

Submitted Abstract

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Abstract

Mountain glaciers in the Alps are highly affected by climate change. One of the most important uses of Alpine glaciers is tourism in glacier ski areas (GSA) which should be strongly affected by climate change too. However, in contrast to glaciological monitoring, the socio-economic impact of climate change on GSA is largely undocumented. That said, the literature about GSA is relatively scarce and a comprehensive review is missing. Therefore, this contribution presents for the first time such a literature review as well as the spatio-temporal diffusion patterns of Alpine GSA along with their development paths.

The literature review is the result of extensive research in four languages (English, German, French and Italian) in a broad variety of sources. The diffusion patterns of Alpine GSA are identified through this extensive literature but also document analyses, supplemented by written and telephone interviews with operators and (former) employees, local experts and tourism historians. These information were transferred in a data base containing all GSA, their years and types of operation linked to ski lift infrastructure data compiled from several sources. GSA were grouped into adoptor categories and statistical analyses were performed.

The literature review reveals that GSA are mainly regarded from four perspectives: planning; economic, ecological and social aspects; demand; climate change impacts and adaptation.

The diffusion curve of Alpine GSA nearly takes an ideal S-shaped form as postulated by geographical diffusion theory, followed by a continuous decline since the mid-1980s, which is even stronger for the GSA offering summer ski. Statistical analyses show that the closed GSA are significantly smaller, less accessible, more focused on the actual glacier part of the ski area but not necessarily situated in lower altitudes. In general, GSA shift their seasonal focus to (extended) winter seasons with relatively few remaining SSA offering this USP.

Results indicate that there is no linear relationship between glacier shrinking and the development of GSA: Although summer skiing is highly affected by climate change, it also suffers from a shortage of demand and low rentability. How GSA cope with climate change depends on the operators' monetary and knowledge resources, their level of experience how to deal with and to adapt to these changing natural conditions. Empirical examples show that various development paths could be chosen by the operators. The impacts of climate change on GSA are also not only negative as snow reliability in winter might decrease even further in lower altitudes.