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ADVANCES IN GLOBAL SERVICES AND RETAIL MANAGEMENT

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# The Integration of Circular Economy in the Tourism Industry: A Framework for the Implementation of Circular Hotels

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## Abstract

The hospitality industry, together with the transports one, represents the highest source of emissions and pollution in the tourism sector. The hotels, to respond to the pressing tourist demand, are forced to make a spasmodic use of resources, causing irreversible environmental damage that includes pollution, CO<sub>2</sub> emissions, high waste production, and depletion of resources. Various initiatives have been proposed to the hospitality industry to improve the environmental performance of hotels: the use of international standards, environmental certifications, sustainable labels, and international tourism guidelines. One solution to this environmental disaster is represented by the introduction of the Circular Economy in the tourism management. In particular into in the hotels business: the realization of Circular Hotels. The objective of the Circular Hotels is to create a closed-loop for the tourist experience. Indeed, Circular Hotels seek to modify their business plans, reviewing supply chains, and engaging stakeholders. Finally, they aim to destroy the traditional idea of waste, considering it as a source of other activities or products. This work seeks to contribute to the existing literature through a review of case studies showing best practices of Circular Hotels. Additionally, this paper presents a systematic classification of best practices promoted by hotels in a circular lens. The Circular Hotels framework is based on a matrix consisting of four variables: the 11 Rs of Circular Economy, the Hotels Areas, the Guest Perception, and the Environmental Impacts. The result of this work explains how the road to the circularity is long, but many hotels have already begun to follow it. The framework demonstrates how the integration of these Rs in the hotels show the strong desire of hoteliers to improve their environmental performance.

**Keywords:** circular economy, circular tourism, circular hotels, sustainable tourism, green hotels

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## Introduction

Tourism is a fast-growing industry, which is forecasted to grow at global level with a significant rate in the next decade. In recent years, tourism has experienced a continued expansion and diversification to become the second-fastest growing sector in the world (World Travel and Tourism Council, 2019), occupying a prominent role in the global and European economy. Tourism must be considered as one of the major economic activities, which stimulates global economic growth through its complementarity with other economic actions, contributing to gross domestic product (GDP), job creation, and local economies (Paramati et al., 2017). If one hand

tourism helps the local economies, rising the GDP through the creation of new jobs, on the other hand, it has a strong negative impact on the environment and society (European Environment Agency, 2014). However, from the 2000s until now, tourism demonstrates its sensitivity to economic change, receiving heavy losses during the financial crisis of 2008 and the current COVID-19 pandemic (Romagosa, 2020; Turner and Sears, 2013). The OECD estimates that the COVID-19 pandemic caused an unprecedented crisis with strong repercussions, counting the 60% drop in international tourism (OECD, 2020). Governments and international organizations must consider the long-term implications of the crisis, staying abreast of the digital curve, supporting the low carbon transition, and promoting the structural transformation necessary to build a stronger, more sustainable, and resilient tourism economy. In this context, the accommodation sector has been particularly affected by COVID-19, and the hotel industry is among the hardest hit. A research conducted by Seitzman, Wittkamp, Mann, & Krishnan (2020) suggests that recovery to pre-COVID-19 levels could take until 2023 or later (Seitzman et al., 2020). Moreover, this sector has been often considered as unsustainable, as to answer to the high tourism demand, hotels are forced to use a lot of resources. Specifically, hotels produce about 21% of total tourism related GHG emissions since a significant part of them derive from the high energy consumption (European Commission - Joint Research Centre - Institute for Environment and Sustainability, 2012). In this regard, the emissions deriving from the electricity produced by hotels is about 40% distinguished into different sources: light, HVAC (Heating, Ventilation and Air Conditioning), water heating, and the electricity used for food service (Styles et al., 2013). Other significant problems are related to the production of waste and the degradation of many tourist areas (Styles et al., 2013). In front of this scenario, hotels must revise their activities and behaviors in order to be eco-friendlier. The shift from linear model, based on the depletion of natural resources, to a circular one is not so easy since it comprehends different factors such as the design and the development of new products and services, throughout the support of many policymakers (Ellen MacArthur Foundation and McKinsey Center for Business and Environment, 2015). In this regard, the hotels that introduce the Circular Economy in their business are named “Circular Hotels”(Jones and Wynn, 2019; Rodríguez et al., 2020). Circular Hotels are still an object of study which try to improve their economic performance, minimizing their negative impact on the environment. The approach of the Circular Hotel is a step forward of Sustainable Hotels: in addition to the implementation of practices and systems that respect the environment, the limitation of resources scarcity and the importance of guest’s experience, Circular Hotels create a sort of symbiosis with the territory, the community, and local suppliers. This means that all products and services are used within this process: what the Circular Hotels build is a closed loop. Indeed, Circular Hotels seek to modify their business plans, reviewing supply chains, and engaging stakeholders. Concerning the latter, Circular Hotels try to realize a strong relation with the guests and staff, making them an integral part of this change. Indeed, the hotels could influence the awareness of the community about their practices and tools based on the respect of the environment. The objective of this paper is double: on the one hand, it seeks to contribute to the literature on hospitality, and on the other hand, it seeks to be a useful and practical tool for the various stakeholders in the sector, such as hoteliers who want to improve their environmental performance or tourists who want to organize more careful and responsible travel. The structure of this work is constituted first by the analysis of Circular Economy literature. Secondly, the focus is shifted on three main case studies of Circular Hotels. Later, the work explains how the Circular Hotels could improve their efficiency in economic and environmental terms through the construction of a matrix. This methodology has the aim to

classify the best practices promoted by Circular Hotels throughout four variables: the Rs of Circular Economy, Hotels Areas, Guest Perception, and the Environmental Impacts. To conclude, the combination of these variables is clarified, which makes easier the systematic distinctions among the best practices carried out by hotels, including both the not expensive and the most high-priced ones.

## Literature Review

The nowadays linear model of economics is based on production and consumption that provide the use of capital, labor, and energy that creates services or goods with a single cycle life (Rodríguez et al., 2020). This economic model, known as take-make-dispose, is becoming unsustainable due to the spasmodic use of resources, generated by the growth of the population and its high level of consumption. A solution to all these problematics is represented by the Circular Economy (CE) which became a priority in many policies adopted by different countries (Rodríguez et al., 2020).

Circular Economy is defined by European Union as an “economy where the value of products, materials and resources is maintained in the economy for as long as possible, and the generation of waste minimized” (European Commission, 2015). This approach eliminates the huge pressure on the natural resource depletion, reducing, at the same time, the waste produced by the consumption chain (Rodríguez et al., 2020). It is considered as “a better alternative” to linear model that requires a comprehensive consideration of the entire life cycle of any product and process, to create an interaction between the process, the environment, and the economy (Cardoso, 2018). In this regard, the tourism industry does not represent an exception and is also being disrupted by this transition, Circular Economy is considered as a key factor in the future of this sector, defined as Circular Tourism (Vargas-Sánchez, 2020). Circular Tourism would bring benefits to the whole economy, throughout the creation of new jobs, the increase of business profits and supply security, and the reduction of volatility (Ellen Macarthur Foundation, 2017). However, Circular Tourism literature is superficial and very hard to find. Most of CT papers are written by Chinese authors, since China has opted for a sustainable development strategy based on the Circular Economy (Rodríguez et al., 2020). Nonetheless, the shifting from Linear Tourism to Circular Tourism is not so easy since it comprehends different factors such as the design and the development of new products and services, throughout the support of many policymakers. As a result, every player in this sector must revise their activities and behaviors, to be eco-friendlier (Pattanaro and Gente, 2017). Circular Tourism could be defined as “a way to make tourism with low impact or, in other words, with low carbon emission that stimulates circular flows, aiming to conciliate the tourism sector and sustainable resource management” (Arzoumanidis, I., Mancini, E., Walker, A., Petti, L., Raggi, 2020). Circular Tourism is not only a “green” strategy that overlaps the Sustainable Tourism, aimed exclusively to abolish waste of various types (such as food or energy) and non-renewable, but also it is based on recovery, redevelopment, reuse, enhancement, and regeneration of products and processes. It constitutes a model able to create a virtuous circle producing goals and services without wasting the limited resources of the planet that are raw materials, water and energy”. With Circular Tourism, value is regenerated and maintained over time (Fusco Girard and Nocca, 2017). Particularly, hotels, that play a main role in the tourism sector, must shift from linear to circular model. However, a common and shared definition of Circular Hotel does not exist yet. If the published works on Circular Tourism consist of only a few papers worldwide, those about Circular Hotels are very hard to find

(Rodríguez et al., 2020). From different studies emerged that a single night at a hotel produces 5.9 kg of CO<sub>2</sub> and between one and two kg of waste for the single tourist (Franchini, 2020). To respond to tourist demand, hotels make a spasmodic use of resources, such as the use of water for washing machines, spas, swimming pools, etc. Following the Kyoto protocol, which decided that the hotel sector will have to reduce CO<sub>2</sub> emissions by 68% by 2030, and in the face of a constantly growing tourist demand, Circular Hotels seem to be the only solution for getting out of this impasse (Franchini, 2020). According to a study carried out by Rodríguez-Antón & Alonso-Almeida (2019) the hospitality industry is slowly incorporating Circular economy practices and principles into hospitality operations management mainly across three areas: energy, water and waste implementing reduction, reuse and recycling; in other words the 3Rs approach. If on one hand the Circular Hotels play a pivotal role in the tourism transition, it is necessary to focus on the Guest' activities too. Most Circular Tourism papers highlight only the activities carried out by the hotels, without considering the importance of guests' behaviors. In this regard, it is important to give more attention on the guests experience and practices, since they could help the hotels, accelerating the transition to Circular Tourism (Sørensen and Bærenholdt, 2020).

## Methods

As a strategy to support a sustainable development and circular economy conceptualization and development, the research tries to figure out how to implement principles of circular economy in the hospitality industry, particularly in hotels. The objective of this paper is double: on the one hand, it seeks to contribute to the literature on circular hotels, which is still developing a shared and common definition and practices, on the other hand, it seeks to be a useful and practical tool for the various stakeholders in the sector, such as hoteliers who want to improve their environmental performance or tourists who want to organize more circular and responsible travel. This paper spotlights on the hotel sector, first retrieving the best practices promoted by hotels analyzing three different European case studies of circular hotels implementation (Luxury QO Hotel in Amsterdam, Conca Park in Sorrento and The Crown Plaza in Copenhagen). Then the paper tries to classify and categorize circular hotels best practices promoted by Circular Hotels. To do so a Circular hotels framework has been proposed. The framework is built on a matrix through four variables: the Rs of Circular Economy, Hotels Areas, Guest Perception, and the Environmental Impacts. The combination of these variables makes easier the systematic distinctions among the best practices carried out by hotels, including both the not expensive and the most high-priced ones.

## Findings

In this paragraph three case studies related to Circular Hotels are carried out. They are chosen at European level, throughout a deep analysis of their companies' website and other papers. The first hotel was selected since it is defined as the first circular hotel; the second, on the other hand, represents an excellence in Italy and finally, the third hotel combines the opportunity offered by both technology and sustainability.

The first case study is about the Luxury QO Hotel in Amsterdam which is defined as the first Circular Hotel in the European Union (Formisani, 2020). Its main circular practices are linked to water, energy, and materials. First, the hotel created an underground water storage system in

which the heated water is taken in the summer and stored until it is needed. Also, the hotel has created an additional system for grey water to limit wastewater. Besides, the water from the showers and sinks is reused to drain the toilets (QO, 2020). Secondly, the façade and the greenhouse located in the roof keep the carbon footprint low, managing the heating in the guest rooms automatically. Third, the hotel's commitment to the materials used in the structure are chosen according to circularity criteria. For example, a third of the concrete used in the construction came from the Shell building in Amsterdam. Finally, other materials are also reused, such as carpets made with cotton threads from fishing lines (QO Amsterdam, 2020).

The second case is characterized by an Italian hotel, known as the first Italian zero waste hotel, in Sorrento (Conca Park, 2020). Since 2014, Conca Park has implemented a policy of engagement with both employees and guests, achieving excellent results. Thanks to their involvement, the hotel correctly differentiates 95% waste. Also, the hotel reduced waste production by 40%, using leftover breakfast and fruit and vegetable scraps as garden compost (Conca Park, 2020). The Italian hotel has banned disposables, single portions, and plastic: it will only be possible to see inside reusable dispensers and glass containers. The latter is shredded and donated to a company that transforms it into swimming pool filters. Furthermore, the green areas of the hotel are irrigated with rainwater recovered and stored thanks to an artesian well. In the hotel the water dispensers are free and recycled and recyclable water bottles are sold. Finally, energy-saving technologies: the lights are timed, just as the air conditioning stops when doors or windows are opened (Conca Park, 2020).

The third case is represented by The Crown Plaza Copenhagen which was inaugurated in November 2009 as Denmark's first CO<sub>2</sub> neutral hotel. The decision to focus on this hotel is based on its capacity to balance sustainability and digitalization. The second represents a key in the transition to circularity (Paulauskas, 2018). It has the largest solar cell system in the Nordic region, complemented by the south façade. An innovative way promoted by the hotel is about the reservation of the rooms: if guests confirm their staying, the hotel, through the online reservation heats the room. This new strategy helps the Danish hotel to reduce the use of heating. Besides, the hotel's restaurant BARK, located in the central lobby, has 60 trees and more than 4,500 plants. The energy comes from renewable sources such as solar panels placed on the facade of the building which reduce energy by 65% compared to other similar hotels (Manniche et al., 2017).

The analysis of the previous case studies shows that doesn't exist a unique framework in relation to Circular Hotels. In this regard, this work contributes to the existing literature proposing a preliminary framework able to provide a systematic classification of best practices promoted by hotels in a circular key. The Circular Hotels framework is based on a matrix that includes four variables: the 11 Rs of Circular Economy, the Hotels operational areas, Guests' perception, and environmental impacts. From the beginning, the Circular Economy literature was based on the conception of three Rs (Reduce, Re-use and Recycle) but, during the years, many new classifications were introduced. Nevertheless, although the Rs may vary from author to author, they follow a very precise hierarchical order, from the highest to the lowest circular potential. This work is inspired by the analysis carried out by Acampora, Preziosi, & Merli (2020), which introduces 11 Rs as the most suitable for the analysis of the accommodation sector. Below are listed the 11 Rs from the most circular to the most linear one:

- Refuse is a fundamental element since it modifies entirely the life cycle of the product/activity. In fact, in this primary phase, the production of waste and excessive consumption is prevented by buying less and using less. In particular, the choice not to buy or not to use certain products comprehend for example hazardous materials while specific activities are avoided, such as preventing suppliers who operate without principles of sustainability and circularity (Potting et al., 2017).
- Re-servitization includes all those activities developed in recent years. The Circular economy must respond to current stimuli to be integrated efficiently, so this element concerns virtualization (such as the use of apps), the performance economy, and the sharing economy. In this context, users have a positive impact on the environment, leading to a reduction in emissions, consumption, etc (Acampora et al., 2020).
- Reduce includes the improvement of the efficiency of the consumption process, diminishing the primary energy inputs, the use of raw materials, and waste. It is possible throughout different elements, as the adoption of new technologies, simplified packaging, or more compact products. The aim is to improve the hotel's social wellbeing and economy, reducing the implication of resources (Manniche et al., 2017).
- Regenerate is the closest R to the food area (such as the kitchen) since it incorporates the return to the biosphere by-products and foods. An example is given by natural composting or systematized ones that speed up this process (Reike et al., 2017).
- Re-use consists of products that are used again with the same purpose. It is one of the most interesting tools from the economic perspective, since it requires fewer resources, less manpower, and less energy respect to other activities, with a decisively positive impact on the environment, avoiding harmful emissions. Those products are based on a design that requires multiple cycles to receive high demand from guests. An example could be represented by second-hand products (Potting et al., 2017).
- Repair means those activities that allow extending the life cycle of a defective product. With the re-use activity, it often does not require high use of money or energy. The repair is an activity that can be carried out in the hotel or delegated to a repair company (Reike et al., 2017).
- Refurbish is an activity where the overall structure of the product remains intact, but some components are substituted or repaired or there are some aesthetic changes. The goal is to give further life to the product, albeit of lower quality than the initial one (Reike et al., 2017).
- Remanufacture involves an activity that, in this case, disassemble the product structure. This activity of repairing or substituting the structure leads to giving another life to a completely new product with the same purpose (Potting et al., 2017).
- Repurpose considers how the product, or in its entirety or its parts, is reused to completely different functions (Potting et al., 2017).
- Recycle is the most spread and known method of the Circular Economy. It refers to those operations in which the waste is recovered and used for other products, materials, or substances with the same or different functions. It includes only organic reprocessing but not energy recovery. Its goal is to benefit from usable resources and reducing the amount of waste to be treated or disposed of (Manniche et al., 2017).
- Recover includes the last phase closest to the linear economy, where the energy or biomass of a product is recovered from the waste stream (Reike et al., 2017).

The second variable is characterized by five different operational areas of the hotel in which the implementation of circular activities improves the efficiency and sustainability of the entire structure: "Indoor & Rooms", "Bathrooms & Laundry", "Kitchen & Restaurants", "Swimming pool & Spas" and "Exterior Area".

Subsequently, the third variable is related to the guest’s perspective, which play a pivotal role in the transition to Circular Tourism. The 11Rs are introduced related to the following areas: “Transport & Outdoors” and “Accommodation & Indoors”. The focus on guests is important, since they play a pivotal role in the integration of circularity in the hospitality sector, participating at the activities introduced by hoteliers.

Finally, the last variable, describes how circular activities affect the environment. In particular, the environmental impacts analyzed have been defined using as a reference the key indicators indicated in the EU Eco-Management and Audit Scheme (EMAS) and defined into different colors in the Figure 1: Energy Efficiency; Material Efficiency; Water Management; Waste Management; Emissions; Biodiversity (Figure 1) (European Commission, 2019).

Figure 2 presents the Circular Hotels Framework showing the combination of these variables. In the intersection between the areas and the Rs the best circular practices will be described. In a second step of the analysis the practices will be also written in red, blue, and green, to diversify the environmental impact they are trying to reduce. The collection and systematization of these best practices will be founded on a deep study of the literature, international reports and specifically hotels case studies related to sustainable and circular tourism. Specifically, the research will be conducted on the most ambitious hotels, such as international chains dedicating efforts to the development of circular strategy, those that have won awards related to sustainability and the ones that have adopted environmental certifications and standards (Figure 2).

However, this paper presents just the results of a preliminary study on circular practices implementation in hotels proving a theoretical tool to systematize these practices. Further efforts will be dedicated to fill in the matrix presented in Figure 2. Just as an example in Figure 2 we fill in the REFUSE row of the table.

**Figure 1.** Legend of Environmental Impacts

Energy Efficiency	Water Management	Waste Management	Emissions	Biodiversity	Material Efficiency
*	*	*	*	*	*

**Figure 2.** The Circular Hotels Framework

R's	HOTEL					GUEST	
	<u>Indoor and Rooms</u>	<u>Bathrooms and Laundry</u>	<u>Kitchen and Restaurant</u>	<u>Swimming pool and Spa</u>	<u>External Area</u>	<u>Transport and Outdoor</u>	<u>Accommodation and Indoor</u>
<b>REFUSE</b>	Avoid printed paper and flyers in rooms * Introduce separate waste bins * Returns magazines to suppliers once after they have been browsed *	Select product with EU Ecolabel, top energy label classes ** Reduce the implementation of bathtubs *** Avoid chemical products ** Choose fabrics that require less energy to wash them **	Refuse to buy raw food and materials from non-certified suppliers * Adopt a plastic free menu * Choose materials without packaging * Try to develop a symbiosis with the local suppliers *** Individual portion are better than buffet * Buy organic items selected from the farmer that use hotel's cooking oil *	Avoid using chemical materials for swimming pool maintenance **	Develop a strong symbiosis with the surrounding environment *** Choose native plants that require less water* Introduce separate waste bins* Selection criteria, to secure quality and sustainability of the materials used in the buildings and landscape Make organic gardens if possible **	Avoid polluting holidays (e.g., cruise) *** Prefer activities that require less energy and in contact with nature (e.g., excursions and slow tourism) ** Avoid the pollution of the area by leaving plastic, waste and products lying **	Select hotels with environmental certifications * Use dedicated research sites for sustainable structures (e.g., Bookdifferent.com) *
<b>RE-SERVITIZATION</b>							
<b>REDUCE</b>							
<b>REGENERATE</b>							
<b>RE-USE</b>							
<b>REPAIR</b>							
<b>REFURBISH</b>							
<b>REMANUFACTURE</b>							
<b>RE-PURPOSE</b>							
<b>RECYCLE</b>							
<b>RECOVER</b>							

**Conclusions**

The road to circularity in hotels is still long, but many structures have already decided to follow it. The focus on this topic has increased in recent years due to climate change and environmental disasters caused by the tourism sector. For this reason, many international organizations and governments are aiming to introduce circular activities in the tourism and hospitality sector. Specifically, hotels must change their approach, as they actively contribute to resource depletion, pollution, and excessive consumption in tourist destinations. However, circular hotels represent a research topic still underexplored because CE approach in tourism is still under development. Also, the of academic literature and the absence of specific international standards about circularity within hotel business, force the players of the sector to improvise without regulatory references. The goal of this work is to provide a useful tool for stakeholders in the hotel sector, regarding the transition to the Circular Economy. The framework explained in the previous paragraph could be considered as an initial milestone with the prospect of becoming a

standardized tool for the classification and systematization of circular practices in hotels in the future.

The selected Rs within the paper are distinguished according to a hierarchical order, from the most circular to the most linear ones providing a decision-making tool helping hoteliers to choose the most circular practices for the hotels' strategy. Specifically, the case studies described above, show how the most important practices within Circular Hotels concern the first category (Refuse, Re-Servitization and Reduce). The introduction of the water storage system and the smart façade presented by the QO hotel in Amsterdam, demonstrates two key practices of the "Reduce" category. Secondly, the Conca Hotel in Sorrento illustrates how avoid the use of single-use plastic from its business represents a model of "Refuse". Finally, the Crown Plaza in Copenhagen launches the smart room booking, proving how digitalization is important, namely the "Re-Servitization" category. Even though many hoteliers and guests focus their attention only on recycling activities, this study shows that the most important practices are represented by the "smartest ones", represented by the first Rs of 11th R classification, since they are closest to the Circular Economy model. Recycling, in fact, belongs to the most linear categories. Certainly, the required strategy to overcome the problematics related both to Covid-19 Pandemic and sustainability hurdles is characterized by the balanced mix of circular activities and technological and digital investments.

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