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Environmentally Sustainable Practices of Cruise Ships: Cruise Ship Passenger Insights

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Abstract: The cruise industry has seen tremendous growth over the years. With rapid expansion in destination and fleet sizes, the industry is subject to concerns related to environmental sustainability. Many fleets adopt advanced technology to address environmental concerns, reduce waste, as well as promote reuse and recycling. However, due to the nature of cruise services, whereby the service is co-created along with passengers, it is critical to gain insights into passenger perception towards environmentally sustainable practices. Therefore, the study aims to gain insights into passenger perspectives, using a qualitative approach. A total of 50 cruise passengers participated in a qualitative survey. The findings suggest that a significant number of passengers are aware of sustainable practices onboard and their perception towards the cruise service providers' efforts is positive.

Keywords: Cruise tourism, sustainability, passenger perception, SDG14

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Introduction

Cruise tourism has emerged as one of the fastest-growing sectors of the global tourism industry, with cruise ships operating in every ocean worldwide (Han et al., 2019; Wondirad, 2019). According to Cruise Lines International Association (Cruise Lines International Association [CLIA], 2025), global cruise passenger arrivals reached 34.6 million in 2026 and is projected to rise to 42 million by 2028, boosted by an average growth of 9% starting 2025. In addition to traditional destinations

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such as the Caribbean and the Mediterranean, regions including Asia, Australasia, and the Pacific are experiencing rapid growth, driven largely by the expanding Asian middle class, with China accounting for 67.8% of Asia's cruise source market (CLIA, 2015; Hung et al., 2019; Xiaoxin et al., 2025).

Cruise tourism is an all-inclusive luxury form of tourism, in which the tourists spend at least two days on board a cruise ship (Asero & Skonieczny, 2017; Petrick & Durko, 2016; Wondirad, 2019). Since the modern development of cruise tourism in the 1970s, the industry has witnessed a significant expansion owing to technological advancements, introduction of larger ships, increased fleet size, diversified destinations, change in passenger demographics and strong marketing strategies (London & Farias, 2020). However, this expansion has significantly raised environmental concerns related to waste generation, air and water pollution, as well as pressure on fragile ecosystems and host communities (General Accounting Office, 2000; Gössling, 2002; Klein, 2011;Wondirad, 2019).

Although cruise lines face public criticism for being environmentally destructive, the industry continues to assert that it has made notable progress through environmental certifications, compliance with international regulations, and the adoption of new technologies (CLIA, 2020; Dorazio, 2024). Many countries have established strict regulations to minimize negative impacts on ecosystems, by ensuring strict monitoring, and enhanced compliance among cruise lines. Nevertheless, scholars argue that many sustainability efforts remain reactive rather than proactive, raising concerns about the long-term sustainability of the cruise industry (Buzova, 2022; Konar & Chen, 2026).

Given these challenges, this study aims to investigate how cruise lines implement environmentally sustainable strategies from the perspective of cruise passengers. This study aims to answer the following research questions (Konar, Islam, Bhutia & Millian, 2025).

1. What is the travel demographics of the cruise passengers in terms of:
    a. reasons for cruising;
    b. number of years of cruising;
    c. activities enjoyed onboard; and
    d. activities not enjoyed onboard?
2. How do cruise passengers learn about the cruise ship's environmentally sustainable policies?
3. Which particular sustainable policies are noticed by cruise passengers?
4. How do cruise passengers receive/respond/react to the environmentally sustainable policies and practices?

Review of Related Literature

Sustainability Concept

Sustainability is defined as the ability to fulfil current needs without compromising the ability of future generations to fulfill their needs. It consists of three pillars; economic, environmental and social sustainability (Goeldner & Ritchie, 2003; Konar, Islam, Bhutia & Millian, 2025). The concept of sustainability was initially institutionalised during the UNCED Conference in 1987; the Earth Summit in 1992 and Agenda 21, paving the way for the formulation of policies and regulations. Several guidelines were established, guiding the sustainable growth and development of member nations. In essence, sustainability aims to promote development without affecting the natural environment (Licht & Folland, 2023).

In this regard, sustainable tourism focuses on a balanced approach which minimizes the environmental and socio-cultural impacts of tourism activities, while promoting livelihoods and conservation of ecosystems (World Tourism Organization {UNWTO] and Asia-Pacific Tourism Exchange Center [APTEC], 2016). Tourism growth significantly impacts resources and social systems, therefore careful planning and collaboration among stakeholders are necessary to ensure sustainability (World Tourism Organization [UNWTO], & United Nations Environment Programme [UNEP], 2005). Sustainable tourism considers all aspects such as social, environmental and economic impacts, while ensuring all stakeholder needs are met (Galluccio et al., 2025; Xiaodan et al., 2025).

Cruise Ship Policies and Practices Toward Environmental Sustainability

CLIA's 2018 report emphasized that sustainability is a key consideration to strengthen the industry's commitment towards sustainable tourism practices and actions (Konar, Islam, Bhutia & Seal, 2025). Cruise ships account for less than 1% of global maritime traffic, yet this industry has taken the lead in developing environmentally responsible practices, adopting innovative technology to ensure sustainability, and following or exceeding international guidelines (CLIA, 2020; Hines, 2020). Transparency is made possible through frequent inspections by port authorities, flag states, and independent agencies, alongside strict enforcement by the US Environmental Protection Agency and US Coast Guard. Additionally, cruise lines contribute to global environmental governance through active participation in International Maritime Organization initiatives and public sustainability reporting (CLIA, 2020; Yanying et al., 2026).

Advanced Wastewater Treatment Technology

Cruise lines are increasingly adopting advanced technologies to treat sewage water onboard. Traditionally, the practice has been to release untreated water sewage

during sail or at port. However, the adoption of technology now allows cruise ships to treat wastewater to a safe level before disposal into the ocean (Dorazio, 2024; Liu J. et al., 2025).

Grey water from galleys, laundries and bathrooms is mixed with black water from lavatories. This is then processed through onboard bioreactors, where contaminants are filtered and broken down by bacteria. Next, the treated water is disinfected using UV radiation. As the processed water now meets standard requirements, many ports allow cruise ships to discharge it closer than the standard 12 nautical miles from land. Out of 1200 tonnes of daily waste generated, about three tonnes of solid waste remains, which is incinerated or stored for proper disposal (Liu Y. et al., 2025).

Additionally, cruise ships also use advanced technology to reduce waste water generation in key operations such as laundry and kitchen. These new technologies facilitate the production of water cleaner than that of wastewater treatment facilities in the coastal cities of the US. Furthermore, passengers are encouraged to practice environmentally sustainable habits with the use of signboards and messages onboard (Chen et al., 2025).

Solid Waste Management

Cruise ships typically produce a substantial amount of solid waste, and to reduce the waste, cruise ships recycle and eliminate single-use plastics. Additionally, many cruise lines employ professional environmental officers and waste management experts onboard. These professionals ensure minimum wastage by repurposing 100% of waste generated on board (Yao et al., 2024).

Green Practices of Cruise Ships Onboard

Cruise lines actively engage with other stakeholders in their efforts to minimise the negative environmental impacts caused by cruise fleets. Likewise, passengers are motivated to be environmentally conscious and participate in green practices onboard, such as recycling. Similarly, while sourcing for raw materials or products, cruise lines consciously choose environment-friendly alternatives such as biodegradable materials (Diedrichs, 2019).

Carnival Cruise Line demonstrates its commitment as an industry leader in minimising environmental impacts by using bio-digesters in its operations. Further, its fleet also implements food waste reduction measures and safe disposal methods. In their efforts to reduce emissions, Carnival Cruise Line has adopted liquefied natural gas (LNG) for use in its passenger cruise fleets. Its ships also minimize single use plastics across all operations (Carnival, 2022).

Similarly, other large cruise lines such as Royal Caribbean also focuses on energy efficiency and with measures taken in 2023, the cruise line has managed to significantly reduce its fuel consumption and emissions (Global Sustainable Tourism Council, 2024).

Cruise Passengers and their Attitude towards Environmental Protection

The perception of cruise passengers on sustainable practices varies across literature. Some authors are of the view that cruise passengers' attitude towards environmental protection is not too favourable.

In 2016, Mantel and Papathanassis reported that complying with sustainable measures is a costly affair for cruise lines. Thus, the adoption of sustainability measures by cruise lines is also influenced by factors such as level of environmental awareness among passengers and the willingness to pay premium price for sustainable products. Their study demonstrated that the willingness among passengers to pay for a sustainable cruise is rather insignificant. Passengers perceived aspects such as itinerary and reputation (Wright, 2023) as more important compared to sustainability (Ackerman, 2015). Price is a significant factor influencing the decisions of cruise passengers and sustainability is not as valued as a monetary factor (Millar & Baloglu, 2011).

On the other hand, a few other authors argue that passengers are environmentally conscious while using cruise services. For instance, American travellers are concerned about the environmental footprint. Environmentally conscious passengers often opt for green hotels as an alternative to cruise (Kim & Han, 2010). In 2021, Crovella et al. studied the behaviour of Italian cruise passengers, and reported that passengers take into account the sustainability criteria in their decision making. Furthermore, passengers are willing to pay additional price to help the cruises bear the additional cost of adopting sustainable measures.

Methodology

This study aims to gain insights into the perspective of cruise passengers on the sustainable policies and practices of cruise ships using a qualitative approach. A qualitative approach aids the researcher in exploring complex subjects by gaining insights to human experiences and perspectives (Bhandari, 2023; Lim, 2024). Qualitative studies mostly employ interviews (structured and unstructured) and focus groups as the method of data collection. The data collection for this study was carried out using survey questionnaires, which included open-ended questions allowing the respondents to freely express their perspectives. Surveys are well aligned with the qualitative approach (Braun et al., 2020). The sample size of this study was 50, and all the respondents participated in the surveys willingly.

The survey, composed of the following questions, sought to understand passengers and their awareness and perception of sustainable policies and practices onboard cruise ships.

1. The first category of questions collected data on the passenger profile.
    a) What motivates you to cruise?
    b) How long have you engaged in cruising?
    c) Which activities do you typically participate in while on a cruise?
    d) What is the most enjoyable activity onboard?
    e) Which onboard activity do you prefer the least?
2. The second question examined the awareness of passengers on sustainable practices onboard the cruise lines.
    a) Were you briefed about the environmental practices onboard?
3. The third question looked at the current sustainable practices onboard observed by the passengers.
    a) How can you contribute to environmental protection and conservation onboard? Provide specific examples of actions you can take or avoid.
4. The fourth category of questions explored the perception of passengers on sustainable practices onboard cruise lines.
    a) What is your opinion about the environmental protection policies adopted by the cruise line?
    b) Do environmental protection programs add value to your product/services? Does it enhance the public image of cruise lines?
    c) Do you consciously participate in conservation and protection efforts onboard?

Results

Demographic Profile

The demographic profile of the respondents is discussed first.

Motive for Cruising

Respondents were asked to share their motive for cruising and based on the responses, six different themes were identified. The majority of the respondents (24) shared that the main motive behind cruising is to relax. The second most common motive is to explore and to enjoy, with nine responses for each theme. Other themes identified include vacation, celebration and favourable weather.

Table 1. Motives of cruise passengers

Motive	Number of responses	Theme
Relax/Destress/unwind	24	To relax
Explore/adventure	9	To explore

Table 1. (con't)

Motive	Number of responses	Theme
Enjoy/pleasure/entertain	9	To enjoy
Vacation	7	For vacation
Celebrate	5	To celebrate
Escape from the winter season	2	To spend time in a place with a better temperature

This finding aligns with previous studies. Cruise passengers travel to escape from daily routines, and relax while also seeking new experiences and fun activities (Papadopoulou & Xesfingi, 2023). Another study on Chinese cruise passengers found that relaxation and enjoyment are the most popular motivation. Cruise lines are designed with multiple onboard entertainment activities, allowing tourists to break away from monotonous daily life and relax in an entertaining environment (Jiao et al., 2021). Chua et al. (2015) as well as Han and Hyun (2018) (cited in Wondirad, 2019), also reported that the most common factors motivating cruise passengers are relaxation, socialization, convenience, luxury, escape from daily routines, and amenities/services. Cruise passengers are attracted to onboard entertainment which creates a pleasant family-oriented environment to rest and relax.

Cruising Experience

Respondents were asked the number of years they have been active as cruise passengers. Among the respondents, 20 reported to have cruised 2 to 5 years and 14 indicated that they have cruise experience of 6-10 years. Only two respondents have cruised for 16 to 20 years while three respondents have for 11 to 15 years. Four respondents were first-timers while another four have cruise experience of more than 20 years.

Table 2. Cruising experience

Years of cruising experience	Number of responses
First time	4
2–5 years	20
6–10 years	14
11–15 years	3
16–20 years	2
> 21 years	**4**

Past literature established a positive relationship between pleasant cruise experiences and loyalty among cruise passengers. Satisfied passengers tend to

demonstrate loyal behaviour through repeat purchase (Baker, 2014 as cited in Hung et al., 2019). The motive for travel for first-time travellers and repeat buyers varies; first-time travellers prefer diversity and sightseeing, while repeat buyers seek leisurely and social experiences (Lau & Mckercher, 2004; Oppermann, 1997, as cited in Hung et al., 2019). First-time travellers are influenced by the emotional aspects of travel. Their decisions are significantly influenced by image and quality. However, repeat purchases are motivated by attachment towards destinations and perceived value (van Asperen et al., 2018; Petrick, 2004, as cited in Hung et al., 2019).

Activities Onboard

Table 3 shows the responses received from respondents, regarding their preferred activities onboard cruise lines. A wide variety of activities were listed encompassing adventurous activities, relaxing activities, pleasurable activities, social activities and wellness activities.

Table 3. Most preferred activities onboard

Responses	Frequency	Category
Tour/excursion/sightseeing/ photography	16	Adventurous activity (soft)
Spa/Massage	13	Wellness activity
Relax, write journals, read books	12	Relaxing activity
Theatre shows/other shows	11	Pleasurable activity
Music/party	10	Pleasurable activity
Swimming/water activities/beach/ pools	10	Pleasurable activity
Food/drinks	7	Pleasurable activity
Play bingo and casino	4	Pleasurable activity
Gym, walk, exercise	3	Wellness activity
Zipline, rock climbing	2	Adventurous activity (hard)
Bonding	2	Social activity
All-in	2	An all-inclusive tour that encompasses all pleasurable activities

The findings are consistent with Severt and Tasci (2020), who highlighted that relaxation is a key attraction factor for cruise passengers. Cruise lines offer a diverse range of activities, resulting in passenger engagement and satisfaction.

Table 4. Least preferred activities onboard

Responses	Frequency	Theme
Nothing	11	Almost all activities are pleasurable on cruise ships
Loud noise/karaoke	5	Noise pollution
Casino/bingo	3	Gambling
Muster drills	2	Drills in on-board safety
Excursions	2	Scheduled tour
Smoking/ drinking	2	Disturbing activities
Waiting in line	1	Waiting
Sea sickness	1	Motion sickness

Despite the vast range of onboard entertainment activities, the survey results identified a few factors that affect preference of activities. Among the respondents, five listed loud activities such as karaoke as least preferred, whereas three indicated disliking casinos and bingo. Other activities disliked by the respondents included, muster drills, excursions, smoking, drinking, prolonged waiting and sea sickness.

Passengers occupying lower deck rooms or cabins located in crowded areas such as the staircase are often subjected to noise pollution. Additionally, entertainment activities at night clubs, dance events and casinos tend to be noisy, causing disturbances to passengers whose rooms are nearby. Muster drill is an essential safety activity to familiarize passengers with muster stations and safety information. Though the drill is an important safety measure prescribed by SOLAS (International Convention for the Safety of Life at Sea), two passengers indicated that it is their least preferred activity onboard.

Non-smoking passengers highlighted smoking as a less desirable activity onboard. Some cruise lines have designated areas for smoking; however, passengers are also allowed to smoke in casinos on ships without designated smoking areas (Crow, 2023). Some cruise ships have a huge carrying capacity, and this may result in overcrowding. Due to the large number of passengers, wait time may increase for services such as dining or entertainment. One respondent indicated that waiting is one of the least desirable activities onboard.

Awareness of Environmental Policies and Practices

In regard to awareness of passengers on environmental protection policies and practices onboard, Table 5 shows that 19 respondents were aware of these measures, while 9 respondents were unaware and 2 respondents reported that they were somewhat aware.

Table 5. Awareness of passengers on environmental policies and practices

Were you briefed by the ship's officers on the ocean's environmental protection while onboard or in port areas? How did they create awareness?		
Yes	19	Aware of environmental policies and practices
No	9	Unaware of environmental policies and practices
Not much/too little	2	Aware but not that much

Table 6 shows the types of orientation and briefing used by cruise ships to create awareness among passengers. Muster drill is the most commonly used technique. It is an essential safety drill that provides crucial safety information to passengers. During the drill, passengers are informed about safety measures such as life jackets. Many cruise lines have adopted virtual muster drills. Passengers are requested to view safety videos online, and are allowed to contact officers in charge for any additional clarification (Wright, 2023).

Table 6. Methods of creating awareness

Methods of creating awareness	Frequency	Details
Muster drills	11	Orientation, briefing, training, and drill onboard
Training and briefings	8	Orientation, briefing, training, and drill onboard
Loudspeaker		PA or Public announcement
Intercom	1	
TV	1	TV in their room
Website	1	Online information

Passenger Actions for Environmental Protection and Conservation

The next question of the survey focused on exploring ways through which passengers contribute to environmental protection and conservation. As listed in Table 7, three main themes were identified. The themes include water conservation, solid waste management and energy conservation.

Table 7. Ways in which passengers contributed to environmental protection and conservation

10. How can you contribute to environmental protection and conservation onboard? Provide specific examples of actions you can take or avoid.		
Responses	**Frequency**	**Theme**
Do not throw rubbish into water/ ocean/do not litter	25	Solid waste management

Table 7. (con't)

Responses	Frequency	Theme
Re-use towels/decrease new towel use	6	Water conservation
Conserve water	6	Water conservation
Conserve electricity/energy	4	Energy conservation
Smoke in designated areas	2	
No straws/No plastic straws	5	Solid waste management—reduce
Reuse bottles	1	Solid waste management—re-use
Segregate garbage	2	Solid waste management
Be cautious of waste produced	1	Solid waste management—rethink
Recycle trash	1	Solid waste management—recycle
Do not leave windows open	1	Energy conservation
Do not leave towels and books on balcony	4	Solid waste management—reduce

Previous research supports the themes identified in this section. As solid waste management is crucial in cruise operations, cruise lines minimize waste production onboard and comply with safe disposal guidelines. Furthermore, as noted by respondents, biodegradable alternatives are used to replace plastics (Diedrichs, 2019). Cruise fleets are mindful of consumption and reduce solid waste by reusing and recycling (Mallinson, 2019). Efficient waste disposal methods assist in sorting waste effectively (Dorazio, 2024). Furthermore, the results show that the passengers are actively engaged in reusing and recycling materials. This corroborates with previous studies conducted by Dorazio (2024) as well as Garay and Palot (2019) who highlighted how cruise passengers are encouraged to adopt sustainable habits such as recycling plastics, glasses, paper and cans or replacing plastic stir sticks with wooden ones.

The second theme identified under this section is water conservation. The results show that six respondents actively reduced water wastage by reusing towels and other materials. An additional six respondents conserved water through other methods. This finding is consistent with the findings of previous studies. Cruise ships employ advanced water-saving technology for housekeeping and kitchen operations (Diedrichs, 2019; Garay & Paloti, 2019). Furthermore, signboards are placed everywhere to remind passengers to reuse towels and other linen (Diedrichs, 2019). Additionally, ships supplement their onboard water supply by treating bilgewater and collecting condensation from air-conditioning systems (Garay & Paloti, 2019).

The third theme relates to energy conservation and is also aligned with previous findings. CLIA (2020) reported that cruise lines prioritize efficient consumption of energy as a part of their environmental protection programs. Energy-efficient lights and appliances significantly reduce energy consumption (Diedrichs, 2019). Cruise lines reuse hot water to heat passenger cabins and windows are tinted to cool the cabins and passages onboard so that air-conditioning can be minimised (Garay & Paloti, 2019).

Essentially, passengers' awareness and engagement is a critical factor in achieving sustainability on cruise lines. Cruise lines focus on providing orientation and training to staff onboard, who eventually create awareness among passengers. Small acts like switching off lights when leaving a cabin, create a huge impact in conservation efforts (Dorazio, 2024).

Perception of Passengers on Sustainable Practices Onboard Cruise Lines

Respondents were asked about their perception of sustainable practices onboard. As depicted on Table 8, respondents were generally positive towards the effort of cruise lines in establishing sustainable practices. This finding is consistent with Peter (2020) who similarly found that passenger perception towards environmental protection and conservation ranges from neutral to positive. However, there is a small group of passengers who is indifferent towards the efforts of cruise lines to minimise negative environmental impacts.

Table 8. General perception of passengers on sustainable practices onboard cruise lines

8. How do you feel about their ocean protection programs? Expound.		
Responses	**Frequency**	**Category**
Good	18	Generally positive
Happy	3	Generally positive
Very good	4	Generally positive
Great idea/nice	5	Generally positive
Feeling celebrity	1	Generally positive
Very much appreciated	1	Generally positive
Necessarily	1	Generally positive
Very supportive	1	Generally positive
No information	3	
Limited awareness	2	
Don't know	1	

Though several other factors such as image, price sensitivity and perceived value (van Asperen et al., 2018; Petrick, 2004, as cited in Hung et al., 2019) are critical in passenger perception, the survey results demonstrate that environmental practices are perceived positively among passengers and has the potential to be a competitive criterion for evaluation. Furthermore, with increased awareness regarding sustainability, passengers are willing to pay additional charge to help cruise lines continue their commitment towards this goal (Crovella et al., 2021).

Table 9. Impact of sustainable practices on customer value and image of cruise lines

9. Do environmental protection programs add value to your product/services? Does it enhance the public image of cruise lines?		
Responses	**Frequency**	**Conclusion**
Yes	41	They appreciate the program, and they agree that it is an advantage to the image of the cruise lines
Fine	1	
Excellent	1	
Very important	1	
Not really/not much	4	

As depicted in Table 9, the majority of respondents agreed that environmental protection and conservation measures add value to their cruise experience. Furthermore, a significant number of respondents are of the view that such practices onboard enhance the brand image of cruise lines.

In 2016, UNWTO reported a shift in tourist behaviour whereby tourists seek authentic experiences while emphasising on positive social and environmental impacts (UNWTO & APTEC, 2016). This shift towards environmentally conscious decisions among passengers impacts cruise lines as passengers become more loyal to environment friendly cruises, demonstrating loyalty, leading to long-term relationships (Meek, 2018).

As a significant number of respondents believe that sustainable practices add customer value, they are more likely to actively participate in co-creating this value by adopting sustainable practices onboard (Kang, 2020). According to Fernández-Gámez et al., (2019), brand reputation is a key variable influencing the buying behaviour of passengers. Improved brand image has positive consequences in the passenger decision making process (Han & Hyun, 2017, as cited in Wondirad, 2015).

Table 10. Participation of passengers in sustainable practices onboard cruise lines

10. Do you consciously participate in conservation and protection efforts onboard?		
Responses	**Frequency**	**Theme**
Yes	38	Most of them participate sincerely in the ship's ocean protection strategies
Not much	2	Sometimes participate, sometimes do not
No	3	Do not participate

Table 10 shows a significant number of passengers are engaged in sustainable practices onboard cruise ships. Past studies also support the willingness of the passengers to be more environmentally conscious in consumption; however, the willingness increases when additional expenses are eliminated. Thus, cruise lines can increase efforts to minimise costs and educate passengers to participate in sustainable practices (Kulkov et al., 2023).

Conclusion

This study is significant in contributing towards SDG14 (Sustainable Development Goal 14) (Life Below Water) by providing insights into the sustainable practices of the cruise industry from the perspectives of passengers. The findings of the study offer both practical and theoretical implications.

Theoretical Implications

The findings of the study underline that sustainable efforts increase perceived value, corporate image and brand loyalty. Thus, adopting sustainable and environmental-friendly practices promotes a positive perception and loyalty among passengers. The findings further support the value co-creation theory, as the involvement of passengers in sustainable practices alongside cruise service providers, aids in creating value.

Practical Implications

The findings suggest that environmental practices are perceived positively by passengers, contributing to an enhanced brand image. Therefore, sustainable practices can help cruise lines improve its brand image and offer a unique selling point. Although the majority of the passengers reported to be aware of sustainable practices onboard cruise ships, a minority of passengers reported indifference. Thus, cruise lines can focus on enhancing active communication strategies to increase the involvement of passengers in sustainable practices.

Scope for Future Research

As this study mainly focused on environmental aspects, future studies can focus on other aspects of sustainability such as social and cultural aspects. It is recommended that future studies also consider larger sample sizes and adopt a quantitative approach to garner more rich insights. Future researchers can also focus on the economic implications of sustainability towards the passengers and their willingness to pay for environment-friendly services.

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