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Will climate change disrupt the tourism sector?

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Abstract

Purpose – This paper aims to explore the links between climate change and tourism and explores the connections between these themes.

Design/methodology/approach – The paper provides an analysis based on the literature and evidences from recent studies.

Findings – The tourism sector was already severely affected by the COVID-19 pandemic, and whereas it is now on a slow pathway to recover, climate change is adding an additional pressure to it.

Social implications – Knock-on effects could also trigger disruptions in various other sectors. This includes not only local agriculture but also important sources of income for people in tourist destinations such as service providers (e.g. drivers, tourism guides), local handicraft industries and many other small businesses, which rely on tourism as source of employment or of direct income.

Originality/value – The paper points out to the fact that, whereas adaptation to climate change is a long-term process, a strategic approach to handle its immediate impacts to the tourism sector are important.

Keywords Tourism sector, Climate change, Temperatures, Adaptation, Resilience

Paper type Research paper

Introduction

The travel and tourism sector is one of the world’s largest economic branches. It was significantly affected by the COVID-19 pandemic: and according to the World Travel and Tourism Council, it suffered a loss of nearly US\$4.5tn in 2020. Its contribution to global GDP dropped from 10.4% in 2019, to 5.5% in 2020 due to restrictions to mobility ([World Travel and Tourism Council, 2021](#)).

But the pandemic is not the only element, which has been negatively affecting the tourism sector. Climate change, which has been leading to several adverse effects including:

- increases in temperature;
- changes in humidity;
- flooding;



- droughts; and
- unpredictable weather conditions (Atasoy and Atasoy, 2020).

as well as extreme events, has been leading to significant impacts to tourism and, inter alia, affecting the national and global economy. Tourism sector and hence, the national and global economy.

A worrying trend is that climate conditions are considered to be a key resource to tourism (Dogru *et al.*, 2019). As the effects of climate change are mostly seen in nature and landscapes, industries such as the tourism sector that rely on nature are greatly affected. More specifically, tourism relies on suitable weather conditions in an area (e.g. sunshine, mild temperatures), for tourists to have an enjoyable experience (Atasoy and Atasoy, 2020).

The coastal or seaside vacation industry is a popular sector within the tourism sector. This particular modality is largely dependent on the aesthetic of the coasts and daily weather, which may attract tourists. However, the rises in sea-level, caused by increased global temperatures, poses a threat to coastal tourism. Additionally, changes in precipitation affect the available times for tourists to enjoy seaside holidays. This has been observed in Sub-Saharan Africa where, for instance, South African beaches are being affected by climate change (Friedrich *et al.*, 2020). Extreme events such as typhoons and cyclones on the one hand, and heavy rainfall on the other, may endanger the infra-structure that coastal tourism depends on.

Furthermore, increases in temperatures are believed to be associated with decreases in snow fall (Bormann *et al.*, 2018), and also glacial retreat, as well as further environmental degradation due to the expansion of other land uses such as for agriculture.

Apart from the fact that it has influences on seasonal aspects of land coverage, the reduction in availability of snow is particularly detrimental to winter tourism, which involves various snow-dependent activities such as skiing or Nordic walking, very popular among tourists. Some studies have indicated that the winter tourism industry will see an approximate 64% drop in demand if global temperatures continue to rise throughout skiing seasons. If snowfall is reduced only at the beginning and end of skiing seasons, then an 18% decline in demand may be observed. These figures were generated following assessment from 53 ski resorts in Austria which is a country popular for ski/snow tourism (Steiger *et al.*, 2020).

Areas that rely on flora and fauna for tourism are also being impacted. This is due to extreme temperatures resulting in drought and thus decreased biodiversity and health of animals. More specifically, this is seen in areas such as Africa where wildlife parks are experiencing adverse outcomes due to extreme weather. In the Kruger National Park of South Africa, costs have been raised to deal with the effects of climate change in terms of wildlife and environmental conservation. Furthermore, tourism infrastructure has been damaged due to severity of weather conditions. Researchers have suggested rethinking land use planning, redesigning and reinforcing existing parks and infrastructure and conservation techniques to build climate resilience (Dube and Nhamo, 2020).

In other instances, increased temperatures facilitate evapotranspiration and cause for moisture stress and shortage of water (Naumann *et al.*, 2018) a trend seen in many popular tourist destinations. One example was the extreme drought in the Western Cape in South Africa in 2015–2017 (Otto *et al.*, 2018). The massive water shortages in the area have resulted in a decrease in the arrivals of tourists, which seem to have a negative view of the area. Furthermore, it was observed that a decrease in tourist spending and admissions at hotels occurred following the onset of the drought. A reduction in rainfall is expected to be repeated in the future, forcing the tourism sector to increase measures to save water

(Dube *et al.*, 2020). Reductions in water availability have also been observed in the Mediterranean region (Roson and Sartori, 2014). Figure 1 presents an overview of some of the impacts of climate change on tourism.

Wine tourism has gained popularity over the years and has increased rural development immensely. Although such tourism is largely dependent on social events, visits to cellars and consumption of wine, a great portion is related to actual fanning of the grapes. However, due to changing climate, wine production has been seeing variable growth (Irimia *et al.*, 2018). Furthermore, most of wine tourism occurs outdoors, which is not always possible due to erratic weather conditions (Sottini *et al.*, 2021).

The unrelented heat

Apart from the issues so far described, a special climate-related problem seems to be becoming more present, and which has the potential to significantly interfere with the tourism sector: heat waves. The year of 2021 has been characterized by very long dry periods in various parts of the world, which have led to various forest fires. Forest fires were not only recorded in tropical countries, but also in the northern hemisphere, both in Europe and North America. As shown in Figure 2, southern Europe has been especially affected, with over 230.000 hectares of forest land being destroyed so far, many of them in tourism destinations.

Table 1 provides an overview of the heat waves recorded in 2021 and the peak temperatures.

Heat waves of this intensity have three main impacts, directly associated with the travel and tourism sector:

- (1) The increased temperatures make coastal tourism and inland tourism very uncomfortable, as the high temperatures are incompatible with outdoor activities.
- (2) There is an increased risks of fires, as seen again in 2021 in areas as varied as California, British Columbia in North America and Greece and Turkey in Europe.

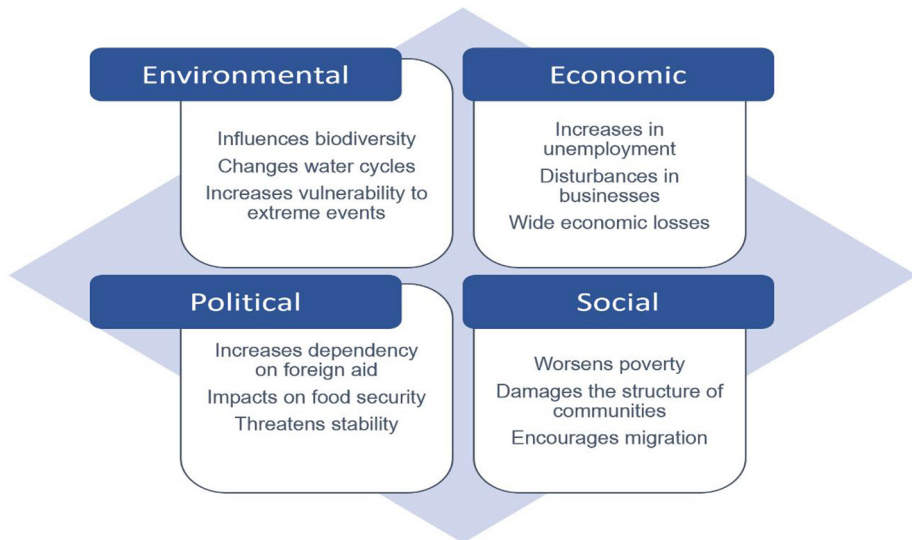


Figure 1.
Some of the impacts
of climate change on
tourism



Figure 2. Some of the European sites affected by forest fires in 2021

Source: Modified from The Guardian, NASA

Location	Country	Peak temperatures in the summer 2021
Athens	Greece	46.3°C on 2nd August
Sacramento in California	USA	45°C <i>n</i> 10th of July
Vancouver	Canada	28.9°C on 1st August
Antalya	Turkey	31°C on 6th August
Korfu	Greece	36°C on 26th of July
Palermo	Italy	36°C on 26th of July
Naples	Italy	37°C on 26th of July
Madrid	Spain	34°C on 6th of August
Valencia	Spain	38°C on 7th of August
Malaga	Spain	38°C on 7th of August

Table 1. Some of the heat waves recorded in 2021

Source: Author, based on weather bulletins

- (3) The health of many visitors, especially children, the elderly or people with some medical conditions may be endangered, due to the many pressures heat poses to the human body.

A further element which can be mentioned is that heat waves tend to increase water and energy consumption (especially for air conditioning), and may lead to reductions in crop yields, creating a possible competition between the needs of local populations-who may need crops for their subsistence- and those of tourists.

Conclusions

The tourism sector was already severely affected by the COVID-19 pandemic, and whereas it is now on a slow pathway to recover, climate change is adding an additional pressure to it. Indeed, it has the potential to disrupt the tourism sector, across seasons. This pressure is

expected to become more intense in the future, as global temperatures are likely to increase. As this paper has shown, knock-on effects could also trigger disruptions in various other sectors. This includes not only local agriculture but also important sources of income for people in tourist destinations such as service providers (e.g. drivers, tourism guides), local handicraft industries and many other small businesses, which rely on tourism as source of employment or of direct income.

On the other hand, there are occasions tourism sector may be positively influenced by climate change. For instance, increased temperatures in northern Europe may make this region more attractive to tourists, as they may no longer need to head south for milder temperatures. Also, the tourism season may last longer, hence extending the times where hotels and other tourism facilities are open, catering for more employment.

In general, whereas adaptation to climate change is a long-term process, which makes a strategic approach all the more important, current trends suggest that urgent measures are needed in respect of adjustments in the tourism sector, so that it may be in a better position to cope with the various challenges posed by a changing climate. This may entail a variety of measures such as the following:

- A review of the holiday times, so as to avoid months known to have very high temperatures.
- Improvements in the infra-structure of tourism destinations so that they may be adjusted to take into account high temperatures on the one hand, and other extreme events such as floods on the other.
- Adjustments to critical infra-structures, leading to more efficient water use, greater provisions for shade and awareness raising for tourists, for instance, on the need to hydrate.
- Enhanced access to weather information and services, so as to report in advance in the cases of extreme events such as floods and heat waves, so that they do not take travel agents and tourists by surprise as it is largely the case now.
- Adjustments in plans to deal with crises such as forest fires, to facilitate the evacuation of tourists and the local inhabitants, whenever needed.

Finally, as tourist activities such as travelling to and from holiday destinations contribute to around five per cent of all greenhouse gas emissions, the opportunity may be used to re-think how travel is pursued and how the emissions associated with it may be reduced.

References

- Atasoy, M. and Atasoy, F.G. (2020), "The impact of climate change on tourism: a causality analysis", *Turkish Journal of Agriculture – Food Science and Technology*, Vol. 8 No. 2, pp. 515-519, doi: [10.24925/turjaf.v8i2.515-519.3250](https://doi.org/10.24925/turjaf.v8i2.515-519.3250).
- Bormann, K.J., Brown, R.D., Derksen, C. and Painter, T.H. (2018), "Estimating snow-cover trends from space", *Nature Climate Change*, Vol. 8 No. 11, pp. 924-928.
- Dogru, T., Marchio, E.A., Bulut, U. and Suess, C. (2019), "Climate change: vulnerability and resilience of tourism and the entire economy", *Tourism Management*, Vol. 72, pp. 292-305.
- Dube, K. and Nhamo, G. (2020), "Evidence and impact of climate change on South African national parks. Potential implications for tourism in the Kruger national park", *Environmental Development*, Vol. 33, p. 100485.

-
- Dube, K., Nhamo, G. and Chikodzi, D. (2020), "Climate change-induced droughts and tourism: impacts and responses of Western Cape province, South Africa", *Journal of Outdoor Recreation and Tourism*, p. 100319.
- Friedrich, J., Stahl, J., Hoogendoorn, G. and Fitchett, J.M. (2020), "Exploring climate change threats to beach tourism destinations: application of the hazard–activity pairs methodology to South Africa", *Weather, Climate, and Society*, Vol. 12 No. 3, pp. 529-544.
- Irimia, L.M., Patriche, C.V. and Roşca, B. (2018), "Climate change impact on climate suitability for wine production in Romania", *Theoretical and Applied Climatology*, Vol. 133 Nos 1/2, pp. 1-14.
- Naumann, G., Alfieri, L., Wyser, K., Mentaschi, L., Betts, R.A., Carrao, H., Spinoni, J., Vogt, J. and Feyen, L. (2018), "Global changes in drought conditions under different levels of warming", *Geophysical Research Letters*, Vol. 45 No. 7, pp. 3285-3296.
- Otto, F.E.L., Wolski, P., Lehner, F., Tebaldi, C., Van Oldenborgh, G.J., Hogesteegeer, S., Singh, R., Holden, P., Fućkar, N.S., Odoulami, R.C. and New, M. (2018), "Anthropogenic influence on the drivers of the Western Cape drought 2015-2017", *Environmental Research Letters*, Vol. 13 No. 12, p. 124010.
- Roson, R. and Sartori, M. (2014), "Climate change, tourism and water resources in the Mediterranean: a general equilibrium analysis", *International Journal of Climate Change Strategies and Management*, Vol. 6 No. 2, pp. 212-228.
- Sottini, V.A., Barbierato, E., Bernetti, I. and Capecchi, I. (2021), "Impact of climate change on wine tourism: an approach through social media data", *Sustainability*, Vol. 13 No. 13, p. 7489.
- Steiger, R., Posch, E., Tappeiner, G. and Walde, J. (2020), "The impact of climate change on demand of ski tourism-a simulation study based on stated preferences", *Ecological Economics*, Vol. 170, p. 106589.
- World Travel and Tourism Council (WTTC) (2021), "Economic Impacts Report", WTTC, Brussels.

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