



# Convinced, ambivalent or annoyed: Tyrolean ski tourism stakeholders and their perceptions of climate change<sup>☆</sup>



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## HIGHLIGHTS

- Climate change perceptions of tourism stakeholders in Tyrol (Austria) are examined.
- Climate change is not perceived as a real threat by stakeholders.
- Awareness is mainly limited to perceiving the issue as a global phenomenon.
- Current technical adaptation strategies are not primarily climate-induced.
- At present, coping with climate change is not a priority for risk management.

## ARTICLE INFO

### Article history:

Received 22 May 2012

Accepted 16 July 2013

### Keywords:

Climate change impacts  
Snow-based winter tourism  
Ski tourism  
Stakeholder  
Risk perception  
Tyrol  
Austria

## ABSTRACT

Its focus on snow-dependent activities makes Alpine winter tourism especially sensitive to climate change. Stakeholder risk perceptions are a key factor in adaptation to climate change because they fundamentally drive or constrain stakeholder action. This paper examines climate change perceptions of winter tourism stakeholders in Tyrol (Austria). Using a qualitative approach, expert interviews were conducted. Four opinion categories reflecting different attitudes toward climate change issues were identified: *convinced planners*, *annoyed deniers*, *ambivalent optimists*, *convinced wait-and-seers*. Although the findings generally indicate a growing awareness of climate change, this awareness is mainly limited to perceiving the issue as a global phenomenon. Awareness of regional and branch-specific consequences of climate change that lead to a demand for action could not be identified. Current technical strategies, like snowmaking, are not primarily climate-induced. At present, coping with climate change is not a priority for risk management. The findings point out the importance of gaining and transferring knowledge of regional and branch-specific consequences of climate change in order to induce action at the destination level.

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## 1. Introduction

Climate change is increasingly regarded as the single most serious global environmental problem (Scott, Gössling, & Hall, 2012; see also Houghton, 2009). Significant variations in the mean state or variability of climate are major drivers of global environmental change encompassing changes in ocean currents, land cover or biodiversity. Environmental change on a global scale will result in possibly far-reaching negative effects at the regional

or even local level, ranging from problems with water availability and water quality to soil erosion and flooding (Houghton, 2009; IPCC, 2007). Because of strong interlinkages, global environmental change is in turn impacting climate change.

Modified temperature and precipitation patterns will also have considerable consequences for various socio-economic systems, including tourism. Since climate is a key resource for several forms of tourism, climate change is likely to pose a major challenge for many destinations (Scott, Amelung, et al., 2008).

International tourism is a global key driver of socio-economic progress; it has a central role in creating jobs and in providing infrastructure (United Nations World Tourism Organization (UNWTO), 2013). Tourism is also of vital importance to the European economy. A total of 534 million international tourist arrivals represent a global market share of 52% for European tourism (UNWTO, 2013). Tourism accounts for more than 5% directly and

Acronyms: CEOs, Chief Executive Officers.

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about 10% indirectly of the EU GDP (European Commission, 2012). European tourism is especially intense in coastal regions, some cities and Alpine regions (Eurostat, 2011).

According to Becken and Hay (2007), the European Alps generate about 7–10% of the annual global income from all-year tourism, with some 100 million tourists visiting the Alps each year. Many mountain and winter tourism destinations in the European Alps are among the most frequently visited regions in the world. Many forms of Alpine winter tourism are dependent on snow-based activities. In many rural areas, winter tourism has become the primary source of income (Abegg, Agrawala, Crick, & de Montfalcon, 2007).

Since the 1970s, downhill skiing has expanded heavily in the over 600 ski resorts located in France, Switzerland, Austria and Italy (Abegg et al., 2007). The number of domestic and international skier visits to the European Alps shows the dominance of this region in worldwide winter tourism. While 400 million skier visits are generated globally, the Alps account for 176 million skier visits per year, representing 44% of the total visits (Vanat, 2013). Austria is among the largest national markets, generating about 51 million skier visits per year (WKO, 2012).

Its focus on snow-dependent activities makes Alpine winter tourism highly vulnerable to the effects of an ongoing warming trend (Scott, 2011; Scott et al., 2012). Consequently, regional climate change projections for Europe and the Alps are essential for assessing the future of snow-based tourism. Kotlarski, Bosshard, Fischer, Lüthi, and Schär (2010) compared current regional climate change scenarios for Europe and the Alps. The greenhouse gas forcing used by these models was derived from the Intergovernmental Panel on Climate Change (IPCC) SRES A1B emission scenario (IPCC, 2000). Depending on the applied model chain and season, winter temperatures are projected to increase by 0.8–2.6 °C until 2050 and by 2.9–4.2 °C until 2100, compared to the 1961–1990 baseline. Precipitation changes were found to be highly uncertain until 2050. However, by the end of the twenty-first century, there is model consensus regarding drier summer seasons and wetter winter seasons (an increase of 6.7–19.7% compared to baseline climate). Moreover, Kotlarski et al. (2010) report a decrease in snow cover resulting in an almost complete loss of snow in lowlands by 2100.

In a study published by the Organisation for Economic Co-operation and Development (OECD), Abegg et al. (2007) found a decline in the number of naturally snow-reliable Alpine ski areas from 609 to 404 (under a +2 °C warming scenario) and to 202 (under a +4 °C warming scenario). The authors concluded that climate change is a serious challenge to the Alpine ski industry, which was confirmed by Steiger and Abegg (2011) for Austrian ski areas. In the latter study, a site-specific physical snow module was applied, also taking snowmaking into account. Steiger and Abegg (2011) showed that the impact of climate change on Austrian ski areas can be balanced with snowmaking under a warming scenario of 1–2 °C. Assuming a warming of more than 2 °C, snowmaking is not considered to be an appropriate strategy because operational costs would increase dramatically.

The severity of effects in the respective tourism regions and destinations will heavily depend on their individual ability to adapt to climate change. Adaptation in the context of climate change refers to “adjustments in ecological-socio-economic systems in response to actual or expected climatic stimuli, their effects or impacts” (Smit, Burton, Klein, & Wandel, 2000, p. 225). Adaptations can be anticipatory (taken proactively before the climate stimulus), concurrent (during) or reactive (in response). Based on their degree of purposefulness, Smit et al. (2000) distinguish between autonomous (spontaneous) and planned (deliberate) adaptive responses to an actual or anticipated stimulus. Adaptations in socio-economic systems are often concurrent or reactive in nature (Smit et al., 2000).

There are many different forms of adaptive responses to climate change. Smit et al. (2000) distinguish between primarily technological, behavioural, financial, institutional and informational adaptations, while Scott et al. (2012) provide a more detailed classification scheme of technical, economic, policy, institutional, managerial, planning, legal and behavioural climate adaptations. Adaptive strategies in the snow-based tourism industry range from technical actions (e.g., increased use of snowmaking) to managerial responses, including the introduction of alternative tourism products to skiing in the winter season or low-season closures (Dawson & Scott, 2013; Hall & Highham, 2005; Scott, Dawson, & Jones, 2008; Scott, de Freitas, & Matzarakis, 2009; Scott et al., 2012). More recent strategies also involve behavioural action, such as the use of real-time webcams of snow conditions (Scott et al., 2012).

Effective adaptation reduces a region's vulnerability to climate change. On the local or regional level, the potential of a system to adapt is not only determined by economic and technical resources but also by such factors as managerial ability or access to information resources (Smit & Wandel, 2006). Stakeholder perceptions are another crucial aspect in reducing vulnerability to climate change. The key players' awareness of climate change determines whether effective action is taken (Belle & Bramwell, 2005; Klint et al., 2012). Stakeholder estimations of the possible scale and effects of the threat are decisive for the perceived need to adapt in a region. According to Belle and Bramwell (2005), perceptions of individuals and interest groups are also crucial to both the development of public policies and the acceptance of proposed policy measures. Correspondingly, learning to live with change and uncertainty is due not least of all to how well stakeholders in a region perceive potential challenges. In the context of climate change research, risk perception studies among stakeholders are vitally important in assessing a region's vulnerability to climate change.

Extensive research has been conducted on the relationship between snow-based tourism and climate change in recent years (e.g. Hall, 2006, 2011; Scott, Dawson, et al., 2008; Scott & McBoyle, 2007; Scott, McBoyle, & Minogue, 2007; Steiger, 2010, 2011). However, empirical social research on the supply side, focusing on the perception of climate change among key players in the ski industry, is still limited.

The present study aims to fill that gap in one of the most important European snow-based winter tourism regions. More specifically, the study (1) reveals the level of climate change awareness of and involvement with the issue in one of the top Alpine tourism regions; (2) identifies the present role of climate change in regional and destination risk management; (3) elaborates on the significance of snowmaking for the ski industry; and thus (4) contributes to the literature on supply-side perception in the context of climate change and snow-based winter tourism.

## 2. Literature review

### 2.1. Risk perception research

Risk perception research is rooted in the nuclear debate of the 1960s (Sjöberg, 2000) and has been of particular interest to scientists and policymakers since that period. The fields of psychology, sociology, political science, geography and anthropology have contributed to the early literature pertaining to this issue (Slovic, 1987). Several theoretical approaches have been developed to explain differences in risk perception among individuals and groups (e.g. Douglas & Wildavsky, 1982; Fischhoff, Slovic, Lichtenstein, Read, & Combs, 1978; Kasperson et al., 1988).

Research (e.g. Slovic, 1987, 2000) has shown that perceived risk is not only influenced by technical risk estimates but also determined by several qualitative characteristics related to whether a

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