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Procedia - Social and Behavioral Sciences 195 (2015) 438 – 445

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**Procedia**  
Social and Behavioral Sciences

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World Conference on Technology, Innovation and Entrepreneurship

## Technical Innovations in Cruise Tourism and Results of Sustainability

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### Abstract

Tourism industry is one of the biggest economic sectors of the world with extraordinary development rates. There are negative and positive ecological, economic and social effects which derive from international tourism. The most important negative effects are mostly on environmental quality and sustainable development perspectives of destinations. Positive effects mostly cover employment and income related issues not only in destination regions but also on the side of tourism product suppliers which are related with neighboring worldwide economies. Tourism regions and industries base on solid ecology but also on positive economic and social environment of touristic supplies. Based on growing environmental conscience, it is only possible to reach desired positive effects of tourism if negative ecological, economical and socio-cultural effects minimized and by this way innovation wins stronger meaning with the help of sustainable transport. This paper will evaluate innovation methods within cruise sector which has strong growth numbers of tourism and prepare recommendations for the future of cruise tourism in Turkey.

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Peer-review under responsibility of Istanbul Univeristy.

*Keywords:* Cruise tourism, Sustainability, Innovations

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## 1. Introduction

Sustainability was defined in 1987 by UN-Commission which was also called as Brundtland-Report as follows: ‘Sustainable development meets the needs of the present without compromising the ability of future generations to meet their own needs’. This approach became very important which has also used as main orientation factor by local or global decision makers about sustainability issues. Beside generation’s responsibility, there are some other principals such as;

- Coherence: Connection of social, economic, political and ecological targets.
- Participation: Involving of different actors in order to implement the sustainability strategies.
- Responsibility: Sustainable development is carried together by industrialized and developing countries but with different methods.

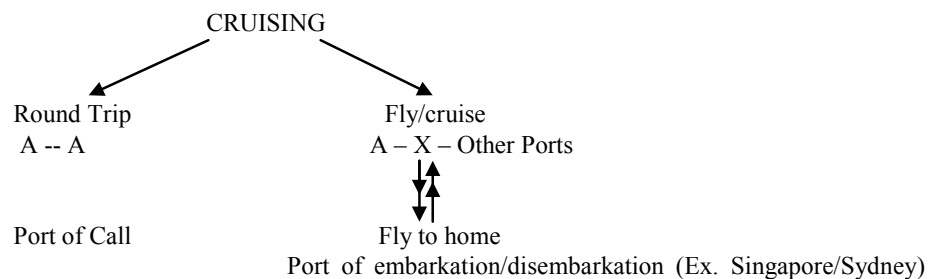
Based on those ground principles, it is possible to approach cruise tourism with components such as economic, socio-cultural and ecological effects (Becker; Hopfinger; Steinecke, 2007).

## 2. Development of Cruise Industry

In 1960’s Caribbean region developed itself as a strong destination under increasing demand. Thereafter, many different destinations became powerful actors in the cruise market. With this development, Carnival Corporation and Royal Caribbean Cruises started to control two third of world cruise market with their sister companies (Biedermann, 2008).

### 2.1. Terminology

Cruising has become one of the fastest growing sectors within tourism. It is a special experience with its own. Meals, activities, entertainment and varied destinations create one-stop holiday shop. Cruising as term is also used by some air or rail companies as Air cruising Australia or Indian Pacific with the combination of train and ocean cruising. Cruise is a voyage on a ship undertaken wholly for reasons of leisure and recreation. *Line voyage* is a sea trip taken with the express purpose of getting from port A to port B. Especially, in the early 20<sup>th</sup> century; five days were needed between London and New York. At those days crossing was meant as trans-Atlantic voyage from Britain and North America or vice-versa. *Positioning voyage* means that the company locates a ship in another part of the world for a short season. It is sometimes called as line voyage. It is possible to show it as follows:



Port of Call: Ship comes to harbour in the morning and it leaves it in the evening, spends nearly 8-10 hours there because of high port charges and strict schedules.

Port of Embarkation/Disembarkation: Customers can fly home after certain tours and new tourists can join the ship at next harbours. Ships are always in the sea without waiting long periods at certain harbours.

## 2.2. Short History of Cruise Industry

In 1844, shore excursions started from England to Cairo, Athens and Istanbul. First sponsored travel writers (embedded writers) were established by P&O (Peninsular and Oriental Steam Navigation Company) which was founded by Arthur Anderson. Popular writers were subsidized in exchange for a free trip, published their adventures in exotic locations in well-known newspaper or journals. At those days, ships were transporting cargo and government officials, missionaries, scientists and travelers were also cruising on those ships. A German company Hamburg-America was created with launching the first tailor-made cruise ship, the Prinzessin Victoria Luise in 1900. It was small, luxurious and world first cruising yacht. After 100 years, Silversea Cruises with white color continue this tradition and symbolizing summer cruising. Until 1930 (Great Depression) cruising was meant long trips for wealthy people. In the USA, Cunard and White Star operated 'Booze Cruises' and people could consume alcohol which was forbidden on the shore. Day after day, Caribbean became most popular destination for the American cruise market (Douglas, Douglas, Derrett, 2001). Especially in the 1920's and 30's cruising boomed. Overwhelming local shop keepers, reaching to accessible natural and built attractions, colonized beaches and sailing in the evening were main negative characteristics of cruising. In 1932, cruising was called as floating resort. In 1960's, air travel became more popular than cruising. Line voyages decreased and cruise operators turn themselves to fly/cruise packages. During 70's, world petrol crises had negative impact on cruising. Large ships were getting smaller because of high petrol prices. Fewer passengers started to visit inaccessible ports of call and tour operators created more multifaceted programs.

## 2.3. Theme Cruises and Marketing

There are different special interests cruising such as wellness at sea, freighter cruises, river cruises. Visual and verbal slogans have increased the attractiveness of cruising: Romance, luxury, exotica or nostalgia. Princess Cruises impose the Love Boat, Carnival Corporation uses slogans such as fantasy, elation, sensation and ecstasy. Late 1990s P&O – Fair Princess used to wake the interest of high school students such as '11 days and 10 nights of testosterone and vomit'. But there were also more sophisticated and patriotic marketing slogans 'You are in good hands with our British officers' or 'Do you favor a full English breakfast?' at P&O in the year of 1993. There was very strict line between marketing slogans of P&O which was based in UK and American based company Princess Cruises because of various type of customers with different expectations. If the past is a foreign country, nostalgia has made it the foreign country with the healthiest tourist trade of all (Loventhal, 1985).

## 2.4. Growth

According to European Cruise Council (ECC), North America (USA and Canada) accounts % 80 of total passengers. Since 10 years, North American cruise market stagnated, but European and Asian Markets won considerable meaning not only as home markets but also as destination (Sachanalyse, 2013). Here are some facts about cruise sector in the world:

- Mediterranean and Baltic Sea regions are still very popular for cruise passengers
- In 2000, there were 8.5 million cruise passengers. In 2005, number of passengers increased to 11.5 million
- International cruise revenue was 17 billion dollars according the numbers in 1999
- (Two+five) day cruise accounts for some 37 per cent of the total product
- Ships with 500 to 1500 berth capacities account for 63 per cent of total berths
- Sixty ships are still under construction. This will result with over supply and aggressive competition not only among cruise companies but also between different harbors. Average annual changes in cruise supply and demand in North American market between 1980 and 2006 gives us strong demand numbers (Table 1). Hence, there is balance between 2000 and 2006, because of new ships which were started to operate.

Table 1. Supply and Demand Change in North American Market (Biederman, 2008)

Years	Passenger Demand	Lower Berths
1980-1989	9.7 %	6.8 %
1990-1999	5.6	6.6
2000-2006	7.6	6.8
1986-2006	7.8	7.2

### 2.5. Market Segments and Travel Duration/Season

There has been given a great emphasis with focus on the variation of supply since 60's. Cruise travel was shaped for mass tourism. Prices have been very differently segmented. There are basically four types of markets (Biedermann, 2008):

Contemporary market: On board fun and amenities are playing important role and destinations have secondary importance.

Premium market: This category is more expensive than the contemporary category and where the destination has same importance as on board amenities.

Luxury market: It was once dominant type of cruise tourism, but now it has only a small portion of the industry. Generally, it is the most expensive cruise category and usually it takes longer than average cruise days.

Adventure/exploration: It refers relatively long cruises with special and exotic places where the destination is the main purpose of the trip.

European cruise travel duration takes more five days than North American travel duration. There is a tendency on European market during the last years that duration of travel is getting shorter. This short duration tendency is explained with the strong demand of costumers (Hensen, 2003). Beside this, it is most likely that cruise companies try to convince tourists with short haul travels instead of long term cruise trips for more expenditure.

### 2.6. Destinations

Ship is mostly seen as a destination. It is well equipped with on board activities with different entertainment, leisure and other different extras. These services bring more values and extra revenues to companies. It is implied that cheap total price help to increase the readiness of customers to buy more on board. There is strong co-relation between short cruise trips and increased board revenues (Hensen, 2003). The culture of countries which are visited by ships is not playing a major role. Most of passengers spend their time on board or they prefer to join daily tours which are mostly organized by cruise ship companies. But destination of ships is still changing according expectations and cultural background of customers. The most common cruise ship destinations are very easy to reach from North America and Europe. Since ten years, there has been newly developed special markets such as Norway, Adriatic Sea and Black Sea region. The infrastructure of many harbors is not ready to offer services to hundreds of passengers. At this point, financing of related investments is getting above the resources of these regions. Cruise ship companies started to invest more in infrastructure of such regions. It brings the danger of strong dependency of locals on such companies and their investments: Cruise ship companies invest increasingly in to build up private clubs, hotels or private islands. This can be easily seen in Caribbean peninsula Haitian Labadee. Royal Caribbean Cruises leased this peninsula in order to create its own private holiday resort. This place is surrounded by fences and protected by security forces.

## 3. Sustainability and Innovations in Cruise Industry

Although cruise industry creates positive economic effects on target regions, middle and long term real negative

effects are stayed unexplained and with mostly unfilled expectations. Relationship between investments and results, costs and benefits in economy and with social and cultural terms is not very balanced and very disadvantage for target regions.

### 3.1. Economic Effects

It is possible to cover all economic effects as follows:

- Countries are profiting from cruise ships with the help of taxes and dues which are paid by companies.
- Many cruise ship companies register themselves in certain countries because of special advantageous labour force laws such as Bahamas, Panama, Cyprus and Liberia.
- Countries make profit because of workers and extra service companies which work for cruise ship companies.
- Harbours make profits with berthing, water, electricity and waste management. But food is sold by international logistic companies and daily trips are mostly organized by cruise ship companies.
- Cruise ships are very mobile and there is very strong competition between harbours in order to win cruise ships as customers. Beside touristic attractions, fees are kept especially very low. This is compensated by alternative methods which have negative effects on environment and labour force.
- Two groups benefit from big number of passengers: Firstly, local traders who sell clothes, accessories and souvenirs to tourists, secondly touristic suppliers such as travel agencies and restaurants which are strongly demanded in target regions. Especially, daily tours are booked on board thousand times by cruise passengers. This creates dependency of regions on cruise ship companies. Greek Islands such as Mykonos or Corfu can be given as examples. Restaurants benefit very less from passengers because daily tours are organized so deliberately, customers have to be at ship during lunch or dinner times. Here, it is possible to give detailed insight about expenditure from three sides such as passenger, operator and crew expenditure with the help of table (Table 2).

Table 2. Cruise related expenditure (Biederman, 2008)

Passenger Expenditure	Operator Expenditure	Crew Expenditure
Airfares to/from base country	Port Expenditures:	Local crew
Internal Travel	Government charges	Port expenditure by foreign crew
Add-on expenditure	Port charges (inc. terminal)	Ship maintenance
Accommodation	Towage	Marketing in base country
Meals	Provedoring	Taxes
Shopping	Stores and provedoring	Income tax
Excursions	Bunkering	Customs duties
Port Expenditure	Services (waste disposal, water)	Departure taxes
Meals		
Excursions and travel		
Shopping		

Sure, not only destinations profit from cruise ship companies but also shipping companies, suppliers and shipyards as well. Here, there is a table about cruise line profitability in the year 2006 (Table 3). It seems that only two big operators are at profitable zone. Star shows us loss at this period. Carnival is four times profitable than Royal

Caribbean. Cruise market mechanism is controlled by only two big companies. These companies show direction of the future of cruise industry.

Table 3. Cruise line Profitability 2006 (Biederman, 2008)

Companies	Net Income	Net Profit Margin	Return on Investment
Carnival	2.2	19 %	5.6 %
Royal Caribbean	0.6	11.4 %	4.3 %
Star	0.1	-	-

### 3.2. Socio-Cultural Effects

Sustainable tourism is based also on intercultural exchange between tourists and locals. It is very important that guests have possibility to see locals in their authentic life. But mostly, passengers see themselves not as guests but mostly as customers. Touristic supplies are mostly offered according to stereotypes of destinations. It seems very typical to select visiting main attraction areas or building private clubs or islands through cruise ship companies. Animation programs help to design cruise ships as destination. Daily tours can be also ignored by passengers with recommendation of cruise ship companies as well. Thousands of passengers are flooding over cruise ship destination regions after and after by big cruise ships and this has negative effects and creates danger on decision rights and self-development possibility of locals.

#### 3.2.1. Job Market and the Situation

International Transport Workers Federation has statistics that crew members of cruise ships are under paid and they have rights under international standards. This has not been changed since ten years. Surely, there are big differences from one company to another. Stephan Bernau underlines that results are minimum wages, long working hours and very questionable working conditions. Some of crew members could not see day light all along the cruise journey. International maritime law allows ships to move under every flag of the world. Working agreements are made under different foreign countries working regimes for different nationalities on temporary basis.

### 3.3. Ecological Effects

Cruise ships are mostly seen as waste producer of the world seas. Big and luxurious ships are real danger for environment protection. These ships need more electricity and water when they are getting bigger. 400 liter water is average daily consumption of a passenger; 3 kg waste is produced also by one person on the board. Additionally, there are also sewage sludge, water contaminated by oil and emissions of ship engines (Sachanalyse, 2013).

#### 3.3.1. Ship Emissions

Ship's engines have negative effects with their pollutant emissions on environment. Amount of pollutant emissions of cruise ships will be increased % 72 until 2020 according to International Maritime Organization. These ships are mostly compared with small cities. They leave ecological footprint in the water while they use rest production of oil refineries during the journey. Soot-, SO<sub>x</sub>- (Sulfurdioxide) und NO<sub>x</sub>- (Nitrogen oxides) – Emissions are most important reasons for climate and health problems. Ship gases have these harmful substances which can create heart and liver illnesses. Especially crew members and locals of coastal regions live under big treat. There is a great need of law in order to decrease the level of harmful emissions which cover especially cruise ships. Since 2010, in some regions such as Baltic Sea, there is a restriction for cruise ships that they cannot be

operated with more than 1 % of sulphur content. Next year, it is only possible to move with maximum 0.1% of sulphur content. These regulations are not applied worldwide. Diesel costs will increase and this will have negative effect on tickets per person.

### 3.3.2. *Environmental Effects of Soot-, SO<sub>x</sub>- (Sulfurdioxide) und NO<sub>x</sub> (Nitrogen oxides) - Emissions*

Especially in Arctic and Antarctic regions, there are drastic environmental effects of soot emissions. Black particles are stored on ice and snow; this could decrease reflection the sun shine. Black particle is getting warmer. Results are increasing of temperature and melting ice. Without soot reduction system, ships are big potential risk for environment. The higher level of SO<sub>x</sub> (Sulphur dioxide) und NO<sub>x</sub> (Nitrogen oxides) brings potential problems. They have negative effects both on vegetation and human beings in coastal regions. NO<sub>x</sub> emissions carry responsibilities of the high level death rates in North America and Europe. High level SO<sub>x</sub> emissions bring acid rains and they sour the earth. It results with eutrophication of seas, earth and coastal regions especially at estuaries.

### 3.3.3. *Sensible Sea Regions*

Cruise industry is challenged by its activities in the World seas and oceans, especially around protected nature areas. International Maritime Organization recognized this problem and built Particular Sensitive Sea Areas, PSSAs. We can count 11 different PSSA protected nature areas. These areas are under strict control of IMO member states. These states follow certain rules to control their ships which are operating under their flags. Here are these sensible regions:

Great Barrier Reef, Australien (1990), Sabana-Camagüey Archipelago in Cuba (1997), Malpelo Island, Colombian (2002), Florida Keys, USA (2002), Wattenmeer, Danmark, Germany, Holland (2002), Paracas National Reserve, Peru (2003), West European Waters (2004), Great Barrier Reef PSSA till der Torres Street (Recommendation of Australia and Papua New Guinea (2005), The Canary Islands, Spain (2005), Galapagos, Ecuador (2005), The Baltic Sea Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Poland and Sweden (2005) MARPOL convention has three different processes against pollution such as reduction of pollutants, recycling and disposal. A cruise ship can process material with its sources or it can transfer it to harbour in order to store, combustion or recycling under MARPOL rules (Dowling, 2006).

## 4. **Results and Perspectives**

When we want to talk about perspectives about cruise industry, there is a certain expression: Boom. Cruise industry is expanding with the yearly average of % 14. German cruise companies such as AIDA will have new ships in the next years; this will increase its bed capacity to 25.000. There are possibilities to make some technical comments and recommendations:

- From 2015, new ships will use ship diesel instead of refinery oil. CO<sub>2</sub> will be reduced with new techniques such as airbags at chimney of ships.

- The easiest technical precaution is the lowering of speed and using of petroleum with low lead level.

- The obligatory usage of filter system will reduce the air pollution as well.

- With the help of land-electricity connection, ships can turn off their generators. But not all harbours have this smart system. Renovation of old model of ships can be costly. Gothenburg, Rotterdam and Antwerp have this infrastructure. A good alternative would also be gas connection but some of ships do not this technical structure (Biederman, 2008).

Beside technical precautions, political decision processes can play crucial roles. If it is needed to have environmental friendly cruise tourism, certain regulations and laws have to be implemented in different regions of the world at the same time.

There are worldwide critics about cruise tourism in the name of sustainability and environment. Some of NGOs and networks can be listed as follows:

- Bluewater Network; Safeguarding the Seas
- Campaign to Safeguard America's Waters; Campaign to Safeguard America's Waters
- Ocean Conservancy, Cruise Ships - Floating cities
- Oceana, Contamination by Cruise Ships
- The Hawaiian Environmental Alliance – KAHEA, Cruise ship traffic in Hawaiian waters

Critics were raised in Germany since 10 years with the campaign of NABU (Naturschutzbund Deutschland) about cruise tourism. This caused also certain reactions from industry to the politicians such as,

- Strict regional laws about reduction of emissions were implemented.
- Volunteer schemes and solutions of companies such as development of new ship technologies for environment such as recycling, energy etc. have been started. But the number of volunteer companies is very limited at the world scale.

- Protection of destinations is also very useful for worldwide operating companies. This has to be settled in the mind of cruise companies with negotiations.

- Economic profit is reached mostly by two important companies. These are mostly registered in countries which are called 'Flag of Convenience Countries'. These countries present themselves to these companies as tax, labour and service heavens with cheap security and working/labor conditions. But coin has two sides:

- Cruise workers live in bad conditions. They have to be under global laws which protect social security rights.
- Destinations make less profit. This must be change if there is strong mutual understanding between companies and destinations.

- International logistic company's services restrict the local company activities (Food and drinks are bought not at local level). Local shops must involve also in purchasing of cruise ships. There is a possible estrangement danger of locals at their hometowns.

- Local tours are mostly organized by cruise companies or their limited local partners. This has negative effect on local service providers and economies.

- Relationship between locals and tourists are very limited. Socio-culturally, this has negative effect on both sides. Locals are seen as service providers or sometimes boring factor for tourists. This will have a certain effect that interest of tourists weighs more than the interest of locals. Covered tension can be raised. This must be changed with education of both sides.

Negative effects are still there but especially in North, Middle and West Europe things are changing slowly with better political and economic infrastructures. But new concepts must be implemented in less developed cruise destinations. Especially positive relationship between Island states and ecological tourism must be encouraged.

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