CRUISING OUT OF CONTROL? DEALING WITH THE ENVIRONMENTAL IMPACTS OF CRUISE TOURISM IN THE CARIBBEAN

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Abstract: Initiated on a small-scale, today the cruise industry has sought to market the ship as the destination itself offering a multi-generational experience with endless activities onboard to meet the demands of its diverse clientele and thus virtually eliminating the need for port calls. Ranked as the number one cruise destination due to its archipelagic nature, the Caribbean welcomes millions of visitors annually. This paper seeks to focus on the environmental issues which arise due to the cruise industry in the Caribbean and further threaten the longevity of the tourist industry which depends on the environmental assets of the region. Furthermore, current strategies governing the industry will be examined with its shortcomings highlighted. Consequently, recommendations will be put forth based on best practices which can be tailored to ensure that the cruise industry poses no threat to the Caribbean but brings only positive attributes to the territory.

Keywords: *cruise tourism; marine pollution; Caribbean; MARPOL; eco-cruises; carrying capacity.*

INTRODUCTION

Tourism refers to the movement of individuals to a destination away from their normal place of origin for business or leisure for a period of over 24 hours but less than 1 year. Traditionally, tourism products were designed for mass tourism. That is, the market clientele was never specified and countries simply marketed their products to a general audience with the typical tag line advocating the 'Triple S' syndrome of sun, sea and sand. Today, with increasing global competitiveness of destinations, offering the same attractions is no longer adequate. The tourism industry now needs to develop niche markets and/or practice a degree of exclusivity if it is to survive amongst the competing destinations. The former factor contributes significantly to the overwhelming success of the cruise industry.

The initiation of the cruise industry was propelled by the 'transformation of an increasingly obsolete maritime transatlantic travel into trend-setting leisure vacation' (Cruise Industry News, 2010). Post World

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War II technological advancements saw dramatic changes in the face of the cruise industry as vessel size increased, carrying capacity multiplied and infrastructural developments facilitated stop over visits. The ideal cruise sought to market the ship as the product itself rather than depending on stop over visits by providing numerous activities for its diverse patrons. Such activities range from ice skating, rock climbing, casinos, swimming pools and even water parks on board.

The Caribbean dominates the total cruise itineraries with almost 40% in 2008 (Florida-Caribbean Cruise Association, 2009). Located within the ideal tropical climate and surrounded by wide expanses of the Caribbean Sea, this volcanic chain of islands produces an idyllic setting for a cruise route. In addition to its natural characteristics, the Caribbean territories are rich in attractions ranging from ecological resources to cultural appeals and even historical products. Furthermore, the territories are seeking to promote their area through continuous infrastructural development to facilitate the cruise ships such as bigger ports and more onshore services. Thus, with a wide diversity in the unique product offerings of individual islands and increasing infrastructural capacities, the Caribbean is held in high regard as an ideal cruise destination.

The focus of this paper is to investigate the environmental impacts of the cruise industry in the Caribbean and the deficiencies of current strategies governing the industry. Subsequently, recommendations would be offered for the region to consider in a bid to minimise or even eradicate the adverse impacts of the cruise industry in the Caribbean region.

The cruise industry has always sparked endless controversy concerning its footprint on the environment, with special interest on the fragile marine environments which are a habitat to numerable ecosystems. These delicate ecosystems, namely coral reefs, sea grass beds and wetlands, not only perform a productive function by providing food and nurseries, but also have a protective function to offer by acting as a natural line of defence against natural hazards such as storm surges. In addition, it is important to recognise the significance of the marine environment to the cruise industry. The marine ecosystems, aquatic organisms and physical beauty are the core of the magnetism of the cruise industry. Thus, given the great importance of the marine environment, any hint of degradation is a great cause for concern and demands immediate action. Key environmental issues arising due to the cruise industry to be highlighted are marine pollution, improper anchoring sites, unregulated infrastructural developments and congestion.

Marine pollution continues to be an overwhelming challenge in the Caribbean, especially due to the cruise tourism industry (Uebersax, 1996), as it is estimated that a general cruise ship capacity of 2,000 passengers and 1,000 crew members can generate waste in amounts of a small city (Adams, 2002). There are seven basic sources of marine pollution from cruise ships as illustrated in Table 1.

The critical adverse effect of improper black water disposal is eutrophication. Eutrophication refers to the over growth of algae, due to the excessive nutrient in the water as derived from the waste. This leads to the restriction of oxygen and sunlight from being penetrated through the waters for the other marine organisms. Thus, these marine species are easily suffocated and prone to death, thereby threatening their existence.

Grey water also threatens ecosystems as the chemicals included in the waste water can be harmful to the delicate marine organisms

Table 1 Major Sources of pollution from a typical cruise ship

Black water	Waste from toilets	40,000 gallons sewage
Grey water	Waste from showers and sinks	90 gallons per person
Garbage and solid waste	Plastics, metals	3.5 kg of solid waste per passenger
Hazardous waste	Batteries, paints	15 gallons of toxic waste
Oily bilge	Fuel, cleaning agents	7,000 gallons of oily bilge
Ballast water		1,000 metric tons per release
Diesel exhaust emissions		Exhaust emissions equivalent to 12,240 automobiles

Source: Klein, 2003

as well as provide optimum conditions for opportunist organisms (Richards, 2009). The tolerance level of marine flora and fauna to varying environmental conditions is low, thus altering the chemical composition of the habitats inevitably leads to its demise.

Furthermore, the disposal of solid waste is an issue. While some may be recycled, or incinerated on board, a great quantity still remains to be properly disposed of. As the excess waste is dumped into the ocean, it washes up on shore, posing a threat to the integrity of the beaches of the Caribbean and ultimately their economies as they are tourism-dependent nations. For instance, the government of the Cayman Islands 'has traced milk cartons on shore to a passing cruise ship' (Richards, 2009). Also, it can be harmful to the marine organisms who may make errors in judgement and attempt to feed on the waste and in the process to suffocate themselves.

In addition, the consequences of incineration cannot be overlooked. While it may reduce to quantity of waste dumped on the ocean floors, it also poses severe environmental threats. The air pollution resulting from the incineration can have the long-term impact of contributing to global warming, which leads to sea level rise and an ultimate loss of critical ecosystems, such as coral reefs which cannot withstand the rising sea levels as well as increasing sea temperatures. In the immediate period, however, marine life can also be harmed. With the release of the incinerator ash in the marine environment, chemicals and other harmful particles may have a negative impact on marine life either by shortened life spans, changed breeding patterns or even ultimate death.

Fourth, hazardous waste produced by cruise ships also signal a grave threat to the environment. Improper handling of such waste is rampant and contributes to the degradation of the environment not only by killing marine species and damaging their habitats through the introduction of these foreign substances but also by its potential to adversely affect human health. For instance, one such substance benzene is a carcinogen while other metals such as mercury affect the life and breeding patterns of aquatic organisms (Belize Development Trust, 1996).

The fifth source of pollution from cruise ships is oily bilge. If filtered to a certain standard, it may be legally discharged in the oceans. However, in the absence of monitoring activities, the ultimate response is the indiscriminate release of this harmful composition into the ocean waters untreated. This practice contaminates the food chain as not only are fishes affected but also the

birds that depend on the fish as a source of food, leading to fatal repercussions on human life.

Another detrimental source of pollution via cruise ship activities is ballast water. This is water intake from the ocean to maintain stability of the vessel as the fuel is depleted. The ballast water needs to be emptied when refuelling occurs, usually at ports. With releases being up to 1,000 metric tons, it raises many environmental issues. The main issue with ballast is the introduction of non-native species. When ballast water is captured in the sea, the marine organisms present are also taken up. However, when this is released in areas far from its origins there is displacement of species due to increased competition for space. Worse yet is if the invasive species are able to suppress the original species and lead to its depletion. Thus ballast water may destroy ecosystems, disrupt food chains, change behavioural patterns of species and even introduce foreign diseases which the original species are not immune to and cannot tolerate. One major incident where ballast water has adversely affected the health of the human population was the introduction of cholera in South America at a port in Peru, 1991, which led to an epidemic affecting millions of lives (Global Ballast Water Management Programme).

The final source of pollution from cruise ships to be examined is the diesel exhaust emissions, contributing significantly to the greenhouse effect and exacerbating the situation of global warming. One major issue is burning of bunker fuel which produces toxic air pollution which can have severe health implications as the pollution travels inland (Environment News Service, 2010). Hence, it is quite apparent that pollution from cruise ships demands great attention due to the vast amounts of different types of waste produced by these vessels.

In addition to pollution, another critical threat to the integrity of the environment as a result of cruise ship activity is their anchoring systems. To accommodate on shore visits, ships are compelled to anchor near shore. Anchors can severely damage fragile ecosystems under its great weight, which may be up to 5 tons and this contributes not only to the loss of habitats, but also threatens the existence of dependent biodiversity. Research in the Grand Cayman Island has shown that 3150 m^2 of reef was destroyed by one cruise ship in one day (Smith, 1988). Thus, these cherished ecosystems which attract visitors are degraded by the same tourism industry which may ultimately lead to its demise. This is reinforced by Lane (2001) stating that 'tourism can destroy the future it promises because it can render a destination spoilt destination, which becomes unfashionable and redundant'.

The aforementioned threats to the environment are basically limited to the marine area. However, the impact of cruise ships extends onto the shores as well. To accommodate the cruise ships, ports of call require certain facilities such as deep water harbours, multiple berthing facilities, fender systems and much more (Atherley, 2003). However, such infrastructural developments jeopardise the environment, as any other coastal infrastructure. With the expansion or construction of port facilities, marine communities are displaced and/or habitats are destroyed. In addition, those species that actually do survive may be threatened by ongoing port activities such as dredging, pollution and anchors as highlighted earlier. These environmental costs skyrocket with increasing demands by multiple ships

to dock at the port. This intensifies the environmental effects and may create another environmental issue, which is congestion especially since environmental thresholds are not measured to determine the carrying capacity of the port.

To deal with the environmental issues outlined, numerous tactics have been employed. International conventions dictating marine pollution rules as well as national legislative and institutional frameworks along with individual policies and programmes are some of the initiatives embarked upon to effectively deal with the environmental crisis of the cruise industry. However, shortcomings and inefficiencies of these attempts have severely hindered their success and it is critical to rectify the situation in the interest of the environment and the cruise industry which depends on the environment for its survival.

The International Convention for the Prevention of Pollution from Ships (73/78) MARPOL has effectively put in place regulations concerning pollution by oil, harmful substances, sewage and garbage from ships (IMO, 2002). It specifies the rate of discharge that is accepted based on criteria such as ship capacity, geographical location and even the age of the ship. From this international convention, local laws and regulations have been devised by individual territories in the Caribbean such as Barbados (Oil Pollution) Act, 1994. Some general regulations postulated include the restriction of air pollution and waste disposal within 12 miles of any land and the prohibition of ballast water exchange 200 nautical miles from land and in areas of less than 200 metres depth (IMO, 2002). In addition, it must be acknowledged that these regulations are accompanied by penalties ranging from fines to clean up costs as well as recovery costs due to damages.

Despite these regulations, pollution has continued as evident by the fines paid by cruise liners. One such incident involves the Royal Caribbean cruise line who was fined US$27 million for oil pollution near the Puerto Rican coast in 1994 (Campbell, 2006). The shortcomings of these regulations lay not in the rules themselves but rather the actual enforcement capabilities by relevant authorities. Inadequate resources are a major crippling factor as a lack of capital, trained personnel and advanced technological equipment reduce monitoring abilities. Thus, without a powerful enforcement body, ships seem to ignore the environmental laws.

In addition to the lack of enforcement, the legislation is ineffective due to the absence of the necessary infrastructure to support the laws. While the rules insist on waste disposal on land, many Caribbean territories have expressed concerns with their inability to facilitate such amenities due to numerous factors including space and financial constraints (Richards, 2009). Attempts to impose a head tax of US$1.50 in Grenada in 1999, to cover the costs of a landfill to accommodate disposal of waste from cruise ships, proved futile as ships took the option to make calls at ports with fewer obligations (Rosenfeld, 2010).

This triggers the surfacing of another obstacle. That is, while Caribbean territories are seeking ways to recuperate the costs incurred to develop the necessary infrastructure, their approach is rendered futile due to the competition amongst the territories to gain increasing numbers of port calls. Moreover, attempts are further undermined as cruise ships have expressed their independence through their possession of private port of calls, e.g., Coco Cay in the Bahamas owned by Royal Caribbean (Anonymous, 2005).

Nevertheless, despite the hindrances to eliminating marine pollution by cruise ships there have been strategies throughout the world which can be applied as best practices to the Caribbean territories. For the success of these strategies, one critical factor is the unification of nations as a collective approach to establish policies will be heeded as a much stronger effort. Thus, with fees such as docking fees and head tax being applied at a constant rate throughout the region with no price undercutting, greater revenue will be generated without compromising individual territories. Furthermore, a unified position on zero tolerance for improper waste disposal would be more effective as the ships would be left with no alternative destinations to make port calls in the region.

Along with improving regional co-operation, the Caribbean should seek to establish a mutually beneficial relationship with the cruise liners. By eliminating antagonism, both parties can engage in discussions to determine the best approach to ensure sustainable cruise tourism practices in the region. That is, they can introduce innovative ways to utilise the resources without jeopardising the future of the environment and also the cruise industry. Plans could include the creation of a fund to finance infrastructural developments which will inevitably benefit the ships upon docking.

Another successful initiative to control marine pollution by cruise ships is the mandatory presence of Ocean Rangers on board the vessels to manage waste disposal and simultaneously increase enforcement capacity (Henry, 2008). Also, the provision of incentives for crew members and even passengers to report any suspicious activities can ensure that cruise ships monitor their activities. This is quite effective as in the 1990s, Princess Cruise was fined half million dollars and the passenger who provided a video as evidence was awarded half the sum (Campbell, 2007).

Together with the reinforcement of laws and accompanying proper monitoring, cruise ships throughout the world have taken the initiative to develop 'eco-cruises' (Underwood, 2009). These practices serve as great lessons for cruise ships traversing the Caribbean region. Firstly, recycling programmes should be encouraged to minimise waste generation. For instance, on board Disney Cruise lines, cooking oil was reused to fuel machinery at ports in private islands saving 8,000 gallons of fuel in 2008 (Underwood, 2009). They also recycle hazardous substances such as aluminium thereby reducing the amount of waste to be disposed. Moreover, water treatment makes a significant contribution to reducing marine pollution. Holland America cruise line passes their bilge water through two systems of treatment while Celebrity Cruises purifies their black water and returns it to the sea in almost pristine conditions (Underwood, 2009).

Another best practice which can be successfully adopted by Caribbean cruise liners is improving fuel efficiency to ultimately reduce air pollution and minimise the creation of fuel wastes. Plug in power stations at ports are highly effective not only in using less fuel but also reducing harmful gases, especially in proximity to the populated coastal areas. Also, simple methods that can be considered to reduce fuel demand include the tinting of windows to lower the need for air conditioning units, which is highly applicable to the region. The geographical location of the Caribbean in the tropical climatic zone also makes it ideal to install solar panels as done on Celebrity Cruises (Underwood, 2009). This clean source of energy minimises the production of oily wastes and air pollution. Hence, it is quite evident that multiple avenues exist

to reduce and ultimately eliminate marine pollution derived from cruise ships.

In addition to marine pollution, another environmental issue demanding attention is the anchoring of cruise ships. While protected areas have been designated throughout the Caribbean there has been little of no monitoring of these areas. To effectively tackle this threat, it is first critical to conduct mapping studies using advance technology such as Geographic Information Systems to identify and delineate ecologically sensitive areas. These areas require strict monitoring and should be deemed as no anchoring zones to ensure the longevity of the fragile marine ecosystems. Hence, the role of honest, dedicated and trained professionals is critical to the success of this policy and this should be the role of the government to appoint adequate numbers of persons given the demands of individual territories.

The environmental issue of coastal infrastructural development has been given overwhelming attention in the Caribbean. Most territories have devised an Integrated Coastal Zone Management Act and established detailed Coastal Zone Management Plans whereby restrictions are imposed, officers appointed for monitoring purposes and penalties clearly outlined. However, the major shortcoming of these efforts is the failure to administer sufficient resources to deliver results. Baseline information is severely limited and mapping procedures are outdated and inadequate. Thus, instruments such as coastal setbacks are being imposed without scientific knowledge. Furthermore, approval is granted to development projects without proper evaluation thereby contributing to the rampant environmental degradation. The key initiative to be undertaken to combat this rapid coastal development is by conducting Environmental Impact Assessments (EIAs) to guide the approval of projects. However, these EIAs need to be done by professionals in the relevant field and unbiased bodies to be reliable and accurate.

Moreover, to deal with congestion of port facilities, stringent policies are to be adopted and enforced as done in Bermuda. Their restrictions include six vessels per week, 6,500 visitors per day and imposed an annual maximum visitor number of 200,000 (Anonymous, 2005). Upon conducting carrying capacity assessments of individual territories, similar limits can be imposed and thereby ensure the sustainable management of the port facility and the environment.

CONCLUSION

Consequently, it is quite evident that the cruise industry threatens the very assets which it depends on for its longevity—the environment. Despite regulations, policies and practices in place to eradicate these threatening characteristics, attempts have been crippled by numerous factors such as a lack of resources and enforcement capabilities to name a few. Yet, global best practices have been highlighted and its applicability to the Caribbean region has been justified for adoption by cruise liners in the region. Nevertheless, recommendations are not to be implemented in a vacuum. To ensure the ultimate success, unity is required to set international standards and also to ensure that these standards are adequately enforced and not act as mere window dressing. In addition it is necessary to gain the participation and involvement of all relevant stakeholders from the cruise owners, visitors, governments and even employees. Agreements must be based on mutual understanding and intensive collaboration. Thus, to avoid its own self-destruction, the stakeholders of the cruise industry need to take control and steer their ships onto the path of sustainable cruise tourism.

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