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THE CIRCULAR ECONOMY, NATURAL CAPITAL AND RESILIENCE IN TOURISM AND HOSPITALITY

Peter Jones and Martin Wynn

Abstract

Purpose - *This paper reviews some of the academic literature on the circular economy, natural capital and resilience by tourism and hospitality scholars and examines how a number of companies and industry bodies within the tourism and hospitality industry have employed these concepts in their business operations and development plans.*

Design/Methodology/Approach – *The paper outlines the importance of sustainability to the tourism and hospitality industry and provides definitions of the concepts of the circular economy, natural capital and resilience. The paper reviews some of the academic literature on these concepts, explores how a number of companies and industry bodies within the tourism and hospitality industry have employed them in their business and planning operations, and identifies a number of future directions for academic research and managerial contributions.*

Findings – *The concepts illuminate a range of sustainability challenges and opportunities, and some companies employ these concepts in their sustainability strategies and development planning. The current depth of theoretical understanding does not lend itself to management strategies, but one fruitful avenue is to explore how information systems can be better deployed to support these concepts and sustainability management in general.*

Originality/Value - *The paper provides an accessible exploratory review of how academics and companies are focusing on the concepts of the circular economy, natural capital and resilience in the tourism and hospitality industry. As such, it will be of interest to academics, students and practitioners interested in the hospitality industry.*

Keywords- the circular economy: natural capital: resilience: sustainability: information systems.

Introduction

Hospitality and tourism is one of the largest industries in the world and while it generates a diverse range of economic benefits, it is seen to produce a number of much less positive environmental, social and cultural impacts. While there is recognition of “the growing importance of sustainability to the tourism and hospitality industry” (Boley, 2011, p. 22), Lim (2016, p. 161) argued “an ongoing challenge facing hospitality and tourism academics, policy makers, and industry practitioners is dealing with the complex issue of sustainability.” In concluding some personal reflections on sustainability in the hospitality industry, Jones *et al.* (2016) suggested that there was little genuine corporate appetite for the transition to a more sustainable future. Further, the authors argued this conclusion reflected the industry’s construction of a definition of sustainability rooted in business imperatives, its failure to commission independent external assurance, and its commitment to continuing economic growth. However, the authors also called on the academy to continue its research endeavours on sustainability within the hospitality industry, to draw on, and contribute to, appropriate conceptual and theoretical frameworks. This, in turn, would allow scholars in the hospitality industry to more fully integrate their work into the wider body of knowledge on sustainability within the business and management literature.

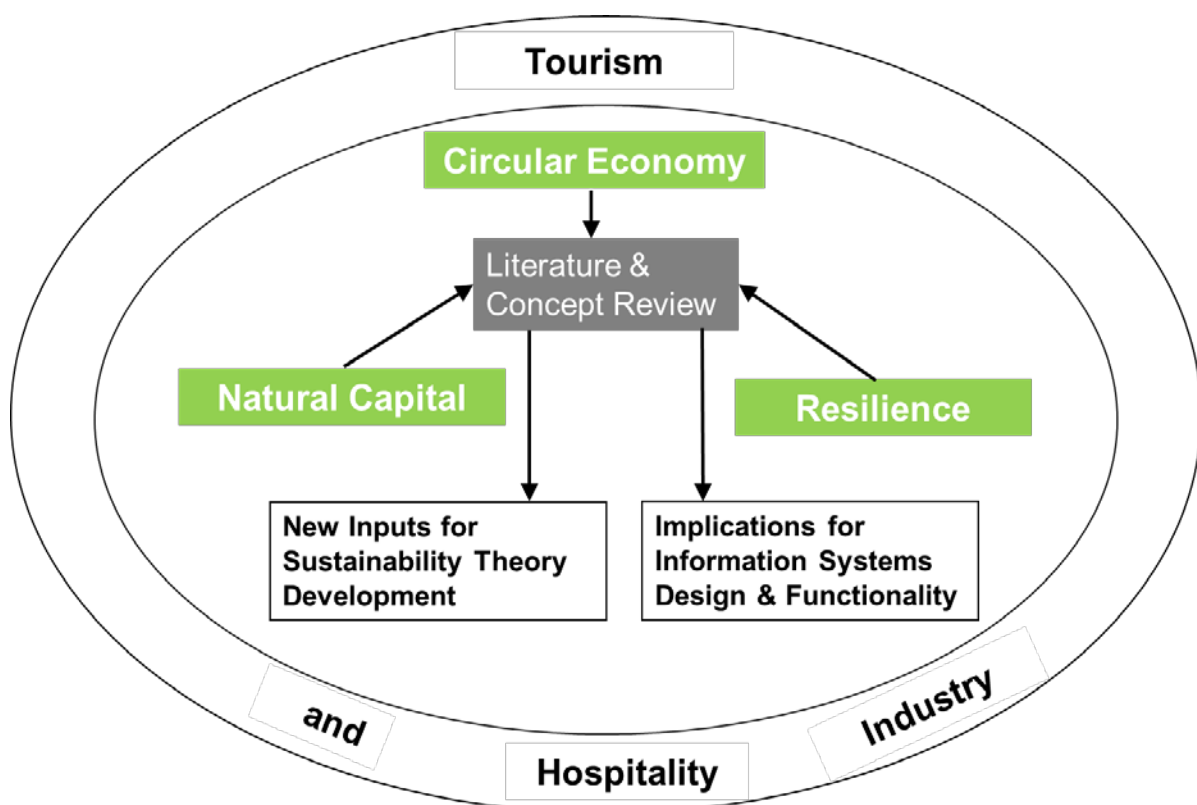


Figure 1. The circular economy, natural capital and resilience: scope of paper

The authors look to pursue these suggestions through an exploratory analysis of how the concepts of the circular economy, natural capital and resilience, seen to be central to

sustainability, are illuminating academic research and informing business practice within the tourism and hospitality industry. The Ellen McArthur Foundation argued that “a circular economy is restorative and regenerative by design, and aims to keep products, components, and materials at their highest utility and value at all times” (Ellen McArthur Foundation, 2017, webpage). The concept of natural capital can simply be defined as “the elements of the natural environment that provide valuable goods and services to people” (Natural Capital Committee, 2015, p.2). Resilience is seen as “the ability of a system to prepare for threats, absorb impacts, recover and adapt following persistent stress or a disruptive event” (Marchese *et al.*, 2017, p. 1275).

More specifically, this paper offers an exploratory review of some of the academic literature on the circular economy, natural capital and resilience and examines how a number of companies and industry bodies within the tourism and hospitality industry have employed these concepts in their business operations and development planning. In undertaking this exploratory review, the authors conducted an Internet search for information, using the key phrases “circular economy”, “natural capital” and “resilience” firstly with the term “tourism industry” and secondly the term “hospitality industry”. These searches were conducted in March 2018 using Google and Google Scholar as the search engines. The paper then identifies two issues that might help to drive future directions for scholarship and business practice. Firstly a theoretical contribution as to how the concepts of the circular economy, natural capital and resilience might be integrated into wider theories of sustainability. Secondly, a more practical contribution, which looks to explore a developing role for information systems in supporting the circular economy, natural capital and resilience programmes and more generally in driving sustainable development (Figure 1). This latter endeavour adopts a business process management approach in assessing new concepts and required support systems (Bekele and Weihua, 2011).

Literature Review

Within the tourism and hospitality research literature, there is growing interest in the concepts of the circular economy, natural capital and resilience. While it is not the intention here to provide a comprehensive review of this body of literature, a few examples illustrate the nature, variety and direction of this work. Much of the work on the circular economy to date has been undertaken in China, “where the perspective on the circular economy is broad, incorporating pollution and other issues alongside waste and resource concerns, and it is framed as a response to the environmental challenges created by rapid growth and industrialization” (McDowall *et al.*, 2017, p.651). That said, Ming (2006) claimed that while the concept of the circular economy has been applied in the agriculture and construction sector within China, its introduction and application into tourism, had, to that date, been limited. Pattanaro and Gente (2017, p. 49) came to a similar more general conclusion and suggested “at present, research work shows that the academic debate on circular economy is quite limited.”

Some of the work has focused on general issues associated with the incorporation of the circular economy concept in tourism while other work has examined specific tourist areas and activities. Ming and Shu (2007), for example, argued that developing the circular economy of tourism can help to achieve a more sustainable use of natural resources, to

enhance the efficiency of the tourism industry, and to enable tourism to contribute more effectively to sustainable development. At the same time, Ming and Shu (2007) also recognised that developing a circular economy approach within the tourist industry is complex and requires the implementation of appropriate legislation and policy and greater advocacy of green consumption. In a similar vein, Girard and Nocca (2017) proposed a circular economy model to help to make tourism more sustainable, and they recognised that circular tourism requires the development of appropriate tools and indicator data, to test the efficiency of this model. In looking to develop both the concept and the operation of the circular economy in tourism, Ming (2006, webpage) argued that “actualizing (the) tourism circular economy” is important for promoting the sustainable development of tourism. More recently, Zhang and Liao (2013) outlined possible development directions for the tourism circular economy within China.

Two examples provide illustration of more specific research into the application of circular economy thinking within tourism. Zhang and Dong (2015), for example, identified a number of problems in seeking to develop a circular economy model for the Mount Emei Scenic Area in Sichuan Province in China. There, problems included a lack of understanding of the concept of the circular economy in tourism, excessive tourist pressure on specific sites within the scenic area, and low resource recycling rates and the quality of employees. In looking to address these problems Zhang and Dong (2015) drew up a tourism circular economy model built around greater government involvement in the tourist economy, encouragement for accommodation and catering companies to develop green procurement of raw materials, waste management, energy saving initiatives and designing tour routes using environmentally friendly vehicles.

Scheepens *et al.* (2016) reported the findings of a case study of a business model for sustainable water recreation in Friesland in the Netherlands. More specifically, they look to apply benchmarking and an analysis of stakeholder actions required to support the transition to a sustainable business, to analyse, design and implement a new business model. While the results suggested ways to help to avoid pitfalls in the design of circular business models and provided a number of environmental benefits, customers’ failure to perceive and appreciate the value of such an approach meant that support for it was not strong enough to overcome powerful market competition.

The role of the circular economy as specifically applied to the hospitality industry has, to date, received very limited attention in the academic literature. In general terms, Van Rheede (2012, webpage) argued that “by applying the principles of a circular economy, hospitality and tourism companies can accelerate their own businesses and move forward in thinking and action to create a more sustainable experience for all stakeholders involved in the hospitality and tourism industry.” More generally, Sing *et al.* (2014) estimated the environmental and financial benefits that recycling waste can produce for the hotel industry, and Pirani and Arafat (2014) have claimed that waste mapping, a tool increasingly employed in developing circular economy action plans, can reduce the waste generation in the hotel industry. However, a more explicit academic focus on the circular economy specifically within the hospitality industry is still to be developed. Thus, in terms of the circular economy in the tourism and hospitality sector, it is evident that water management, waste management and energy monitoring are increasingly recognised as key activities in an

emerging strategy for sustainability management, and that these will require appropriate systems support for the capture, processing, analysis and reporting of data and information.

Although Saarinen (2014) suggested that the natural environment has been a major attraction for tourists since just before the industrial age, when the wealthy upper classes sought to escape periodically from increasingly crowded urban environments, Collins (1999) was one of the first authors to explicitly discuss the relationship between tourism and natural capital. He argued that the tourism industry had been “hijacking” the terms “ecotourism” and “alternative tourism” as popular labels for “sustainable tourism” in an attempt “to justify further commercial exploitation of culturally and environmentally sensitive areas”. This led him to explore “the use and abuse of sustainability principles in tourism development from what may be termed an explicit natural capital perspective.” He concluded that much of what is described as sustainable tourism development, “cannot be genuinely conceived of as sustainable” (Collins, 1999, p.99). However, in an “overview” of the concept of “sustainable tourism”, Hardy *et al.* (2002, p.475) referred to natural capital just once and that was in relation to the economic factors driving sustainable development and not to tourism. In a more recent “comprehensive literature review” of “sustainable tourism”, Zolfani *et al.* (2014, p. 1) made no explicit reference to natural capital.

While academic research on the role of natural capital in the tourism and hospitality industry is, to date, fragmented and lacks a coherent structure, some examples provide an illustration of the varied nature of this research. Piciu and Trica (2011), for example, examined the impact of tourism on natural capital, and more specifically on tourist related development, tourist related transport and tourist activities including boating, cruising and lodging. They concluded that while growing environmental awareness had an important impact on the tourist industry, economic motives were still primary. Yenidogan *et al.* (2016) argued that one of the key challenges in triple bottom line accounting in sustainability reporting within the hospitality industry is the difficulties involved in measuring natural capital. Raymond *et al.* (2009, p.1303) reported on their work in “mapping community values for natural capital and ecosystem services” in the Murray-Darling Basin region of South Australia, where tourism and recreation were identified as being amongst the most highly valued ecosystem services. They suggested that their findings have implications for how natural capital is “integrated into planning and environmental management in Australia and elsewhere” (Raymond *et al.*, 2009, p.1314). Garrod *et al.* (2006) argued for “reconceptualising rural resources as countryside capital” and in recognising that rural resources are subject to an ever-widening range of pressures, they emphasised the advantages “of adopting a sustainable development approach to identifying suitable policies and strategic action plans to address these increasingly important challenges”(Garrod *et al.*, 2016, p. 117).

A number of studies have examined the role of natural capital vis-a-vis other capital assets. McGehee *et al.* (2010), for example, explored the relationship between tourism-related social capital and perceptions of its relationship with other forms of capital including natural capital, for over 300 tourism industry stakeholders in Virginia in the US. Here structural equation modelling of the data collected from these stakeholders revealed that there was no significant relationship between tourism related social capital and natural capital. Bennett *et al.* (2012, p. 752) employed “a capital assets framework for appraising and

building capacity for tourism development in aboriginal gateway protected areas” in Canada. This study concluded that incorporating natural capital into the framework, along with other capital assets, had an important role to play in ensuring “benefits across the various spheres of a community’s development, while also safeguarding the environment” (Bennett *et al.* 2012, p. 761). Cai *et al.* (2014, p.751) used a “predator-prey model and the correlation between natural and physical capital” to explore natural capital efficiency in tourism. Their results suggested that an “appropriate proportion of natural capital investment” will facilitate long term growth and maximise growth in the number of tourists. In outlining the “economic incentives for restoring natural capital in southern African rangelands”, Milton *et al.* (2003) demonstrated how new opportunities in nature tourism, along with a decline in the profitability of traditional ranching, led to increasing diversification into tourism and hunting. It is thus clear that natural capital is now seen by many as an asset that must be protected and managed along with other assets that we possess - as a society as a whole, or as individual companies and organisations.

Academic researchers have explored a number of issues in examining the concept of resilience within the tourism and hospitality industry. In “reconceptualising tourism”, Farrell and Twinning-Ward (2002, p. 272) emphasised the importance of “resilience analysis and management” (Farrell and Twinning-Ward 2002, p. 284), and more particularly questioned how building resilience and coping with uncertainty could contribute to the success and sustainability of the tourism industry. Espiner *et al.* (2017, p. 1385) argued that the concept of resilience, based as it is on a “social ecological systems approach..... gives it a firm interdisciplinary underpinning in its application to tourism.” That said, they argued that there had been little by way of a critical treatment of the concepts of sustainability and resilience by tourism scholars, before presenting a conceptual model to discuss the relationship between sustainability and resilience in tourism. Drawing on examples from nature based tourism in New Zealand, they then looked to explore some of issues that “a critical insight of the sustainability-resilience nexus might offer both academics and practitioners in the field of tourism studies” (Espiner *et al.*, 2017, p. 1385)

More specifically, Becken (2013, p. 506), in response to Farrell and Twinning-Ward’s (2002) call for further research on resilience, developed a “framework for assessing resilience of tourism sub-systems to climatic factors.” Here, the focus was on climate disturbances and stress, and their impacts on tourism activities. Becken (2013, p. 506) provided empirical information that helped to identify eleven surrogates that describe the factors that shape resilience and are seen to be important in maintaining “tourism profitability.... in the face of climatic events.” With a wider focus, Calgaro *et al.* (2014, p.341) presented “a framework for assessing the vulnerability and resilience of tourism destinations” which was described as “the first framework to chart the complex manifestation of vulnerability and resilience in tourist destinations.”

Though Lew (2013, p. 14), suggested that “tourism scholars had been somewhat slow to adopt recent conceptual ideas related to community resilience”, this is certainly an emerging area of academic endeavour. He outlined a matrix model, based around both the scale and the rate of change within tourism, which presented four contexts, each with distinct resilience issues, and which, in turn, were associated with specific responses, including facilities and services maintenance programmes, training and welfare support

systems. Bec *et al.* (2015) suggested that some of the academic work on community resilience had focused on the tourism system's ability to respond to short term problems and looked to identify core concepts of community resilience to develop a framework to explore community resilience to long term tourism decline. Amir *et al.* (2015) explored the resilience of communities to rural tourism development in Malaysia, and Powell *et al.* (2017) explored how community resilience could assist sustainable tourism development in the Dong Van Geopark in Vietnam. Sydnor-Bouso *et al.* (2011) discussed the impact of natural disasters on jobs in the hospitality and tourism industry, looked to model job resilience after such disasters, and suggested that changes in jobs within the industry are a function of community resilience.

A number of research studies have examined resilience in vulnerable tourism areas and industries. Biggs (2011, webpage), for example, examined the "perceived resilience of reef tourism enterprises on Australia's Great Barrier Reef to large disturbances or shocks." His findings revealed that where owners and managers are themselves "active in reef tourism as a lifestyle choice" this enhances enterprise resilience. He argued that "financial and marketing support are the most important actions governments can take to support enterprises in the face of a large shock." In a similar vein, Biggs *et al.* (2012) explored the resilience of both formal and informal tourism enterprises in a study of reef tourism in Phuket in Thailand. Recognising that coral reef tourism was particularly vulnerable to both extreme natural events and economic and political shocks, they stressed that enterprise resilience was central to sustainable tourism management and recommended that management policies designed to support reef tourism should encourage enterprise flexibility and facilitate cost cutting measures during times of crisis. Orchiston (2013) looked to examine tourism disaster planning in a high seismic risk area of New Zealand's Southern Alps, and she drew on the business resilience literature to outline an alternative approach to disaster planning for small communities reliant on tourism. In a study of the remote tourist townships of Franz Josef and Fox Glacier in New Zealand's "Glacier Country", Espiner and Becken (2014) used the concepts of resilience and vulnerability to examine how change and response have shaped the community, conservation and tourism. They concluded "vulnerability and resilience are discrete but highly compatible concepts, offering much to the analysis of protected area tourism facing global change" (Espiner and Becken, 2014, p. 647).

Other authors have explored the concept of resilience specifically within the hospitality sector. In a systematic literature review of disaster resilience in the hotel sector, Brown *et al.* (2017) explored how disaster and resilience are framed. This review highlighted the importance of prioritising resilience building in the hotel sector but suggested that improvements were required in the sector's disaster preparedness and concluded by recommending that all stakeholders within the sector should be actively involved in the improvement process. Tibay *et al.* (2017) were concerned to measure the resilience of hospitality businesses in Auckland, New Zealand's largest city. The results revealed that leadership and management, the core competences of staff, market sensitivity, situational awareness and preparation planning were all key resilience attributes.

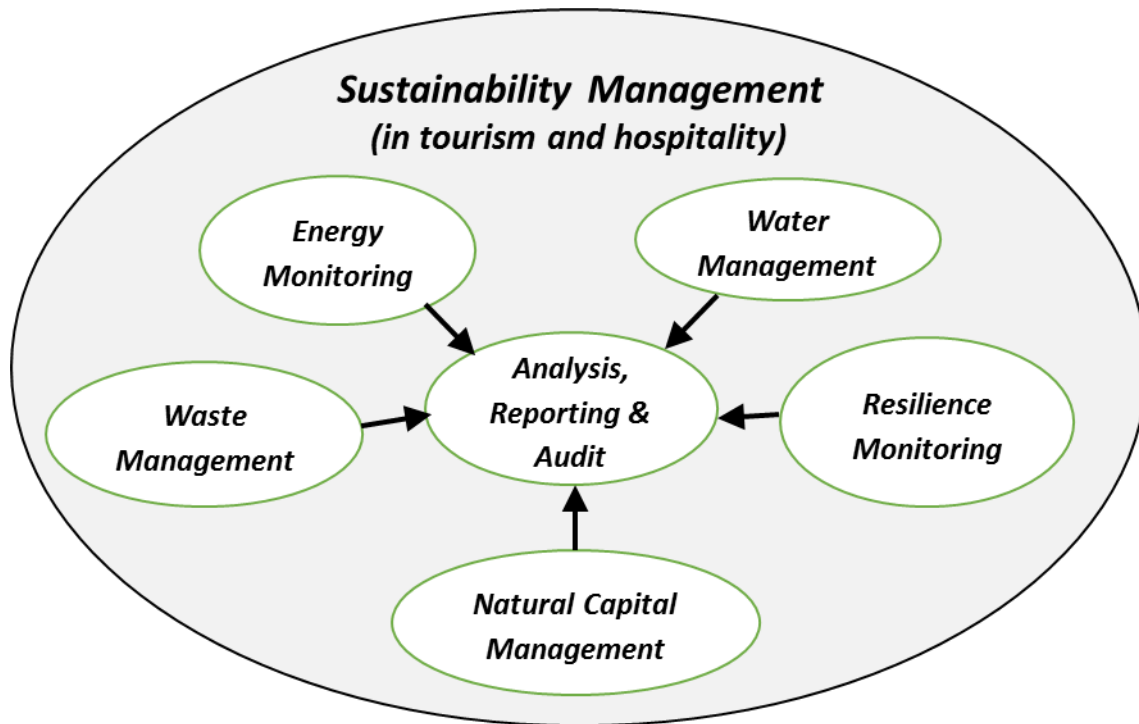


Figure 2. Sustainability management sub-processes in tourism and hospitality

Hospitality scholars have also explored the role and importance of resilience leadership. Haver *et al.* (2014), for example, examined how general managers within the hospitality sector regulated their emotions in the face of complex and demanding leadership duties and responsibilities. The results of this research revealed that “experienced general managers have to develop resilience through extensive experience and wise emotional regulation” (Haver *et al.*, 2014, p. 152). In a study of work engagement and frontline employees’ satisfaction within the hotel industry, Karatepe and Karadas (2015) revealed that resilience was one of the best indicators of psychological capital, which *inter alia*, was seen to be important in managing service encounters.

The foregoing discussion suggests that sustainability management is emerging as a core business process in the tourism and hospitality industry, encompassing a number of sub-processes related to the concepts of the circular economy (water, waste and energy management) natural capital and resilience (Figure 2). The need to provide information technology support for these sub-processes is equally evident, to allow the capture, analysis and reporting of key sustainability management information.

Approaches to the Circular Economy, Natural Capital and Resilience within the Tourism and Hospitality Industry

The significance of these concepts has been recognised by a number of companies and voices within the tourism and hospitality industry in their development of sustainability strategies and programmes. In reviewing such approaches within the industry, the aim here again is to illustrate the nature and variety of such approaches rather than to offer a comprehensive review. In general terms, Brightley (2017, p. 2), writing under the banner of the International Institute of Gastronomy, Culture, Arts and Tourism, suggested developing “a circular tourism economy could help to bring about the sustainable use of resources, enhance the efficiency of the tourism industry and achieve the sustainable development of tourism.” Further, Brightley (2017) argued a number of ways in which the adoption of more circular thinking could effectively contribute to sustainable development including more efficient waste management, optimising the energy and water efficiency of buildings and making increasing use of renewable energy resources. Servin (2017) has suggested how hoteliers can reduce their water footprint, improve their eco-credentials and contribute to the circular economy by the laundry choices they make and by purchasing products with a view to the ability of such products being reused and/or recycled. Green Tourism (2016, webpage) argued “opting for circular tourism allows travelers to take a responsible approach at all stages of their stay, from preparing for the trip to the local experience.”

The commitment to the circular economy within the tourism and hospitality industry increasingly spans both national and international companies. Under the banner “Tomorrow’s Needs Today”, Martin’s Hotels (Taylor, 2017, webpage), the Belgian hotel chain, has the circular economy model in its purchasing, waste and renovation projects. In pursuing its purchasing policy, for example, Martin’s Hotels looks to give priority to local, natural, recycled, recyclable and seasonal products, to minimise the flow of incoming waste and to maximise the recycling of the waste that is inherent to the hotel business. Thomas Cook Group (2018, p. 20) used a cameo case study to illustrate its approach to “operational efficiency” in its drive to “conserve natural resources, improve energy security and support efforts to return waste to meaningful use, contributing to a circular economy.” The Coca Cola Company (2018, webpage) reported that one of its global goals “sets out a vision for us to achieve a true circular economy where everything we use is designed to be reused and recycled, and very little is thrown away.” More specifically, the company outlined its pilot programmes in the US, which are focused on designing for reuse, collecting, recycling and reusing to close the loop.

There has also been interest in how circular economy thinking might be applied at tourist destinations. The South Pacific Tourism Organisation (2017), for example, has suggested that the opportunities created by a move towards the circular economy could be important in more effective waste, water and energy management and in creating employment within the industry. The BLUEISLANDS project (Network of European Regions for a Sustainable and Competitive Tourism Sector, 2018, webpage) emphasised “the potential of sustainable tourism as a lever to promote circular economy” across over 60 islands in the Mediterranean. Here, the focus is on identifying, addressing and mitigating the effects of the seasonal waste generated by the tourist industry on the islands.

More extensively, Manniche *et al.* (2017, unnumbered front cover) produced an extensive handbook “for transitioning toward a circular economy within the tourism and hospitality sectors in the South Baltic Region.” The aim is to support the integration of elements of the circular economy into the business models of small and medium sized enterprises in four regions namely, Pomerania in Poland, Klaipeda in Lithuania, Kronoberg in Sweden and Bomholm in Denmark. The concept of the circular economy was applied in the accommodation; food service in hotel restaurants; and the spa and wellness sectors of the tourism and hospitality industry. In addressing refurbishing and decorating hotels, for example, the handbook showcased the “Green Solution House”, a 4 Star Danish hotel and conference centre, as a demonstration project for the circular economy.

The tourism and hospitality industry has also stressed the importance of natural capital in promoting specific areas and destinations. Over two decades ago, Australia Capital Territory (1997, un-numbered front page) published “Promoting the Natural Capital”, subtitled “A Nature Based Tourism Strategy for the Australia Capital Territories.” Here nature-based tourism is defined as “all forms of tourism focusing on visitation to natural or near natural areas” (Australia Capital Territory p. 1). The strategy looked to encourage “the further development of a sustainable industry for the Territory” (Australia Capital Territory 1997, p. 2). One of the planned outcomes for this strategy was that Territory’s natural and cultural values would be protected and appreciated by the community and industry and here “integrating tourism and land management for conservation” was seen to underpin continuing sustainable development. A natural capital consultant Honza Kerver (Kerver, 2017, webpage) emphasised the vital importance of natural capital in underpinning the local economy in the Yellowstone National Park in the US and claimed, “in 2016, more than 4 million people visited the park. This benefited Montana to the tune of \$3.7 billion in visitor spending and 65,000 jobs, in its leisure and hospitality sector.” Further Kerver (2017, webpage) argued, “keeping Yellowstone’s natural capital protected and intact is vital for the many families in the region that rely on tourism.”

Under the banner “Protecting Natural Capital”, Wyndham Worldwide (2017, webpage), for example, reported on energy use, carbon emissions, water and waste in its 2016-2017 Corporate Social Responsibility Report. In addressing water management, the company reported on its water conservation programmes, measures to address local water risks and the implementation of innovative water savings schemes. The company’s water conservation programme looks to “promote cleaner water and more conservative and efficient water consumption” while programmes have also been established to address “water scarcity, water stress, flood occurrence and pollution” (Wyndham Worldwide 2017, webpage) in a number of the company’s locations. In a similar vein, Marriott International (2017, p.24), emphasised its “support for natural capital initiatives across the globe”, and recognised that “biodiversity is critical to ensuring health ecosystem and a viable planet.” Further, the company reported relying “on these ecosystems, or natural capital, for basic necessities, security and health” and that “key benefits for valuing and protecting natural capital include reducing risk, lowering cost, enhancing brand and company” (Marriott International, 2017, p. 31).

Companies and industry bodies within the tourism and hospitality industry have also drawn on the concept of resilience. In addressing climate change in its 2017 Sustainability Report,

the Thomas Cook Group (2018), for example, outlined the company's response to the impact extreme weather events were having on its business and on causing flight delays and significant disruption for its customers' holidays. Here the company outlined its approach to enhancing resilience "by operating more efficiently and reducing our impact on the environment and our demand for natural resources" and by "understanding our exposure to, and impact on, climate change" (Thomas Cook Group, 2018, p.5). In its 2016 Responsible Business Report, The International Hotels Group reported on its commitment "to continue to enhance disaster preparedness efforts in International Hotel Group hotels and local communities, to deliver greater community resilience" (International Hotels Group, 2017, p. 16).

Future Directions: Theoretical and Practical/Managerial Contributions

Looking to the future, a wide range of academic research issues on the circular economy, natural capital and resilience within the tourism and hospitality industry merit attention. While it is not the purpose of this paper to provide a comprehensive schedule of such issues, a few illustrative examples can be identified. In addressing the circular economy, for example, future academic research might focus on how specific companies within the industry are embracing the circular economy and on the challenges and barriers they face in pursuing such a strategy throughout their supply chains. Further, tourism and hospitality consumers' perceptions of, and enthusiasms for, the changes that the circular economy will demand, will provide valuable insights into what may be a radically changing consumption process. Researchers may wish to explore wider international dimensions of the circular economy and to focus on how major players within the industry are connected to both local and global recycling networks. Research into perceptions of the concept and the definition of natural capital and of its importance and value in strategic decision making within the tourism and hospitality industry would help to shed light on what may increasingly become a complex and testing issue for the industry. Consumers' perceptions of the value of natural capital, particularly in sensitive and prized environments, will also shed light on possible future changes in the consumption process within the industry. Similar research agendas can be identified for scholars interested in resilience and here, work on approaches to measuring resilience, for example, in the face of climatic change, and measuring the success of recovery programmes seems likely to repay endeavour.

However, there is also a pressing need to explore how the concepts of the circular economy, natural capital and resilience, either individually or collectively, can make a theoretical contribution to the understanding of sustainability. In many ways the tourism and hospitality industry would seem to offer an ideal arena for such work in that it not only illustrates, but also depends on, so many of the environmental, social and economic elements that fundamentally underpin sustainable development. However, while theory is vital in helping to understand and plan successful implementation of sustainability agendas and programmes, work on theories of sustainable development has received much less attention than empirical studies of the achievements of corporate and government sustainability strategies.

There have been some attempts to address the theoretical underpinnings of each of the concepts of the circular economy, natural capital and resilience, but this work has been

more concerned with underlying principles rather than the development of theory itself. Kalmykova *et al.* (2017, p. 10), for example, provided a short review of what they described as “the theory ... of the circular economy” but here the focus was on “stock optimization, eco-efficiency and eco-effectiveness” and the authors recognised that there “isn’t a unified theory.” In a similar vein, in addressing the circular economy, Ellen MacArthur Foundation *et al.* (2015, p. 14) simply suggested that “the concept rests on three principles: preserve and enhance natural capital, optimize yields from resources in use, and make the system more effective by removing negative externalities.” At the same time natural capital has been examined as an element in “the theory of economic growth” (England, 2000), rather than as a theoretical challenge in its own right; and while Zimmerman (2013) suggested that “resilience theory” provided a conceptual framework for understanding child and adolescent development, no such frameworks have been applied in work on sustainability.

As such, the development of theoretical work on the circular economy, natural capital and resilience, developed within tourism and hospitality would seem to be fertile territory for future research endeavour. That said, such an approach would not only need to recognise the potential linkages between the three concepts, but also the complex and interlinked array of environmental, social, economic and political factors associated with, and at times undermining, these concepts. Work by Chiesua and de Groot (2013), which looks to provide a “socio-cultural perspective” on “critical natural capital”, may provide a possible way forward here, in that the authors highlight the importance of a range of factors including health, recreation, amenity, and heritage, for the quality and sustainability of human life.

However, given the concepts of the circular economy, natural capital and resilience are widely seen to be central to sustainable development, then an approach to theory development which embraces these concepts under the wider umbrella of sustainability, might have more to commend it. As interest in sustainability has gathered momentum so a number of attempts have been made to conceptualise sustainability and two approaches - the first based on a liberal pluralist perspective and the second rooted in political economy - would seem to offer opportunities to contribute to the development of a greater theoretical understanding of sustainability within the tourism and hospitality sector.

Firstly, stakeholder theory suggests that companies should be sensitive to the needs of a wide range of stakeholders. In developing a model of stakeholder management for sustainability, Garvare and Johansson (2010, p.737), for example, argued, “contemporary organisations must satisfy a variety of stakeholders.” Steurer *et al.* (2005, p. 264) explored the relationship between sustainability and stakeholder theory and examined how “corporations are confronted with economic, social and environmental stakeholder claims.” A wide, and increasingly growing, range of stakeholders are bringing their influence to bear on the tourism and hospitality industry and future research which looks to analyse the role of these stakeholders, could add to the current theoretical understanding of sustainability within the industry. At the same time, given the global reach of the tourism and hospitality industry, such work might be particularly valuable in integrating a greater understanding of the international dimensions of sustainability, not just within the industry itself, but also more widely within the corporate world.

Secondly, there have been attempts to develop a more critical theory which embraces competing perspectives. Amsler (2009, p.127), for example, argued that “the contested politics and ambiguities of sustainability discourses” can be embraced to develop a “critical theory of sustainability.” She further argued that current debates should be located “within a broader tradition of social criticism” and that “competing interpretations of sustainability” should be viewed as “invitations to explore the complex processes through which competing visions of just futures are produced, resisted and realized” (Amsler, 2009, p.125). Castro (2004) has sought to lay the foundations for a more radical theory of sustainability by questioning the very possibility of sustainable development under capitalism and arguing that economic growth relies upon the continuing and inevitable exploitation of both natural and social capital. While such approaches may seem both unfamiliar and challenging to many tourism and hospitality scholars, they may provide new insights into the workings of the industry and its relationship with its political, social, economic and physical environment. In shining a light on some of the contested issues within the ocean cruising industry and the development of tourism within fragile environments, for example, researchers may be able to add powerful economic and political dimensions to the theoretical understanding of sustainability within the tourism and hospitality industry.

The academic community will continue to work on developing a deeper theoretical understanding of the circular economy, natural capital and resilience and on the wider concept of sustainability, within the tourism and hospitality industry. However, in addressing “sustainable development and its implications for industry”, Welford (2016, p. 6) argued that “strategies are needed to translate conceptual theories into practical reality.” That said, at the present time the level and depth of the theoretical understanding of the three concepts and more widely of sustainability does not easily lend itself to management strategies that will find widespread favour within the tourism and hospitality industry. However, one potentially fruitful practical avenue is to explore how information systems can be employed to support these concepts and wider sustainability initiatives within the industry.

Over 20 years ago, Poon (1993) suggested that information technologies were being rapidly diffused throughout the tourism and hospitality industry and no player would escape the repercussions. More recently, Law *et al.* (2009, p. 599) noted that “IT is increasingly becoming critical for the competitive operations of the tourism and hospitality organizations as well as for managing the distribution and marketing of organizations on a global scale.” More recently, with reference to the need for sustainable business practices, the Economist Intelligence Unit (Economist Intelligence Unit, 2009, p. 4) noted that “information technology (IT) is not itself a big part of the problem, as it is estimated to contribute only a small percentage of global carbon emissions. But it can be a big part of the solution.” IT will likely be most useful in making sure that information is available and presented in such a way that it empowers executives to make intelligent decisions regarding the circular economy, natural capital and resilience. TechUK (2015, p.13) suggested “problems of resource scarcity, pollution and constraints on energy use” are “particularly compelling for the technology sector”.

Most authors agree that IT can play a key sustainability role in data management, in terms of the monitoring of greenhouse gas emissions, energy use and other environmental

parameters. At the same time, “rapid rates of improvement in smart phones, telecommunication systems and other forms of IT enable solutions for sustainability” and “this provides opportunities for the fields of telecommunication and information systems” (Funk, 2016, p. 861). In the specific context of the hospitality and tourism industry, Klupacs (2016, webpage) has recently observed that “new technologies which help your business become resource efficient can both create a competitive cost advantage and further reinforce your focus on sustainability at the same time. Chosen wisely, these investments can be profitable and win over the hearts of your customers.” More pointedly, the Aurecon Group (2018, webpage) noted “technology is advancing at a faster pace than ever before, and this is changing both the expectations of patrons as well as the way in which the hospitality industry conducts its business.” This is relevant to the above discussion, because the concepts of the circular economy, natural capital and resilience are now being incorporated into the design of mainstream information systems, benefitting from new means of data capture, and dovetailing with the increased focus on data analytics and information reporting that many industries are now demanding (Figure 3).

There are several mainstream technologies now impacting the tourism and hospitality sector, and these in turn are being shaped and configured by the need to support and process the requirements of the sustainability concepts discussed above. At the so-called “front-end” of the sales order processing cycle, the use of third-party websites allied to social media has revolutionised the way in which the tourism and hospitality industry operates, driving down costs and improving customer choice. Insta Research Ltd (2018, webpage) aptly summarised this change thus: “IT and the Internet have transformed distribution of the tourism product to form an electronic market-place where access to information is instantly achievable” and “the dramatic ongoing development of the Internet has resulted in the re-engineering of the entire production and distribution process for tourism products.” The application of these technologies has now put the customer centre stage. This trend was started by Lastminute.com in the dotcom era, and websites like Trip Advisor have become a main access point for those seeking information on holidays, hotels and leisure facilities. Newer social media tools like Facebook and Twitter are now an integral part of daily hotel operations and need to be integrated with mainstream hotel information systems.

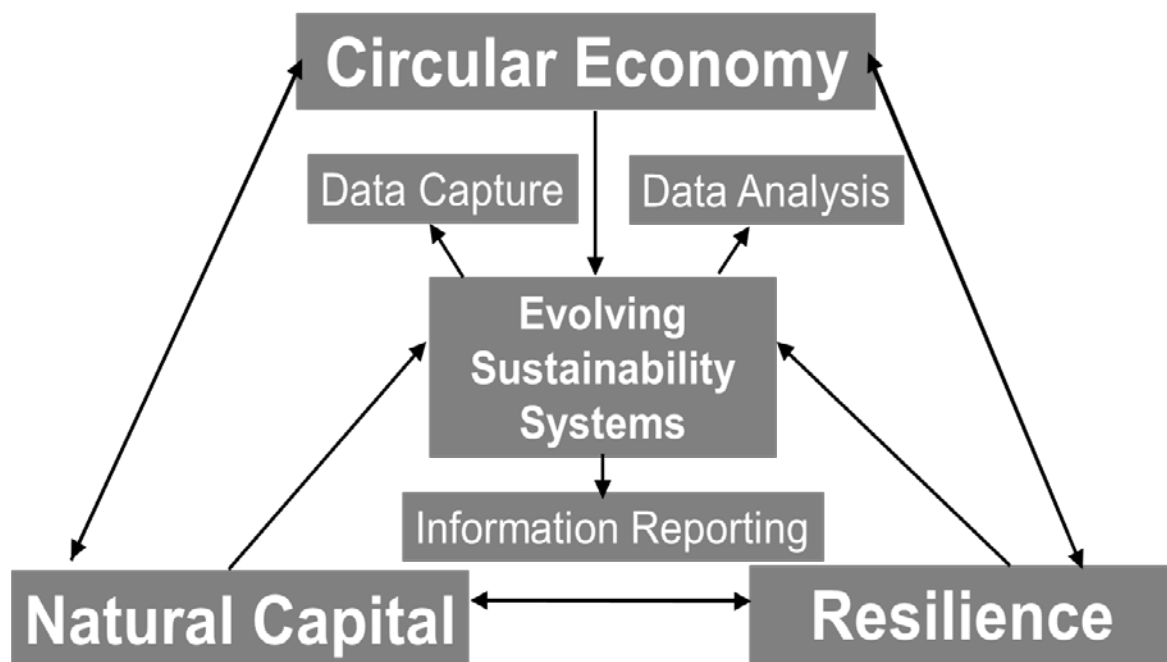


Figure 3. Data capture, analysis and reporting from evolving sustainability systems

Integration of technologies is a more general trend that is impacting tourism and hospitality operations, and is particularly relevant to the accommodation of sustainability management moving forward. Hotels, for example, span many functions - from accommodation and event catering to specialised facilities such as golf or health spas. Each of these areas has traditionally operated using standalone information systems, resulting in silo like administrative and information structures. Integrating these systems provides a more efficient back office financial accounting and reporting capability, and also supports the provision of improved customer service. For example, many hotels can input guest preferences into their databases so that their visitors can have more personalized experiences upon their next hotel stay. In addition, such integrated systems can now be hosted off-site, available as a service (Software as a Service - SaaS), delivered over the internet via the Cloud, rather than being held on premise, and this also has the potential to drive down costs in the hospitality sector. As Garg and Buyya (2011, p.12) note, “there are several technologies and concepts employed by Cloud providers to achieve better utilization and efficiency than traditional computing. Therefore, comparatively lower carbon emission is expected in Cloud computing due to highly energy efficient infrastructure and reduction in the IT infrastructure itself by multi-tenancy.” Upfront hardware costs are lower, as are associated expenses such as full time, in-house IT staff; and implementation timetables should be reduced. These developments are helping to make hospitality operations more efficient in their use of human and physical resources and thus more sustainable; and the widening use of mobile devices - tablets, mobile phones, smartphones and laptops - and the use of “apps” that either run or link up to hospitality information systems, means that these benefits can be gained even by smaller scale operators.

More specifically, the need for companies in the tourism and hospitality industry to address the circular economy, natural capital and resilience, as part of their wider approach to

sustainability, is driving major changes in software functionality and design. Some of the major software vendors are now developing their flagship Enterprise Resource Planning (ERP) products to sell into the tourism and hospitality sector. This requires adaptation of these products to fit the business model of companies in this sector. For example, both Infor and Epicor, major ERP vendors, now have versions of their ERP products specifically geared to the tourism and hospitality sector, and both companies stress the benefits of integration of systems and related technologies. At the present time, the benefits of the Epicor iScala ERP for the hospitality sector, for example, are “to efficiently integrate all of the hotel’s operations, from room reservation and F&B to event sales, human resources, and finance, on a single platform” (IDG, 2018, p. 11), but new functionality could profitably be developed to support sustainability management.

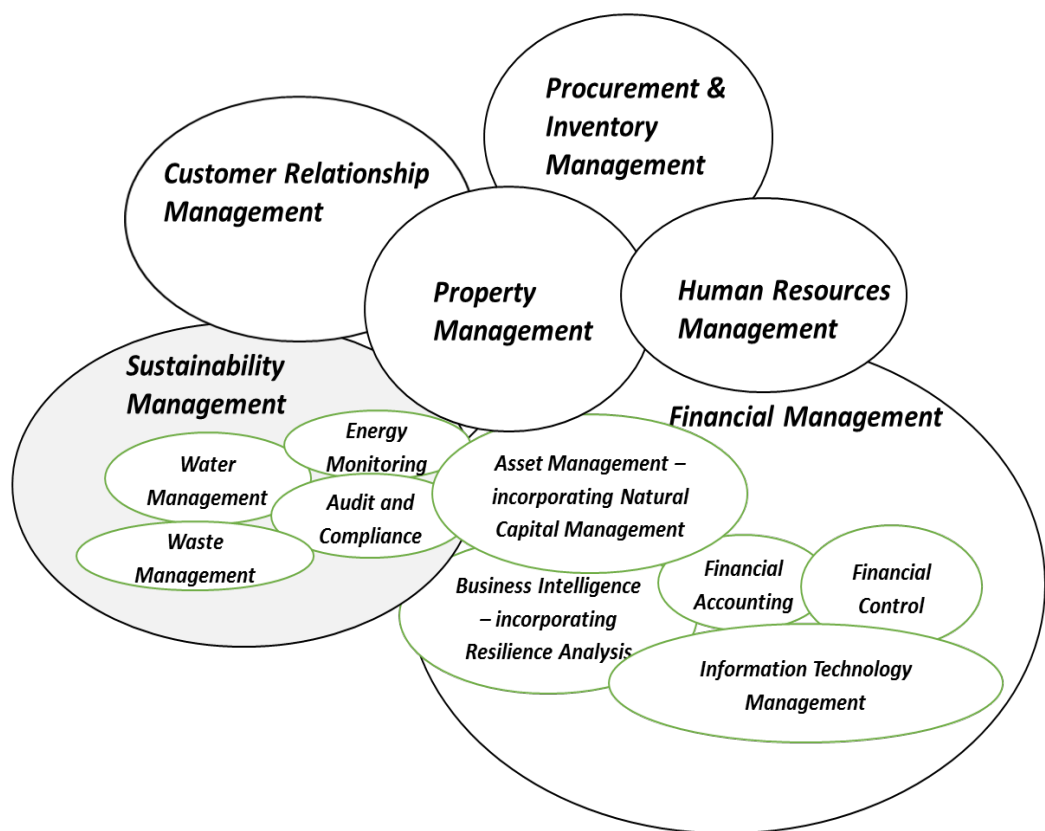


Figure 4. New sustainability and financial management processes in tourism and hospitality management systems

Indeed, tourism and hotel companies may increasingly demand accommodation of sustainability management functionality in ERP software that recognises the significance of the circular economy, natural capital and resilience within these mainstream systems. Systems like those currently available from third parties like Epicor and Infor will be required by end-users and market competition to enhance their systems to effectively support the sustainability data gathering, analysis and reporting processes. This will likely see the further development of ERP systems, though such developments may take time and evolve in a

variety of ways. In terms of the process model that underpins ERP product design and structuring, a new top level process for sustainability management could emerge, encompassing a range of sub-processes, including energy monitoring, waste management and water management that are central to the circular economy concept. At the same time, resilience reporting and natural capital management could be incorporated in some form, possibly as part of the financial management process in the first instance. Resilience reporting may become a dimension of the business intelligence function, of which predictive analytics is a part; and natural capital management will at first most likely be seen as part of asset management, a sub-process within financial management (Figure 4).

Conclusions

In completing this exploratory review, the authors offer a concluding summary before going on to outline both the theoretical and practical implications raised by the review and to identify the limitations of their approach and the potential avenues for future research. The concepts of the circular economy, natural capital and resilience have attracted growing attention within the tourism and hospitality industry, even though all three concepts might be seen to stand in marked contrast to the present patterns of conspicuous consumption actively promoted by the industry. Academic researchers have employed the concepts of the circular economy, natural capital and resilience in a variety of geographical settings and a range of disciplinary contexts, to illuminate the challenges of sustainable development. The work on all three concepts has been clearly pitched under the umbrella of sustainability and taken collectively, it spans the environmental, social and economic elements of sustainable development.

Within the tourism and hospitality industry, a number of companies have drawn on these concepts in reporting on their sustainability strategies and achievements. At the same time, a number of industry bodies have also employed them in looking to provide advice on both tourism development and planning, and in response to natural disasters and shocks, for companies and public sector policy makers. That said, a number of major players within the industry might be seen to be pursuing a weak model of sustainability, which prioritises economic development over natural and social capital. At the same time, they can be seen to be citing their commitment to the circular economy, natural capital and resilience in their sustainability reports, primarily as part of cost cutting and efficiency measures to protect their businesses.

Turning to the theoretical implications, there is little evidence within the literature, to date, of attempts to draw up a conceptual framework to guide future work on all three concepts or to integrate these concepts within existing conceptual and theoretical thinking on sustainability and this clearly is an important future task/goal for tourism and hospitality scholars. In pursuing this goal, on the one hand, scholars may be advised to take a grounded theory approach in that it emphasises the development and building of theory from empirical data, which may be particularly appropriate in the tourism and hospitality field, where the study of the circular economy, natural capital and resilience are still at a formative stage. On the other hand, researchers might also profitably look to reflect on their empirical work to inform and potentially develop existing theories of sustainability and here

work on stakeholder management models and on theories which draw on political economy seem likely to pay dividends.

A number of practical and managerial implications can be identified for those companies within the tourism and hospitality industry that are looking to more fully and more genuinely embrace these concepts as part of the transition to a more sustainable future. Such companies would be advised to look to improve their sustainability reporting processes, to improve stakeholder engagement in the reporting process, to commission independent external assurance of the data included in their reports and ultimately to improve the integrity and the transparency of the reporting process itself. Here reporting on the circular economy, natural capital and resilience will need to be seen to be increasingly important elements in companies' core business strategies. At the same time, new systems functionality will be required from software vendor companies to allow users to capture, process and report on how an increasing focus on the circular economy, natural capital and resilience is contributing to both sustainability and broader company strategy. These developments come at a cost, which some companies may be reluctant to bear in the short term, but embracing these concepts, as integral elements of corporate sustainability strategies, may be vital for long term business survival and success.

Finally, the authors recognise that the review has a number of limitations. On the one hand, it draws its material exclusively from secondary sources, published in the English language and accessed via the Internet and as such, for example, faces the familiar problems of personal bias in selection and reliability. On the other hand, the corporate and industry body material cited effectively represents the strategies and policies of those organisations that are already exploring the role of the circular economy, natural capital and resilience within the tourism and hospitality industry and thus it cannot necessarily be seen to reflect the views of the industry as a whole. Nevertheless, the authors believe that as an exploratory review it provides a platform for future research. Looking to the future, such academic research might profitably look to involve primary research on whether, and how, a range of stakeholders are becoming involved in putting pressure on companies within the industry to introduce the concepts of the circular economy, natural capital and resilience in to their sustainability strategies. At the same time, researchers may wish to explore if, and how, customers' perceptions of the sustainability credentials of companies, as reflected in their commitments to the three concepts, influence their buying and patronage behaviour. Elsewhere in the supply chain, there are also interesting opportunities to examine if, and how, a wide range of suppliers are embracing the principles of the circular economy, as part of their developing relationships with the major corporate players within the industry. Such change will inevitably have a knock-on effect on major systems design and functionality, which is also an area for future research and development.

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