



The economic revenues and the emergy costs of cruise tourism



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ABSTRACT

Emergy analysis was applied to three municipalities (Portofino, Santa Margherita Ligure and Rapallo) of the Liguria Region coast, where tourism and cruise tourism are thriving. The results were compared with traditional economic indices. The territorial assessment of the municipalities was analysed by comparing the environmental costs with the economic benefits, focusing on tourism and cruise tourism. Similarities and differences among the case studies emerged. The three economies resulted as being driven by the tertiary sector, but consequences from the different development strategies came to light. Portofino has developed an elite type of tourism with greater attention devoted to the environment. This is mirrored by a sort of safeguarding of tourism and natural resources and by the detriment of the productive sector's success, on the contrary, in Rapallo. Santa Margherita lies in a boundary condition. The cruise tourism sector was analysed in these contexts. The ecological and economic impacts of the cruise sector were revealed to be significant only in Portofino, being less than 1% in Rapallo and Santa Margherita Ligure. The load imposed on the local environment by cruise ship tourism was calculated, and Portofino showed a limited condition, while Santa Margherita Ligure and Rapallo exceeded the local carrying capacity. This is due to the different management approaches pursued: only in Portofino is the territory more able to absorb the impact, although the limit is currently reached. As a consequence it appears to be evident that such phenomena as cruise tourism, albeit economically promising in the short term, should be managed with a long-term perspective, integrating them into the local context and setting up strategies for impact reduction or mitigation.

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1. Introduction

Cruise tourism has experienced phenomenal growth in the last four decades, most of all in terms of passenger numbers, becoming a mobile version of their land-based tourism competitors (Lumsdon and Page, 2007). In the 1970s the average capacity of a cruise ship was 800 passengers, 30 years later it reached 1900 passengers and currently the main companies are investing in ships that can accommodate 6000 people (Stefanidaki and Lekakou, 2014). From 2003 to 2014 the demand for cruising worldwide increased from 12.0 to 21.6 million passengers, with 410 cruise ships and \$37.1 billion in revenues (Sun et al., 2011; CLIA, 2014). Nowadays the revenues of cruise corporations represent a modest share of the total international tourism receipts, equal to 3%. Nonetheless, the sector is the fastest-growing segment in the travel industry, increasing at almost twice the rate of other land-based

tourism sectors (Kester, 2002).

In 2013 the European cruise ship market played a significant role in the global cruise scenario: 30% of the total passengers were Europeans, while the European industry engendered 31.2 million passenger visits to 250 European port cities, in both the Mediterranean and the Baltic Sea. This generated a significant impact on the European economy consisting of direct expenditure of €16.2 billion linked with the European cruise industry (almost 25% of which was due to crew and passenger spending) and 339,417 (CLIA, 2014) jobs generated. In more detail the Mediterranean European fleet is composed of 166 cruise ships carrying 3.86 million passengers, equal to over 20% of the total passengers, with a 10% increase from 1998 (Dwyer and Forsyth, 1998; CLIA, 2014; Stefanidaki and Lekakou, 2014). In this context Italian ports play a central role, with five ports (Civitavecchia, Venice, Naples, Genoa and Savona) included in the Mediterranean top ten for embarked, disembarked and visiting passengers, four of which are included in the major ports for revenue passengers and represent the country with greater direct expenditures in Europe (CLIA, 2014).

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It is at present generally accepted that globalised cruise tourism affects localities, but it is not totally definite how (Stefanidaki and Lekakou, 2014). A great majority of studies about cruise tourism have addressed economic issues or analysed passengers' profiles and behaviour. The economic contribution of the cruise industry to destination economies has been widely investigated in different areas, even though the real economic impact on local economies has rarely been analysed (Field et al., 1985; Marti, 1986; Dwyer and Forsyth, 1998; De la Vina and Ford, 1999; Gabe et al., 2003; Seidl et al., 2007; BREA, 2012; BREA, 2014a,b,c; CLIA, 2014; World Bank Group, DFAT-Australia and Carnival Australia, 2014; Chua et al., 2015; De Cantis et al., 2016).

On the contrary environmental and social impacts have scarcely been quantified and consequently managed (Maragkogianni and Papaefthimiou, 2015). When environmental impacts have been taken into account, it appears to be evident that they cannot be neglected. Cruise ships have been defined as “floating cities” mimicking their land-based luxurious resort counterparts with a variety of facilities on board, from restaurants to shopping centres. As a consequence they constitute one of the most energy-intensive forms of tourist activities, generating a huge quantity of emissions and waste (Eijgelaar et al., 2010; Brida et al., 2013). It has been evaluated that the carbon emissions per cruise passenger are four times greater than those of economy class aviation and about five times higher than the average energy use for luxurious hotels per visitor night (Howitt et al., 2010). These harmful substances do not affect only open water ecosystems, since on one hand some of them, such as solid waste, are stocked during navigation to be landed mainly in home ports and on the other hand others are generated by activities carried out at the mooring. Consequently these impacts occur in part on ports, both on home ports, from which ships begin and end, and less heavily on ports of call, which are intermediate stops (Brida et al., 2013). Maritime activity influences port cities, generating pollution that cruise ships can contribute to intensifying. In particular emissions can affect the local air quality, considering that around 6% of ships' fuel consumption takes place during in-port operations (Isakson et al., 2001; Cooper, 2003; Miola et al., 2009; McArthur and Osland, 2013). Moreover, destinations frequently suffer from overcrowding and have to face sudden population increases with a great load imposed on the public service system in terms of transport and the provisioning of resources and goods. In this context it should be considered that tourism is intrinsically dependent on natural resources. It is said that “Tourism contains the seed of its own destruction”, since it can lead to the destruction of the environmental features that attract visitors (Glasson et al., 1995). This is why recently the dominant perception of cruise tourism as an income generator has been contested, since an accurate balance between benefits and costs should be performed. In particular nature provides a service to humans, namely an “ecosystem service” (MA, 2005), giving them the opportunity to enjoy certain natural characteristics. Tourism activities fall within the category of “cultural services”, namely the non-material benefits that people obtain from ecosystems through spiritual enrichment, cognitive development, reflection, recreation and aesthetic experiences (MA, 2005).

Nonetheless, the exploitation of a certain service can potentially cause environmental deterioration through, for example, pollution that can negatively affect the ecosystem service itself or other ecosystem services, causing a quantitative or qualitative reduction of the ecosystem service. This is a cost that humans inflict on nature (and consequently on themselves, potentially compromising the possibility to enjoy natural resources) that the economy is often unable to measure adopting a user side and preference-based approach. In this context a number of economists have recently

suggested the application of so-called biophysical measurements. Biophysical valuation uses a “cost of production” perspective that derives values from measurements of the resources exploited (e.g. in terms of labour, surface requirements, energy or material inputs) to generate goods or services and maintain a given ecological state (TEEB, 2010). Among these methods emery analysis is a widely recognised donor side approach, since it values natural capital and ecosystem services as the amount of resources invested by nature (the “cost of nature”) to satisfy human needs and expresses them in the emery unit of the solar emery Joule (sej) (Odum, 1996).

This evaluation is independent of the presence of users and of their appreciation of the service (Pulselli et al., 2011). The fulfilment of this kind of evaluation, free from subjective preferences, can be crucial, since the undervaluation of ecosystems that support human well-being and welfare in public and business decision making can be essential to assure the ecosystems' capacity to provide services and resources for present and future generations. Moreover, it is necessary to translate biophysical assessment into units of measures, allowing a comparison with economic services and manufactured capital and being easy to include in the economic and territorial balance (Costanza et al., 1997; Franzese et al., 2015). For this purpose emery units can be converted into currency equivalents to convey the importance of natural capital and ecosystem services better to policy makers and other stakeholders. This conversion does not change the “donor side” feature of emery accounting but provides results in monetary equivalent values that still represent the biosphere's investment, thus helping to bridge the gap between biophysical and economic assessments (Pulselli et al., 2011; Paoli et al., 2013; Franzese et al., 2015; Turcato et al., 2015). The study is thus focused on the estimation of both the economic benefits and the environmental costs of cruise tourism in the Gulf of Tigullio in the Liguria Region in the western part of Italy. The area, despite its narrow extension, is globally recognised as a high natural value tourist attraction, and it includes a marine protected area. In the Gulf three ports of call (Portofino, Santa Margherita Ligure and Rapallo) for cruise ships are present, attracting over 37,000 passengers overall in 2014.

The three municipalities, despite all being tourist-oriented, are characterised by different features in terms of, for example, occupied land, population density, urbanised area and development of the main economic sectors (Table 1), with Rapallo maintaining the economic livelihood of the Gulf and Santa Margherita Ligure and Portofino acting as leading tourist resorts (Salmona and Verardi, 2001). In particular Portofino is a very small resort that is recognised as one of the main international destinations attracting tourists from across the world. Accordingly the three tourist ports display different characteristics in terms of the size of ships accommodated, the number of passengers received and demographic, economic and environmental patterns.

The considered area is thus of particular interest in investigating the interactions between cruise passengers' arrivals and hosting communities with different territorial planning. This topic is indeed still considered to be underinvestigated and worthy of further research. In particular, the effect on small coastal municipalities, like those considered here, has to be investigated due to the risk of overcrowding or the inability of the system to absorb sudden but huge influxes of people that could cause the environmental thresholds to be exceeded and social conflicts to occur (Raluca and Monica, 2008). Through the comparison of the different cases considered, general evaluations about the impacts that cruise visitors generate on the destination can be obtained. Moreover, in Portofino, following the promulgation of a national decree, cruise ships can only anchor 0.7 miles from the coast, with repercussions for the 3 municipalities. Given this specific mooring procedure, the impacts on the 3 ports are quite limited and restricted to

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