



Climate Change

Impact on Environment and Society

Tourism

The Impact of Climate Change on Overnight Stays of Tourists in Austria

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The interdisciplinary COIN project evaluates the impact of climate change on Austrian tourism, based on analysing the change in the number of overnight stays.

Main findings

- The results of three climate change scenarios (mild, moderate, strong climate change) and three socio-economic scenarios (low, medium, high sensitivity) predict climate change-induced financial losses for the winter and gains for the summer tourism seasons.
- The tourism sector is thus expected to already face net losses under mild climatic changes.
- Moderate climate change would cost the tourism sector an average of approx. € 90 million (mn) (€ 300 mn) over the 2016–2045 (2036–2065) period.
- Moreover, the damage to the overall economy caused by a climate change-induced decrease in overnight tourism will exceed the losses for the tourism sector by 60 %.

Tourism is one of Austria's key economic factors. According to Statistics Austria (2013), in 2012 the direct added value effect from tourism was approx. € 18 billion, which corresponds to 6 % of the gross national product. A large part of Austrian winter and summer tourism is related to activities in nature and thus highly sensitive to climatic change, especially as regards temperature and precipitation sums. Therefore, climate change has a strong influence on the demand for Austria as a tourist destination and on the attractions the country has to offer.

What has been analysed?

The actual impact of the anticipated climatic changes strongly depends on the type of tourism and on the season: summer tourism in particular benefits from rising temperatures and precipitation decrease which,

The interdisciplinary COIN (Cost of Inaction – Assessing Costs of Climate Change for Austria) project evaluates economic impacts of climate change in Austria. For this purpose, a scenario-based analysis of and across twelve key sectors is conducted, which assesses the possible impact of climatic change in combination with socio-economic developments. The main scenario assumes a temperature rise within the two degrees Celsius margin for the period up to 2050. This assumption presupposes stronger climate policies than the ones currently in place. The analyses presented here only show that part of all potential impacts which has already been quantified and takes into consideration individual adjustments made.

Project info box

at the same time, have a negative effect on Austrian winter tourism in its current form. The COIN project investigates individual impact chains of changing snow, rain, and temperature conditions that affect the number of overnight stays.

However, this inquiry carried out by COIN does not cover all potential climate change impacts on the tourism sector. The monetary assessment has not taken into account impacts on the demand for Austria as a tourist destination caused by changes in the availability of environmental services (e.g., an altered appearance of the landscape). Likewise, the consequences for the sector's cost structure (e.g., irrigation expenditure, amounts of artificial snow required, air-conditioning, etc.) have been disregarded as well as increasing damages due to extreme weather events (e.g., the destruction of tourist facilities).

¹ The moderate climate change scenario projects a mean temperature rise of 1.0 °C (2.0 °C) and changes in annual precipitation sums of +1.5 % (-2.3 %), when comparing the reference period (1981–2010) and the first (second) scenario period 2016–2045 (2036–2065).

² Moderate socio-economic developments project average annual changes in overnight stays of +0.8 %, tourists displaying the same weather sensitivity as in the past (1973–2006) (both differentiated according to NUTS3 regions and seasons), and an average annual increase in actual expenditure per overnight stay of 0.8 %.

What impacts are to be expected?

The analyses of the impacts quantified in the current study under a moderate climate change scenario¹ and moderate socio-economic developments² show that the decrease in the number of winter tourists (approx. -600,000 [-1,500,000] overnight visitors p.a.) exceeds the increase in the number of summer tourists (approx. +220,000 [+440,000]) for both periods of analysis (2016–2045 [2036–2065]). This amounts to an average decrease in annual overnight stays of -0.3 % for the first

Table 1: Average annual climate-induced economic impact on the tourism sector, based on climatic and socio-economic developments (in million €).

Future economic impact* relative to \emptyset 1981-2010	Climate change				
		mild	moderate	strong	
\emptyset 2016-2045	Socio-economic development (sensitivity**)	low	-14	-48	-140
		medium	-21	-67	-199
		high	-30	-89	-264
\emptyset 2036-2065	Socio-economic development (sensitivity**)	low	n/a	-136	n/a
		medium	n/a	-210	n/a
		high	n/a	-304	n/a

* Future economic impact: negative numbers indicate net losses, positive numbers indicate net gains.

**Result sensitivity with respect to socio-economic development parameters.
n/a: data not available.

and of -0.6 % for the second period. Accordingly, the tourism sector would suffer average annual losses³ of € 67 mn between 2016 and 2045. The numbers for the 2036–2065 period are even higher, indicating an annual loss of € 210 mn (see Table 1). These findings do not yet consider feedback effects related to other economic sectors.

Are there regional variations in Austria?

Individual regions in Austria will benefit or suffer from the developments projected in the model scenarios to different degrees: the state of Salzburg would suffer the biggest losses under a moderate climate change scenario and moderate socio-economic developments, i.e., a decline in annual overnight stays of approx. 1 % (2 %) during the 2016–2045 (2036–2065) period. However, Upper Austria could potentially record an increase (+0.3 %/+0.6 % p.a.) in overnight tourists over the respective periods.

³ The results refer to the comparison between the simulated future tourism revenue under consistent climatic conditions and the simulated future tourism revenue under changing climatic conditions. The climatic conditions of the 1981–2010 period serve as the basis of comparison.

⁴ The mild (strong) climate change scenario was defined in terms of »barely« (»strongly«) negative effects on the tourism sector and thus supposes warmer and dryer (cooler and wetter) summers and more (less) snowy winters as compared to the moderate climate change scenario.

⁵ The impact of climate change intensifies with the importance of tourism and with tourists becoming more sensitive to the weather. Higher (lower) sensitivity: assuming that the amount of overnight stays changes at an annual rate of plus (minus) 25 %, and that tourists display a 25 % higher (lower) sensitivity to the weather.

⁶ The result is based on comparing the respective climate change scenarios to a baseline scenario (which interprets socio-economic development without climate change at a medium sensitivity level of the tourism sector).

Do alternative projections for the future change the results?

To represent the uncertainties as to which climate scenario will occur, additional scenarios assuming mild and strong climate change⁴ have been analysed for the 2016–2035 period (see Table 1). The results show average annual net losses of € 21 mn in the case of mild and of € 200 mn in the case of strong climate change. This is to say that strong climate change could cause nearly the same financial losses by the 2030s as moderate climate change would by the 2050s.

The study, moreover, takes into account that socio-economic changes (e.g., changing touristic preferences or economic growth in neighbouring countries) influence the sector's sensitivity to climatic changes. In the moderate climate change scenario, a higher (lower) sensitivity⁵ of the tourism sector results in net losses of € 89 mn (€ 48 mn) over the 2016–2036 period, as compared to € 67 mn when assuming moderate sensitivity (see Table 1). These results display notably less variability than those of the three climate scenarios. This means that extreme climate change would affect the sector more severely than a change in the socio-economic factors as reviewed.

What impacts on the Austrian national economy can be expected?

The current findings do not yet consider the tourism sector's interrelations with other sectors. When taking those interdependencies into account, the gross national product (GNP) is estimated to decrease by an annual average⁶ of approx. € 100 mn during the 2016–2045 period and by as much as € 340 mn between 2036 and 2065, assuming moderate climate change. The lodging and food services sector will be most strongly affected, with its gross value added (contribution to the GNP) decreasing by an annual average of approx. € 40 mn during the first and by approx. € 120 mn during the second period. The impact on the overall economy caused by changes in the tourism sector are therefore significantly higher than the effects on the tourism sector itself (i.e., specifically 60 % higher in all cases).

References

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