

Original Article

## Identify the CLIA's Effort Towards to Mitigate the Environment Impact by Cruise Tourism Industry

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### Abstract

Cruise tourism is the fastest growing industry in the leisure travel market, and annually nearly 30 million passengers engage in cruising. Thereby it encounters for massive negative impact on the marine environment. The cruise industry is under the leadership of **Cruise Lines International Association (CLIA)** which has over 95 % global capacity under the membership. CLIA establishes policies and procedures to undertake by its members to ensure the sustainability of the industry. The primary objective of the study is to explore the negative environmental impact caused by cruise shipping industry and the secondary objective is to recognize the contribution of CLIA towards mitigating the negative environmental impact. The study is conducted using an exploratory approach and the data is drawn from the official website of CLIA and other websites and publications regarding cruise tourism, waste management and environmental impacts. Cruise industry policies and environmental stewardship reports of CLIA are used to manifest the negative environmental impact caused by the cruise ships and implement policies and procedures to mitigate them using high end technology, driving towards sustainability. The study provides an understanding on how the implied mechanisms of CLIA is driving the cruise industry towards sustainability.

**Keywords:** *Cruise Industry, Environmental Impact, Environmental Stewardship*

### Introduction

Cruise tourism is recognized as trending, the most luxurious form of travel blending the attractions, accessibility, amenities, activities and accommodation (Siriwardena, S., & Silva, D. A. C. 2017) (Senevirathne, M.B.D.R, Siriwardana, S, 2020). Generally, Cruise ships are known as the most luxurious way of travel in terms of cruise tourism, and it is also known as floating cities as it comprises all facilities which a land base luxury resort hotel can experience. The industry has commenced booming from previous years and has encountered for huge economic, social and environmental impacts globally. In 2018, 28.5 million passengers cruised globally, and it was a 7% increment compared to 2017 (CLIA, 2018). The total economic impact in 2017 was \$134 billion which encountered 1.1 million jobs in the industry. However, the industry makes a huge negative environmental impact on the world as it consumes lot of resources for facilitating its customers with transportation, accommodation,

Energetic resources and it contribute to air pollution such as carbon emission and due to the solid and liquid wastage and sewage emerging from the enormous operations of the cruise ships contribute to the ocean pollution. When passengers are engaging in shore excursion, it causes negative impact to the destination in terms of higher carbon footprint, air, water and soil pollution, wet and solid garbage dumping and higher consumption of resources. At the same time cruising damage, the marine resources such as corals, sea grass beds and disturb the marine animal species. Generally, these negative impacts drive towards the climate changes, rise of sea water levels, destroying the corals such as Great Barrier Reef which was identified dead in 2019 and several health-related issues to the host community who lives around famous cruise ports and destination. Focussing about these potentially negative results is required to get necessary actions by implementing policies and regulations by related authorities. Cruise lines need to focus on adopting innovative practices or technologies such as LNG powered energy systems in order to mitigate the environmental impacts and contribute towards the wellbeing of the cruise industry. International Cruise Lines Association (CLIA); the world's largest trade association in the cruise industry is concerned about the policy implementation to mitigate the environmental impact of cruise tourism. Currently it consists of over 60 of world major cruise lines which is about 95% of the global cruise capacity. It includes the market leaders of the industry such as Carnival Corporation, Royal Caribbean Cruise line and Norwegian Cruise line (Cruise Market Watch, 2021). Up to 2019, there are 272 cruise ships including ocean, rivers and specialty cruises registered under the association more than 340 executive partners such as suppliers and cruise line partners are with the association. The association has registered 13000 global travel

agencies and 50000 travel agent members. Globally it operates in 7 regions such as Australasia, Asia, Brazil, Europe, North America, Canada, UK and Ireland (CLIA, 2019). It serves as a non-governmental consultative organization to the International Maritime Organization (IMO), an agency of the United Nations (CLIA, 2021). CLIA states its main vision as "Promote policies and practices that foster a safe, secure and healthy cruise ship environment; educate and train its travel agent members; and promote and explain the value, desirability and affordability of a cruise holiday" (CLIA Asia, n.d.). Two mission statements have been stated to their members to adhere to mitigate the environmental impact; minimal environmental impact of their vessel operations on the ocean, marine life and destinations and a regulatory environment that will foster the continued growth of the industry. CLIA has initiated an environment policy and a waste management policy which the member companies have to adhere, and they have invested in adopting new technologies in order to mitigate the impacts of the environment. Generally, CLIA put their commitment to mitigate environmental impacts from the cruise ships through leadership, investment in adopting new technologies and by collaborating with worldwide respective organizations. The primary objective of the study is to explore the negative environmental impact caused by cruise shipping and the secondary objective is to recognize the contribution of CLIA towards mitigating the environmental impact. Identification of the negative environmental impact caused by cruise tourism and the contribution of CLIA towards mitigating them to conserve the environment create awareness in the government bodies, stakeholders, industry practitioners regarding what ought to be done and what should be avoided in cruising.

## Research Methodology

The study is conducted using an exploratory approach and the data is drawn from the official website of CLIA and other websites and publications regarding cruise tourism, waste management and environment impact. To collect the data secondary sources are used; CLIAs' environmental stewardship report, cruise industry regulations and cruise industry policies. Under the Waste Management Policy of CLIA the Environmental protection chapter is used to access information. Ocean planning, transparency and industry environmental technologies and practices chapters of the Environmental Stewardship report are used to access information. This does not measure the effort but merely explore the policies, practices, procedures that CLIA has implemented to identify and mitigate the negative environmental impact.

## Results and Discussion

According to United States Environmental Protection Agency (EPA) there is an increasing concern about the environmental impact of cruise ship discharges as the industry is continuously growing. Some of the waste streams are as follows (EPA , 2017)

- Bilgewater- water that contains oil, grease and other contaminants
- Sewage - which are the solids wastewater from toilets
- Ballast water – water that taken in to the onboard and discharge from the vessels to maintain the stability of the ship
- Gray water – wastewater from showers, sinks, laundries and kitchen operations
- Solid waste – food waste, garbage including plastic, paper, wood glass, cans

Other than that, the Bureau of Transportation Statistics (BTS, 2017) has recorded that waste

streams of cruise ships and their estimated amount of waste generation and the potential impact from each type of waste stream. According to that typically one-week cruise tour creates 21000 gallons of sewage which can heavily impact the water ways through releasing diseases via microorganisms. Grey water which has potential to cause negative impact as the water discharge oxygen demanding substance to the waterways, nearly generate 1 million gallons per week of voyage. Solid waste is another type of waste stream from ships including paper, wood, glass, plastic, food waste and glass. Due to the massive operation of the cruise ships, it generates 8 tons of waste in a weeks' voyage. There are 25000 gallons of Oily Bilge generating typically from one-week voyage which consist of oil grease and other contaminants. According to research briefing (Jennings & Ulrik, 2016) cruise ships contribute to negative environmental impact in many ways. It emphasizes that one of the main environmental impact of cruise ship tourism is the huge energy consumption and the carbon emission as the cruise ships consume more energy than for the operation of the ship for on board facilities, including laundry, water treatment, refrigeration and air conditioning. Thereby the considerable amount of CO<sub>2</sub> is releasing into the environment by single cruise tour. For example according to the environment report of the Carnival Cruise Line, their ships releases 712kg of CO<sub>2</sub> per kilometre on average, or about 0.4kg per passenger per kilo meter. A result of the huge production of carbon emission, it may impact on climate changes; global warming, increasing the sea levels, melting of polar ice caps and disturbances to natural habitats. However, with the implementation of new technologies, modern cruise ships have environmental standards regarding energy consumption and carbon emission comparing to the old vessels. Another impact on the environment from this industry is

air pollution. Air pollution is occurring in many ways. One is that from the burning the bunker fuel which contains a huge amount of Sulphur content. Another way is from the diesel particulars and emission with Sulphur dioxide and nitrogen oxide which releases when docking ships to the ports. It makes a huge negative impact to the human health and to the environment effecting on global warming. When it comes to marine pollution, cruise ship tourism is encountered for the largest portion as cruise ships are quietly similar to a floating town and they generate liquid wastage, bilge oil and sewage in the larger amounts due to the heavy operation of the ship. Even though the ships carry out its systems for purifying these liquid wastes, sewage ships can legally dump the black water (toilet wastewater) anywhere beyond three miles from shore. And when it comes to the sewage, the ships are still using old technologies to treat sewage by dumping to the sea while it contains significant number of faecal bacteria, heavy metals, and nutrients. This may cause damage to the quality of the water and the natural habitats. Another harmful liquid waste is toxic water and bilge oil which is a combination of a mixture of water, oil, lubricants, and other pollutants that collect in a ship's hold. Even though it is illegal to dump the bilge oil, some ships are discharging it illegally as it is cheaper than discharging at the ports. Thereby it may cause diseases to the fish breeds and to the birds. Since this is a massive operation, ships are normally creating a larger amount of solid waste including food waste, paper, plastic, wood, cans, and glasses. Under regulations imposed by MARPOL these wastes can be discharged to the sea. As an example, some cleaning agents and food waste can be discharged over 12 miles from shore. It causes damage to the quality of the water and also harmful to the live organisms in the sea. Damage to the eco system and coral reef is another major impact and due to anchoring and

common sea routes, these coral reefs significantly getting damaged. Coral reefs are major attraction among tourists. This has become a principal income generating source. And also, these corals are home to 25% of fish species and it protects the coastlines from erosion. Once it gets damage it may not get heal and it will die for permanent. Therefore, it is essential to impose strict rules and regulations to protect these natural attractions.

Practices and Procedures outlined in the CLIA's Waste Management Policy.

As the leading trade association in the cruise industry, CLIA's primary objective is to provide leadership through implementing policies and procedures to its' members to adopt regarding the cruise operations. The regulatory framework undergoes CLIA members by the International Maritime Organization and flags and the Port States regarding the waste management practices. International Convention for the Prevention of Pollution from ship (MARPOL) is the international convention covering the prevention of marine pollution from the ships by implementing regulation under six annexures which addresses different waste streams and the practices that need to carry out when dumping them in to the waterways. Apart from these national and local legislations, CLIA members are agreed to incorporate with the waste management practices and procedures under the waste management policy of the CLIA and add them to their respective safety management systems. Basically this waste management policy consists of the best practices that need to be adopted by the CLIA members regarding the traditional wastes such as garbage, grey water, sewage, oil residues, sludge oil, bilge water and some other hazardous waste produced from the cruise operations. CLIA Members have voluntarily agreed to adopt the more stringent

practices outlined in this policy, which exceed legal requirements, during all normal operations. According to the Waste Management Policy (CLIA, n.d.) the members agree to manage the waste and to implement more effective waste minimization processes within their ships. The members of CLIA agree to conduct training programs for the ship crew and raise the awareness of the shipboard environment procedures. And, to take necessary steps to raise the passenger awareness on the environment protection by displaying videos on cabin TV channels of shipboard on environmental protection commitment and by placing booklets in public lounges about environment practices. As there is a massive generation of different type of waste from the cruise operations, members have agreed to establish proper waste management plan for collection separation and processing. Wastewater reclamation is another significant area that need to be addressed as per the enormous amount of water generation from the cruise operations through large scale of pools, recreational facilities such as Symphony of the Seas’ 10 whirlpools, Ultimate Abyss water slide stimulator, surf simulators, three multi-story water slides (RCL, n.d.) and other operational activities. Thereby under the policy, CLIA members have agreed to adopt techniques to minimize onboard water usage such as to use technical water to flushing toilets, laundry and open deck washing as possible, use of water recovery systems, use reduce flow shower heads and other possible active water conservation and also to train the crew to reduce the water consumption in operation. The following table indicates how the CLIA members are treat the different waste streams as per the waste management policy.

Waste Stream	Practices
Bilge & Oily water Residues	Members agree to meet or exceed the international requirements for removing oil from bilge and wastewater prior to discharge.
Plastic	Members are committed to reducing plastics disposed of in landfills and increasing recycling volumes. Plastics are separated and recycled whenever possible.
Wastewater Reclamation	This management includes minimizing water usage and reclamation and reuse of water for non-potable purposes
Gray Water	Only be discharged while the ship is underway and proceeding at a speed of not less than 6 knots and at a distance not less than 4 nautical miles from the nearest land or such other distance as agreed to with authorities having local

	jurisdiction or provided for by local law except in an emergency or where geographically limited.
Sewage	Members agree to process sewage through a sewage treatment system that is certified in accordance with international regulations, prior to discharge during normal operations.
Incinerator Ash	CLIA members use testing standards for test the Incinerator ash and at least they tested it annually for any hazardous components.
Cooking oil	Waste cooking oil typically strain to remove hazardous components then collected and landed ashore for recycling. Or it may use as a fuel to make steam or electricity on board.

Figure 1: Treatment of Waste streams

Investment and technology adopting by the CLIA members to mitigate environmental impacts

Liquefied Natural Gases (LNG) LNG is an eco-friendly alternative fuel source that mitigates the carbon emission from cruise ships and burning LNG produce zero sulphur emission. AIDANOVA by Aida Cruises is the world first launched LNG powered cruise ship. It has the capacity of accommodating 5252 passengers and its' gross tonnage is 183853 GT. As per the cruise industry report's environmental commitment, innovation, and results (Oxford Economics, 2020), 25 ships are in order or under construction to get LNG powered.

Exhaust Gas Cleaning Systems

ECGs are important to reduce emissions by as much as 98% of the level of sulphur oxides in a ship's exhaust. According to the data (Oxford Economics, 2020) 69% global capacity of cruise ships utilize ECGs to meet air emission requirements

Cleaner Fuels and reduce emission

Currently, the cruise industry has invested in ships with \$ 23 billion to adopt energy efficient technologies and cleaner fuels. The target of the cruise industry is to reduce carbon emission by 2030 in 40%.

Shore-side electricity

This technology drives towards to achieving CLIA's carbon reduction goal. This method generally allows cruise ships to turn off ship engines while in ports and rely on efficient municipal power systems when available. According to (Oxford Economics, 2020) 50% of new ships ordered and under construction are specified with shore-side electricity system.

### Advance wastewater treatment systems

This is the method that can be used to remove the hazardous contaminants in the grey water and the black water. CLIA members have broadly adopted this system and according to (Oxford Economics, 2020) 70% of global capacity of cruise ships adopted this system and 99% new cruise ships are equipped with this system.

### Discussions and Conclusion

CLIA, one of the pioneering bodies of the industry takes environmental practices and actions focusing on the sustainability. According to the waste management policy implemented by CLIA, members are committed to eco-friendly practices which may exceed the international regulations such as zero discharge policy for untreated sewage and advanced wastewater management. As per the investments and the technology adaptation, the marine environment benefit in terms of reduction of carbon emission, sulfur emission, reduction of waste, reduction of water usage, reduction of energy usage. CLIA members are investing 8 billion USD to development of environmentally friendly technologies and fuel alternatives such as LNG (Liquefied Natural Gas) from which 25 new built ships from 2018-2027 will be LNG powered. In cooperation with International Maritime Organization (IMO), CLIA develops compulsory measures for lowering CO<sub>2</sub> emissions of new built ships by 40% as of 2030. Despite the promising progress of the industry in reducing environmental impacts, there is still a need for more effort to accelerate sustainability transition of the industry

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