

Climate Change and Touristic Winter Activities

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ABSTRACT

Majority of scientists approve and acknowledge the existence of climate change effects and are aware of the predicted intensity and frequencies, in the long term, of the results that the year of 2100 will be showing. The objective of this article is to shed light on the risks that the present effects of climate on tourism in general and specifically on the winter activities. This article will also explain the measures that could be taken to help the fight against the effects of climate change and the measures that would certainly be costly ecologically and financially speaking.

Climate Change, Winter Activities, Global Warming, Green House Emissions, Tourism, IPCC.

1. Introduction

Travel destinations are bound by the life cycle principle that was first claimed by Butler (Centre, 2020). In this principle, a destination starts its life with its exploration and with practically no services offered to tourists, then several actors take roles in the involvement and then development with more and more services and tailor-made activities being introduced, the local economy starts witnessing expansion until the phase of stagnation where competition with other destination is being felt. The last phase determines the future: there might be a decline followed by rejuvenation, or a final decline.

Travel destinations in this case perhaps need to add a new phase to this cycle: "adaptation to climate change" where they would consider, in advance, the negative impacts of climate change on their activities and eventually generate danger.

Adaptation to climate change could require a series of investments that would impose the destination a shift towards a new specialization when reaching the final phase of decline, or a series of adaptation measures that could delay the final phase of decline

2. IPCC: climate change vs global warming

Many people fail to make a distinction between the phenomenon of climate change and global warming. In simple words, climate change generates global warming. This means that one is the result of the other, a consequence, an effect on the other.

The term "global warming" is used generally to describe the increase in average temperature whereas climate change addresses, not only global warming but also extreme precipitations, droughts etc. (Isik et al., 2019; Isik et al., 2018; Isik et al., 2017; Isik, 2010)

Similarly, to any particular phenomenon, international organizations are in charge of studying closely the current situation, effects, forecasts, problems and solution and for our case which is climate change, an international entity, being a body of the United Nation, has been implemented to observe and provide the international community with quantitative and qualitative data that would help forecast and solve potential issues generated by the effects of climate change. This organization is entitled the Intergovernmental Panel for Climate Change for which we will be referring to, in our paper, as the IPCC.

As per the IPCC climate change is defined as modification in a climate that can be statistically identified – these modifications last for long periods, up to centuries and lead to destabilization of climate parameters and variabilities (Change, 2011).

IPCC also adds that human activities play a major key role in intensifying the effects of climate change and the fifth report indicates a certainty rate of 95% as per human activity is the main and primary reason of climate change's effects in the 20th and 21st century (IPCC, 2014).

3. Forecasts of climate change in the year of 2050

Articles and research papers are analyzing, on a daily basis, the projections of the effects by 2050 and 2100, and majority of these publications agree with the IPCC reports which suggest that human activities are the main reason behind climate change, but unfortunately many people still believe that climate change isn't in progress, and some think that human activities are not linked to the intensification of its effects.

To prove the existence of climate change we have thought of illustrating the evolution of global warming and temperature rising through a graphic which we have built using statistics from the World Bank.

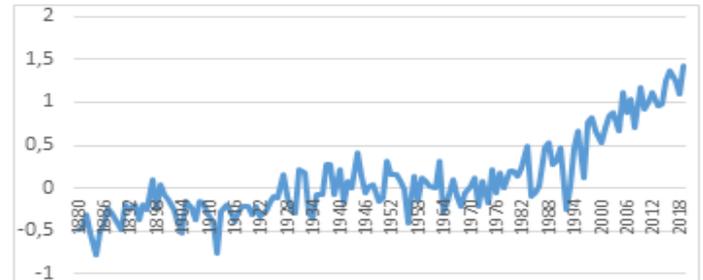


Figure 1: Evolution of global average temperature since 1880 - Source: Personal elaboration – Data: World Bank

As shown in the above graphic, the evolution of average global temperature has been, since 1880, in a continuous increase despite some decreases and some early climate cooling around the years of 1884 and 1912 where the temperature was below -0.5 degrees Celsius.

In parallel with these trends, human interaction is proved to exist through the analysis of Greenhouse gas emissions: Luthi and Etheridge conducted studies between 2008 and 2010 to demonstrate the general evolution of CO₂ emission in the air 800,000 years ago (Luthi & Etheridge, 2008, 2010)¹.

With a continuous increase of CO₂ emissions and temperature warming, it will be challenging to meet 0 Greenhouse gas emissions by 2050 despite the efforts from IPCC to mobilize world governments and international entities.

4. Winter tourism activities, the USA on top – China on the way!

With a description being drafted about the current situation with regards to the climate change effects and its forecasted effects on the short-medium term, it is extremely important to think of the impact that climate change and global warming would have impacts on the economy in general and on the tourism sector in particular – however, we will limit our analysis to winter activities.

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We will first explain the present situation of winter touristic activities and locate the best stations before linking the result to the climate change effects and study the possibilities for adaptation in a separate paragraph.

International tourism reached to be one of the most important economic activities in the world early 21st century. Tourism can be categorized in several fields such as travel for business, leisure, health, sports, etc.

When looking, in detail, at the “tourism market” of winter activities, the USA is on top of the list with 59 million ski-days sold in 2018/2019 winter season, Austria was next with 54.1 million and China scored 19.5 million ski-days sold during that season.

The USA, at the top of the list as mentioned above, offers numerous activities of ski and diversified options that meet touristic expectations with an offer of approximately 25 ski stations in Colorado, and most of them are unique and exclusive.

Aspen is one of the famous ski stations specialized in ski activities with 4 domains and a large choice of restaurants and hotels, next is Vail with exclusive experience and reputable ski stations. Largely known for world cup activities, Beaver Creek station is located on the mountainous areas of Colorado.

It would be interesting to analyze the Chinese market as well and allocate some time to study the rapid growth of Chinese internal tourism which keeps its trend increasing in 2018 following the good results in 2017. As claimed by the Chinese Minister of Culture and Tourism, China scored 5.54 billion internal touristic visits: an approximate annual growth of 10.8%.

The above-mentioned growth was itself sufficient to generate a total of 5,130 billion of Yuan (74 billion dollars) for the tourism sector – a growth of 12.3%. In parallel with these numbers, expenditure also increased by 11.2% in 2018.

It is worth mentioning that China is hosting the 2022 Winter Paralympics which include activities of skiing, cross-country skiing, ice sledge hockey, snowboarding, wheelchair curling, biathlon and other winter activities. Because of this Olympic sports event, China is expecting, between 2021 and 2022, 340 million tourists for sports activities and an approximate touristic receipt of 680 billion Yuan.

Before studying the effects of climate change and the threats that climate change would cause together with these activities, we must remember that the USA is today on the top of the list of tourism attractions for winter activities; however, China is expected to take this place by 2030 and the year of 2022 seems to be the year for this change

5. Climate change: a threat to winter tourism

With climate change in the winter tourism economy, winter activities in China and the USA deteriorate as in other countries and they are all included in the danger list. However, perhaps a chance for these countries and economic actors could be given to take necessary steps towards the adaptation of relevant measures.

It becomes very often to read in the news that the ski season in a certain place had less snow compared to previous seasons and that due to these circumstances there is a loss in ski visitors and their expenses, which has an impact on the services economy of the country.

No matter what we try to do in order to fight against climate change, there will be a global warming and the global warming would mean an increase in average world temperature, which means less snow (Luetsch, 2005).

This is why, now that we understand the situation, we can imagine that it is certain that the consequences of global warming affecting ice and snow, would have a severe impact on ski tourism. Taking Europe as example, a study conducted by Robert Steigner and Daniel Scott shows that Austria would be suffering from 50% of the ski stations since they would not be reliable for skiers (Steiger, 2019).

We need to understand that with continuous emission of CO₂ and greenhouse gas, all the ski stations located at an altitude between 1500 and 1800 meters will be the only stations benefitting from enough snowfall to be categorized as “reliable ski stations” by tourists.

This means that all stations below 1500 meters would have less or perhaps no snow at all. With an average increase of 1 degree Celsius in the Alps, 75% of today’s ski stations would be reliable – note that today with the actual situation for 91% of ski stations in the Alps are reliable.

However, global warming affecting ski stations comes not only with less snow affecting the ski season, but it also comes with higher temperature, less water, higher natural risks and droughts. These changes would affect tourists

that would be visiting for other winter activities – similarly to what we listed earlier in this paper.

6. Adaptation measures: an expensive safety measure

We have seen that climate change has negative effects on the tourism of winter activities including less snowmaking the ski season non-profitable and higher temperatures obliging tourists to reconsider other destinations or perhaps other activities.

However, destinations may consider adaptation measures to be taken and applied in order to avoid losing tourist stream, they can, for instance, invest in artificial snow technology in order to have their station covered with enough snow and ice for a successful ski season. In this case, such stations would be reliable in terms of snow coverage, but several issues might be encountered.



Figure 2: Artificial snow represents 30% to 35% of stations’ surface – stock.adobe.com Britta und Ralph Hoppe/fatoo

Between 1960 and 2017, snow seasons decreased around 38 days. Europe experienced its warmest winter during the season of 2015-2016 with a snow coverage of about 20% in the Southern Alps. When temperatures are high, it rains more than it snows and snow doesn’t stay as much as needed to ski – but melts quickly, this phenomenon is not true for the altitude above 2000m where temperatures stay relatively low – providing that until the year of 2100, human should continue to emit CO₂ at the same as present intensity

The picture that we have used to illustrate this development includes what we call ice canons, or snow guns. They are used to increase the snow coverage on a certain station using basic components that benefit from water and air. But this procedure is more complex than thought. It compresses air that is ejected with water, in parallel with a mechanism that generates head and then a sudden Cooling makes snow. When the fan starts operating, the seeds start dispersing in the air and form snow on the ground.

But the question is, if snow guns help ski stations to become reliable, what happens to water as a resource that is continuously in danger noting that without water the system wouldn’t be operational? The second important point is that artificial snow is five times harder and four times denser than natural snow, which makes it easier to deteriorate faster at mountainous massifs.

In addition to the above mentioned ecological impacts that can be complemented with additional reasons such as the energy consumption of these snow guns, we can also discuss the financial side of the impact of this new measure: it is explained that the production cost of one square meter of snow is between 2 and 2.5 euros, which will certainly be added to the cost that a tourist would pay for skiing.

As seen earlier, numerous ski stations that are lower in term of altitudes would not be reliable by 2100 considering that the earth would be warmed by 2 degrees by 2050. This means more snow guns, higher installation costs, additional maintenance costs and continuously increasing final bill paid by the tourist for such winter activity.

7. Conclusion

In conclusion, we need to accept the fact that Earth will be warmed by 2050 and no matter what measures are taken, the CO₂ and other greenhouse gases

that have been emitted until this time have contributed to a series of intensive impacts that will be felt beyond 2050 and up to 2100.

The impacts that are being witnessed today in the form of hurricanes and droughts, would be the same – but there would be an increase in intensity. The answer to the questions of what should be done in order to avoid such results is to first stop emitting CO₂ in the atmosphere and the oceans, and secondly to think of better alternatives.

Alternatives can also be green and pocket-friendly. For instance, if snow guns are not a green solution and are very costly in terms of construction, installation and maintenance, then perhaps the destination can offer a different type of services, except winter activities.

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