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The Sustainability Management in the Cruise Tourism – An Application

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Abstract: *This chapter aims to present the sustainability management in the cruise industry, a constantly growing sector, except in 2020 and 2021, which were affected by the Covid-19 pandemic. After a literature review that highlighted a limited research interest in these topics, the authors presented the results of a structured analysis conducted in several steps. Firstly, this study focused on the evolution of the cruise sector in terms of the growth of passengers in the last twenty years. Secondly, the authors analyzed the environmental policies adopted by cruise shipping companies and finally, they presented the results of the evaluation of the eco-friendly behavior of cruise passengers.*

1. INTRODUCTION

The cruise industry, which has experienced exponential growth since the 1970s (Di Vaio et al., 2021), moved millions of passengers and, in particular, has shown its increase in the last twenty years, net of a particular decrease in 2020 due to the stop caused by Covid-19 pandemic..

Unfortunately, the emergency of COVID-19 imposed a global pause in cruise operations in mid-March 2020. Following this stop, the companies implemented extensive public health protocols that allowed for the resumption of navigation in Europe, parts of Asia and the South Pacific, a few months later (CLIA, 2022). The success of the protocols adopted by the cruise lines has reported a COVID-19 incidence rate aboard cruise ships to lower values than in any other leisure activity.

Statistically, the typical world passenger is between the ages of 50 and 69. This is 36% of cruise passengers who choose an 8-14 days cruise and come mainly from North America and Western Europe (Tab.1).

Among the most preferred destinations, the authors highlighted: the Caribbean, the first and the most historic destination from the origins of cruises, Asia, China, Panama Canal, South America, Australia and New Zealand, Africa and the Mediterranean.

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Table 1. Cruise passengers volume for 2018-2020 by source passengers region (in millions)

Region	2018	2019	2020
North America	14,24	15,408	3,008
Western Europe	6,371	7,226	1,223
Asia	4,24	3,738	497
South America	883	935	458
Australia	1,46	1,351	340
Eastern Europe	213	263	72
Africa	154	169	68
Scandinavia/Iceland	225	218	52
Central America	47	49	14
Middle East/Arabia	111	108	8
Caribbean	56	57	7

Source: Authors' elaboration on data CLIA (2022).

Conversely, despite the large volume of business, equal to 155 billion $ of global output in 2019 (CLIA, 2022), cruise industry generates significant environmental impact across the process chain (Han and Hyun, 2019; Bhuiyan et al., 2021).

This kind of tourist-maritime activity is distinguished from other forms of tourism by sea for the use of large cruise ships, to offer passengers the opportunity to relax and visit different countries in a short time (Smirnov et al., 2022). In particular, this industry offers simultaneously almost all its forms of tourism: recreational, sporting, healthy, educational, congress, adventurous and archaeological, as well as combining different options for service, recreation, accommodation and catering (Logunova et al. 2020).

For this reason and all the activities associated with them, the cruise sector produces waste, consumes natural resources, changes ecosystem balance, and generates pollution and negative spillovers for host communities. In particular, the cruise sector produces a large quantity of solid waste (Werma et al., 2016; Mwanza et al. 2018; Paiano et al., 2020), especially packaging for food and beverage (Klein, 2011). It is estimated that the cruise industry generates 25% of the waste produced by all merchant ships.

Despite everything, recently a small number of cruise shipping companies have adopted measures of management and reduction of the general impacts (Crovella et al., 2021), such as solid waste, and greenhouse gas emissions (Murena et al., 2018; Pulido-Fernández et al., 2019) and grey water from sanitary facilities (Zheng et. al., 2019). Some more innovative companies, instead, have implemented new sustainable technologies such as the installation of solar panels, wastewater treatment systems, high-efficiency domestic appliances, and electronic devices that reduce harmful factors onboard and solid waste compactors. However, environmental impacts do not just affect onboard population and the sea, but also cruise terminals, ports and local host communities.

Therefore, the constant growth in maritime cruises stimulates shipping companies to build ships by the highest standards: recent ones powered by Liquefied Natural Gas (LNG) and with onboard waste compactors (Smirnov et al. 2022).

It has to be noted that in scientific production there are few studies on the environmental impact caused by the cruise sector, with a growth trend only in recent years, although an interdisciplinary approach to the tourism phenomenon has been quite broad (Okumus et al., 2018).

Consequently, this chapter aims to enhance the scientific production of these topics, and to drive attention to environmental issues by public government, international agencies, scientific groups and cruise shipping companies.

2. LITERATURE REVIEW

Tourism is an interdisciplinary area that has reached great interest in recent decades concerning multiple perspectives of analysis and also regarding various papers. Within this macro-area of study, the cruise sector is one of the tourist phenomena that has not received enough attention (Vega-Munoz et al., 2019).

Although the scientific literature produced on the cruise industry is well developed at a general level (Papathanassis and Beckmann, 2011), scholars have paid a lot of attention to marketing, security, communication, and corporate reputation activities (Ryschka et al., 2016; Remondino et al., 2019), much less on the environmental issue.

The cruise sector presents three categories of impacts according to MacNeill and Wozniac, (2018): solid waste, wastewater and impacts on the ecosystem (Herz, 2002; Butt, 2007) which can become a threat to ecosystems and resident communities (Zeppel, 2012; Svaetichin and Inkinen, 2017). These problems cause environmental damage to the ecosystem hosting ports or ship stopovers (Zuin et al., 2009) and also influence climate change (Carić and Mackelworth, 2014).

Moreover, according to Aran and Leon (2017) tourism above all does not offer incentives to behave responsibly towards environmental protection. Therefore, environmental policy has to be implemented to change the passengers' behavior towards socially and environmentally responsible decisions. Therefore, despite the growth of the cruise sector and its increasing environmental impact, the scientific literature on the behavior of cruise tourists is still quite limited.

However, a positive attitude of cruise passengers has been revealed, but they are not encouraged daily (Vermeir & Verbeke, 2006). Despite everything, there are a lot of green consumers that travel on cruise ships (Gadenne et al., 2011). From the few studies conducted, it emerged a positive attitude toward environmental protection in the tourism industry, especially in Arctic destinations (Chen, 2015). For this purpose, Schafer et al. (2011) analyzed the awareness of cruise tourists on environmental issues through a survey in a city in Southern Brazil (Schafer et al., 2011).

Recently, the choices of green products that generate changes in the production chain have also been analyzed through a survey (Kowalski & Veit, 2018). In any case, environmental awareness is positively correlated with green and conscious purchases (Dhandra, 2019). This also confirms the leading role of consumers in the production and supply chain of service, including tourism (Lamb, 2019). Additionally, in terms of sustainable behavior, surveys are a useful tool for assessing the willingness of tourists to pay additional amounts for the purchase of more sustainable tourism products and services (Jurado-Rivas & Sanchez-Rivero, 2019).

Unfortunately, it has emerged that the relationship between eco-labels and preferences for greener tourism services has still been poorly studied (Penz, Hofmann & Hartl, 2017). Similarly, some cruise lines in the Caribbean were more concerned with limiting the number of tourists than with reducing their environmental impact (Lowe et al., 2002).

Finally, there is a positive aspect: tourists are willing to contribute by paying higher taxes if the concept of sustainability is clearly explained (Derrin & Tisdell, 1999). In particular, high and middle-income passengers have a greater willingness to pay for environmental protection (Franzen & Meyer, 2009; Sun et al., 2016; Shuai et al., 2018). This statement is also in line with the results of our survey conducted.

The conceptual model and hypotheses were developed based on the literature review:

Hypothesis One (H1): There is a relationship between background elements that characterize the cruise passengers and their behaviors, as suggested by Han et al. (2018).

Hypothesis Two (H2): There is a statistical significance between awareness of the environmental issue and the attention of cruise passengers to read sustainability reports, as highlighted by Dhandra, (2019).

Hypothesis Three (H3): There is a statistical significance in the intention to purchase a travel package at a higher price in order to facilitate the reduction of CO_2 emissions and awareness of environmental issues, as suggested by Jurado-Rivas & Sanchez-Rivero (2019).

Hypothesis Four (H4): There is a statistical significance between the involvement of the cruise passengers by the cruise companies through the publication on the website of their sustainability reports and passengers' willingness to pay a higher price to counteract environmental damage, as highlighted by Jurado-Rivas & Sanchez-Rivero (2019).

3. METHODOLOGY

In order to achieve a replicable analysis method and representative, reliable and applicable results, the authors followed a mixed-method research design as suggested by Hair et al. (2007).

Phase One: the authors used an exploratory methodology, as shown in Fig.1, in order to highlight the distinctive features of the cruise sector according to some points of view.

Phase Two: a brief literature review relating to the sustainability of cruises and the behavior of the cruise tourist was made.

Phase Three: the authors analyzed the evolution of the cruise industry in terms of features of the sector, worldwide cruise shipping companies, global movement of passengers and effects due to the pandemic.

Phase Four: the scholars presented the different policies that cruise shipping companies adopt to mitigate the environmental impacts.

Phase Five: this study provided a snapshot of the environmental awareness of the cruise tour through the results derived from a survey conducted in 2018.

Particularly:

1. In the literature review section, the authors conducted a literature investigation using the Web of Science platform and they found a shortage of papers in the last 20 years.

2. In order to focus on the evolution of cruise shipping, this chapter presented a picture of the worldwide passengers that travelled in the last twenty years.
3. For evaluating sustainability in the cruise industry, sustainability management according to several policies adopted by cruise shipping companies was analyzed.
4. Lastly, using survey methodology, in 2018 the authors administered a questionnaire at a cruise terminal port, in order to investigate the level of awareness and behavior concerning the environmental issues of cruise passengers. The results of this survey were manipulated on StataMP software. Particularly, the "probit" commands were used for the descriptive/exploratory analysis of the variables. However, the authors evaluated the possible relationships between the variables through StataMP.

In this last part, the authors used Spearman's Coefficient analysis: this is a non-parametric statistical technique used to evaluate two ordinal quantitative variables. Hence, Spearman's test measures the strength and direction of the relationship between the ranks of two quantitative or qualitative ordinal variables. Particularly, it is suitable for measuring relationships between variables on Likert scales: in this case, each variable had different levels to which certain values were assigned.

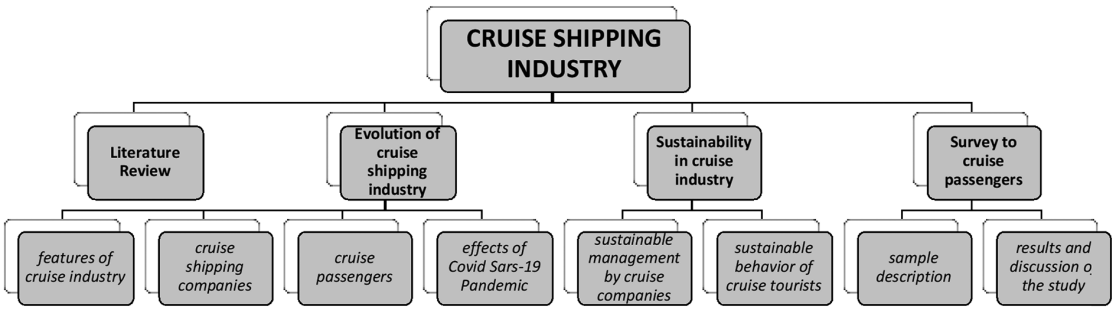

Figure 1. Methodology framework

Source: Authors' elaboration

Moreover, the authors manipulated control variables (gender, age, education, and occupation) and other variables to identify sample characteristics. Then, dummy variables (response value 1 or 0) and categorical variables (with response 1, 2, 3, 4, or 5, then with a Likert scale) were analyzed.

After collecting the responses and transforming them into a numerical data matrix, as suggested by Wang et al. (2018), the data were translated and encoded.

4. EVOLUTION OF THE CRUISE INDUSTRY

Historically, cruise tourism has been the most desired mode of travel for social elites after World War First in the 1920s. Later, during the Second Post-War period, however, the contraction of the cruise market caused a decline in trade due to passenger planes (Johnson, 2002) which stimulated the transition from cruising to the airplane.

Nowadays, cruise companies are passenger ships that sell and deliver leisure travel on an all-inclusive basis. Hence, according to one of the first definitions by Wild & Dearing (2000, p. 319-320): "A cruise is any paid leisure trip aboard a ship with the main purpose of providing accommodation for guests, not transportation usually, and to visit a variety of destinations according to a definite journey".

4.1. Features of the cruise industry

In the last twenty years, the cruise sector has grown in terms of the movements of passengers and the number of cruise vessels. In 2016 the global economic impact of this sector was equal to €126 billion (CLIA, 2017, 2018; MedCruise, 2018), European to about € 50 billion and the USA over € 27 billion. Among the Mediterranean destinations, Italy was the first, followed by Spain, Greece and France (CLIA, 2018) totaling over € 13 billion.

As a result, the cruise industry caused further pressures on the ecosystems (Popiolek, 2014; MacNeill & Wozniak, 2018), also contributing to climate change (Brida & Zapata, 2010). Nevertheless, according to the UNEP (United Nations Environment Programme), cruise ships are among the most polluters of the sea ecosystem (Allsopp et al., 2005).

Furthermore, the large size of the ships and the high number of passengers has increased the pressure on ports and host communities, which play a very complex role. First of all, companies offer different itineraries to attract more cruise traffic, and increase the economic benefits for the port and local communities, but, at the same time, cause the environmental impacts (Karlis & Polemis, 2018).

For this reason, important international organizations, such as UNWTO (United Nations World Tourism Organization), UNEP and OECD (Organization for Economic Cooperation and Development), are studying the impact of tourism on climate change and, above all, the approach to tackle the negative environmental effects (Rico et al., 2019).

4.2. Cruise Shipping Companies

The global cruise market is dominated by American cruise shipping companies such as Carn val Corporation, Royal Caribbean Cruises, and Norwegian Cruise Line. Globally, the other most important cruise shipping companies are Celebrity Cruises, MSC Cruises, Oceania, Azamara, Viking Ocean Cruise, Un-Cruise Adventures, Lindblad Expeditions, Europe River Cruise Regent, Crystal, Seabourn, Silversea, SeaDream, Windstar, World Cruise, Celebrity Cruises, and Costa Cruises.

Table 2. LNG-powered Cruise Ships

Cruise companies	Ships' name	Launch year
AIDA LNG Ships	AIDAnova	2018
	AIDAcosma	2021
	AIDA unnamed	2023
Carnival LNG Ships	Mardi Gras	2020
	Carnival unnamed	2022
Costa Cruises LNG Ships	Costa Smeralda	2019
	Costa Toscana	2021
Disney Cruises Line LNG Ships	Disney Wish	2021
	Disney Unnamed	2022
	Disney Unnamed	2023
MSC Cruises LNG Ships	MSC Europa	2022
	MSC Meraviglia Class	2023
	MSC World Class unnamed	2024
	MSC World Class unnamed	2025
	MSC World Class unnamed	2027

P&O Cruises LNG Ships	Iona	2020
Princess Cruises LNG Ships	Princess unnamed	2023
	Princess unnamed	2025
Royal Caribbean International LNG Ships	Royal Caribbean Icon Class unnamed	2022
	Royal Caribbean Icon Class unnamed	2024
	Royal Caribbean Icon Class unnamed	2025
TUI Cruises LNG Ships	TUI unnamed	2024
	TUI unnamed	2026

Source: Authors' elaboration on data Cruise Critic (2020)

Nowadays, in terms of innovation, cruise shipping companies are investing millions of dollars in research and development activity in order to implement new technologies for their cruise ship vessels (CLIA, 2016) and to achieve the fundamental sustainability goals. Especially, cruise companies have planned to launch several ships powered by Liquefied Natural Gas (LNG) in the next years (Tab.2).

4.3. Cruise Passengers

According to estimates by Dowling (2006), the cruise industry has grown by 2,600 percent since 1970, serving as many as 7.2 million passengers in 2000 to around 19.1 million passengers in 2011 (Rodrigue and Notteboom, 2012).

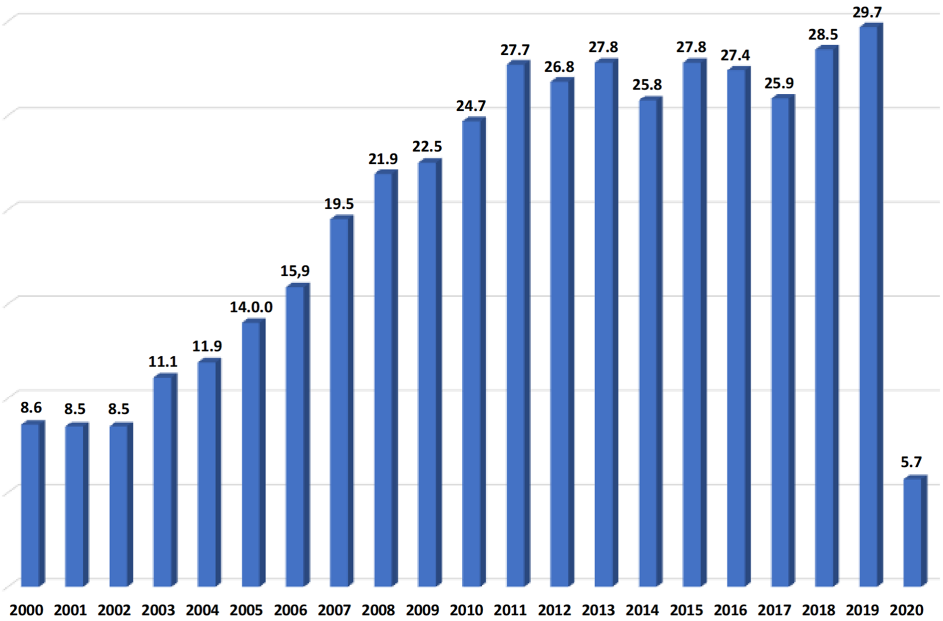

Figure 2. Global cruise passengers during 2000-2020

Source: Authors' elaboration on data Clia (2021)

Global cruise passengers mainly choose Oceanic, American, Mediterranean, and European destinations. In the ports of the last areas, the number of passengers grew by over 230% from 2000 to 2018, recording a peak in the 2011-2013 period (Fig. 2). About 70% of the total number of passengers handled has travelled in the last 10 years and almost 40% in the last 5 years. Of these, nearly 160 million have taken a cruise of at least 2 days. In the last four years, however, the trend has been more stable, except for 2020 which recorded a break of 80.6% due to the Covid-19 pandemic (CLIA, 2021).

4.4. Effects of Covid-19 Pandemic

COVID-19 had a great slump that has caused a serious economic downturn with huge implications for tourism (Bhuiyan et al., 2021): 6 million fewer passengers, came from North America and about half from Western Europe (Statista, 2021). Consequently, this period has overwhelmed all stakeholders' interests involved in the cruise sector. From the economic point of view, employers, crew and passengers reached, in this period, very low levels below the 2000s (Mizumoto & Chowell and Rocklöv et al., 2020).

On the contrary, this industry has implemented extensive public health protocols that have made it possible to test the safety of these trips.

Finally, despite the dangers, cruise ships recorded the lowest number of Covid-19 infections (Clia, 2021).

5. SUSTAINABILITY IN THE CRUISE INDUSTRY

Generally, the tourism and hospitality industry has been working for a few years to make their operations more ecologically sound. These shipping companies have implemented environmentally friendly onboard technologies, encouraged environmentally friendly practices, and developed environmental policies and guidelines to change operational processes (Han et al., 2019). It is important to pay more and more attention to environmental issues so that positions are raised by citizens, governments, and national and international agencies.

5.1. Sustainable management by cruise shipping companies

According to MacNeill and Wozniac (2018), the average carbon emissions per cruise passenger and day is equal to 169 kg of CO_2. For this reason, cruise companies need to implement sustainable technologies (such as alternative fuel ships) and environmentally friendly practices for the products and services offered onboard (Klein, 2011). This direction represents a possibility of sustainable development and the ability to attract the most ecologically conscious consumers who currently do not prefer cruises for the high impact on the environment.

To achieve sustainability, the cruise industry has implemented for a few years the reduction of waste and emissions (Pulido-Fernández et al., 2019), fuel (Murena et al., 2018), solid waste and wastewater discharge (Zheng et. Al., 2019). However, some companies have recently applied new sustainable technologies, such as solar panels, wastewater treatment systems, high-efficiency appliances and onboard waste compactors.

Therefore, the authors encourage to act proactively to reduce emissions and adopt a green approach to the port, maritime and shipping sectors (Zhen et al., 2018), involving all the players in this sector. In particular, the final user of the cruise service has a leading role (Tiba and Omri, 2017) and can improve the quality of cruises towards a more sustainable approach.

5.2. Sustainable behavior of cruise tourists

Through a survey, the authors investigated the cruise tourists' awareness of the environmental issues, by distributing 500 questionnaires at the arrivals terminal, during the 2018 summer,

in a port in Southern Italy. Among them, 352 questionnaires (over 70% of the total) formed the assessable sample and it was a validated value for statistical significance (Crovella et al., 2021).

As shown in Table 3, passengers who earn an average income and have a high level of education have shown a strong willingness to pay to improve environmental protection. So H1 is supported by this result. In the purchase of the cruise travel package, 91.5% of the sample paid attention to the environmental protection actions carried out by the cruise shipping companies. Each passenger also provided more answers on some environmental issues: 45.5% had read about the reduction of CO_2 emissions and fuel consumption, about 36.0% had read about the reduction of noise pollution, only 24% paid attention to reducing energy and water, whilst only 12.0% had read about waste reduction. Therefore, 53% knew of the publication of the sustainability reports on the websites and among these, 47.44% will read it and 45.45% had already read them (H2 was supported). The 83.0% of the last percentage was aware of the important results of reducing environmental impact by cruise shipping companies (H2 was supported). Furthermore, almost 40% are strongly influenced by the protection and improvement of the environmental conditions implemented by the company and only 6.53% are indifferent. 41.5% of the sample is willing to pay additional charges and about 7.4% are not. 63.4% were aware of the presence of LNG-propelled ships. The majority had diplomas and were in employment. To reduce the specific impact of the CO_2, most respondents are willing to pay a higher price, in particular, 52% of them a 5-10% higher price and 13.0% up to 20% more on the final price of a cruise package. This result supports the H3 hypotheses.

In terms of waste, 89.0% of the respondents paid attention to separate food and beverage packaging waste onboard.

The results underlined that level of education, employment and age are discriminant on the awareness and knowledge of environmental issues. In particular, passengers with a degree are more sensitive than the other passengers. It also has to be noted that half of the sample passengers read the sustainability reports published by the cruise shipping companies on their websites. Generally, age, level of education, and employment affect the adoption of sustainable behaviors (e.g. separate disposal of waste onboard). Therefore, the H1 hypothesis was supported.

Furthermore, more than half of the sample who have read the sustainability reports published by the cruise company are willing to pay a higher price to allow cruise shipping companies to use fuels less impacting. In this case, the H4 hypothesis was supported.

Thus, according to the Spearman' Coefficient analysis, there is a positive, moderate and statistically significant relation between the reading of the sustainability reports shared by the cruise shipping companies on their website and the willingness to pay a higher price ($n>30$, $\rho=0.2558$, 0.900) by cruise passengers. Particularly, the authors highlighted a positive and directly proportional relationship between the two ranks represented by the group of cruisers that reading of the sustainability reports shared by the cruise shipping companies on their website and the group willing to pay a higher price to reduce the environmental impact.

The same positive, moderate and statistically significant relationship is observed also between the future willingness to read the sustainability reports by cruise passengers and their willingness to pay a higher price in order to allow the cruise companies to counteract the negative environmental effects ($n>30$, ρ =0,3331, 0.900).

6. DISCUSSION

The main findings of the research outline the attitude of cruise passengers toward environmental issues. After manipulation of data derived from the questionnaires, the authors observed a sample of passengers aware of the environmental issue with the willingness to invest a part of their earnings to pay for a more expensive package, enjoying a more sustainable service. On the contrary, the scholars noticed a negative approach in terms of future reading sustainability reports (52.56% declared that will not be willing to read).

Table 3. Results of dates derived from questionnaires

Item	Question Number	Variables		Results (%)
BACKGROUND	1	*Gender*		
		Male		*54.83*
		Female		*45.17*
	2	*Age*		
		18-25		*14.49*
		26-40		*31.53*
		41-60		*37.22*
		61 and over		*16.76*
	3	*Education*		
		Elementary License / Media License		*6.25*
		Diploma in upper secondary education		*46.02*
		Degree		*28.41*
		Master's /Postgraduate Diploma		*17.90*
		Ph.D.		*1.42*
	4	*Employment*		
		Student		*11.36*
		Employed (Temporary / Permanent / Occasional or Project)		*53.69*
		Self Employed (Entrepreneur/ Craftsman/ Other / Freelancer)		*6.25*
		Unemployed		*7.67*
		Retired		*16.19*
		Housewife		*4.83*
KNOWLEDGE	5	Reading any actions for environmental protection	*Yes*	*91.48*
			No	*8.52*
	5a	Reading about reduction of:		
			Yes	*45.45*
	I	*greenhouse gas emissions*	*No*	*54.55*
			"	*44.89*
	II	*fuel consumption*	"	*55.11*
			"	*35.80*
	III	*noise pollution*	"	*64.20*
	IV	*water and energy consumption*	"	*23.86*
			"	*76.14*
	V	*waste*	"	*11.93*
			"	*88.07*
	6	Knowledge of online publications of sustainability representatives	"	*52.84*
			"	*47.16*
	6a	Reading reports?	"	*45.45*
			"	*54.55*
	7	Knowledge of the achievement of important levels of reduction of environmental impacts	"	*83.24*
			"	*16.76*
	10	Presence of LNG ships	"	*63.35*
			"	*36.65*

ACTION	6b	Future reading of sustainability reports	*Yes*	*47.44*
			No	*52.56*
	12	Separate disposal onboard of food & beverage packaging	*“*	*89.20*
			“	*10.80*
INFLUENCE	8	Influence of environmental practices on the choice of the company	*None*	*6.53*
			Little	*29.26*
			Enough	*36.93*
			Much	*19.03*
			Very much	*8.24*
WILLINGNESS TO PAY	9	*Willing to pay more to counter the negative effects on the environment caused by cruise ships*	*None*	*7.39*
			Little	*32.10*
			Enough	*41.48*
			Much	*14.49*
			Very much	*4.55*
	11	Willingness to pay a higher travel cost to reduce fuel impacts	*Yes*	*87.78*
			No	*12.22*
	11a	Percentage of increased willingness to pay	*5-10%*	*51.99*
			10-20%	*35.23*
			Beyond the 20%	*12.78*

Source: Author’s elaboration

Particularly, it emerges that age negatively affects knowledge of the cruise company’s environmental policy. The variable of the level of education has a higher positive relation to the purchase phase of a cruise package than the kind of employment. Education and employment have equal levels of positive effect on the response.

Through this survey, the willingness of passengers to read the sustainability reports published by the companies on their websites has been investigated too. There was a strong positive nexus between education level and response, and not between employment and response. In addition, middle-aged passengers paid more attention onboard to separately dispose of food and beverage packaging waste.

It also highlighted the higher positive nexus of the level of education of passengers than employment with the willingness to pay more for a travel package. Additionally, the authors underlined that there is a positive connection between willingness to pay more and age and knowledge of environmental issues.

Results also reveal a gap between environmental concern and eco-friendly attitude of passengers: 89.20% of them declares to pay attention to the correct disposal of waste onboard, but only 12.78% of the sample towards the willingness to pay more than 20% of the cost of the final package.

Although some previous studies have involved other points of view to explain pro-environment decision-making, this analysis provides an overview of knowledge of environmental issues and measures to be implemented onboard. Lastly, the importance of this analysis lies in the description of the environmental perspective of tourists (Tan et al., 2016), in particular cruise passengers.

This chapter highlighted that the development of certain attitudes for this group of consumers originates in hedonic consumption (Howard & Gengler, 2001) and the intention to repurchase the trip could be influenced by their past and positive travel experience. Pavesi et al. (2016) showed that travelers shape their emotional judgment, and therefore also the answers to the questionnaire administered, based on the evaluation they made of their experience.

However, in this post-pandemic context, travelers' perception of a cruise company during a crisis can certainly negatively affect their post-crisis purchase intent (Laufer & Coombs, 2006). For this reason, the companies must transform the package of this service into a tourism trend closer to the needs of safety, health, and respect for the person and the environment.

Generally, it was highlighted that the decision-making process of new environmentally conscious consumers (in this case cruise passengers) is similar to a problem-solving process: first of all, cruise passengers gather sufficient information to understand the market for the product they are buying; subsequently, they carefully evaluate the alternatives even among the most sustainable ones and, finally, make a well-considered decision (Pan et al. 2021).

7. FUTURE RESEARCH DIRECTIONS

Some limitations of the survey conducted reside in the kind of target identified, numbers, countries of passengers involved and cruise routes. Mainly, the authors have focused on mass cruises, in the Mediterranean area, leaving out the luxury cruises preferred mainly by consumers with high spending capacity but not very widespread. Particularly, most of the respondents came from Italy, had a medium level of education and were in employment. These were passengers with a medium level of awareness interested in enhancing environmental issues in cruise tourism.

Future research directions will focus on a larger sample (for target passengers and cruises) to more reliably analyze relations through different econometric tools.

8. CONCLUSION

These analyses provide important feedback for cruise shipping companies, scientific research, and public administration for designing new policies in order to reduce pollution and environmental impact (Carić, 2015). Furthermore, this chapter disseminated environmental awareness among passengers, stimulating greater awareness of these issues.

Particularly, this study is useful to all stakeholders involved in assessing the behavior of cruise passengers, exploring the characteristics of the cruise industry and formulating environmental awareness strategies.

Following this analysis, the authors stated that it is necessary to act proactively through the reduction of emissions and the adoption of a green approach by all stakeholders (Zhen et al., 2018). In particular, cruise passengers as the final consumers play a leading role (Tiba & Omri, 2017), in the adoption of a more sustainable approach.

The sample of tourists investigated is generally careful with the environmental information provided during the purchase but does not know the measures taken by the companies. Therefore, onboard separate collection activities, composting of organic waste, and recycling of materials, for passengers and crew, are therefore necessary prerogatives in cruise tourism.

As conclusive remarks, this chapter offers a snapshot of the passenger who travels on commercial cruise shipping companies, who is attentive during the purchasing phase and willing to separate waste disposal on board, in particular food and beverages packaging. However, cruise

shipping companies should involve passengers through onboard information, inviting them to use in rational way water resources, energy, separate waste correctly and reduce food waste.

Among the different solutions, paying a premium price would allow cruise lines to plan more sustainable actions and increase their reputation. For this reason, a close collaboration is needed between all the stakeholders of the cruise chain to manage, monitor and raise public awareness of the major environmental problems of this type of tourism.

In order to implement effective strategies and reduce the environmental impact, it is important to engage and sensitize crew and passengers to behave more sustainably.

Finally, the results of the survey showed that most cruise passengers pay attention to the general sustainability criteria adopted by the shipping companies when purchasing their holiday and are willing to pay additional charges to cope with the environmental load caused by the cruise. In any case, the cruise sector requires greater international coordination to make the adoption of sustainable models, currently voluntary, mandatory. Hence, all stakeholders (cruise lines, public authorities and tourists) can change the environmental approach of this sector and achieve complete environmental, economic and social sustainability.

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