud and others (2024).

Multi-use planning and diversification for infrastructure, services and operators

This can provide backstop income and employment opportunities during periods of tourism disruption and enhance destination resilience to natural hazards and economic shocks. Public investments in infrastructure improvements targeting energy efficiency, maintenance of water and waste management

infrastructure, and protection of ecosystems and biodiversity have been shown to provide positive economic and environmental returns (Paramati, Alam and Lau, 2018). Opportunities for tourism diversification include niche markets such as ecotourism, cultural and heritage tourism and community-based tourism (Leotaud and others, 2024). Increasing focus on service quality for business travellers and providing incentives to extend visits beyond the work period can offset losses from the decline in demand for business travel, generate additional economic impacts and create new opportunities for return visitation. Examples include remote work visa programmes that target digital nomads (Sánchez-Vergara, Orel and Capdevila, 2023). Investments in local capacity-building, such as training marine tourism operators to monitor protected sites and collect data regarding ecosystem health and function, can also enhance economic resilience to tourism downturns and empower tourism stakeholders as stewards of the natural environment (Day, 2008). A key challenge is that diversifying tourism value chains and decreasing economic dependence on tourism requires structural reform.

Enhanced use of economic instruments to incentivize the transition towards sustainable outcomes and create fiscal space for investments in natural and cultural capital

Coastal and ocean tourist destinations can use an array of fiscal policy tools to harness the power of monetary incentives and direct financial resources towards activities that generate long-term economic returns through regeneration and resilience, pollution reduction and the increased sustainability of tourist attractions. Taxes, fees, subsidies and payments for environmental services have been shown to be effective in funding protected area management, green energy, nature-based solutions, the decarbonization of supply chains, waste and emissions reductions and water use efficiency without constraining economic and social development or deterring visitation (Olmstead and Stavins, 2009; Sun and Feng, 2023; von Saltza and Kittinger, 2022).

Tourist fees can serve the dual purpose of revenue generation and visitor management. A large body of empirical evidence suggests that visitors are willing to pay fees that improve resource quality or offset management costs when the purpose is clearly communicated (Edwards, 2009; Font, Cochrane and Tapper, 2004; Rivera-Planter and Muñoz-Piña, 2005). In addition, collection points for visitor fees create a conduit for bidirectional exchange of information, enabling enhanced visitor management and the education of tourists on codes of conduct, the importance of natural systems, history, culture and traditions, and environmentally and culturally responsible behaviours, and facilitating the collection of information related to tourist activities, spending, preferences and satisfaction.

In addition, Governments can incentivize private sector sustainability initiatives through monetary and operational subsidies such as favourable tax treatment and fast-tracked permits for tourism projects that promote renewable energy, green products and services, locally sourced inputs, high-quality and low-volume experiences and community benefits (Leotaud and others, 2024; World Economic Forum, 2024). Special events, visitor concessions for off-season trips and visits to less popular sites and attractions can also be used for visitor management and for the reduction of the impacts of seasonality (Connell, Page and Meyer, 2015). Quota or reservation systems can also be used for high-demand or sensitive sites. Destinations must first measure and understand capacity limits in terms of adverse impacts on ecosystems, cultural integrity, water and energy resources, infrastructure, community well-being, safety and visitor satisfaction.

6. Conclusion

The review of the nature and extent of coastal and ocean tourism and its impacts on human and environmental well-being set out above highlights a coupling of dependence and impact. Economic and social gains from coastal and ocean tourism rely on the ability of coastal and marine ecosystems to provide benefits to visitors and local communities. However, mounting evidence suggests that continued growth of the sector poses threats to the natural and cultural resources upon which tourism depends.

Transitioning coastal and ocean tourism towards more sustainable outcomes will require a shift among tourism stakeholders to view the value and success of tourism more holistically, complementing traditional market-based measures of economic activity with measures of environmental, cultural and community costs and benefits. This shift will require purposeful public and private sector investments. Investments in data collection and analysis can close information gaps, allowing for a more comprehensive view of tourism's value and impacts, facilitating evidence-based planning and decision-making and providing the foundation for education and capacity-building programmes. Support for nature-positive and community-based tourism opportunities can create economic gains and empower both visitors and local communities to be agents of change. Multipurpose infrastructure and diversification of product and service offerings can improve economic efficiency and enhance destination resilience to natural hazards and economic shocks. Enhanced use of economic instruments can incentivize sustainable behaviours and create revenue streams to support investments in natural and cultural capital.

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