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*UNDERSTANDING THE IMPACTS OF CRUISE  
TOURISM AND THEIR REMEDIATION COSTS FOR  
SMALL ISLAND COMMUNITIES IN THE AEGEAN*

**Farr Richard**

University of Bolton, UK

**Mavragani Eleni**

New York College

**Hall Christine**

University of Bolton, UK

**ABSTRACT**

The cruise industry continues to enjoy strong growth, and represents a significant portion of the tourism industry as a whole. Nevertheless, amid considerable success, questions remain as to the environmental impact it can have on delicate natural systems, and the disruptions caused within small host communities. There is a need to understand the full costs of cruise tourism; to put a value on the things that are disrupted or damaged when visitors arrive in large numbers, and to ensure that adequate funds are recovered by the communities themselves – and used for remediation.

Seeking to arrive at sustainability through a 'Triple Bottom Line' approach, the aim of this research was to investigate the environmental and social impacts upon a Greek island destination, and to compare these with the economic benefits resulting from cruise tourism. Empirical research was conducted in early 2013 in the small island community of Chios. The research involved in-depth interviews with stakeholders such as residents and local business owners. The broad, open-ended format of the questioning encouraged

interviewees to share their opinions and experiences, identifying a wide range of ways in which cruise tourism had affected the social and natural environment of the destination, and posing questions for the future development of cruise tourism on the island.

**Key Words:** Sustainable cruise tourism, socio-economic factors, carrying capacity, Mediterranean region

## **INTRODUCTION**

Tourism remains one of the most important industries for Greece and her islands [Tselentis et al, 2012]; the World Travel and Tourism Council reported that tourism in Greece contributed €12bn, or 6.5% of total GDP for the nation [WTTC, 2013]. Furthermore, tourism directly supports 330,500 jobs, representing 8.8% of total employment. With an anticipated 5 million cruise tourists visiting Greece this year [Politis, 2013], significant numbers of day visitors arriving via cruise ships have the potential to contribute substantially to local economies [ECC, 2013]. Quantifying the economic contribution of cruise tourism remains problematic, however, since it comprises business transacted with locally-owned leisure facilities, restaurants, retail shops, visitor attractions and the like, plus charges levied by port authorities (handling charges and taxes), and charges imposed by cruise operators that cruise tourists pay to partake in port excursions. These last are usually paid in advance of the visit, and typically include transport, entry to attractions, and refreshments. Such payments will eventually trickle through as a reduced sum for local businesses, for services rendered, but what can be construed as a high price to the cruise tourist will in fact be greatly reduced when it reaches the host economy.

For Chios, tourism in general is an important contributor to the local economy, and cruise tourism is surprisingly significant, with day visitor numbers approaching those for leisure tourists arriving by air. Ashcroft and Associates [2011] describe Chios as having an increasing appeal, particularly for cruise tourists. Chios can be considered atypical, when compared to other Greek Island destinations such as Corfu, Rhodes, Kos, Crete or Santorini; it is at an early stage of tourism and especially cruise tourism development, and decisions must be made as to the extent to which the host community will seek to develop the industry. Critical in such decisions is an understanding of the level of benefit to the island's economy, and the impacts in terms of sustainability.

## RESEARCH METHODOLOGY

A useful starting point when considering issues of sustainability is Elkington's [1994] vision of Triple Bottom Line (TBL) accounting, often summarised as "people, planet and profit". Here, an activity is only said to be sustainable (which is to say, viable in the long term) if it is socially just, environmentally benign and commercially sound. This definition has been widely adopted, and the Venn diagram that shows sustainability existing only at the confluence of all three issues is well known – but on its own it does not provide a means for practitioners to pursue sustainability. According to MacGillivray [2004] for sustainability to occur "economic, environmental and social balance sheets must all be in the black", yet the toolsets to measure environmental and social harm lag far behind the level of accuracy and wide understanding found in the assessment of economic performance.

Mitchell et al [2007] found that TBL reporting promoted sustainability thinking within organisations, but trade-offs between the different TBL dimensions remained difficult. (In a sustainable tourism context, for example, this might mean choosing between job creation and natural habitat destruction, when considering the construction of facilities.) Adams [2006] states that trade-offs between TBL elements are a flawed concept because governments and businesses will always tend to prioritise the economic. It can be argued that it is human nature for a system to tend toward further environmental or cultural degradation over time – at the risk of "killing the goose that lays the golden eggs." Middleton and Hawkins [2012] concur, warning that tourists can destroy the natural environment that attracted them to the destination in the first instance, if their tourism activities are not managed sustainably.

In this study, trade-offs have not been attempted; final decisions rest with the host community, after all. Instead, each component of the system has been examined to identify the scale, value and growth potential of the industry (profit), the environmental strain it imposes upon an island community (planet) and the social impacts upon the hosts (people).

Graci and Dodds [2010] acknowledge that it is important to establish just who the principal stakeholders are in the area of sustainable tourism, and more importantly for this study, in relation to island destinations. In this context we use Freeman's [1984] definition of a stakeholder, as a person or group who may hold an interest in the ability of an organisation to exercise actions involving the destination and possibly influence change. Several authors argue that qualitative research in tourism is an evolutionary practice and well recommended [Veal, 2011; Phillimore and Goodson, 2004]. When taking this approach Veal argues that it is possible to obtain a more comprehensive account of the situation in tourism related scenarios, involving individual feelings and thoughts, as opposed to the limited amount of information obtained from a larger study that quantitative research can reveal. Veal also argues that individuals absorbed in tourism experience situations are best positioned to interpret their account of the situation in a qualitative type of information

gathering. In view of such recommendations, qualitative research was carried out among local businesses. Graci and Dodds recognise local businesses as being the 'grass roots' of the tourism industry, especially in an island destination [2010] since local businesses, as stakeholders, work to ensure that a high proportion of the income generated from tourism reaches the local economy, and that it is distributed across the island community.

Empirical research was carried out through in-depth personal interviews with a variety of local business owners, citizens and officials, in a non-directive manner. An interview guide was formulated, featuring semi-structured, broad, open-ended questions aimed at obtaining comments illustrating the experiences and opinions of the interviewees. In total, eighteen interviews were conducted, obtaining contributions from local residents, café and shop workers, taxi drivers, law enforcement and local officials.

The stakeholder interviews allowed the researchers to catalogue the concerns of the interviewees, in terms of the ways that cruise tourism affects the business, social and natural environment of an Aegean island community. These distinct issues are discussed in Sections 3, 4 and 5, respectively.

#### **ASSESSING THE SOCIAL IMPACTS OF CRUISE TOURISM**

The social aspects of sustainability vary from one business proposition to another, but might include issues such as health and safety, consumer rights, participation in local democracy, fair dealing with consumers and suppliers, equal opportunities, infrastructure and access to services, culture and heritage; a list of potential impacts that remain difficult to measure or assign a value to.

The interviewees reported a number of social issues. By far most commonly identified, from 16 of the 18 interviewees, was that cruise tourism is affecting the opening hours of businesses in the port area. This represents a recent change; before the economic crisis tourists were left with little to do when shops closed mid-afternoon, but now their business is considered more valuable. The extended opening hours are something of a grey area, legally, but closure is not enforced. Taxi drivers were also reported to be working a lot on days when there was a cruise ship in port, and some interviewees reported that road traffic congestion was an issue on those days.

Interestingly, all interviewees rejected the idea that cruise visitors have a negative affect upon their everyday life; in fact residents rarely interacted with cruise tourists, who tended to take coach tours around the island. An emerging cultural influence on Chios comes from the growing number of Turkish visitors who also arrive by sea, as day visitors or on a two-day cruise from Izmir. Interviewees generally failed to distinguish between Turkish day visitors and more conventional cruise tourists. The emergence of this market segment has

led to new signage appearing on the streets and within shops, where staff have started learning Turkish, and organising related cultural events.

Overall, respondents had relatively little to say that showed cruise tourism in a negative light. Local businesses appreciate the extra revenue, and reported that they cope with the influx of tourists by arranging to have extra staff on duty on 'cruise days'. It was also reported that the short period for which cruise day visitors stay meant that bars and cafés could still serve residents as usual.

## **ASSESSING ENVIRONMENTAL IMPACTS FROM CRUISE TOURISM**

When questioned about environmental impacts, the great majority of interviewees saw no environmental problems at all. Just two reported that cruise ships "pollute the sea" and none mentioned problems of air quality, or climate change. It may be significant that the region is often subject to strong winds, and thus any smoke that the engines of a ship generate will rapidly be dispersed. In any event, 'green' issues seem not to be considered, beyond the two respondents who took exception to the discharging of waste that they assumed to take place. The relevant marine environmental convention, MARPOL, specifies conditions under which the discharge of food wastes, certain cleaning agents, sewage and grey water are permissible [IMO, 2013] – although one respondent's statement that "they empty their tanks just outside our port" is unlikely to describe the discharging of sewage, as a minimum distance of 4.8km from shore is specified for such material.

### **Metrics for the Environmental Impact of Cruise Holidays**

To some extent, environmental impact can be quantified, although this remains highly complex. A common option is to consider the 'carbon footprint', based upon the emissions of greenhouse gases that are associated with the provision of a good or service, and the corresponding risk of climate change. Ward [2010] suggests a figure of 960kg CO<sub>2</sub> per passenger, for a one-week cruise (not including travel to and from the ship). For comparison, annual CO<sub>2</sub> emissions for a person living in Greece are around 8,400kg [World Bank, 2013].

The cruise vessels that call at Chios appear to produce substantially higher CO<sub>2</sub> emissions per passenger. *Le Levant*, a cruise ship that regularly visited Chios in 2011, is reported to consume 14 tonnes of heavy fuel oil (HFO) per day [ship-technology.com, 2012]; using the standard conversion factors published by DEFRA [2012] this quantity of HFO equates to 53,717kg of CO<sub>2</sub> and equivalent greenhouse gases emitted, or 597kg per passenger, per day – and more if full occupancy is not achieved. *Le Levant* carries just 90 passengers in

luxury and at speed; calculations based upon a typical large cruise ship – of the kind not currently seen at Chios – broadly confirms the Ward [2010] figure for CO<sub>2</sub> per passenger, although it should be noted that these basic calculations are for energy use only and do not include food, services, excursions, and the like.

Sustainability calculations based purely upon climate change potential are limited in that they do not address other environmental issues such as toxicity, habitat destruction or the consumption of scarce material resources – nor the other component parts of the TBL, such as social issues. Another key problem when calculating the environmental harm of tourism is that measurements tend to be attributed to the country where emissions occur, rather than being associated with the nationality of the citizens who visit [Kitzes et al, 2007]. This does not affect calculations of environmental degradation at the global level, but can serve to conceal the source of climate change. An additional source of complexity is that some environmental problems are global in nature, such as CO<sub>2</sub> emissions, while others are more local, e.g. affecting water or air quality.

Addressing one example of the latter, EU Legislation (Directive 2005/33/EC) imposed a limit of 1.5% sulphur in HFO used by passenger ships serving the EU with effect from 2010, and further limiting the sulphur content of fuel used when berthed to 0.1%. Sulphur occurs naturally in crude oil, and can be present in HFO at up to 4.5% by weight, but the sulphur dioxide (SO<sub>2</sub>) resulting from combustion is known to cause many health problems, plus acid rain. Further sulphur reductions are planned for 2015 and 2020, compelling ship operators to use more expensive, low-sulphur fuels.

Despite the lack of concern about gaseous emissions from those interviewed, the potential for environmental harm is huge, as the data on shipping in Greek waters in Tzannatos [2010] show. Passenger ferries and cruise ships are considered together because the vessels tend to be similar in terms of their performance; taken together they accounted for 18% of ship movements in Greek waters, and 390,633 tonnes of HFO consumed in 2008. Even with low sulphur fuels substantially reducing the local air quality problems, the global issue of climate change remains: based on the DEFRA [2012] conversion factors this fuel usage implies the emission of greenhouse gases equivalent to 1.47 megatonnes of CO<sub>2</sub> – and there are other emissions of concern as well. Vogtländer et al [2002] identified seven different classes of emission (acidification, eutrophication, heavy metals, carcinogens, summer smog, winter smog and climate change), and proposed a common denominator in the form of “prevention costs at the norm”. It may be that an adapted form of this mechanism could be used to assign a cost to the various forms of damage that occur as a result of cruise ship operations, perhaps with the ultimate aim of levying taxes and using money obtained for remediation or offsetting – but we have yet to consider the environmental harm that occurs when passengers come ashore, causing soil erosion in sensitive sites that endure high footfall, or engaging in hazardous or resource-intensive activities during excursions. Fortunately, the low numbers of cruise passengers seen on

Chios at present are unlikely to be doing damage that cannot be repaired by natural processes.

### **Emerging Improvements to Cruise Ship Environmental Performance**

On the technical side, some efforts have been made to improve the 'green' performance of cruise ships: some cosmetic, and some more practical. Fitting low energy lighting and heat-reflecting glass help to reduce the fuel consumed for on-board electricity generation, while "cold ironing" (using a shore-based electricity supply while docked) can further reduce emissions. Tzannatos [2010] and Kalli et al [2009] also reported favourably on the use of a seawater-based scrubber to reduce SO<sub>2</sub> emissions, it being permitted to continue to use fuels with higher sulphur content with this technology in place to treat emissions.

Less conventional attempts to make cruise holidays more 'green' have included the addition of solar panels, sails, and even the introduction of biodegradable golf balls, made from surplus lobster shells [Daley, 2011]; MARPOL [IMO, 2013] classifies conventional golf balls as waste plastic, and prohibits their 'discharge'. Lobster shell golf balls provide an example of how a leisure activity can once again become sustainable, through re-engineering, but there is a danger that the small changes make good press, while failing to address the real problems.

### **ASSESSING THE BUSINESS IMPACTS OF CRUISE TOURISM**

The responses from interviewees regarding the business impacts of cruise tourism on Chios were overwhelmingly positive. Stakeholders were pleased at the additional business generated by cruise ships, although one negative comment concerned a cruise ship that arrived complete with bicycles, allowing the visitors to tour the island without having completed a business transaction with local companies. As cruise ships become increasingly sophisticated, this kind of competition with local leisure amenity providers may become a significant problem.

The business issue that was most commonly discussed concerned the inadequacy of the present-day port. When a cruise ship is berthed within the port, it can prevent access for other vessels, and the larger cruise ships cannot gain access to the port at all, but must transfer passengers to and from shore by tender. The strong winds in the region can make this activity difficult or impossible on some days. As a result, there is considerable interest in the development of a more suitable port, most likely at Mesta on the west of the island. Naturally, the proposal is unpopular with the businesses in the port area of Chios that would suffer if cruise visitors were to land elsewhere.

## THE LIFE CYCLE OF CRUISE TOURISM

An aspect that needs approaching with caution when considering sustainability (literally, the ability to continue an activity) is that a business activity may flourish only for a brief time. Those who invest in developing a tourist destination may be disappointed to find that numbers cease to expand, and ultimately decline – with consequences in terms of the monetary investment and materials that have been expended on development, which will ultimately have social and environmental consequences.

It is useful, therefore, to determine the stage of development at a destination, when assessing the impacts of tourism (and specifically in this case, cruise tourism). Many authors [Cooper et al, 2008; Page and Connell, 2009] recognise Bulter's [1980] Tourist Area Life Cycle (TALC) as being a valid model to explain how a destination develops over time, moving through the stages of involvement, development and consolidation with a corresponding growth in tourist numbers. Graci and Dodds [2010] caution that the TALC cannot provide a typical evolution of an island destination, especially in a planning context. Choy [1992] and Agarwal [1997] support this, arguing that the exact angle of ascent in the TALC graph cannot be determined as "one size fits all". Indeed, there is evidence to support a very different tourist area life cycle occurring on Chios in comparison to Rhodes, despite the islands being of a similar size and in close proximity.

Rhodes evolved with the first charter flights in the early 1960s, attracting large numbers of tourists originating from UK and European consumer markets searching for an inexpensive packaged holiday [Visit Rhodes, 2013]. For summer 2013 Rhodes is expecting to attract in excess of 1.3 million tourists arriving by air, with a further 600,000 arriving as cruise tourists on 33 large capacity cruise ships, participating in day visit activities. These vast numbers of tourists in their various forms exceed the carrying capacity of the island at the height of the season [Pappas and Tsartas, 2009], degrading the tourism product and overstretching the infrastructure and natural resources. Obviously, day cruise visitors also cause a noticeable 'spike' in the load that tourists impose upon the destination.

Chios is largely unknown to the mass tourist markets of Europe, and instead attracts affluent Greek families, often with holiday homes, and Turks visiting on short excursions from the nearby Turkish mainland, only 10 km away. The island is expected to see fewer than twenty cruise ship visits during the 2013 holiday season, from five different ships with a maximum capacity of only 450 passengers [Seabourn 2013; Silversea, 2013] – although it is worth noting that Seabourn, in particular, describe this as an 'ultra luxury' cruise product, which may increase the value of each passenger to the local economy. Of course, a cruise tourist arriving at the island only stays for a few hours, but contributions from this source can be significant, if a fair share is allowed to permeate through to the host community.

When utilising Butler's [1980] TALC to determine the maturity of the destinations, Rhodes can be seen to be in the 'consolidation' stage, and arguably bordering on stagnation as the destination regularly reaches over-capacity, degrading the tourism product [Pappas and Tsartas, 2009]. In comparison, Chios has developed so as to attract a very different kind of higher spend consumer, albeit in limited numbers. In addition to the low level of visitors, comments from stakeholder interviewees confirm Chios to be at the 'involvement' stage of Butler's [1980] TALC. The tourism industry on Chios has developed at a much slower pace, and the island lacks the infrastructure that would be needed to serve the mass market, although in consequence much of the coastline remains in a highly desirable, undeveloped state that has largely escaped tourism [Lonely Planet, 2009].

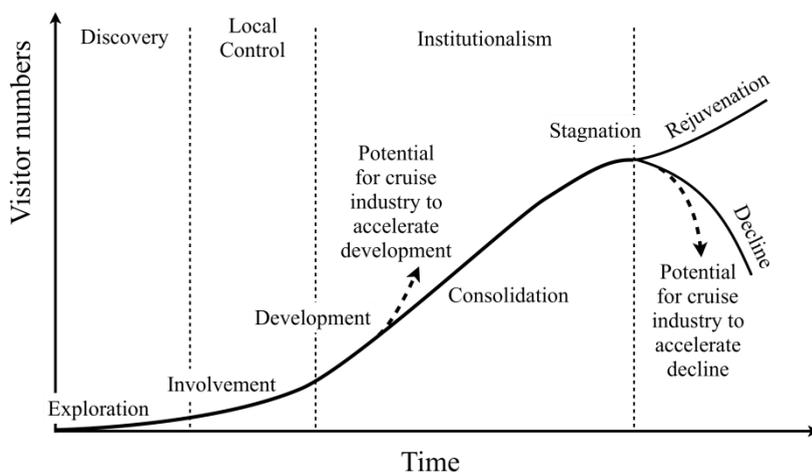


Figure 1: Tourist Area Life Cycle showing the cruise industry's potential to accelerate development, and decline (adapted from Butler [1980])

Cruise tourism should be pursued with caution, as its appeal as a sustainable income generator is questionable. It has the potential to skew the TALC because the mobile nature of the cruise product can overcome the normally slow process of development and consolidation. If a destination becomes popular, cruise visitor numbers can increase rapidly by the simple expedient of changing cruise itineraries from one season to the next, as Figure 1 demonstrates:

Destination-specific investment would remain relatively small, allowing cruise operators to sample a destination, and move elsewhere if it proves insufficiently profitable. In this sense, cruise ships are superior to land-based development, but introduce considerable variability that may leave local businesses struggling to meet capacity requirements without taking on considerable financial risk.

In addition to the TALC theory, there are further established concepts that can be utilised to develop an overall image of the development of tourism on Chios. Cooper et al [2008]

highlight that when searching for the allegations of socio-cultural impacts in tourist destinations, one of the major impacts on the host community occurs when they come into any kind of contact involving communication with tourists, either arriving to stay overnight or, it can be argued, via a cruise ship. This activity is reported as being a direct impact that can lead, over time, to irritation (as characterised by Doxey's [1975] Irritation Index.)

Brida et al [2012] have completed focused research involving destinations receiving cruise tourism, utilising successfully the fundamental theories devised by Butler [1980] and Doxey [1975] to determine the social-cultural impacts of tourism in Messina, Sicily. In Chios both the TALC and Doxey's Irritation Index can be utilised to demonstrate that not only is the island destination at the 'involvement' stage, the responses from the local host community taking part in the primary interviews, acknowledge 'euphoria' per the Doxey Irritation Index. Largely as a result of the continuing economic crisis in the Eurozone which has impacted many businesses in Chios, the host population is increasingly reliant on tourism and in particular, on the cruise tourist to supplement their income and the local economy.

It appears that cruise tourism on Chios is developing towards the next stage of both the TALC and Doxey's Irritation Index models, although other authors [Brida et al, 2012; Brida and Zapata-Aguirre, 2010] have argued that these models are only reliable when utilised retrospectively. In the case of Chios it seems reasonable to suggest that an accurate prediction can be made, in that the economy is moving towards reliance on tourism and consolidation, involving the cruise tourism industry in particular. The cruise industry may ultimately become a major cause of *annoyance* amongst the host population, particularly if larger cruise ships are able to land greater numbers of cruise tourists on the island in the future. Cruise tourism could develop to attract numbers that would test the carrying capacity of the island, as has been seen on Rhodes.

## Conclusions

Chios is at a pivotal stage in its development, and the importance of cruise tourism has been magnified by wider economic issues. The islanders must resolve some difficult business decisions if they are to invest in a major port development, and even if successful in this they run the risk of substantially altering the character of the island.

It appears that stakeholders are largely unaware of the negative impacts that a large increase in cruise tourism could inflict on their island, and their lives. The host population were found to have only a limited regard for maritime environmental issues, and the current social impacts were largely considered to be of minor importance and easily addressed. Meanwhile, the people of Chios remain well-disposed to tourism, and few perceive any significant risk. As a result, developments that will permit increased cruise tourism appear likely.

Whilst an attractive solution in the short term, and especially in the current economic climate, the fostering of cruise tourism on Chios ought to be undertaken with care – taking into account the luxury positioning of the current product, and aiming to maintain or increase local revenue per passenger even as numbers increase. Offering a rare example of a largely unspoiled destination, it should be entirely possible to derive further income from both cruise operators and passengers.

Even when considered on a purely business level, investing in new port infrastructure is risky because there are no guarantees that with such facilities in place the island will attract larger cruise ships in sufficient numbers to repay the initial investment. Furthermore, there will be social changes for some in the host community, in the form of longer working hours and highly seasonal work, plus issues of congested roads and crowded amenities, while the environmental impacts of increasing cruise tourism in general will be borne by the much wider (or even global) community.

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