SPORTS TOURISM AND CLIMATE VARIABILITY

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ABSTRACT

There is evidence that sport and activity holidays are growing in importance and forming an increasingly important segment of the holiday market. More leisure time and affluence could lead to an increasing demand for sporting facilities. Provision of facilities, such as golf courses, requires an estimation of future climate. To date there has been a concentration of research activity on the effect of climate on winter sports activities, such as skiing, in part because of the importance of winter sport for mountain areas. However, it can also be shown that environmental change, for example in river valleys affecting fishing and boating activities, could be highly damaging to local economies.

The purpose of the paper is to review the whole field of sports tourism and climate variability and suggest where research activities might usefully be concentrated. Developing a research agenda and identifying priorities is a pre-requisite to making progress in this hitherto neglected area.

KEYWORDS: *Sports, Climate, Climate Change, Tourism*

INTRODUCTION

It is timely in this year of the Athens Olympic Games, and following the publication of the World Meteorological Organization study 'Weather and Sport' (1) to consider how climate variability might affect sports tourism. Since most sporting events take place outdoors they are subject to the possibility of disruption, delay, postponement or cancellation due to adverse weather. Whether it is participating or going to watch professional sporting events, climatic conditions can affect the enjoyment and safety of the participants and the commercial viability of an organized event. Forecasts of bad weather make many less committed fans reluctant to watch an event in an open stadium or uncovered stands. In addition, quality of play can be diminished by bad weather on the playing field.

There has been a big increase in the importance of sports tourism, activity holidays and "soft adventures". In the UK, John Hall, chairman of Gulliver Sports Travel, suggests that this surge in interest is indicative of wider changes in the way people travel. Sports tourism is no longer a male

only preserve, with the number of couples and families travelling on this kind of holiday increasing. The term 'sports tourism' has been defined as "travel away from home to play or watch sport or to visit a sports attraction and including both competitive and non-competitive activities" (2). It might be said to comprise two main areas:

1) *Participation in individual or team sporting events*. Whilst sport is a major element of recreation, many regular participants of sports seek to enjoy their sport in a different setting while on holiday. For example, they may seek to play on a different golf course, or to devote more time to their sport. For many people a holiday is also seen as an excellent opportunity to try out a new sport, perhaps one that is water-based and not available at home, or to learn a new skill (e.g. deep sea diving).

2) *Sport spectator travel*. This may be to regular annual events (such as the Dubai World Cup, Monaco Grand Prix, French Open Tennis, Six Nations Rugby, Ryder Cup, etc.) or to occasional events (such as the Olympic Games, Rugby World Cup, International Cricket Tours, etc.). Fans want to see not just the sporting spectacle but also their heroes in action. Audience participation in sport certainly extends back to the Ancient Greeks.

PREVIOUS RESEARCH

One of the first overviews of the subject was published in Poland and later translated into German (3). Although it does not cover such popular sports as golf, Table 1 suggests that for activities ranging from sailing and rowing to skiing and football, wind and temperature are the most influential climate parameters. Paul (4) in Canada looked at how weather affected the daily use of outdoor recreation areas and found a series of relationships between participation rates in various sports and weather parameters. Multiple regression techniques have been used by Illingworth (5) to predict attendance at premier division football matches in the UK and by Thornes (6) for an open-air swimming pool. To date there has been a concentration of research activity on the effect of climate and climate change on winter sports activities, such as skiing; this is because of the obvious marginality of such activities in areas where they are currently popular. The recent announcement of the closure of two of the five Scottish ski resorts as a result of financial failure is a reminder that climate change could already be affecting the financial health of the leisure industry. Because there have been several reviews of the possible impacts of climate change on the winter sports industry in various parts of the world, winter sports industries will not be considered in detail in this review.

Many individual sports have attracted a considerable literature, for example climbing and hill walking (7, 8), sailing (9), and marathon running (10). Thornes (6) recognised that there could be a division into specialised weather sports. These sports are dependent on certain weather conditions to take place at all, such as gliding or sailing. Weather interference can also be a major factor in sport, where weather can afford an advantage to one side of the competition over the other. For example,

wind can affect ball play in a soccer or rugby match, leading to an unequal advantage. One of the most comprehensive studies of the impact of adverse weather on a range of sports in a particular country was Kay and Vamplew's (11) study for the UK.

Table 1: Subjective Assessment of Influence of Meteorological Parameters on a Range of Sports

Sport	Air Pressure	Temperature	Wind	Precipitation	Fog
Sailing	1	4	5	3	4
Ice Sailing	1	5	5	4	3
Rowing	2	4	5	3	1
Canoeing	2	4	5	3	1
Downhill Skiing	1	4	3	5	4
Spring Skiing	1	4	5	5	5
Cross Country Skiing	2	5	4	5	2
Bob-sleighing	1	5	3	4	4
Ice Hockey	2	5	-	-	-
Ice Skating	2	5	3	4	1
Swimming	1	5	4	1	1
Aerial Sports	2	5	5	1	4
Football	1	2	4	5	1
Parachuting	2	3	5	4	4
Cycling	3	3	5	4	1
Athletics (Jumps)	2	4	5	3	1
Athletics (Track)	3	3	5	3	1
Athletics (Field)	3	1	5	2	1
Archery	-	3	5	3	4
Shooting	1	1	5	3	4
TOTAL POINTS	33	75	86	65	47

Key to POINTS: 1 – slight; 2 – little; 3 – noticeable; 4 – important; 5 - large

A major theme in weather and sports has been player comfort. Most sports have high activity levels and exercise changes the heat transfer within the body and on the skin surface. An early example of this research looked at heat production and loss in a man playing squash. In order for an athlete to perform to their top ability they must be within their thermal comfort zone. Weather indices can provide information on the effects of single or multiple environmental elements on the human body. For example, the Heat Index, Windchill index and the principals involved should be extended to produce more suitable indices relating to sport.

RESEARCH AGENDAS

Much of the existing research has focused on climate change in specific geographical locations or milieus, such as mountains. A number of further research avenues that could produce useful information include:

1) *Changes in sports preference*. Substitution of activities might occur as climate changes, along with extension or contraction of the season over which the sport is played. In general it could be assumed that warmer conditions in summer might favour more water-based sports and recreation. There could be a need for more outdoor swimming facilities, or for current facilities to remain open for a longer season. Such warmer summers might also dissuade athletes from using indoor leisure centres unless there was more widespread air conditioning. The economics of running and operating leisure centres could thus change. From another perspective, specific threshold weather conditions, both permissive and prohibitive, are applicable to specific sporting activities. Quite often these thresholds are merely the subject of value judgements by individuals. Each sport is affected by a particular level of severity of weather. Even apparently low risk recreational pursuits, such as hill walking, can be dangerous in certain conditions, and the frequency of occasions when an activity becomes dangerous may well change over time. Therefore any change in the frequency of events, which themselves may not be severe, could have implications for safety. For group and team activities specialist staff, such as grounds crew or referees, may need to make decisions on behalf of players; weather impacts both on turf and soil, and hence the playability of those surfaces.

2) *Cold-weather sports dependent on a grass turf surface could benefit.* They could find that less disruption from snow and ice would result in less postponements and abandonment of fixtures so that the economics of sports like horse racing could benefit. Lengthy and expensive shut-downs, abandonment and suspensions can not only play havoc with fixture lists, but also result in huge financial losses. Often it is the quality of play on the field that is diminished by poor weather. Mud-soaked fields, blizzards, fog and strong winds affect the style of the game, the degree of athletic control and the overall performance of the players.

3) *Summer sports.* Cricket and outdoor tennis are particularly weather sensitive. Rain, poor lighting and the state of the pitch or court are highly influential. Both sports, when played professionally, tend to be lengthy. For example Test matches and Wimbledon are spread over several days or weeks, and thus there is considerable potential for disruption. Heat can upset players and spectators in crowded stadiums, whilst drought can influence the playing surface. It is an interesting paradox that while sport is perceived as a healthy activity, more people are killed in developed countries from severe weather events like lightning, while engaged in outdoor activities such as golf, than in almost any other activity. If convective summer storms become more severe or more frequent this toll could rise. Similar storms, leading to flash flooding, could make extreme sports like potholing, kayaking and rafting more dangerous. How can we provide better forecasts for sports participants and do we need shelters on courses?

4) *Deterioration and destruction of sports infrastructure*. Many sports facilities, such as race tracks, (in the UK at Newton Abbot, Windsor, Worcester and Perth) and athletic stadiums are situated in

flood prone areas. Climate changes that might include more winter rainfall could mean periods when flood plain resources are unusable. Coastal golf links are subject to coastal erosion accelerating as a result of rising sea levels. Perry (12) reported that in the UK the Royal West Norfolk Golf Course spent £165,000 in 1990 to improve sea defences. Re-alignment of the coast could impact further on coastal courses. The costs of upkeep of sports facilities could change with changes in site drainage and irrigation needs, in both winter and summer. Operational decision-making on course and pitch maintenance will need to be reviewed. Expertise by sports professionals in this area (e.g. the golf industry) should be passed on to others involved in turf management, such as park and garden management.

5) *The economics of weather-proofing*, including stadiums with retractable roofing, and pitch protection systems, could change. As Taylor (12) suggests, the more sophisticated the weather-proofing, the more expensive the cost of the proofing. These costs would mirror the scale of the environmental stress which is being countered. In addition, the economics of using artificial grass and under-pitch heating systems could also change.

6) *Sports gear design*. Opportunities exist in the design and use of new materials for sports wear that helps to maintain body micro-climate. With higher temperatures there will be a need for more lightweight clothing suitable for exercising in warmer conditions.

7) *Narrow-margin sports*. Conditions are most critical when the margin of victory or defeat narrows to hundredths of a second. This would apply to sports such as athletics and motor racing. Changes in conditions can be extremely influential in such sports and winning may come down to anticipating the most likely climate conditions when training for an event, and studying the actual weather when the event takes place. Climate change could affect the future likelihood of breaking world records in such sports.

8) *Fauna and flora*. Some sports involve fauna and flora in the natural environment. Climate change that alters the balance or number of species could have an impact on sport. Examples would include fishing (a very popular sport in many industrial countries), and hunting. Marine tourism would also fall into this category if there are changes to the underwater environment.

CONCLUSIONS

Engaging in and watching sporting events is likely to grow further in popularity as the population ages but becomes more health conscious and wishes to stay fit and trim. Climate change will offer threats and opportunities to the whole sports provision industry as changes develop in the supply side. Tastes and preferences of the public are likely to change, and there will be a considerable need to monitor and to anticipate what facilities are likely to be most in demand.

Already there is a lot of activity in this area, but it has not been drawn together into a cohesive picture of how climate change will influence the sports industry as a whole. There is a need for climatologists to collaborate with the new and developing field of sports science to initiate and to develop a research agenda. Sports planners and organisers represent an important group of stakeholders who are often unaware of how changes of climate could impact sport. Sports tourism can be seen as an important sub-set of tourism; it is growing rapidly, and offers some interesting research areas.

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