

## APPLICATION OF CIRCULAR ECONOMY PRINCIPLES IN THE TOURISM SECTOR

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### Abstract

In order to implement a closed-loop system, which leads to a more responsible and efficient management of resources, the traditional principle of “take, use, throw away” has been gradually replaced by more sustainable circular economy principles in recent years. However, even if it is recognised that resources are limited and that the linear model is no longer viable, the tourism industry as a whole has not shown a clear and decisive shift towards a more circular tourism model. And it is circular economy solutions and circular economy principles applied in the tourism sector that would allow changing trends and reduce the use of natural resources, waste, and CO<sub>2</sub> emissions. The aim of the research is to investigate the peculiarities of the application of circular economy principles in the tourism sector. The research was carried out in 12 establishments in the tourism sector using the qualitative research method of interviews. During the research, it was found that the “Reduce-Repeat-Recycle” (3R) principle is mostly applied in establishments providing hospitality and accommodation services based on the principles of the circular economy. The principles of the circular economy are applied in order to promote sustainability, solve environmental problems, optimize the use of resources, and reduce waste. However, despite the obvious benefits of circular economy practices, establishments also face challenges in their implementation.

**Keywords:** sustainability, circular economy principles, tourism, hospitality and accommodation establishments.

**JEL Codes:** Q01, Q20.

### Introduction

Today, economic activity is still based on a linear pattern of production and consumption: extract (produce) and consume (dispose), which depletes natural resources and generates waste. In today's linear economy, materials are not optimized, and recycling, reuse or recovery are not encouraged. As a result, the concept of the circular economy (CE) is gaining increasing attention from policymakers and stakeholders worldwide (Rodríguez et al., 2020).

The circular economy is being actively addressed at the European Union (EU) level. In March 2020, the European Commission presented a new Circular Economy Action Plan, which includes proposals for more sustainable product design, waste reduction, and recycling.

In February 2021, the European Parliament endorsed the new Circular Economy Action Plan and called for binding 2030 targets for material use and consumption (European Parliament, 2021).

Most of the E&E is based on the 3Rs – „reduce, reuse, recycle“ (Morsetto, 2020; Neves, & Marques, 2022). However, some researchers add other principles relevant to the 3Rs model. For example, Kirchherr et al. (2017) distinguish the 4Rs and include the principle “recover”. According to Buren et al. (2016) and Morsetto (2020), the principles of the circular economy are not only reducing, reusing and recycling, but also reducing the amount of raw

materials in processes, and designing goods in such a way that they can be reused. These authors identify 9 principles of the circular economy, referred to as the 9Rs.

Although CE is gaining popularity as the still prevailing linear economy model based on the “take, use, throw away” principle is criticized for its lack of sustainability, the new model – the circular economy – is still not widely practiced in the tourism sector; and it is this sector that consumes a lot of energy and water, produces a lot of food waste, faces congestion problems and emits a lot of CO<sub>2</sub> (Rodríguez et al., 2020). The tourism industry uses large amounts of finite natural resources to accommodate and feed tourists, often in a linear “take, use, throw away” model (Manniche et al., 2019; Manniche, Larsen, & Broegaard, 2021). In addition, travel and tourism consumption worldwide has increased to the point where it is unsustainable and contributes to climate change (Gren & Huijbens, 2014; Hall, 2019; Hall ir Saarinen, 2020), and is a major factor in environmental degradation (Martí nez-Cabrera & López-del-Pino, 2021).

There is no doubt that the tourism sector needs to be studied because of its economic importance and its negative impact on the environment (Kaszás, Keller, & Birkner, 2022), and its negative impact on the environment (Vargas-Sánchez 2018). The scientific problem is formulated with the question: How widespread are the principles of the circular economy in the tourism sector?

The object of the research is the application of circular economy principles in the tourism sector.

The aim of the research is to investigate the peculiarities of the application of circular economy principles in the tourism sector.

Objectives of the research:

1. To determine the applicable circular economy principles in establishments providing hospitality and accommodation services.

2. To identify the problems and challenges faced by hospitality and accommodation providers in engaging in circular economy initiatives.

A qualitative research method was chosen. The research uses a case study strategy. The case is a tourism sector

establishment (providing hospitality and accommodation services). Different tourism sector establishments and the circular economy principles applied in them have been studied. This strategy was chosen in order to analyse the phenomenon under study, its characteristics and to gather as much information as possible. The study collects, analyses and summarises good and bad experiences of the application of circular economy principles in hospitality and accommodation establishments.

The following data collection methods were chosen: content analysis and semi-structured interviews. The method of content analysis was chosen because information is easily accessible, using this method, according to Žydžiūnaitė and Sabaliauskas (2017), “verbal, written or visual information is analyzed” (p. 56). A semi-structured interview was chosen because it is desired to delve into the investigated problem, to obtain as detailed information as possible about the application of CE principles in establishments providing hospitality and accommodation services, because during such an interview additional question can be included, the sequence of questions can be changed or the question can be clarified. A total of 12 interviews were conducted with representatives of the tourism sector (hospitality and accommodation providers). One interview was conducted in each establishment.

### **Circular economy concept and application of principles in the tourism sector**

The circular economy is a prerequisite for sustainable development (Geissdoerfer et al., 2017). According to Suarez-Eiroa, Fernandez, Mendez-Martinez, and Soto-Onate (2019), sustainable development and the circular economy are strongly interlinked, and such an economic model contributes to the achievement of sustainable development. Millar et al. (2019) and Skvarciany et al. (2021) argue that the circular economy has a direct impact on a country’s sustainability and is considered one of the main tools for sustainable development.

Sustainable economic growth based on a linear production model is not possible on a

planet with finite resources and a limited capacity to absorb waste (Eiroa, Fernandez, Martínez, et al., 2019). The growing awareness of the limits of the linear economy has led to an interest in creating a new economic model that provides the goods and services needed by more and more people without increasing the consumption of raw materials and the amount of waste emitted (Bonciu, 2014). The circular economy is a concept that emphasises a sustainable and renewable system, with the aim of reducing waste, promoting resource efficiency and minimising environmental impacts. Unlike the traditional linear economy, which follows a “take, use, throw away” approach, the CE promotes the closure of material flows, recycling, reuse and refurbishment of products and materials to create a more sustainable and resilient economic model (Ekins, 2019).

Since Stahel (1989) first formally used the term circular economy, there have been various attempts to define CE. The most common authors (McDonough and Braungart, 2005; Hawken, 2009; Raworth, 2016; Skorupskaitė, and Junevičius, 2017; et al.) and organisations (European Commission, 2006; World Economic Forum, 2010; European Environment Agency, 2015; McKinsey & Company, 2017; World Business Council for Sustainable Development, 2018; United Nations Environment Programme, 2020; European Parliament, 2021) provide resource-oriented definitions, highlighting the need to create closed loops in material flows and to reduce the consumption of raw resources and the associated harmful environmental impacts. The definitions highlight several key aspects of the circular economy concept. In particular, the circular economy is a closed economic model (Sauve et al., 2016; Suarez-Eiroa et al., 2019; Morsetto, 2020), which focuses on reducing the amount of resources extracted and increasing the efficiency of the use of materials already in circulation (Geissdoerfer et al., 2017; Ranta et al., 2021; Dinca et al., 2022; Neves and Marques, 2022). CE is defined as an industrial system that is designed to be reproducible, regenerative, and

resource efficient (Ellen MacArthur Foundation, 2002), which in turn aims to maximise the quality and usefulness of products, components, and materials throughout their life cycle, while minimising the generation of waste.

The German Environment Agency has developed a comprehensive set of principles adapted to policy, commerce and society. These principles systematically define the key objectives, scope, guiding principles, assumptions and success factors in the context of the circular economy. The Principles are strategically designed to promote a holistic understanding of the circular economy and to provide a structured framework for the strategic direction of its practical application (Potting, et al., 2017).

Despite the comprehensive classification of circular economy principles (refuse, rethink, reduce, reuse, repair, refurbish, remanufacture, repurpose, recycle, recover), the use of the 3Rs is still popular in scientific literature. According to Ghisellini et al. (2016), the 3Rs are identified by applying the principles of reduce, reuse, and recycle. Some scholars complement the 3Rs with other principles relevant to the circular economy model. Kirchherr, Reike, and Hekkert (2017) have extended the circular economy principle to the 4Rs by adding the law of “recover” to the 3Rs. Xing et al. (2017) proposed an even broader explanation and added 5R to 4R by adding a “rethinking” aspect. Meanwhile, Buren et al. (2016) did not include the law of “rethinking” but identified the principles of “refusing, repairing, refurbishing, and using for another purpose” and extended the 4Rs of the circular system to 9Rs. The most comprehensive, 10R, was identified by Morsetto (2020).

In the tourism industry, interest in the circular economy has been driven by the need to address environmental concerns. The tourism sector is particularly vulnerable to the negative consequences associated with the non-adoption of circular economy principles (Jones et al., 2014; Julião et al., 2019; Rodríguez et al., 2020; Rodríguez-Antón and

Alonso-Almeida, 2019; Rosenblum et al., 2000). The industry's focus on mass tourism, which includes hotels and various travel-related activities, has led to significant 'resource depletion' and environmental degradation (Rodríguez-Antón et al., 2012). Notably, hotels have been singled out as a major problem because of their high energy consumption due to their continuous operation and multifunctional use (Ghisellini et al. 2016).

Researchers (Fang and Zhang, 2010; Ma et al., 2016; Deselnicu et al., 2018; Petit-Boix et al., 2018; Uche-Soria and Rodríguez-Monroy, 2019; Margeta, 2019) in the hospitality and accommodation sector have shown that the most widely applied principle in the tourism sector is the 3Rs of "Reduce-Reuse-Recycle". The main objectives of applying circular economy principles relate to the promotion of environmentally friendly and low-carbon tourism products, taking into account energy saving and clean production, control of pollution sources and terminals, green goods and infrastructure systems from an industrial point of view; the use of renewable and more advanced resources; and the implementation of waste policies to improve the integrated management of municipal solid waste. These results underline the importance of implementing practices that promote waste reduction, resource conservation and material recycling in order to achieve a more sustainable and environmentally friendly hospitality and accommodation sector.

According to UNWTO, in 2019, the hospitality sector accounted for 5% of the world's total water consumption, 1% of global greenhouse gas emissions, and 20% of the tourism industry's total carbon dioxide emissions (Julião and Marques, 2019). Hospitality and accommodation establishments generate huge amounts of waste, including food waste, energy, and water consumption (Alonso and Ogle, 2010; Rodríguez et al., 2020), including wastewater, as well as hazardous products and chemicals (Styles et al., 2013). Some major hotels are already addressing these issues and are hoping to align their strategies to address their

environmental impacts (Jones et al., 2014). The growing awareness of environmental issues and the need to use resources sparingly is forcing us to rethink our approach to the hotel industry and consider new principles of hospitality and lifestyle management. The implementation of circular economy principles in the tourism sector can help to reduce waste, optimise resource use, and ensure the sustainable development of the hotel business.

The application of circular economy principles in the tourism sector is indicative of a growing trend towards sustainability and responsible tourism (Julião et al., 2019; Rodríguez-Antón and Alonso-Almeida, 2019). Hotels are taking proactive measures to reduce their environmental impact and promote resource efficiency, in line with broader efforts to combat climate change and protect natural ecosystems (UNWTO, 2019). By using renewable energy sources such as solar power, these hotels not only reduce their carbon footprint, but also demonstrate the opportunity for the tourism industry to move towards clean and sustainable energy solutions (Ma et al., 2016). They are setting an example for other establishments to promote similar green practices (Fang and Zhang, 2010).

There are a number of hotels that already apply circular economy principles. Some hotels are investing in reducing their carbon footprint, sustainably using the natural resources around them, ensuring strict waste sorting, reducing water consumption and promoting water efficiency, implementing energy-saving measures, working with the community and government to protect natural resources, etc. Other hotels are moving away from resource-intensive meat production and focusing on vegetarian dishes to reduce their environmental impact. There are hotels that use recycled paper key cards, recycled sheet rock, bamboo towels, recycled glass trays, solar panels for pool heating, non-toxic cleaning products, support the local economy and reduce the environmental impact of transport, grow and use fresh vegetables from their own gardens, etc.

To summarise the examples of circular economy principles in hospitality and accommodation, Table 2 provides a quantitative comparison of the applied CE principles.

**Table 2. A quantitative assessment of the application of circular economy principles in the hospitality and accommodation establishments studied**

Case	Principles of circular economy										Total principles applied
	Reduce	Reuse	Recycle	Repair	Remanufacture	Refurbish	Repurpose	Recover	Rethink	Refuse	
Garonga Safari Camp, South Africa ( <a href="https://www.garonga.com/">https://www.garonga.com/</a> )		+					+	+			3 R
El Nido Resorts, Philippines ( <a href="https://www.elnidoresorts.com/">https://www.elnidoresorts.com/</a> )	+	+					+	+			4 R
Kachi Lodge, Bolivia ( <a href="https://www.kachilodge.com/">https://www.kachilodge.com/</a> )		+						+			2 R
Three Camel Lodge, Mongolia ( <a href="https://www.threecamellodge.com/">https://www.threecamellodge.com/</a> )	+	+	+				+	+			5 R
The Black Sheep Inn, Chugchilán, Ecuador ( <a href="https://blacksheepinn.com/">https://blacksheepinn.com/</a> )	+	+	+	+	+		+	+		+	8 R
1 Hotel South Beach, Miami Beach, US ( <a href="https://www.1hotels.com/south-beach/">https://www.1hotels.com/south-beach/</a> )		+	+		+		+	+		+	6 R
The Westin Savannah Harbor Golf Resort & Spa, Savannah, Georgia ( <a href="https://westinresortsavannah.com">https://westinresortsavannah.com</a> )	+	+									2 R
Inn by the Sea Cape, Elizabeth, Maine ( <a href="https://innbythesea.com/">https://innbythesea.com/</a> )		+	+					+		+	4 R
The Allison Inn & Spa, Newborn, Oregon ( <a href="https://theallison.com/resort/">https://theallison.com/resort/</a> )			+					+		+	3 R
Golden Arrow Lakeside Resort, Lake Placid, NY ( <a href="https://www.golden-arrow.com/the-resort/">https://www.golden-arrow.com/the-resort/</a> )	+	+								+	3 R
The Rubens at the Palace, London ( <a href="https://rubenshotel.com/">https://rubenshotel.com/</a> )		+				+		+			3 R
Crowne Plaza Copenhagen Towers, Denmark ( <a href="https://www.ihg.com/crowneplaza/hotels/gb/en/copenhagen/">https://www.ihg.com/crowneplaza/hotels/gb/en/copenhagen/</a> )	+	+						+			3 R
Whitepod Eco-Luxury Resort, Switzerland ( <a href="https://whitepod.com/">https://whitepod.com/</a> )	+	+						+			3 R

\*Source: compiled by authors.

As shown in Table 2, the 3Rs are mostly applied in the provision of hospitality and accommodation services, they were applied by 6 out of 13 examined establishments. The cases examined emphasise waste reduction and promote reuse and repurposing of materials. Water-saving technologies and innovative design approaches are implemented, conserving valuable resources, especially in water-scarce regions, and promoting responsible water use among guests (Alonso and Ogle, 2010; Rodríguez et al., 2020).

Overall, the incorporation of circular economy principles into the tourism sector

represents a paradigm shift towards more sustainable, environmentally friendly and socially responsible practices. These hotels are beacons of progress, demonstrating that successful and enjoyable tourism experiences can go hand in hand with responsible environmental stewardship and support for local communities (Jones et al., 2014). As more and more industries follow suit, the positive impact on the environment, the local economy and overall sustainable development will continue to grow, making the tourism sector a key contributor to a greener and more environmentally friendly global economy.

### Research methodology

In order to understand the specificities of applying circular economy principles, it is important to identify how hospitality and accommodation providers understand the circular economy, what circular economy initiatives they are involved in and what challenges they are most likely to face. The institutions selected to participate in the study are those whose activities are linked to the tourism sector and whose activities are linked to sustainability. The qualitative research method chosen for this purpose is a semi-structured interview, as the aim is to gain a deeper insight into the issue under study and to obtain the most detailed information possible on the application of the principles of the CE in establishments providing hospitality and accommodation services.

The 12 hospitality and accommodation establishments in Lithuania (12 informants were interviewed) were selected for the study, which emphasise sustainability in their operations, promote the use of sustainable, environmentally friendly, recycled materials and aim to raise awareness among their guests/customers by encouraging them to get involved in circular economy initiatives. Informants from the hospitality and accommodation establishments surveyed helped to assess what best describes the circular economy, what specific

initiatives/steps the establishments are taking to apply the principles of the circular economy, what they perceive to be the benefits of applying the principles of the circular economy and what challenges they face. The survey was carried out between July and August 2023.

The informants for the qualitative research were selected according to their knowledge and direct involvement in the implementation of circular economy initiatives, i.e. the people with the most information to provide (owners, managers), those who could best describe their experience of circular economy principles were included. The sample was drawn from the cases most easily accessible to the researcher. According to Žydzūnaitė and Sabaliauskas (2017), “this strategy requires less effort and saves the researcher’s time” (p. 63). 4 interviews were conducted face-to-face, 2 interviews were conducted by telephone and 6 interviews were conducted online. The survey was conducted between July and August 2023.

The qualitative research questionnaire is based on an analysis and synthesis of theoretical frameworks and research carried out by other researchers. The qualitative research questions used in the interviews with hospitality and accommodation providers (informants) are divided into 4 blocks of questions (Table 3).

**Table 3. Qualitative research questions**

Subject	Questions	Goal
General information about the establishment	Questions 1-4	Examine general information about the establishment’s activities, approach and understanding of sustainability.
Application of circular economy principles	Questions 5-7	Determine how the circular economy is described and what principles of the circular economy are most often applied.
Experiences in the application of circular economy principles	Questions 8-11	Summarize the good and bad experiences of the application of CE principles in the institutions providing hospitality and accommodation services.
Benefits of applying circular economy principles	Questions 12-14	To determine whether the application of CE principles in the establishment can contribute to increasing its attractiveness.

*\*Source: compiled by authors.*

The questionnaire highlights the area of research – the good and bad experiences of the application of circular economy principles in hospitality and accommodation establishments. The study began by identifying the characteristics of establishments providing

hospitality and accommodation services, including years of operation and main activity. The analysis then focused on their understanding of sustainability, the application of specific circular economy principles, the benefits and challenges faced, the level of guest



and customer engagement, the impact on their image and attractiveness, and the economic implications of applying the circular economy. Finally, the future plans of these establishments regarding the further implementation of circular economy practices were examined.

In this study, all interviews were first transcribed. The text was analyzed, the research object was explored, aspects relevant to the research problem were distinguished, and the data were examined. Texts are grouped by content and categories are created. Categories are joined by subcategories. The content analysis made it possible to better understand the thoughts expressed by the informants, to analyze and summarize them.

Ethical principles were followed in conducting the qualitative research and analyzing the collected information. Most of the establishments participating in the study agreed to answer the questions, but did not agree to reveal their identity, therefore, in order to ensure their confidentiality, the data were depersonalized, the establishments were given codes, i.e. the institution is coded with a number (E1, E2, etc.).

### Research results

The results of the research show that the market experience of the interviewed establishments is considerable and ranges from 2 to 28 years (Table 4).

**Table 4. General information about hospitality and accommodation establishments**

Code	Activities of the establishment	Lifetime of the establishment, in years	Average number of guests/customers per week (~)
E1	Accommodation services, rural tourism	20	15
E2	Accommodation services	2	5
E3	Catering and accommodation services	8	20
E4	Catering services, production	10	1200
E5	Accommodation services	11	300
E6	Accommodation services	5	200
E7	Catering services, educational activities	6	100
E8	Accommodation services	3	50
E9	Catering services	6	500
E10	Accommodation services	12	60
E11	Accommodation services	6	45
E12	Catering and accommodation services	28	350

*\*Source: compiled by authors.*

2 establishments have more than 20 years of experience, 4 establishments have experience in the market from 8 to 12 years (Table 4). Such longevity means stability in this sector. The activities of these establishments include accommodation services, rural tourism, catering services, production, etc. (the establishments offer their guests a variety of entertainment (such as table football, mini billiards, entertainment for Cinema and TV lovers, etc.), other activities (e.g. mushroom picking, berry picking or just spending time surrounded by nature) and services (such as a sauna, cycling, hiking, etc.), some of which are involved in the sustainable travel

program. This diversity highlights the potential application of circular economy principles in tourism sector contexts.

The further direction of the interview is sustainability and its importance for the establishments. All informants answered positively to the question of whether sustainability is important in the establishments. It is noted that it is important to follow the principles of sustainability, because “this saves resources” (E2) or “protects nature” (E10), “sustainability helps to reduce pollution and conserve natural resources, which are not infinite” (E6); moreover, it is “part of the corporate philosophy that we follow in our

activities” (E8). Informants from two establishments commented on the importance of sustainability in more detail. One emphasized: “We understand that resource conservation and waste reduction not only contribute to environmental sustainability, but also impact our business operations. We aim for long-term operations and responsible use of resources” (E5). Another informant noted: “We are convinced that careful use of resources contributes to quality service and contributes to more efficient management” (E9). This awareness is an important condition for the application of circular economy principles, as sustainability is the cornerstone of the broader circular economy concept. Hospitality and accommodation establishments’ awareness of the importance of sustainability reflects their understanding of the environmental and economic challenges facing the tourism sector as well.

One of the main tools of sustainable development is the circular economy. It is noteworthy that, despite the different definitions, all informants emphasized the importance of efficient use of resources, reduction of waste and prolonging the life of products. When answering the question which definition best describes the circular economy, the informants mostly mentioned “reuse, repair,

refurbish, recycling of existing materials” (E1, E4, E12), emphasized that “the value of materials and products in circulation should be maintained for as long as possible” (E5, E6, E7, E8, E11). This consensus is in line with the basic principles of the circular economy.

The analysis of scientific literature and conducted research on the application of the principles of the circular economy in the tourism sector showed that the circular economy is mainly based on the 3R principle – “reduce, reuse, recycle”, although more principles are distinguished. The interviews revealed specific measures taken by establishments to implement circular economy principles. Informants that participated in the study also mostly indicated the principle of “reduce” (E1, E2, E3, E5, E6, E7, E8, E9, E10, E11). The principles of “repair” (E2, E7, E8, E9, E10, E11, E12) and “refuse” (E4, E8, E9, E10, E11) were frequently mentioned. The application of the rest of the principles is not very common in the studied establishments, so only some informants mentioned other circular economy principles: “reuse” (E5, E6, E10), “remanufacture” (E1), “rethink” (E2).

What specific initiatives/steps have already been taken in the studied hospitality and accommodation establishments to apply circular economy principles are listed in Table 5.

**Table 5. Circular economy initiatives**

Category	Subcategory	Statements
Waste reduction	Taking measures to reduce the amount of food-related and other waste	“Guests are encouraged to sort waste, waste is recycled” (E2) “We try to waste as little food as possible, we encourage guests to sort waste” (E3) “We take measures to reduce food waste” (E7) “We take measures to reduce food waste” because “we are convinced that careful use of resources is related to quality service” (E9)
	Avoiding plastic	“We refuse single-use plastic dishes and replace them with paper or wooden ones. <...> Single-use plastic bottles of shampoo, conditioner and body wash are not used” (E2) “We replace plastic bags with paper ones, disposable plastic dishes with paper or wooden ones, refuse plastic straws, etc.” (E4) “We are reducing the amount of disposable plastic dishes used. We try not to use plastic bags, we prefer paper ones, we refuse plastic straws” (E6) “We use nature-friendly bath cosmetics; in paper packages” (E8) “We refuse plastic if there is such an opportunity. Because it usually requires additional costs” (E9) “We try not to use plastic bottles for hair and body care” (E10) “We choose recycled and environmentally friendly packaging, replace plastic bags with paper ones and refuse single-use plastic dishes” (E12)
Saving energy and water	Use of renewable energy sources	“We reuse energy in heating, ventilation and air conditioning processes. We haven’t taken any other initiatives yet” (E3) “You probably know that there is a lot of talk now about the use of renewable



		energy resources, and that is what we are doing. We use renewable energy sources" (E7) "Energy saving is particularly important in our operations." <...> "Yes, we prioritize it and use renewable energy source" (E8) "We mostly use LED lights in our accommodation, <...> it really helps to save and the electricity bills are a little lower" (E10) "We use energy-saving light bulbs. Power supply controlled by number card or motion" (E11)
	Rational management of water resources	"We contribute to saving water resources, we have implemented solutions for saving water resources. We have installed water-saving showers and toilets, we encourage guests to contribute to saving water resources, we inform them about the possibility of refusing to change towels" (E2) "We offer one of the most advanced technologies towards a sustainable economy – geothermal heating and cooling. It is the least expensive and energy-consuming way of cooling rooms" (E11)
Nature-friendly initiatives	Use of recycled and secondary materials	"We use recycled or secondary materials to furnish the rooms and other premises. In this way, we contribute both to reducing resources and increasing guest awareness" (E1) "When we furnish hotel rooms, we use recycled materials" (E5)
	Installation of green spaces	"Our accommodation has green spaces" (E11)
	Promotion of local tourism	"It is important to encourage people to travel responsibly and take more interest in their region and its places of interest. We prioritize local tourism" (E1)
	Raising guest/customer awareness and promoting sustainable consumption	"We encourage and use our example to teach guests how to sort waste. <...> We try to make sure that the waste is fully used and that little has to be thrown away" (E1) "We provide guests with information about local ecosystems" (E11)
		"We use organic food products" (E12)

*\*Source: compiled by authors.*

In summary, specific practices include:

- Effective management of water resources. Some establishments have implemented water-saving systems to ensure the rational use of this vital resource.

- Use of secondary materials. The use of reclaimed materials in the decoration of hotel rooms and common areas demonstrates a commitment to sustainable sourcing.

- Extending the service life of furniture and equipment. Repairing and updating furniture and equipment, rather than premature replacement, reduces the need for new acquisitions.

- Reducing food waste. Measures to reduce food waste help to use resources efficiently.

- Replacing plastic with environmentally friendly alternatives. Replacing plastic bags, containers and straws with paper or wooden alternatives reduces dependence on non-renewable materials.

Next, it was aimed to find out what advantages the establishments see and what problems and challenges they face when applying circular economy principles. Thus, several benefits obtained from the implementation of circular economy principles were identified: cost reduction, resource conservation and environmental preservation (Table 6).

**Table 6. Good and bad experiences of applying circular economy principles in hospitality and accommodation establishments**

<b>Advantages of applying CE principles</b>	<b>Problems and challenges in applying circular economy principles</b>
Cost reduction (E2, E5)	Legal Restraints (E1, E2, E3, E4, E8, E9, E10, E11)
Resource conservation (E1, E2, E3, E4, E6, E7, E9).	Investments (E2, E3, E7, E10, E11)
Environmental preservation (E1, E2, E6, E8, E10, E11, E12)	Lack of clarity (E1, E2, E5)

*\*Source: compiled by authors.*

Informants repeatedly emphasized the potential cost savings (Table 6). By reducing waste and optimizing the use of resources, establishments can reduce operating costs. For example, extending the life of furniture and equipment reduces the need for costly replacements during repair. However, the implementation of some initiatives is often not associated with decreasing costs, but, on the contrary, with increasing costs and liabilities for hospitality and accommodation providers.

Informants noted that circular economy practices contribute to resource conservation. Effective water management, use of secondary materials and waste reduction initiatives promote sustainable use of resources. Also, the implementation of circular economy practices meets the objectives of environmental protection. For example, replacing plastic with green alternatives reduces the ecological footprint associated with plastic production and disposal. These advantages highlight the economic and environmental advantages of implementing circular economy principles in the hospitality and accommodation sector.

Despite the obvious benefits of circular economy practices, institutions also face challenges in their implementation (Table 6). Some informants noted that there are legal constraints and requirements that make it difficult to apply circular economy practices. These restrictions may include unclear rules on the use of secondary materials or waste management. Implementing certain circular economy practices, such as installing solar panels or switching to renewable energy sources, can require significant upfront investment. For smaller establishments, these investments may prove prohibitive. Several informants emphasized that there are no clear directives and guidelines for the implementation of circular economy practices. Well-defined standards and guidelines could

make this practice more effective. In addition to the already mentioned problems and challenges, some institutions admitted that they do not actively discuss circular economy initiatives with guests. As a result, guests may not be aware of establishments' efforts in this regard and may miss opportunities to engage in such initiatives.

The issue of how the application of circular economy principles affects the image and attractiveness of establishments is also examined from different perspectives. Informants of some establishments (E2, E5, E6, E9) believe that this can have a positive effect, especially for guests who already value sustainability. However, others (E1, E3, E4, E7, E8, E10, E11, E12) argue that factors such as price and guest convenience may be more important than sustainability efforts.

The implementation of circular economy principles can have economic consequences for business. For example, using energy-efficient lighting can reduce electricity costs, but it requires an upfront investment. Nevertheless, these economic costs can often be offset over time by reducing operating costs. However, all surveyed establishments expressed their intention to develop circular economy practices in the future. Future plans include the installation of solar panels, greater use of renewable energy sources and further promotion of circular economy principles among guests and customers.

Analysis of the results of interviews with hospitality and accommodation establishments shows that the application of circular economy principles has great potential for economic and environmental sustainability. Despite the current challenges, the benefits, commitment to sustainability and future plans show the possibility of positive change in these establishments. Through joint efforts, regulatory support and improved

communication strategies, the integration of circular economy practices can help create a more sustainable and resilient tourism sector.

In conclusion, it can be said that the hospitality and accommodation establishments that participated in the study apply circular economy principles to promote sustainability and solve environmental problems, optimizing the use of resources and reducing the amount of waste. It provides valuable insights into the current practices, benefits and challenges these institutions face in achieving sustainability. Further research in this area could delve into the specific environmental impacts and economic benefits of circular economy hospitality and accommodation practices, analyze guest and customer perceptions and behaviors related to sustainability initiatives, and explore regulatory frameworks and incentives that could support and encourage circular economy practices. economic principles in the tourism sector in general. Furthermore, assessing the scale of these practices and their potential to drive systemic change in the tourism sector could be a good avenue for future research.

## Conclusions

Although more principles are distinguished, the analysis of scientific literature and conducted research on the application of circular economy principles in the tourism sector showed that the circular economy is mainly based on the 3R principle – “reduce, reuse, recycle”. The establishments providing hospitality and accommodation services that participated in the study also

mostly indicated the principle of “reduce”, often mentioned the principles of “repair” and “refuse”. The application of the rest of the principles is not very common in the studied institutions, only some informants mentioned other circular economy principles: “reuse”, “remanufacture”, “rethink”.

Hospitality and accommodation providers have identified several advantages of applying circular economy principles: cost reduction, resource conservation and environmental preservation. It was mentioned that by reducing the amount of waste and optimizing the use of resources, institutions can reduce operating costs, it was agreed that circular economy practices contribute to the conservation of resources. However, the implementation of some initiatives is often not associated with decreasing costs, but, on the contrary, with increasing costs and liabilities for hospitality and accommodation providers.

Despite the obvious benefits of circular economy practices, establishments also face problems and challenges in their implementation. It has been noted that there are a number of legal constraints and requirements that make it difficult to apply circular economy practices. Certain circular economy practices may require large upfront investments, which is too much of a financial burden for smaller establishments. There are no clear directives and guidelines for the implementation of circular economy practices. Some establishments admitted that they do not actively discuss circular economy initiatives with guests, and as a result, guests may not be aware of establishments' efforts in this regard.

## References

- Alonso, A. D., & Ogle, J. P. (2010). Evaluating energy and resource consumption in the hotel industry. *International Journal of Hospitality Management*, 29(4), 659-668. Retrieved from: [https://www.researchgate.net/publication/321203598\\_Customer\\_experience\\_management\\_in\\_hospitality\\_A\\_literature\\_synthesis\\_new\\_understanding\\_and\\_research\\_agenda](https://www.researchgate.net/publication/321203598_Customer_experience_management_in_hospitality_A_literature_synthesis_new_understanding_and_research_agenda)
- Blomsma, F., & Brennan, G. (2017). The emergence of circular economy: A new framing around prolonging resource productivity. *Journal of Industrial Ecology*, 21(3), 603-614. Retrieved from: [https://www.researchgate.net/publication/316840016\\_The\\_Emergence\\_of\\_Circular\\_Economy\\_-\\_A\\_New\\_Framing\\_Around\\_Prolonging\\_Resource\\_Productivity](https://www.researchgate.net/publication/316840016_The_Emergence_of_Circular_Economy_-_A_New_Framing_Around_Prolonging_Resource_Productivity)

- Bonciu, F. (2014). The European Economy: From a Linear to a Circular Economy. *Romanian journal of European affairs*, 78-89. Retrieved from: [https://www.researchgate.net/publication/289891523\\_The\\_European\\_Economy\\_From\\_a\\_Linear\\_to\\_a\\_Circular\\_Economy](https://www.researchgate.net/publication/289891523_The_European_Economy_From_a_Linear_to_a_Circular_Economy)
- Buren, N., Demmers, M., Heijden, R., & Witlox, F. (2016). Towards a Circular Economy: The Role of Dutch Logistics Industries and Governments. *Sustainability*, 8(7), p. 1–17. <https://doi.org/10.3390/su8070647>
- Deselnicu, C. C., Albu, L. L., & Ciocoiu, C. N. (2018). Circular Economy: A review of the concept and its implementation in the EU. *Sustainability*, 10(10), 1-20. Retrieved from: <https://docs.iza.org/dp9611.pdf>
- Dinca, G., Milan, A. A., Andronic, M. L., Pasztori, A. M., & Dinca, D. (2022). Does Circular Economy Contribute to Smart Cities' Sustainable Development? *International Journal of Environmental Research and Public Health*, 19(13), p. 1–27. <https://doi.org/10.3390/ijerph19137627>
- Eiroa, B. S., Fernandez, E., Martínez, G. M., & Onate, D. S. (2019). Operational principles of circular economy for sustainable development: Linking theory and practice. *Journal of Cleaner Production*, 953. Retrieved from: [http://davidsoito.webs.uvigo.es/Files\\_research/2019\\_Suarez-Eiroa\\_et\\_al\\_%20JCP.pdf](http://davidsoito.webs.uvigo.es/Files_research/2019_Suarez-Eiroa_et_al_%20JCP.pdf)
- Ekens, P. (2019). The circular economy: progress, impact, and directions. *Annual Review of Environment and Resources*, 44, 25-51. Retrieved from: <https://www.oecd.org/cfe/regionaldevelopment/Ekins-2019-Circular-Economy-What-Why-How-Where.pdf>
- Ellen MacArthur Foundation. (2002). *Towards the Circular Economy: Economic and business rationale for an accelerated transition*. Retrieved from: <https://ellenmacarthurfoundation.org/towards-a-circular-economy-business-rationale-for-an-accelerated-transition>
- European Commission. (2006). *Circular economy: Definitions and concepts*. Retrieved from: [https://www.eesc.europa.eu/sites/default/files/files/ceps\\_report\\_the\\_circular\\_economy\\_a\\_review\\_of\\_definitions\\_processes\\_and\\_impacts.pdf](https://www.eesc.europa.eu/sites/default/files/files/ceps_report_the_circular_economy_a_review_of_definitions_processes_and_impacts.pdf)
- European Environment Agency. (2015). *Circular economy in Europe: Developing the knowledge base*. EEA Report No 2/2016. Retrieved from: <https://www.eea.europa.eu/publications/circular-economy-in-europe>
- European Parliament. (2021). *Circular Economy Action Plan 2.0 – For a Cleaner and More Competitive Europe*. Retrieved from: [https://www.europarl.europa.eu/news/en/headlines/economy/20151201STO05603/circular-economy-definition-importance-and-benefits?at\\_campaign=20234-Economy&at\\_medium=Google\\_Ads&at\\_platform=Search&at\\_creation=RSA&at\\_goal=TR\\_G&at\\_audience=eu%20circular%20economy%20action%20plan&at\\_topic=Circular\\_Economy&at\\_location=EE&gclid=Cj0KCQjw9MCnBhCYARIsAB1WQVWEpTy6JtTBkUGjzLbNzNfzUA-UkMpD4\\_-KvgmTSKTNM-\\_i99SeFGQaAoHnEALw\\_wcB](https://www.europarl.europa.eu/news/en/headlines/economy/20151201STO05603/circular-economy-definition-importance-and-benefits?at_campaign=20234-Economy&at_medium=Google_Ads&at_platform=Search&at_creation=RSA&at_goal=TR_G&at_audience=eu%20circular%20economy%20action%20plan&at_topic=Circular_Economy&at_location=EE&gclid=Cj0KCQjw9MCnBhCYARIsAB1WQVWEpTy6JtTBkUGjzLbNzNfzUA-UkMpD4_-KvgmTSKTNM-_i99SeFGQaAoHnEALw_wcB)
- Fang, L., & Zhang, J. (2010). *The study of industrial tourism development based on circular economy*. In 2010 International Conference on E-Product E-Service and E-Entertainment (ICEEE) (Vol. 2, pp. 1-4).
- Geissdoerfer, M., Savaget, P., Bocken, N. M. P., & Hultink, E. J. (2017). The Circular Economy – A New Sustainability Paradigm? *Journal of Cleaner Production*, 143, p. 757–768. <https://doi.org/10.1016/j.jclepro.2016.12.048>
- German Environment Agency. (2020). *9 Principles for a Circular Economy: Strategic Guidelines for Politics, Business, and Society*. Retrieved from: [https://www.umweltbundesamt.de/sites/default/files/medien/1410/publikationen/2020\\_10\\_23\\_leitlinie\\_kreislaufwirtschaft\\_englisch\\_bf.pdf](https://www.umweltbundesamt.de/sites/default/files/medien/1410/publikationen/2020_10_23_leitlinie_kreislaufwirtschaft_englisch_bf.pdf)
- Ghisellini, P., Cialani, C., & Ulgiati, S. (2016). A review on circular economy: The expected transition to a balanced interplay of environmental and economic systems. *Journal of Cleaner Production*, 114, 11–32. <https://doi.org/10.1016/j.jclepro.2015.09.007>
- Hawken, P. (2009). *The Ecology of Commerce: A Declaration of Sustainability*. HarperBusiness. Retrieved from: <https://p2infohouse.org/ref/31/30233.pdf>
- Jones, P., Hillier, D., & Comfort, D. (2014). Sustainability in the global hotel industry. *International Journal of Contemporary Hospitality Management*, 26(1), 5-17. Retrieved from: [https://www.researchgate.net/publication/263041090\\_Sustainability\\_in\\_the\\_global\\_hotel\\_industry](https://www.researchgate.net/publication/263041090_Sustainability_in_the_global_hotel_industry)
- Julião, M. D. R., & Marques, R. C. (2019). *Circular Economy in Tourism: Literature Review and Implications for Hotels*. In Circular Economy in the Tourism Industry (pp. 15-41). IGI Global.
- Kirchherr, J., Reike, D. & Hekkert, M. (2017). Conceptualizing the Circular Economy: an Analysis of 114 Definitions. *Resources, Conservation and Recycling*, 127, p. 221–232. <https://doi.org/10.1016/j.resconrec.2017.09.005>
- Ma, J., Liu, X., & Wang, Y. (2016). Study on the Sustainable Development of Tourism Based on the Concept of Circular Economy. In *Proceedings of the 2016 International Conference on Education, Management Science and Economics* (EMSE 2016). <https://doi.org/10.3390/su13137493>
- Margeta, J. (2019). *The implementation of circular economy principles in waste management*. In 5th International Scientific Conference “Managing and Marketing of Places” (pp. 44-51). Retrieved from: <https://www.aimspress.com/article/id/5f994c5eba35de0b4b21b27c>
- McDonough, W., & Braungart, M. (2002). *Cradle to cradle: Remaking the way we make things*. North Point Press. Retrieved from: [https://www.researchgate.net/publication/240457059\\_Book\\_Review\\_Cradle\\_to\\_Cradle\\_Remaking\\_the\\_Way\\_We\\_Make\\_Things\\_William\\_McDonough\\_and\\_Michael\\_Braungart\\_2002\\_North\\_Point\\_Press\\_New\\_York\\_208\\_pp\\_2750\\_paperback\\_978-0-86547-587-8](https://www.researchgate.net/publication/240457059_Book_Review_Cradle_to_Cradle_Remaking_the_Way_We_Make_Things_William_McDonough_and_Michael_Braungart_2002_North_Point_Press_New_York_208_pp_2750_paperback_978-0-86547-587-8)

- McKinsey & Company. (2017). *Growth Within: A circular economy vision for a competitive Europe*. Retrieved from: <https://www.mckinsey.com/capabilities/sustainability/our-insights/growth-within-a-circular-economy-vision-for-a-competitive-europe>
- Millar, N., McLaughlin, E., & Borger, T. (2019). The Circular Economy: Swings and Roundabouts? *Ecological Economics*, 158, p. 11–19. <https://doi.org/10.1016/j.ecolecon.2018.12.012>
- Morseletto, P. (2020). Targets for a Circular Economy. *Resources, Conservation and Recycling*, 153, p. 1–12. <https://doi.org/10.1016/j.resconrec.2019.104553>
- Neves, S. A., & Marques, A. C. (2022). Drivers and Barriers in the Transition from a Linear Economy to a Circular Economy. *Journal of Cleaner Production*, 341, p. 1–13. <https://doi.org/10.1016/j.jclepro.2022.130865>
- Petit-Boix, A., Gasol, C. M., Roset, J. R., & Rieradevall, J. (2018). Environmental and economic assessment of a rainwater harvesting system in high-density tourist cities. *Journal of Cleaner Production*, 171, 420-432. Retrieved from: [https://upcommons.upc.edu/bitstream/handle/2117/132360/Vargas-Parra%20et%20al.%202018\\_Article\\_RainwaterHarvestingSystemsRedu.pdf](https://upcommons.upc.edu/bitstream/handle/2117/132360/Vargas-Parra%20et%20al.%202018_Article_RainwaterHarvestingSystemsRedu.pdf)
- Potting, J., Hekkert, M., Worrell, E. & Hanemaaijer, A. (2017). *Circular economy: Measuring innovation in the product chain*. Policy Report. Retrieved from: <https://www.pbl.nl/sites/default/files/downloads/pbl-2016-circular-economy-measuring-innovation-in-product-chains-2544.pdf>
- Ranta, V., Aarikka-Stenroos, L., & Vaisanen, J. M. (2021). Digital Technologies Catalyzing Business Model Innovation for Circular Economy – Multiple Case Study. *Resources, Conservation and Recycling*, 164, p. 1–11. <https://doi.org/10.1016/j.resconrec.2020.105155>
- Raworth, K. (2017). *Doughnut Economics: Seven Ways to Think Like a 21st-Century Economist*. Chelsea Green Publishing. Retrieved from: [https://www.researchgate.net/publication/340685996\\_Kate\\_Raworth\\_-\\_Doughnut\\_Economics\\_Seven\\_Ways\\_to\\_Think\\_Like\\_a\\_21st\\_Century\\_Economist\\_2017](https://www.researchgate.net/publication/340685996_Kate_Raworth_-_Doughnut_Economics_Seven_Ways_to_Think_Like_a_21st_Century_Economist_2017)
- Rodríguez, A. L., Cárdenas, P. S. L., & Gómez, J. G. B. (2020). Circular Economy and Sustainable Tourism: A Systematic Literature Review. *Sustainability*, 12(12).
- Rodríguez, C., Florido, C., & Jacob, M. (2020). Circular Economy Contributions to the Tourism Sector: A Critical Literature Review. *Sustainability*, 12, 4338. <https://doi.org/10.3390/su12114338>
- Rodríguez-Antón, J. M., & Alonso-Almeida, M. D. M. (2019). Environmental behaviour and tourist accommodation: A comprehensive analysis of the Balearic Islands. *Sustainability*, 11(23). doi: <https://doi.org/10.3390/su11205665>
- Rodríguez-Antón, J. M., Williams, A. M., & Hall, C. M. (2012). Tourism, competitiveness, and societal prosperity. *Journal of Travel Research*, 51(6), 663-672. Retrieved from: <https://www.semanticscholar.org/paper/Tourism%2C-Competitiveness%2C-and-Societal-Prosperity-Crouch-Ritchie/53a828e76d6c4da2ca6ee89eef85c70b967fa593>
- Rosenblum, S., & Black, R. (2000). Tourism and the environment: Economic, socio-cultural and natural factors. *Tourism Management*, 21(1), 1-2. Retrieved from: [http://www.tourism.tallinn.ee/static/files/090/exploring\\_the\\_cognitiveffective\\_nature\\_of\\_destination\\_image\\_and.pdf](http://www.tourism.tallinn.ee/static/files/090/exploring_the_cognitiveffective_nature_of_destination_image_and.pdf)
- Sauve, S., Bernard, S., & Sloan, P. (2016). Environmental Sciences, Sustainable Development and Circular Economy: Alternative Concepts for Trans-disciplinary Research. *Environmental Development*, 17, p. 48–56. <https://doi.org/10.1016/j.envdev.2015.09.002>
- Skorupskaitė, K., & Junevičius, A. (2017). Atliekų tvarkymo politikos formavimas Lietuvoje taikant žiedinės ekonomikos modelį. *Viešojoji politika ir administravimas*, 16(1), p. 91–107. <https://doi.org/10.5755/j01.ppaa.16.1.18016>
- Skvarciany, V., Lapinskaitė, I., & Volskytė, G. (2021). Circular economy as assistance for sustainable development in OECD countries. *Oeconomia Copernicana*, 12(1), p. 11–34. <https://doi.org/10.24136/oc.2021.001>
- Stahel, W. R. (1989). The product-life factor. *The Ecologist*, 19(1), 20-24. Retrieved from: <https://www.quebeccirculaire.org/data/sources/users/4/32217.pdf>
- Styles, D., Schoenberger, H., & Daniel, P. (2013). Green hotel practices: A review of the literature. *International Journal of Hospitality Management*, 34, 227-237. Retrieved from: [https://www.researchgate.net/publication/312667982\\_The\\_review\\_of\\_green\\_research\\_in\\_hospitality\\_2000-2014\\_Current\\_trends\\_and\\_future\\_research\\_directions](https://www.researchgate.net/publication/312667982_The_review_of_green_research_in_hospitality_2000-2014_Current_trends_and_future_research_directions)
- Suarez-Eiroa, B., Fernandez, E., Mendez-Martinez, G., & Soto-Onate, D. (2019). Operational Principles of Circular Economy for Sustainable Development: Linking Theory and Practice. *Journal of Cleaner Production*, 214, p. 952–961. <https://doi.org/10.1016/j.jclepro.2018.12.271>
- Uche-Soria, M.; & Rodríguez-Monroy, C. (2019). An Efficient Waste-To-Energy Model in Isolated Environments. Case Study: La Gomera (Canary Islands). *Sustainability*, 11. doi: <https://doi.org/10.3390/su11113198>
- United Nations Environment Programme. (2020). *Making Peace with Nature: A scientific blueprint to tackle the climate, biodiversity, and pollution emergencies*. Retrieved from: <https://wedocs.unep.org/xmlui/bitstream/handle/20.500.11822/34948/MPN.pdf>
- UNWTO. (2019). *Global Report on Tourism and Climate Change*. United Nations World Tourism Organization. Retrieved from: <https://www.e-unwto.org/doi/pdf/10.18111/9789284421152>

World Business Council for Sustainable Development. (2018). *CEO Guide to the Circular Economy*. Retrieved from: <https://www.wbcsd.org/Archive/Factor-10/Resources/CEO-Guide-to-the-Circular-Economy> \

World Economic Forum. (2010). *More with less: Scaling sustainable consumption and resource efficiency*. Retrieved from: <https://www.weforum.org/reports/more-less-scaling-sustainable-consumption-and-resource-efficiency/>

Xing, J., Silva, J. M. V. B., & Almeida, I. D. (2017). *A New Conceptual Perspective on Circular Economy: Preliminary Confirmation of the 7R Principle by a Descriptive Case Study in Eastern China*. Retrieved from: <https://www.researchgate.net/publication/333755946>

Žydzionaitė, V., & Sabaliauskas, S. (2017). *Kokybiniai tyrimai. Principai ir metodai*. Vilnius: Vaga.