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【研究ノート】

Mountain Tourism in Hokkaido, Japan and Tyrol, Austria

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Contents

1．Introduction to the study topic

This manuscript is a brief outline of future study which will compare mountain tourism for three areas in each of Hokkaido, Japan, and Tyrol, Austria. Each area will roughly correspond to an area in the other study province. One represents an easily accessible urban ski area, another a major ski resort located not far from the urban area, and the third a moderately-sized resort with plentiful snowfall, also not far from the urban area. The goal of this study is to compare the situations of two regions where ski tourism is important to the local economy.

Downhill skiing represents perhaps the most easily recognized form of mountain leisure tourism. As well as having a large areal footprint, it is quite energy and resource-intensive. At the same time, it is strongly dependent on natural forces. Abundant snow and reasonably pleasant weather are the main requirements. A season with poor or insufficient snowfall can have a serious impact on the economic viability of a resort, so they have tended to be located in areas where the conditions are historically favourable. Some resorts operate at lower levels of intensity due to less favourable conditions.

Obviously, as a business catering to a market in which there are abundant leisure options, nature is not the only issue with which ski resorts must contend. Skiing in Japan experienced a major boom between 1970 and 1990, but this was followed by slump after the bubble economy 'burst' and visits languish at roughly half their peak 1980s levels (Vanat, 2013).

Key words： Mountain Tourism, Hokkaido, Skiing, Sustainable Tourism, Tyrol

Product diversification is one approach that seems to have been taken in mountain tourism destinations in Japan in response to declining domestic demand, whereas in other destinations it may also be being driven by environmental factors, such as decreasing snowfall.

In areas where snowfall is becoming less reliable technical solutions may also be pursued, such as the creation of 'artificial snow', often referred to as 'technical snow' (*technischer schnee*) in German language literature.

2. Snowfall

Innsbruck was host to the 1964 and 1976 winter Olympics and numerous ski resorts and areas of varying sizes are located in close proximity to the city, which is the largest in the Austrian Tyrol.

European ski resorts are relatively more vulnerable to issues of snowfall reliability than Hokkaido (Singh, 2012, p.343), and Innsbruck in the Austrian Tyrol would seem to be no exception. Figure 1 shows that although winter precipitation has remained within a fairly constant range of fluctuation, the ominously rising winter temperatures visible in Figure 2 suggest that an increasing amount of this precipitation is likely to be rain, not only snow. Firsthand accounts (Nozzi, 2007) may reinforce this suspicion.

Figures 1 and 2 were constructed from the HISTALP (HISTORICAL INSTRUMENTAL CLIMATOLOGICAL SURFACE TIME SERIES OF THE GREATER ALPINE REGION) database by ZAMG (German: *Zentralanstalt für Meteorologie und Geodynamik*), which in English is The Central Institution for Meteorology and Geodynamics - the national meteorological and geophysical service of Austria ("Central institution for," 2013).

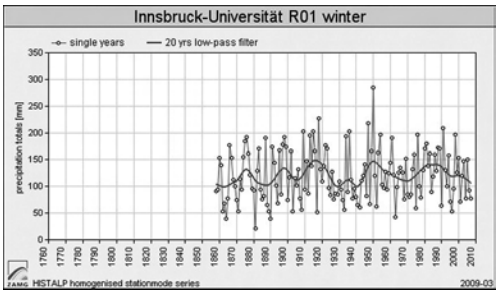

Figure 1: Winter precipitation in Innsbruck

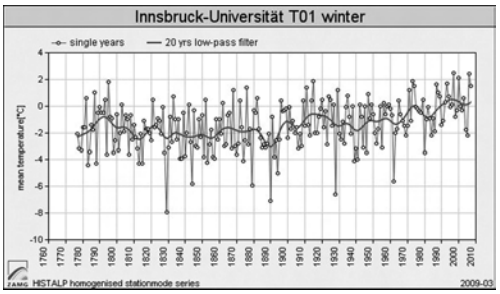

Figure 2: Winter temperatures in Innsbruck

(Data source: the 32 LSS monthly series of the ZAMG HISTALP database)

Auer, et al. (2007) describes some of the limitations of the HISTALP dataset (used here for Figures 1 and 2), but it can be seen in the case of Innsbruck that although winter

precipitation has maintained a steady variance, temperature has increased, with levels above zero occurring even in winter, suggesting that some of the winter precipitation would be in the form of rain, instead of snow, with attendant effect on snow accumulation and duration of laying on the ground.

Snow-making facilities are common at the larger ski resorts near Innsbruck, as can be seen in Figures 3 and 4. Large quantities of water are needed to feed such 'snow-cannons' and the location next to a stream in Figure 3 likely reflects this. The large water reservoir seen in Figure 5 is also probably used, at least partially, for their operation.

Figure 3: Snow-cannons along a stream at a ski resort

Figure 4: Snow-cannon above a piste

Figure 5: Cablecar ascending above a reservoir

Although not directly comparable, historical data for early February maximum snow depths in Sapporo and nearby areas close to ski resorts, suggest relative stability within a fluctuating but somewhat predictable range (Table 1). Average temperatures, where available, show little indication of any trends and maximum snow depths seem to exhibit no obvious general decline. This table utilizes only a small fraction of the historical data available from the Japan Meteorological Agency (JMA), but may be considered a reasonable sample thereof. Further analysis and graphical representation are planned for a later, more detailed, study.

Early February (by year)	Kutchan average temp. (°C)	Kutchan max. snow depth (cm)	Akaigawa average temp. (°C)	Akaigawa max. snow depth (cm)	Sapporo average temp. (°C)	Sapporo max. snow depth (cm)	Koganeyu average temp. (°C)	Koganeyu max. snow depth (cm)
1989	-5	126	n/a	113	-1.8	56	n/a	76
1990	-5.5	214	n/a	175	-2.3	81	n/a	86
1991	-4.9	152	n/a	156	-2.4	98	n/a	100
1992	-6.1	129	n/a	95	-3.6	51	n/a	76
1993	-3.6	135	n/a	108	-2.1	70	n/a	87
1994	-4.3	168	n/a	146	-3.3	124	n/a	124
1995	-7.4	167	n/a	154	-4.6	61	n/a	109
1996	-6.5	208	n/a	172	-4.7	145	n/a	151
1997	-4.5	130	n/a	147	-1.8	54	n/a	94
1998	-6.5	150	n/a	103	-4.9	79	n/a	78
1999	-6.9	210	n/a	171	-5	99	n/a	141
2000	-5.4	126	n/a	141	-3	82	n/a	98
2001	-9.3	167	n/a	142	-7.1	82	n/a	121
2002	-3.3	109	n/a	113	-0.9	65	n/a	74
2003	-4.6	155	n/a	124	-2.2	80	n/a	107
2004	-5.5	151	n/a	156	-3.2	91	n/a	137
2005	-5	164	n/a	194	-2.2	107	n/a	176
2006	-7.5	216	n/a	227	-5.5	111	n/a	139
2007	-3	120	n/a	72	-1.5	68	n/a	90
2008	-7.4	161	n/a	71	-4.4	78	n/a	71
2009	-4.4	127	n/a	118	-2.3	74	n/a	121
2010	-7.5	179	n/a	149	-5.3	63	n/a	103
2011	-4.2	202	n/a	153	-1.6	85	n/a	63
2012	-7	216	n/a	166	-4.8	65	n/a	95
2013	-5.5	183	n/a	139	-3.1	110	n/a	120

Table 1: Selected Hokkaido maximum snow depths and average temperatures in early February (JMA, 2012)

3. Climate change

The impact of climate change cannot be ignored, especially in the case of ski areas. Steiger, Dawson and Stötter (2012) detail the likely demise of many Tyrolean ski areas by the mid to end of the 21st century as a result of climate change in a piece aptly, but ominously, subtitled as 'Last chance to ski?'

Tervo-Kankare and Saarinen (2012) illustrate the challenge of addressing the issue of climate change vis-a-vis ski resorts because of its seeming overwhelmingness, especially to non-experts, and suggest that approaching the issue in terms of working toward 'sustainability' may be the best way forward (pp. 234-236).

The use of covers on parts of glacier ski areas (Figure 6) is likely to be not much more than a stopgap measure giving only temporary relief, but given the feelings of helplessness engendered by the scale of climate change, an understandable effort to protect an asset for as long as possible.

Figure 6: Crucial parts of a glacier piste partially protected with covers

4. Diversification and activity substitution

The prospect of shortened seasons and even the possible loss of viability is becoming reality for many ski areas worldwide. Technical solutions, such as snow-making and snow covers, can go some way toward easing the transition, but many areas practicing mountain tourism are also looking to other non-ski ways to cover potential downturns or even to further expand their businesses.

In Hokkaido, it is more likely that diversification has been driven by a drop in the demand-side component, given that little noticeable physical change in snow conditions has yet to be experienced, whereas there have been significant drops in the number of active domestic skiers since the peak levels of the 1980s, as mentioned earlier.

Field research in Tyrol revealed that '*Wandern*' (hiking) is very popular (Figure 7) and seems to represent a long-established source of business for '*Gasthof*' (inns) and '*Berghütte*' (mountain huts) in-season. It is not likely to contribute significantly to the revenue of ski areas, however, despite their slopes being popular venues for the activity.

Figure 7: Hikers entering the trail near the ski lift of a Tyrolean inn

Other activities in the Tyrol that are more likely to contribute to revenue for tourism operators include horse or pony riding and paragliding in summer and dogsledding in winter, which were directly observed taking place (Figure 8), or for which advertising was present.

Figure 8: Paragliding in Stubaital, Tyrol

The Niseko region of Hokkaido offers a variety of activities outside of the winter season, such as rafting, hot air ballooning, as well as other less revenue-generating options like hiking or mountain biking. Demand-side pressures have likely influenced operators there to aim for being year-round enterprises from an early period, instead of being in a situation of needing to adapt to the gradual climate changes more noticeably affecting other skiing destinations.

Dawson, Havitz, and Scott (2011) address issues of substitution behaviour and adaptation of skiers to climate change, using the US northeast as their study area.

5. Sustainable tourism

Tervo-Kankare and Saarinen (2013) make the significant point that the tourism industry tends to paint itself as the victim of climate change, yet pays scant attention to its own role in contributing to the problem. Feelings of complexity and/or apathy tend to dominate with the result that climate change is not being adequately or substantively addressed in tourism strategies. This seems counter-intuitive given the awareness of issues such as decreasing snow seasons.

The role of environmental impact assessments in the case of ski or other mountain tourism facilities will be looked into further, as continued degradation of nature can lead to loss of the destination's appeal.

Newsome, Moore, and Dowling (2013) outline the adoption of EMSs (environmental management systems) at ski resorts within Kosciuszko National Park in the Australian Alps with the intention "to continue to enhance environmental performance" (p. 288). Such cooperation between public and private interests should be considered key to ensuring sustainable tourism practices.

6. Conclusion

The need for a sustainable approach to any form of tourism is becoming more and more recognized around the world, not only to satisfy feelings of somehow needing to 'do something' but more concretely to ensure that both the enjoyment and the economic benefits of the activity will continue to be there in years to come.

Ali and Frew's vision of a future ski trip in their epilogue (2013, pp. 172-180) seems mundane enough until the end when it is revealed to be a sophisticated virtual reality endeavour - a novel way to experience the thrills we seek without unduly expanding our already sizable carbon footprint? Or the shape of things to come, and a warning to not become victims of the future?

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