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Implications for tourism of a future transition to a low-carbon economy

Abstract

In the near future, global economic production systems will be forced to transition from the current high-carbon linear production system characterised by a ‘take, make, dispose’ approach to a low-carbon production system based on recycling. This paper briefly discusses how previous global scale economic production systems have transitioned through a series of revolutions including the Agricultural Revolution and the Industrial Revolution to create today’s high-carbon economy and mass tourism. The paper then considers implications for the tourism industry of a future transition to a low-carbon economy and suggests three propositions that can provide a baseline for future research. The paper concludes that provided the tourism industry is proactive in its approach to this transition there are likely to be significant opportunities for further growth.

Key words: Climate change, high-carbon, low-carbon, the circular economy, transition, production systems

Introduction

The industrial revolution ushered in a new era of economic prosperity where year-on-year growth in GDP has become the accepted benchmark for national economic success. The economic production systems that underpinned this growth are based on a high-carbon economy characterised by a ‘take, make and dispose’ approach to resource use (Gregson, Crang, Fuller and Holme 2015). In recent decades, there has been growing recognition that this style of resource use is no longer supportable and there is a need to transition to a low-carbon or no-carbon form of resource use based on recycling and renewable energy. Tourism has been a major beneficiary of high-carbon production systems where rising national wealth based on resource exploitation has generated sufficient economic surplus to underpin a massive increase in tourism related consumption.

This paper uses the term low-carbon in preference to sustainability to acknowledge that the concepts underlying the current understanding of sustainability are contested and difficult to calibrate due to rapid ecosystem changes. While the need for a greater emphasis on low-carbon production is acknowledged by international agreements such as the 1997 Kyoto Protocol and the 2015 Paris Agreement, global level strategies to transition to low-carbon production systems continue to encounter opposition from governments and many high-carbon industries (oil, energy companies etc). Achieving a low-carbon production system will require transition from resource use based on ‘dispose’ to one based on ‘recycling’. A radical change of this type will be difficult. It will require enforceable international treaties supported by national governments willing to introduce appropriate policies and regulations. Opposition can be expected to be fierce. Strong citizen support will also be required. The March 15th, 2019 global scale *School strike for climate* sparked by the August 2018 protest by 15 years old Swedish secondary school student Greta Thunberg outside the Swedish Parliament (Watts, 2018) is one example of the type of citizen support that will be required.

Global warming poses an existential threat to global ecosystems, and by extension to human ecosystems (IPCC 2018). Alternative economic production systems have been suggested including degrowth (Hall 2009), the green economy (Law, et al. 2012) and the circular economy (Geissdoerfer, Savaget, Bocken and Hultink 2017). The ultimate structure of future production systems will be determined by the magnitude of the problem encountered by policy makers when they accept that action is required. Early adoption of low or no-carbon production systems will require less radical changes in consumption and production while late adoption will require radical solutions to solve the major environmental and by extension, economic and political problems associated with late adoption.

Tourism research into recycling has largely focused on the enterprise level generally ignoring macro scale, global level issues with the exception of climate change and some work on the green economy and degrowth (Andriotis 2018). There is a high level of endorsement for the need for sustainability, however defined. However, most research has been deductive with a focus on multiple retesting of small scale problems such as consumer demand, enterprise sustainability, tourism planning etc (Prideaux and Yin, 2019). The use of inductive research to explore issues such as a transition to a low-carbon economy has been largely ignored. The aim of this paper is to explore a range of issues related to transitioning global production systems to 'recycle' rather than 'dispose' and ipso facto, how this readjustment may impact on the tourism industry.

The paper reports on the first stage of a two-stage project that examines the impact on tourism of a transition to a low carbon economy. Three propositions are outlined. To develop these propositions the paper will consider how the Agricultural Revolution and the Industrial Revolution have created the current system of production and the tourism system that it supports. Drawing on this understanding the paper briefly reviews the circular economy model as a possible alternative to current production systems. The paper concludes with a discussion on how changes in production systems (capitalist, planned and Chinese) may affect global and local tourism systems. The underlying premise of the paper is that to combat climate change, global production systems must quickly transition to low-carbon production systems. A macro level, global scale is used in the following discussion.

Methodology

Given the future orientation of this paper, an inductive approach was used to identify relationships and models that can be tested more rigorously in later deductive research. This approach facilitates the parallel assessment of numerous related and unrelated issues, in a research space that is shaped by policy responses to problems, many of which are wicked, or difficult if not impossible to solve. The discussion draws on both the academic and grey literature. While the lack of qualitative data may concern some tourism scholars, the outputs of this form of inductive qualitative research will enable identification of issues that may be later tested by quantitative methods. The circular economy was adopted as the key model for discussion in this paper based on its in-principle acceptance by the European Union (Gregson et al. 2015).

Discussion

Changes in production systems in the past

The British Agricultural Revolution and the later Industrial Revolution demonstrate how the dominate production systems of the past have responded to the disruption caused by the

ongoing introduction of new processes and other innovations over time. They provide useful case studies for understanding the processes likely to occur as the current high-carbon economy transitions into a future low-carbon economy. The British Agricultural Revolution describes a centuries' long process of restructuring of British farming practices that led to substantial increases in farm output and decline in the rural workforce. Some authors (Overton 1996; An, Banerjee and Madsen 2010) describe the Agricultural Revolution as a series of sequential revolutions that started several centuries before 1750 and continued in parallel to the Industrial Revolution until at least the middle 19th Century, if not later. Key technologies and trends that provide the impetus to the Agriculture Revolution were the enclosure movement that led to increased farm size, crop rotation, the Rotherham swing plough and new infrastructure including transport, drainage and reclamation (Overton 1996). By the beginning of the Industrial Revolution around 1780 (Hobsbawm 2010), a large number of displaced rural workers were available to work in rapidly growing industrial cities such as Sheffield and Birmingham.

The Industrial Revolution describes the transition of manufacturing processes from hand production of goods including cloth and tools to machine production facilitated by the parallel introduction of new technologies in iron and steel production, use of steam power, the introduction of machine tools and the emergence of the factory system. New transport technologies including railways and improved waterways underpinned the Industrial Revolution by facilitating cheap and fast access to raw materials and after manufacture, to markets (Hobsbawm 2010). One output of this rapid change was the emergence of tourism as an organised industry sector. An unforeseen consequence of the Industrial Revolution was global warming as the per-Industrial Revolution economy based on low-carbon production was replaced by a high-carbon production system based on non-renewable fossil fuels.

A further period of labour force disruption occurred in the mid-20th Century when new industrial processes and information and communications technologies (ICT) freed up labour to be redeployed from secondary industry to the tertiary sector. For example, by the beginning of the 21st Century only 2.55% of the Australian workforce was employed in agriculture. In parallel with the shift from agriculture to secondary industry and more recently to the service economy, the hours of work fell while the productivity of labour increased.

Economic responses to new technologies in the Agricultural and Industrial Revolutions forced the workforce and capital to migrate to the new production system. It can be expected that in a future low-carbon economy, surplus labour will be redeployed to new industries, wages will continue to increase, and tourism has the potential to be a net beneficiary. Figure 1 illustrates this process where the responses to past problems have created the present and where the options that are adopted to solve the problems of today will create the future. The model suggests there are multiple future options, although only two are shown. Unless there is a shift to a low-carbon production system, the future is likely to trend towards the undesirable scenario (Figure 1). A low-carbon production system will produce a more desirable future. Rising concerns about rapid temperature increase will force the transition to a low-carbon economy characterised by a 'make from recycled' production system where recycling will be the main source of resource input and 'dispose' will be largely eliminated as an industrial process. Concurrently, action is required to prevent ecosystem breakdown through ecosystem restoration. Ecosystem restoration using strategies such as reforestation and restoration of peat bogs as mechanisms to draw down atmospheric carbon

This transition will generate significant disruption as older industries and distribution channels are replaced by new industries. Similar disruptions occurred in past transitions. Past experience

suggests that innovative companies and tourism destinations will adoption new ideas and experiences while those that don't may go out of business.

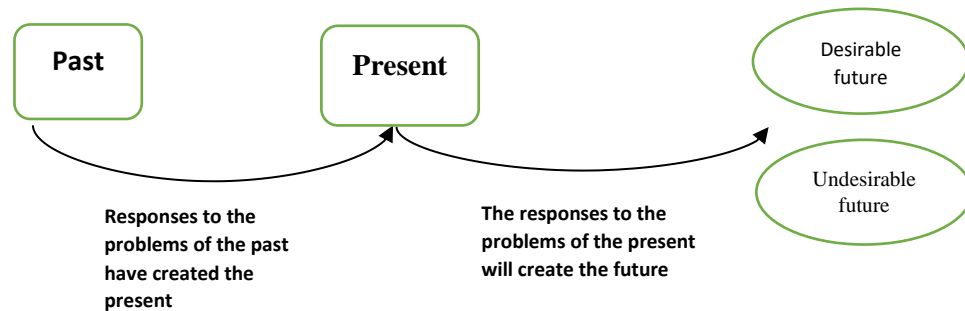


Figure 1 Transitioning from the past to the present and into the future

Candidates for future production systems

Scholars have suggested several alternative models for future production systems including the green economy, degrowth and the circular economy. Only the circular economy model is considered. The current position of the global production system (capitalist, guided and Chinese) can be understood in terms of Figure 1 where global warming will force policy makes to respond, hopefully creating a desirable low-carbon future.

Geissdoerfer, Savaget, Bocken, and Hultink (2017 p. 795) described the circular model of economic production as “as a regenerative system in which resource input and waste, emission, and energy leakage are minimised by slowing, closing, and narrowing material and energy loops. This can be achieved through long-lasting design, maintenance, repair, reuse, remanufacturing, refurbishing, and recycling”. This model is based on strategies that prevent waste, improve production practices by dispensing with inbuilt obsolesce, reuse rather than disposal of resources and use renewable energy. More extreme versions of the curricular economy advocate dematerialisation of the production system but this appears to be unlikely unless a global scale crisis emerges.

As policy makers begin to implement new legislation, numerous changes will occur in production systems. As noted previously, the shift from the low-carbon agricultural economy to the high-carbon economy of the Industrial Revolution generated significant wealth and opportunities for leisure creating the conditions for the emergence of large scale tourism in the 19th Century. The transition into the service economy in the Mid-20th Century, also based on high-carbon production systems, unpinned further rapid growth in mass global tourism.

Implications for tourism

The key issue that must be addressed by the global tourism industry is: will the next revolution in production systems continue the past trend of being tourism friendly? Two parallel policy actions will be required to transition to a low-carbon economy, the first directed at mitigation

of climate change and the second directed at adaptation. The need to respond quickly is demonstrated by the IPCCs (2018) latest report which indicates the extent of changes that will occur at 1.5⁰C temperature increase.

For some time, the main areas of debate and legislative action have involved measures to reduce GHG emissions by encouraging the substitution of fossil fuels by renewables in energy production and more recently in transport. There is a growing movement to replace fossil fuels with new technologies including battery electric and hydrogen. In a recent paper Prideaux and Yin (2019) postulated that the introduction of battery electric and possibly hydrogen powered cars will be accelerated by the transition to a low-carbon economy as global warming increases in coming decades. Another area that will require a response is the GHG emissions generated by global aviation, particularly in the long-haul sector.

There is a growing body of research into strategies to increase the sustainability of tourism enterprises through recycling, switching to renewable energy, and purchasing products that have been manufactured or grown according to ‘sustainability’ principles. However, while useful, most current research has failed to look at the more pressing need to consider the implications for the tourism sector of an economy-wide transition to a low-carbon economy.

The factors that will need to be considered by the tourism industry can be grouped into issues that relate to: the structure of production systems; mitigation and adaptation; robotics; and increased use of Artificial Intelligence. Factors that relate to the transition to low-carbon include the timing and form that a transition may take, how quickly manufacturing and logistics systems can adopt recycling rather than resource extraction as the principal source for inputs, a potential change in food production systems away from animal protein to crop based protein and restructuring and retraining the global workforce. In terms of mitigation the major issue that need to be dealt with is the impact that GHG emission reduction will have on tourism consumption. Issues related to adaptation are likely to include responses to changes in the weather (increasingly severe heat waves in some destinations for example), rapid changes to key tourism ecosystems (eg coral reef dependent destinations), rising sea levels and how quickly tourism infrastructure can achieve GHG emission neutrality.

A third more speculative group of factors that are likely to affect the tourism sector are how the adoption of Artificial Intelligence (AI) and greater automation via robotics will affect global society. In past revolutionary transitions the hours of work have declined to a >40 hour work week in many countries, the length of annual holidays have increased and there has been an increased emphasis of wellbeing. Collectively, these factors have underpinned the explosive growth in domestic and international tourism post World War II. If these trends continue through the transition to a low-carbon global economy, the tourism industry may find that it is on the threshold of a new wave of increased demand, although the structure of the low-carbon tourism sector may be substantially different from that of today.

Based on the foregoing discussion three research propositions are proposed:

1. Transition to a low-carbon economy will create significant disruption in the tourism industry.
2. Approaches to researching the impact of the transition on tourism systems should be both conceptual (model building) and deductive (model testing).
3. Initial theory development should focus on the macro level and include candidate models of possible production systems such as the circular economy.

Conclusion

Transitioning to a low-carbon economy will create massive disruption across society and in global production systems. Many existing jobs and industries will become redundant allowing surplus labour and capital to be redeployed to new industry sectors. Past economy wide transitions stimulated a rapid growth in tourism as well as a reduction in the work week and increased personal disposal income.

A de-coupling of the global economy from the current paradigm of resource will require strong national and international political leadership. It will also and provide opportunities for promoting improved society wellbeing with increased opportunities for leisure including tourism. To maximise the benefits from this transition, the tourism sector must become informed by understanding the science behind climate change, and the economic issues that will arise in transitioning to a low carbon economy. The tourism sector must also become a vocal advocate to ensure that international treaties and national policy formation does not disadvantage the global tourism industry. Concurrently, the global tourism industry must be on at the forefront in adopting strategies that support a low-carbon economy.

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