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Introduction

Climate change, urbanization, biodiversity loss, disruption in biochemical cycle, depletion of freshwater resources, ozone layer depletion, land use change, population growth and prosper, fossil fuel consumption, pollution and waste are the drivers to resource shortage escalation and environment deterioration (Tonelli & Cristoni, 2019). The United Nations Environment Programme (UNEP) (2011) announced that consumption levels will triple by 2050 if economies continue to use natural resources faster than planet Earth can regenerate them. As a result, the traditional linear economy model of production and consumption that assumes a take–make–waste pattern in which resources are taken from the earth (take), processed into components (make) and, after being used, thrown away (waste)-called the Cradle-to-grave principle is no longer efficient or sustainable for the standard consumption (McDonough & Braungart, 2010). Thus, the concept of Circular Economy (CE) has received increasing attention among stakeholders and policymakers in growing number of countries (Cornejo-Ortega & Chávez Dagostino, 2020). Within a CE society, no waste for disposal should exist, instead waste should be viewed as a new resource within the economy (Geng & Doberstein, 2008). Besides, through the CE model, pressure on the critical resources and its negative effects of disposing of waste can be reduced and rebuild the ecosystem to support human health, society and healthy resources that generate value (Ziraba, Haregu, & Mberu, 2016). Hence, more value can be obtained from the produced resources.

In light of this, tourism operations in linear economic model is related to large volume of people who visit other different destinations, having negative impacts on the environment including shortage of natural resources (e.g., water, energy, and raw materials), high level of CO₂ emission due to transportation, deforestation, and concentrations of waste (UNTWO, 2008; Restrepo & Villa, 2018). To reduce such impact governments have been pressing the tourism operations with new regulations and promoting the adoption of new strategies in order to reduce the environmental impacts (Berezan et al., 2010). On the other hand, consumers are becoming more aware of pollution and waste issues, and they look for green practices (Berezan, Millar, & Raab, 2014). Some consumers are also willing to pay a *primum price* for tourism products and services (Berezan et al., 2014). Thus, Paris Tourism Agreement enunciated that sustainable tourism and tourism industries should be the main objectives of tourism (UN, 2016). This agreement aims to limit climate change through global commitment and collaboration among all stakeholders, and advises adopting more sustainable patterns of production within tourism industries (Girard & Nocca, 2017). The CE is considered a possible solution to mitigate issues such as increasing global demand of natural resources, climate change, and worldwide pollution (Whalen et al., 2018). However, the application of CE principles in tourism operations are particularly lacking in existing research. The CE was developed mainly for the manufacturing industries and there are few

references to the tourism operations despite the fact that it is an industry predominantly based around the model of the linear economy (Gusmerotti et al., 2019). Therefore, many CE solutions can also be applied to tourism operations and destinations to reverse the trend and reduce consumptions of natural resources, waste, and CO2 emissions. Existing research highlights the need to understand the CE principles and perceptions among tourism operations (hereby foodservice operations). Studies have noted that there is relative lack of empirical studies on CE principles and its adoption in foodservice operations across North America especially from Vancouver context. Greater Vancouver is an emerging hub for CE and the home for many circular businesses across multiple sectors including tourism operations. Vancouver and British Columbia (B.C) economies are also heavily dependent on natural resources. Three materials offer the biggest opportunity for advancing circularity in Vancouver are food, textile, and construction materials (Vancouver Economic Commission, 2020). To this end, The Vancouver Economic Commission (2020) has developed CE strategies, convening business stakeholders to facilitate action with new circular business ideas or adopt circular practices to existing business (e.g., Project Zero Circular Incubator). In order to measure the progress toward the CE related goals, this research therefore, will explore the foodservice operations knowledge about CE concept, their actual involvement in its practices, and their willingness to design a transition to a CE in Vancouver.

Literature Review

Circular Economy (CE)

The origin of CE has received increasing attention with in recent years. The concept is not new. It is rooted from the 1920s and onwards and the concept of CE did not emerge until 1990. There are many definitions of the CE concept. Sauvé et al. (2016) defined CE as a model of production and consumption of goods through closed-loop material flows that internalizes environmental externalities with virgin resource extraction and the generation of waste. Geissdoerfer et al. (2017) described CE as a regenerative economic system where resource input and waste, emission, and energy leakage can be minimized by slowing, closing and narrowing materials and energy loop through long-lasting design, maintenance, repair, reuse, remanufacturing, refurbishing and recycling. Most recently, Suárez-Eiroa (2019) argued that CE is a regenerative production-consumption system that aims to maintain seven operational principles: extraction rates of resources, generation rates of wastes and emissions, closing systems, reducing its size, maintaining resources value, designing for CE, and educating for CE under suitable values for planetary boundaries. Despite the variety of definitions of the CE concept, this paper will focus on the definitions provided by the Ellen MacArthur Foundation. The Foundation defines CE as “an industrial system that is regenerative or restorative by intention and design” (MacArthur, 2013). It replaces the ‘end-of-life’ concept with restoration, wherein energy and resources are renewable and non-toxic. Hence, CE refers to production and consumption processes leaving close to zero waste.

Circular Economy, Tourism and Hospitality

The CE concept is growing enormously within different business organizations, however, its application in the tourism and hospitality industry has been limited (Berg, 2018). Jones and Wynn (2019) examined how several tourism and hospitality organizations have used CE, natural capital, and resilience concepts in their commercial operations and development plans. Vargas-Sánchez (2019) stated that the economy was in a process of transition toward the CE model. However, the lack of common understanding of this concept and limited scope in use. The differences between sustainability and CE have also been examined. For example, Geissdoerfer et al. (2017) found that CE was frequently viewed as condition to achieve sustainability and could not be implemented in isolation. Their investigation was based on how a better understanding of both concepts and practices could influence the performance of businesses, supply chains, and companies in different economy sectors. The CE is also linked to the United Nations Sustainable Development Goals (e.g., responsible consumption and production) to ensure environmental quality, economic prosperity, and social equity, to which the tourism sector could contribute actively to the benefit of current and future generations (Brears, 2016).

Although, CE is becoming main concept of sustainability related topic among the broad ranges of organizations while, small organizations still perceived it is something unnecessary, innovative, and too expensive (Miret et al., 2011). Manniche et al. (2017) argued that medium-sized (SMEs) enterprises (e.g., hotels) has financial barrier due to the lack of capital to invest in new technologies to reduce negative environmental impact, while Gupta et al. (2019) suggested that stakeholders' involvement is critical for providing the necessary framework for successful transition toward the CE paradigm due to their real interest and the financial or human capital investments. Other several existing studies on tourism have also noted on how companies are applying general CE production principles (Cristoni & Tonelli, 2018) or recently how tourists' practices may sustain the development of CE in tourism and hospitality (Sørensen & Bærenholdt, 2020).

CE and Foodservice Operations

In the context of foodservice operations, the implementation of CE models and solutions is important. Foodservice operations can take advantage of many CE initiatives to reduce the consumption of natural resources, organic waste generations, and CO₂ emissions. Foodservice operations not only have the opportunity to reuse, recycle and recover products, services, waste, materials, water and energy but also can achieve greater profitability and increase revenue. To this aspect many foodservice operations are taking initiative or implemented CE model into their organizations (e.g., Nolla, n.d.). The Ellen MacArthur Foundation published the report "Cities and Circular Economy for Food" that stated circular food system can be food production that improves rather than degrades the environment; ingredients kept at their highest value and cycled through the biological system; and people that have access to healthy and nutritious food. The report also suggested a successful shift not only would benefit the climate and communities, it also would generate \$2.7 trillion in annual benefits by 2050. And chefs will play a vital role in driving this transformation (Phipps, 2020). UK based Sustainable Restaurant Association (SRA) have been instrumental in helping CE ideas to the different foodservice operations with their sustainability framework that demonstrated what this could look like in practice (SRA, 2021). For McDonald's Netherlands, final goal of CE is to manage used cooking oil and recycle it efficiently to produce

the equivalent amount of renewable diesel to fuel the trucks that supply the restaurants without having negative impacts on human life or ecosystems (Neste, 2020). However, Kalmykova et al. (2018) concluded that the dissemination of CE concept is hampered because the CE field is currently populated by diverging approaches.

Methodology

The City of Vancouver is selected as the study location because it is the third largest city in Canada and located on Canada's West coast and the largest population (631,486 as of 2016) within the regional district of Metro Vancouver (2.5 million in 2020). Vancouver is also frequently listed among the top ten livable cities in global livability rankings (Economic Intelligent Unit, 2014) and attributed the status of a green city by scholars, and international media. In 2021, lonely planet designated Vancouver as one of the most sustainable cities in the world (Shepert, 2021). Tourism is also important to the city of Vancouver and it has been described as one of the top travel destinations in the world (Tourism Vancouver, n.d.) and attracted more than 10.3 million visitors and generated \$4.8 billion for the local economy in 2017 (Chan, 2018). According to the Statistic Canada, 6.1 million tourists visited to B.C and tourism brought \$18 billion a year to the provincial economy in 2017 (Carrigg, 2019). Beyond being the top travel destination, Vancouver nominated for the "Foodiest City on Earth" award by British culinary website Chowzter (Birkett, 2014).

The data for this study will be collected through a survey (online) to obtain the opinion of the tourism operations through a self-administered questionnaire format in which attitudes and motives will be measured using a Likert scale. The questionnaire will be developed from a thorough literature review or adapted from similar studies, in accordance to the research objectives. A pilot test will be conducted with a small sample of respondents to check comprehension of questions, validity of the questionnaire before data collection. The survey questionnaire will be designed to collect information about sociodemographic of the respondents, each operations impact on the environment, knowledge of the concept of the CE and sustainability, CE practices, and operations preferences to participate in transition to a CE.

The sample of foodservice operations will be acquired from telephone directories and websites that maintain extensive foodservice business addresses. Due to the small population and easy to contact in a short period of time, all the foodservice operations will be approached and ask to participate in the study (Hair et al. 2003). Considering the exploratory nature of this study, there is no necessary to predefine the sample and determine the number of answers (Gray, 2017). However, it is established a minimum 165 answers, similar to other study related to circular economy (Cruz, 2017). For improve the validity of this study, a great amount of literature from related to CE and tourism studies will be revised to define concepts, ideas and issues. On the other hand, to access internal consistency reliability or multi-item scales, Cronbach's alpha or coefficient alpha will be used (Pallant, 2011).

Conclusions

Overall, outcomes of this study will provide valuable knowledge and directions to develop clear and informed strategies for the tourism operations wishing to transition to the CE in Vancouver and in Canada as a whole in the context of sustainable tourism in future.

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