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Sea-Level Rise is Inevitable: An Adaptation, Diversification, and Navigation of Coastal Region Tourism

Mohsin RAZA
Faculty of Hospitality and Tourism, Prince of Songkla University, Phuket, Thailand, Email, mohsinraza006@gmail.com

Rimsha KHALID
Faculty of Hospitality and Tourism, Prince of Songkla University, Phuket, Thailand, Email, rimshakhalid82@gmail.com
Corresponding Author

Abstract

Rising sea levels is a significant threat to coastal communities and ecosystems, impacting coastal tourism and sun, sand, and sea products. The study investigates tourists' perceptions about rising sea levels and their preferences, destination management authorities' preparation level, contingency plans, and proposed solutions to coastal erosion and sustaining tourism. The study interviewed tourists and destination management authorities in Thailand. The findings revealed tourists' environmentally conscious behaviour and preferences in case the coastal area becomes temporarily or permanently inaccessible. The study is one of the earlier calls to respond to the rising sea level threats to coastal tourism. It involves tourists' perceptions and destination stakeholders' responses to rising sea levels, tourism management, improving coastal inhabitants' lives, and making strategies to avoid the severe impacts of the global threat of rising sea levels.

Keywords: Rising sea level; contingency plans; tourism; Thailand.

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Introduction

Coastal regions are among the most vulnerable areas because of rising sea levels, even though they are countries' economic hubs. High tides, extreme waves, storms, and rising sea levels have increased the frequency of coastal erosion and impacted inhabitants, infrastructure, and communities (Antunes & Lemos, 2025). A study of Storer (2021) revealed devastating facts that 270 million people are living on land just above two meters from sea level, and the majority of this population is living just one meter high. By the 2100th century, the number will have increased to 410 million people, even with a zero-population growth rate. The rising sea level is one of climate change's most significant and major outcomes. The year 2024 was the warmest ever recorded, and the sea level was unexpectedly increased by 35%. On average, it rose by 0.17 inches per year; in 2024, the rising rate was 0.23. About two-thirds of the sea's rising level is because of glaciers and ice sheets melting, and coastal regions are witnessing its impacts. The inhabitants of coastal regions are ready with plans to deal with floods and rising levels. However, they must accelerate their plans as every coming year brings no hope or less than average increase in rising sea levels (Knapp & Ohnsman, 2023). Small islands and coastal regions contribute around 1% of global emissions, yet they face the hardest consequences (Plummer, 2024). Rising sea levels are potentially threatening the extinction of communities, displacing the population from the land they have inhabited for centuries and causing economic disruptions. Small and low-lying islands are near extinction; some have already sunk, including Maldives, Kiribati, and Fiji. A country in between the west-central Pacific Ocean, halfway from Australia and Hawaii, is losing its status as a country and is on the edge of extinction (Barnett et al., 2025). History might not repeat the tragedy of Dogger Land, home to Mesolithic people and a region of northwest Europe submerged beneath the southern North Sea. Although low-lying islands are disappearing, there is still no threat of humanity's extinction (Krol, 2023).

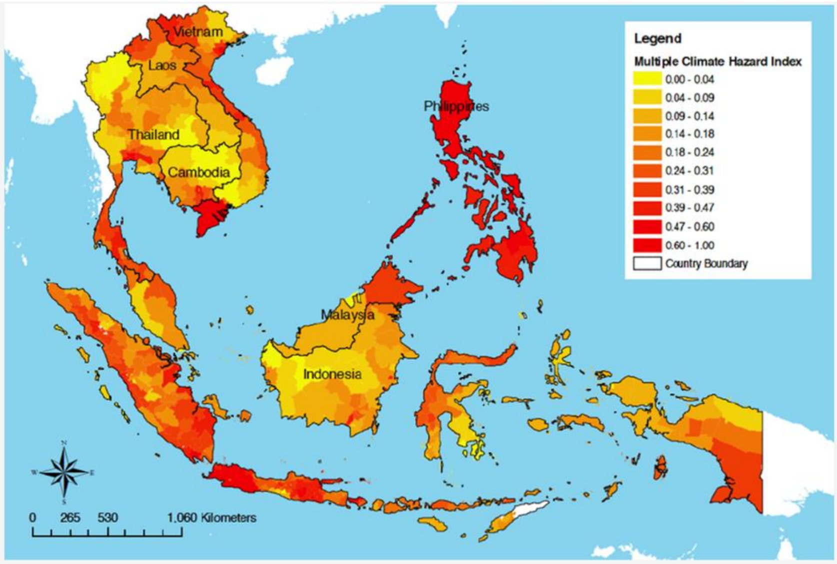
The increase in sea level is nature's response to our mishandling of the environment. We are already too late, and the rising sea level is absolutely guaranteed, even if the world stops emitting greenhouse gases tomorrow (McVeigh, 2023). The study of DeConto et al. (2021) stresses the need to slow down the rising sea level and make plans for coastal regions as they are always an economic hotspot. The coastal regions are important for people living there and are always an integral part of a country. However, their importance is much higher for tourism-based countries, as the coastal regions are key to keeping their tourism alive (Causevic et al., 2021). The measurement radars failed to measure the difference in sea level and the governments in coastal regions have shorter deadlines to deal with potentially catastrophic climate impact. The coastal regions are highly important for a country as they provide recreational activities and sea-sun-sand products and serve as the backbone of tourism-based countries (Pilkey & Pilkey-Jarvis, 2007). The study by Spencer et al. (2022) about Caribbean islands predicted a 53% loss in sandy beaches, resulting in a 30% hotel room loss and a 38% tourism revenue loss before we reach the next century due to rising sea levels. Asia Pacific region has received the highest number of tourists, and the most crowded areas are always the coastal regions. Yong (2021) evaluated the data of 48 countries and highlighted the vulnerability of Southeast Asia Pacific. Further, the study of Nitivattananon & Srinonil (2019) emphasizes that the coastal region of Thailand is hardest hit if proper measures are not timely adopted. Khalid et al. (2023) noted that most Thai tourism is in coastal regions, and recent floods and rainfall should be taken as a wake-up call before environmental hazards, climate effects, and rising sea levels turn Thailand into tourophobic destination. During this 20th century, one of the Thai villages, 'Ban Khun Samut Chin', was slowly swallowed by the sea, and this village is just 10 kilometers from the capital city of Thailand, Bangkok, which is also a tourist hotspot (Picone, 2015).

Due to rising sea levels, Indonesia, a Southeast Asian country, has relocated its capital Perwira et al. (2024), and there are speculations that Thailand will move its capital from Bangkok to another city (Hussein, 2024). The threat of rising sea levels is real and Dube et al. (2021) argues that while focusing on their migration and slowing down the sea's rising level, plans should be made to revive tourism. Further Spencer et al., (2022) mentions the need to develop strategies to save tourism even though we fail to save the destination. Hernández-Delgado, (2024) urged the need to respond to the rising sea level through timely actionable plans. A shocking report by Libson (2019) revealed that 10 per cent of Thailand's citizens live and host tourists on land that will be inundated by 2050. The report of Edwards, (2021) considers rising sea levels and coastal erosion to be unstoppable, but their pace can be slowed down. This is exactly what we need, and this time should not be wasted. We must make strategies to thrive through this crisis, which seems like a destiny (Walsh, 2022). Apart from coastal erosion, the rising sea level has the capacity to impact tourism revenue directly (Yong, 2021). The study of Spencer et al. (2022) fears that due to delayed response to rising sea levels, the tourism revenue can be impacted by 47%. In the case of Thailand, the two cities that are on threat of extinction facilitate and support most of the tourism. The rising sea level of the Gulf of Thailand is impacting Bangkok, and the rising sea level of the Andaman Sea is also threatening the coastal areas of Phuket. These cities are the top tourist cities in Thailand (Simons et al., 2019). The rising sea level is already redefining the shorelines of Phuket. Although it is not an immediate threat to Phuket tourism, the response should not delayed as we witness a change in earlier projections (Nidhinarangkoon et al., 2023). The study of Jaroenongard et al. (2021) highlighted the need to investigate the rising sea level impacts on Bangkok and Phuket Province of Thailand. Further, Nidhinarangkoon et al. (2023) suggested the need to implement strategies to respond to the rising sea level in Phuket because of its 15% contribution to the gross domestic product from the tourism industry. Considering the importance of avoiding tourism disruption in coastal regions, the study's key objective is to interview tourists at coastal destinations to understand their preferences and suggestions to deal with sea levels, support the economy, keep luring tourists, and support the inhabitants of coastal destinations.

Literature review

Sea level rise

Although man-made or nature revives itself after a certain period, as in the Doggerland case or many civilizations, the rising sea level is one of the greatest threats of this century. The rising sea level and the island's disappearance have become global catastrophes. The report of Pasricha, (2021) highlights that the rising sea level is an equal threat to all regions, including the USA, the UK, Europe, and Asia, but it is hardest to Asia because of population density, hydrology, and asset concentration. Specifically, the tropical coastlines of Asia are most vulnerable to crises and are responsible for millions of human migrations and home loss (Kapoor, 2021). The study of Subramaniam, (2023) mentioned that the consequences of Asia, specifically Southeast Asian countries Thailand's capital, Bangkok, Vietnam's Ho Chi Minh City, and Yangon, Myanmar, are worse than we think. These cities are not only losing the shoreline. Still, they are at the cusp of extinction as the study of Southerland, (2020) published a map mentioned in Figure 1 of the hazard situation and particularly mentioned that southeast Asia is sinking. During the 20th century, the sea slowly swallowed one of the Thai villages, Ban Khun Samut Chin. This village is just 10 kilometers from Bangkok, the capital of Thailand, which is also a tourist hotspot. A shocking report by Lu & Flavelle (2019) revealed that 10 percent of citizens living and hosting tourists on land will be inundated by 2050.



Vulnerability to climate change in Southeast Asia accounting for exposure to climate hazards, sensitivity and adaptive capacity. 0 = lowest vulnerability, 1 = highest vulnerability. Source: ResearchGate

Figure 1 Vulnerability index of Southeast Asia
Source: Southerland, (2020)

Few studies have highlighted the existential threat to Bangkok, which is sinking. Projections indicate that 96% of the Bangkok metropolitan area will be beneath water in the next 100 years. By the year 2030, Bangkok will face extreme calamities and be vulnerable to high-intensity floods (Rujivanarom, 2023). The report of Lu & Flavelle (2019) fear that the rising sea level could be three times higher than previously thought and called for immediate actions by managing authorities. Figure 2 highlights the difference between old and new projections of the sea level for Southeast Asia.

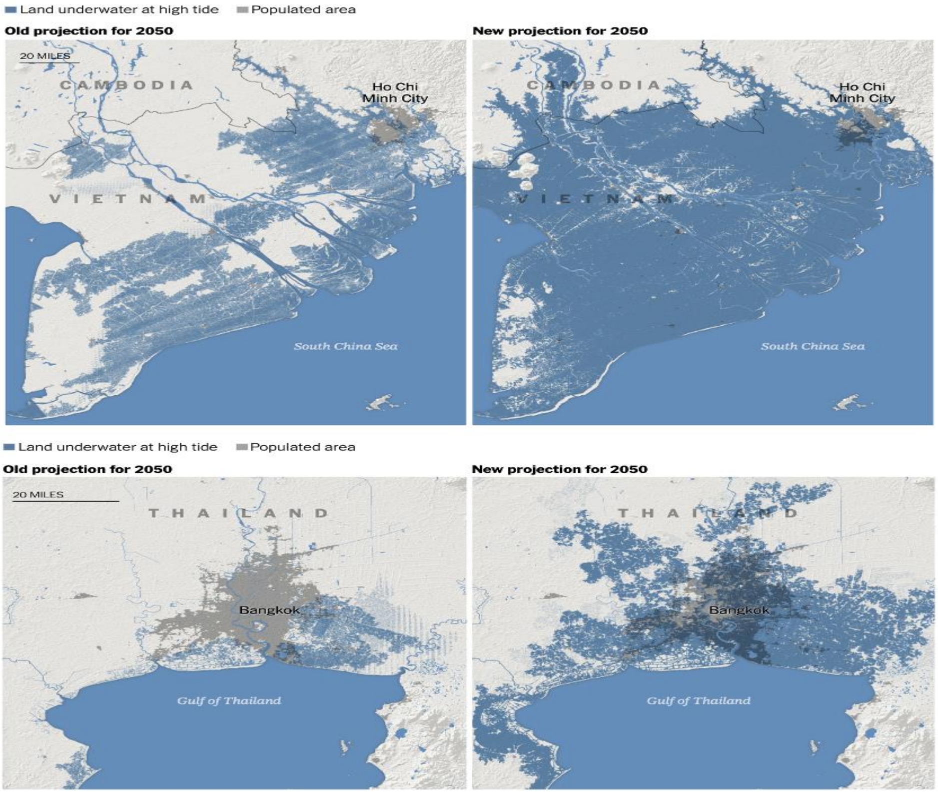


Figure 2: Sea Rising level project
Source: Lu & Flavelle (2019)

We are already too late, the rising sea level is absolutely guaranteed even if the world stops emitting greenhouse gases tomorrow (McVeigh, 2023). Greenland's ice sheet is melting, with a 10-inch rise in sea level every year. If Greenland's ice melted at the rate it melted in 2012, a 30-inch rise in sea level can be anticipated. The report of the Intergovernmental Panel on Climate notes the increased sea level threatening coastal regions, increased coastal erosion, and loss of coastal ecosystems, specifically low-lying islands, which are at threat of extinction whether they are at any latitude irrespective of their level of development (IPCC, 2022). The impacts of rising sea levels are significant for Southeast Asian countries (Tun et al., 2024). The report Lazaro (2023) witnesses the capital relocation of Indonesia, the sinking of Manila, and the capital relocation intention of Thailand while keeping in view the village of Samut Chin that could not be saved and asking for prompt action to save land, people, and economy.

Rising sea level impact on the tourism economy

Rising sea levels, propelled by climate change, cause substantial threats to global coastal tourism economies (Majumder et al., 2025). This concern is particularly due to the city's reliance on its coastal attractions. The study of Dube et al. (2021) describes these challenges through an in-depth analysis. Around 80% of beaches in Cape Town are under threat due to rising sea levels and coastal erosion. The iconic sites and islands confront risks from storm waves and land encroachment. Consequently, facilities containing coastal roads, railway lines, and tidal pools are vulnerable to smashing up from increased storm intensity and flooding (Nichols et al., 2024). Even though extreme weather has led to the erosion of beaches, spoiling their charm to tourists, The eroded condition of beaches and tourist sites threatens the incomes of businesses reliant on tourism (Devienne, 2024). Therefore, there is a pressing requirement for increased insurance attention to mitigate possible financial losses from climate-induced damages (Dharmarathne et al., 2024). Moreover, collaborative determinations are necessary to mobilize resources intended to adapt the tourism sector to the challenges created by climate change. Moreover, regular assessments must be conducted to stay side by side with ongoing disruptions and execute strategies to protect coastal tourism resources (Abel et al., 2011). This study highlights the need for tourist destinations to foster the planning and implementation of strategies that address the multifaceted challenges caused by rising sea levels to its coastal tourism sector (Abel et al., 2011). Further, the study of Mahon et al. (2013) discovered the effect of climate change on tourism in small island countries, representing that beach loss due to rising sea levels could considerably shrink tourist visits and disturb the whole economy. Besides, tourism infrastructure, involving hotels, restaurants, roads, and airports, are often situated along coastlines (Khalid et al., 2025). Rising sea levels make These infrastructures extremely vulnerable to flooding, storm waves, and saltwater damage. Also, tourism businesses in these zones may encounter redoubled repair and rebuilding costs. Moreover, a study by Dillimono & Dickinson (2015) discoursed how rising sea levels and risky weather incidents are put at risk to infrastructure investment, leading to financial damages and lessened tourism activities. Therefore, coastal communities usually depend on tourism as a key source of revenue. As rising sea levels threaten housing areas and cultural landmarks, local populations may confront dislocation. This not only disturbs the livings of locals but also diminishes the cultural authenticity many tourists look for in coastal destinations.

Further, Jancaitis (2007) emphasized how the shift due to sea level rise could interrupt tourism movements in the Maldives, as the damage to local cultures and heritage may discourage international tourists. Rising sea levels can lead to the saltwater interruption of freshwater supplies, adversely influencing local agriculture and fisheries, essential to tourism experiences in many coastal areas. Henderson et al. (2024) investigated the vulnerability of sea biodiversity and how harm to coral reefs and coastal ecosystems could diminish from eco-tourism and wildlife-based tourism, specifically in spaces like the Great Barrier Reef in Australia and the Caribbean. Promoting sustainable tourism that spotlights environmental conservation and lessens the carbon footprint can support reducing the long-term effects of climate change on tourism, bringing in renewable energy, reducing waste, and protecting natural areas (Hunter, 2002; Sawangchai et al., 2025). Besides Tehseen et al. (2024) highlighted the role of sustainability in facilitating climate change risks and preserving long-term tourism viability. Capitalizing on coastal protection measures, such as sea walls, dune restoration, and natural buffers, can be beneficial to safeguard coastal infrastructure. Additionally, eco-friendly infrastructure and flexible tourism offerings can survive through flooding and erosion. Coastal destinations can expand their tourism contributions to shrink reliance on beach tourism (Wojtowicz-Jankowska & Bou Kalfouni, 2022). Moreover, Alexander (2024) reports from Palomino, a beach resort on Colombia's Caribbean coast, uncovered that rising sea levels and coastal destruction have overwhelmed the local tourism economy. The constant devastation of beachfront establishments has led to economic difficulty, with locals appealing for urgent state involvement to lessen damage and support adaptation efforts. Another study of Hitt (2025) specifies that parts of Hawaii are dipping into the ocean faster than before, predictably due to sinking and rising sea levels. This heightened sinking could flood vulnerable parts containing major tourist destinations such as Waikiki and urban Honolulu and pose substantial threats to Hawaii's tourism, coastal development, and ecosystems. After reviewing the literature, these studies mutually underline the convincing challenges that rising sea levels pose to coastal tourism countries. They emphasize the necessity for comprehensive reforms and improvement strategies to protect these key sectors from the rising impacts of climate change (Chambwe & Shereni, 2024).

Methodology

To get deeper insights into the impact of rising sea levels on tourism and to understand tourists' preferences, the study conducted interview sessions with tourists in Bangkok and Phuket, which are the top tourist cities in Thailand and are on the cusp of rising sea threats. The interview process assist in obtaining deeper insights (Raza et al., 2024). Alongside the interviews with tourists, the study interviewed the tourism management departments, crisis response teams, and destination stakeholders to comprehend their perspectives. To gather interviews from tourists, the study contacted tourists in the coastal regions of Bangkok and Phuket. The list of tourists was obtained from the tourism companies in coastal regions, and tourists who had spent at least six months in the coastal region in a collective period of two years were considered for the study. The reason for having this criterion is to ensure their understanding of coastal activities and cultural values and a wide understanding of local businesses in coastal regions. Further, the study contacted thirty tourists based on the provided list and interviewed twenty-five of them because of their availability and achieving saturation point. Only participants above 18 years old who have spent at least 6 months in the coastal region and have been lived around the coastal region, and are enthusiasts of the sea, sun, and sand offerings. The study employed purposive sampling, and the participants were presented with Thai souvenirs as tokens of appreciation. The interviews took 40 minutes on average, and firstly, tourists were asked for their demographic information. Out of twenty-five, five tourists were with their kids, seventeen were either single or divorced, and three were in an open relationship. Regarding age, ten were above eighteen years old, three were above thirty-five years old, five were above forty-five years old, and seven were above sixty and intended to spend their retired life in Thailand. Regarding gender, sixteen were male, five were female, and four did not specify their gender. Further, the tourists were asked the following questions.

Interview Questions From Tourists
1. Are you aware of the rising sea level and its potential impact on your travel plans in the future?
2. Have you ever visited a coastal area that has been affected by rising sea levels or climate change? If so, how did it affect your experience?
3. Do you believe that rising sea levels could make popular coastal destinations less appealing in the future? If so, why?
4. Would you change your travel plans if you learned that a favorite coastal destination might no longer be accessible due to rising sea levels?
5. As sea levels continue to rise, do you believe the tourism industry will need to shift towards more sustainable or inland tourism options?

Figure 3: Interview questions from tourists

After interviewing the tourists, the second round of short interviews is conducted with destination stakeholders, the tourism department, and disaster management authorities. These interviews aim to understand their understanding of rising sea levels, their plans to lure tourists, and coastal tourism destination management. The study attempted to contact twenty respondents and managed to interview twelve respondents while reaching the saturation point of interviews. The following questions were asked.

Interview Questions From destination stakeholders
1. What steps have you taken to assess the vulnerability of coastal tourism sites to rising sea levels?
2. What actions have you implemented so far to mitigate the effects of rising sea levels on tourism infrastructure, such as hotels, beaches, and other coastal attractions?
3. Are you planning to diversify tourism offerings to ensure long-term sustainability as sea levels rise, such as promoting nature-based tourism, eco-tourism, or inland adventures?
4. What contingency plans are in place if key tourist destinations become temporarily or permanently inaccessible due to flooding or erosion?
5. What innovative solutions or technologies do you see playing a role in adapting tourism infrastructure to deal with the rising sea level?

Figure 4: Interview questions from destination stakeholders

After interviewing the tourists and destination stakeholders, the study proceeded with a thematic analysis carried out by line-by-line coding, and initial themes were generated following the guidelines of Berbekova et al. (2021). The qualitative data of this study was compiled through Nvivo 15 in approximately 12,000 words and ensured its accuracy. First, the thematic analysis was performed by generating initial codes. After that, the qualitative data were coded and redefined, and themes were generated. The topics were assigned names and definitions, and summarized results were compiled. The study employed several data triangulation techniques to validate qualitative findings (Al-Smadi & Al-Saad, 2022). In precise manners, the investigator triangulation technique was followed, and themes and codes were identified from multiple research perspectives.

Results

The tables below highlights the identified themes of this research.

Table 1: Key identified themes from tourists

Theme	Respondents' Quotes
Awareness of rising sea levels	"I'm aware of rising sea levels, but I don't think it will affect my travel plans directly." (Respondent 7,10) "It's a global issue, but I don't see it affecting my future trips to coastal areas yet." (Respondent 2,23)
Impact on coastal destinations	"Coastal regions are becoming less accessible, and I'm starting to reconsider visiting certain islands." (Respondent 5,12) "The beach shrinkage and flooding concern me, I might avoid these destinations in the future." (Respondent 9,24)
Sustainability and ethical travel	"I want to focus on sustainable travel and destinations that have lower environmental impact." (Respondent 3,17,18) "I believe eco-tourism is the future, and I plan to avoid destinations that harm the environment." (Respondent 15,3)
Emotional connection to affected destinations	"It's sad to think that my favorite coastal destinations might not be accessible in the future." (Respondent 9,12) "I'd visit these places one last time before they disappear completely." (Respondent 17,22)
Shift towards inland and nature-based tourism	"The tourism industry has to adapt to these changes by promoting inland and nature-based tourism." (Respondent 1) "Inland tourism seems inevitable as coastal regions become less accessible due to climate change." (Respondent 14,17)

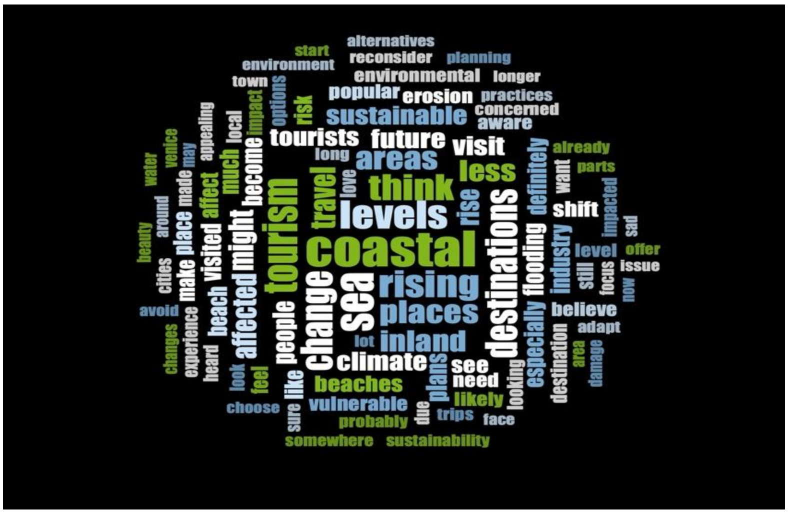


Figure 5: Word cloud from identified themes of tourists

Table 2: Key identified themes

Theme	Respondent Quotes
Vulnerability Assessment and Technology Use	"We use geospatial mapping, satellite imagery, and hydrological modeling to assess vulnerability." (Respondents 1, 2, 3, 6) "Collaboration with climate scientists and environmental agencies enhances our vulnerability assessments." (Respondents 3, 6, 9)
Coastal Protection and Infrastructure Adaptation	"We need to build sea walls, flood barriers, and restore natural coastal buffers like mangroves to protect tourism infrastructure." (Respondents 1, 2, 3, 8) "Elevation of infrastructure and flood-resistant materials should be used for new developments." (Respondents 1, 3, 4, 8)
Diversification of Tourism	"We plan to offer eco-tourism activities, such as hiking and wildlife tourism, in inland areas to reduce reliance on coastal destinations." (Respondents 1, 2, 6, 9) "Expanding eco-tourism and incorporating cultural and rural tourism are important." (Respondents 3, 5, 10)
Contingency Planning and Crisis Management	"We need to have alternative inland destinations ready in case coastal areas are affected by flooding or erosion." (Respondents 1, 4, 6, 9) "Crisis communication strategies should inform tourists about changes in travel plans due to calamities." (Respondents 4, 5, 12)
Innovative Solutions and Adaptive Architecture	"Modular structures, floating hotels, and elevated buildings can make tourism infrastructure more flexible and resilient to rising sea levels." (Respondents 1, 3, 8) "Using smart technologies like sensors and drones helps monitor environmental changes and activate protective measures." (Respondents 2, 4, 7)

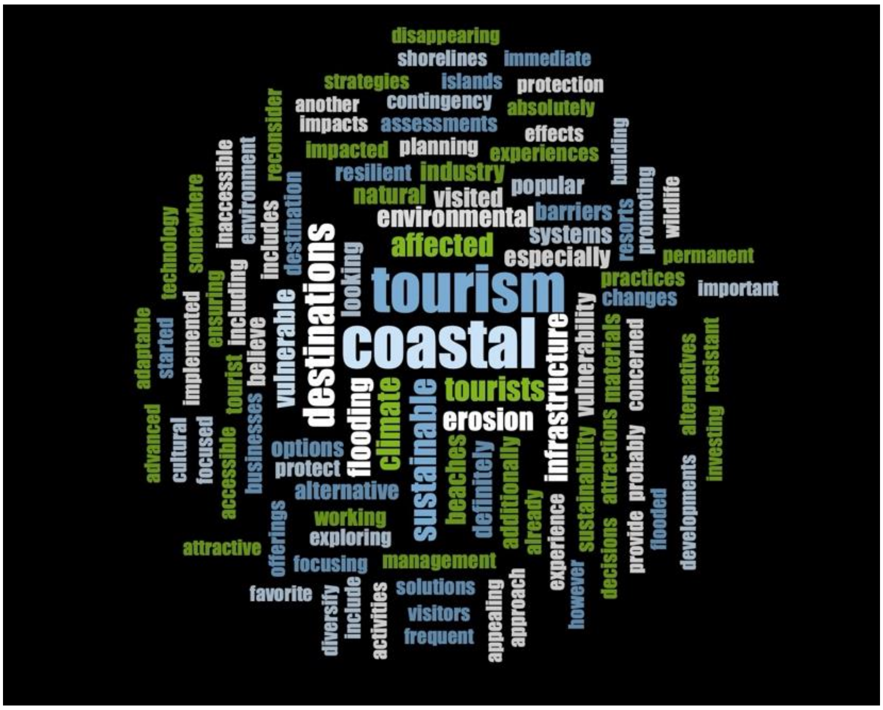


Figure 6: Word cloud from identified themes of destination managing authorities

Discussion

Rising sea levels are one of the most significant factors affecting future travel choices. The outcomes of interviews emphasized that consciousness of rising sea levels is increasing, with varying degrees of concern among tourists. Many of the respondents were aware of rising sea levels and their possible consequences on future travel, especially relating to coastal and beach destinations accessibility. This awareness indicates the extensive societal shift towards environmental consciousness, as demonstrated by a prior study of Gössling & Reinhold (2024) which emphasizes the growing concern about climate change and its impact on tourism preferences. These tourists are more likely to embrace sustainable travel practices (Chihwai & Dube, 2023). The accessibility and protection of coastal destinations reveal the growing discomfort among tourists about the future of these regions. Several respondents endorsed the risk that rising sea levels pose to well-known coastal destinations such as Miami, the Maldives, and parts of Southeast Asia (Nicholls, 2018). The shift towards discovering other inland options or less vulnerable destinations is the ultimate solution. While a few of the respondents stated partial concern relating to the direct effect of rising sea levels on their travel behavior, it is marked that this group is less involved with environmental concerns and concentrates on convenience, protection, and other aspects of environmental concerns. This irrelevance is coherent with the outcomes of Hall et al. (2022) who categorized that while some tourists may realize climate change, they may not rapidly change their travel behaviors if not directly affected, highlighting an important gap between consciousness and action. Further, the direct impact of environmental situations, such as beach erosion, flooding, and destruction, on the attractiveness of coastal destinations is frequently considered. A few respondents stated that these environmental uncertainties have concerned the destinations and made them less alluring. This is in line with the research of Becken et al. (2017) that argues that the substantial degradation of tourist destinations can substantially reduce their demand. The adverse effect on the aesthetic and recreational effectiveness of coastal regions from security concerns may lead tourists to shift their choice to more inland substitutes.

Another theme is the emotional effects of recognizing environmental degradation in coastal regions, which are more considerable in the responses. Many respondents were sad and uncomfortable over the visible consequences of rising sea levels. This expressive connection to the environment plays a remarkable part in forming travel decisions, mainly when it comes to escaping destinations that cause environmental harm. The findings are align with a prior study of Peng (2020) who endorses that tourists who are heartily associated with the destinations they visit frequently are more likely to change their behaviors to affiliate with sustainable practices. This ethical consideration reveals the growing importance of sustainable tourism in raising environmentally responsible travel procedures. Moreover, a shift towards more sustainable and inland tourism is essential as rising sea levels continue to disrupt coastal regions. Several respondents declared that the tourism industry should shift tourists to destinations that are less vulnerable to climate change. This shift aligns with the study of Fennell et al. (2024), who mentions that the tourism industry must incorporate sustainability to remain viable in the face of climate change. As coastal tourism becomes less viable due to rising sea levels, inland and nature-based tourism is expected to gain attraction and presenting tourists another possibility that aligns with environmental preservation and eco-tourism.

More particularly, tourism areas situated along coastlines are in peril due to rising sea levels. Therefore, the tourism industry is responsible for assessing their vulnerability and adopting mitigation techniques and innovations that are of utmost importance for securing long-term sustainability. The interview results refer to various strategies that destination management is seeking to implement in addressing the elevated risks associated with climate change. Most participants demonstrated the predictability of future risks through scientific models. Further, the study by Woodroffe et al. (2023) mentioned that satellite imagery and GIS are increasingly relied upon in tracing coastal deviations and locating endangered areas. Using modern technology means governments can predict and undertake practical responses, such as strengthening their coastal defenses or diverting infrastructure away from areas that remain vulnerable to ensure tourism sites are defended. Collaboration with practitioners, respondents suggested a more encompassing view of environmental hazards, and this holistic approach to vulnerability evaluation aligns with the study of Gallo & Aldrich (2024), suggesting the presence of local understanding and community engagement in climate change adaptation preparation. Many stakeholders from destinations advocated for coastal protection with protective measures including sea walls, flood barriers, and natural coastal buffers. Barbier et al. (2011) also confirm the success of coastal areas in preventing natural barriers from eroding and highlight the increased attention paid to their importance in climate adaptation approaches. Respondents also addressed infrastructure resilience, such as elevating buildings and implementing flood-resistant designs.

The study by Lennert et al. (2024) illustrated the prerequisite for adaptive infrastructure, as it is essential to enforce flood-tolerant materials and verify that new developments follow current guidelines for floods. Additionally, many respondents emphasize tourism as a crucial component of broader strategies for adapting to sea-level rise in the long term. One of the major themes is promoting inland and nature-based tourism to cushion for lack of coastal resort destinations. This increasing focus on internal and eco-tourism is seen more as a potential way to reduce the dependence of the vulnerable coastal regions. These alternative types of tourism can offer more robust travel experiences and sustainable tourism prospects. Allkins et al. (2025) stress this overall increase in demand for eco-tourism by travelers whose environmental defense-consciousness is more developed (Duruibe & Van Der Merwe, 2022). Also, the nature enthusiasts could go on hiking, wildlife sightseeing, and eco-lodges as more earth-friendly options for traditional beach breaks. These services also provide tourists with broader options, spreading tourism to different places and thereby reducing the load on coastal areas. Few respondents highlight the need for flexibility in tourism offerings. Effective crisis communication is crucial in dealing with tourism disruptions due to environmental disturbances, so clear and easy communication methods are vital for making tourists aware of travel plan alterations. In addition, preventive and disaster management frameworks are primarily applied to revive tourism if a coastal place is affected (Khalid et al., 2023). These include evacuation routes, creating backup supplies, and utilizing real-time surveillance technologies to detect environmental changes. Respondents also indicated that resources should be in the form of the best engineering solutions, such as floating hotels and elevated structures, so that coastal tourism is not threatened. The technologies provide flexibility and resilience, as tourism infrastructure is expected to rise with sea levels. Floating hotels have been conceptualised in the literature as one of floating infrastructure options that can be used to keep tourism activities alive in disaster-affected coastal areas Dalkıran et al. (2023). Additionally, using nature-based solutions as well could help the coastlines from further damage, restoring and planting up something like mangroves or coral reef for protection. This is in line with van Bijsterveldt et al. (2022) explores nature-based solutions as an environmentally friendly and low-cost approach to protect coastal tourism infrastructure.

Implications of the study

Along with the suggestions of tourists and tourism management authorities regarding sea level rise, there are numerous implications for responding to sea level rise. Some people also understand that sea levels are rising, which leads to an increasing number of tourists considering the environmental aspects of their trips. And with a heightened level of awareness comes potential opportunities for improved destination selection, such as knowing not to take your family to a city at high risk for future floods, or the importance of adopting sustainable travel practices. Moving inland or to less vulnerable zones may become satisfactory for vacationers themselves, as tourists seek new destinations with the least environmental threat. This aligns with the rise in eco-tourism and nature-based activities, offering a sustainable alternative to high-risk coastal destinations. This increase forces travelers to eventually choose an alternative more inland compared to coastal locations, which are severely suffering from the threats of erosion and flooding. This could be a major draw point for eco-tourism, along with outdoor experiences like hiking or wildlife viewing. With growing negative emotions toward the environment, some tourists may reconsider visiting at-risk coastal zones, suggesting a need for greater attention to sustainability in travel behavior. Destinations that take a proactive approach to adapting to climate change can attract tourists who are more likely to seek sustainable options. Tourism authorities shall account for efforts to utilize innovative technologies like GIS, hydrological modeling, and satellite imagery for mapping vulnerability of coastal areas. They provide the predictive capability to make informed decisions about everything from coastal security to where to build storm fortifications. Collaboration among authorities, climate experts, environmental agencies and local communities should help develop the most comprehensive and realistic adaptation plans. There is an urgent need to enact both complex mangrove rehabilitation as well as engineering solutions, including sea walls, in order to protect tourism infrastructure from rising sea levels. This helps to finance flood resistant building designs and enriched structures that ensure the sustainability of key tourism infrastructure. Additionally, the authorities must expand the tourist offerings to reduce their dependency on the beaches. The promotion of inland and eco-tourism options also offers the opportunity to spread visitor activity around more areas and take some of the pressure off the coast. Eco-lodges, hiking, and wildlife experiences are all sustainable alternatives to beach vacations and other nature-based tourism ideas. Contingency approaches ought to be promoted in the management of tourism, when it comes to redirecting tourists towards other possible destinations if coastal zones are not accessible. Emergency response and contamination control are as important steps in minimizing the disruptions reached. Furthermore, planners should integrate creative infrastructure measures (e.g., floating hotels, modular buildings, or elevated developments) to maintain tourism opportunities in at-risk coastal zone locations. Furthermore, nature-based solutions such as coral reef restoration and mangrove planting can have a large impact.

Limitations and future directions

The study has highlighted a novel aspect and the great threats climate change poses. Despite its comprehensiveness, the study is not free of limitations. The sea level is rising periodically, and time series analysis or gathering data periodically can enhance the rigor of the study. The rise of sea levels is a global threat, and obtaining data from different countries, islands, and coastal regions would be good. A larger sample size or mixed methodology can present deeper insights besides the contextual contribution. Future researchers are also invited to obtain secondary data for a clearer picture. The data for this study focuses on the tourism sector. However, the livelihood of coastal inhabitants and their challenges can be further investigated.

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