The Relationship between tourism and water in dry land regions

La Vergne Lehmann
University of Ballarat, Victoria, Australia
llehmann@ballarat.edu.au

***Abstract**: In 2003, the World Tourism Organisation recognised that fresh water is a critical element in tourism. Dryland tourism destinations, particularly those that focus on nature-based and ecotourism, rely on a healthy environment and therefore indirectly use water to create the original attraction for tourists. Once tourists start to visit a destination, water is utilised in both in consumptive and non-consumptive ways during their stay, thereby creating a direct use of water in tourism.*

At a destination level there are dryland regions where water is closely linked to a successful tourism industry through its role as an attraction. Water affects a wide range of environmental resources that can be the main attraction for tourism including wildlife, biodiversity, snow regions and health spas.

This paper reviews the current literature concerning the relationship of water to tourism, water management initiatives in the tourism sector and the contrast between water demand and supply for sustainable tourism. The literature review revealed that the relationship between water and tourism becomes more critical when considering the nature and breadth of the ongoing drought situations along with the climate change issue. These findings inform future research aims, which are outlined in this paper.

Introduction

Freshwater has been recognised by the United Nations World Tourism Organisation (UNWTO, 2003) as one of the most critical and scarce natural resources for the tourism industry. It is also well documented in the literature that the tourism industry over-uses water resources by at least a factor of two over permanent residents (UNEP, 2009). For example, the United Nations Environment Program (UNEP) has estimated that tourists in Spain use as much as 440 litres a day, more than double the average Spanish citizen. Other estimates of tourist water use range from 300 to 850 litres (De Stefano, 2004) or up to six times that of local residents (Narasaiah, 2005).

De Stefano (2004) highlights the causal relationship between the tourism industry and a range of water uses including; water shortages, the degradation of water supplies and the local environment, as well as increased production of waste water. Water scarcity in some tourism areas, however, has also led to increased interest in water recycling, desalination and improved water storage capabilities in order to provide greater water security into the future (Jamieson *et al*, 2003).

Water plays an essential role in attracting tourists to a region. This is reflected in marketing material which often contains images of water which, in turn develops the 'tourist gaze', a theory developed by Urry (2002) to define the relationship that tourists have with the images they see when they travel. This becomes particularly important in those tourism destinations such as dryland regions where water is becoming increasingly scarce.

Literature Review

This literature review provides an overview of key tourism literature where issues of water management have been identified. The focus of much tourism research in arid and semi-arid regions has been in relation to aspects of freshwater usage in tourism, particularly in those with well developed tourism attractions and those that have highly defined water volumes, such as small island states (UNWTO, 2003, 2008).

Within the literature the prominent area of discussion concerning the role of water in tourism are consumptive or non-consumptive uses of water and direct and indirect uses of water. In the context of tourism, water can be considered an input for consumption or as an integral part of the environment that is enjoyed but not consumed. The difference between the two uses is that consumed water is either no longer available or is highly contaminated.

An alternative view of tourism water use, expressed in the literature is a case study by Gössling (2001, 2006). This study, based on the island of Zanzibar has a focus specifically on the differentiation between direct and indirect use of water in the tourism sector. Examples of direct water use in tourism include bathing, toilet flushing and washing hands, or any activity that is controlled by an individual tourist. Indirect uses are those that involve the use of water to create an attraction or in the overall running of the tourism business and can include irrigation for gardens, swimming pools, facility cleaning and restaurant purposes.

International research into sustainable use of water in tourism is predominantly concerned with determining whether there is likely to be a significant impact on either water quality, water quantity or both (Orams, 1998; Garrod and Wilson, 2003; De Stefano, 2004). For example, research into tourism destinations in the Mediterranean, the world's largest tourism playground, is concerned with consumptive water use (Essex *et al*, 2004). Island destinations have also attracted attention because of limited and defined water supplies (Gössling 2001; Essex *et al*, 2004). However research that brings together the multiple issues of water and its association with tourism remains limited and Gössling (2001) concludes that there is insufficient data for many tourism regions on overall water use.

This focus on consumptive use is demonstrated in recent Spanish case studies that have highlighted the contrasts in water use by tourists using different types of accommodation facilities (Rico-Amoros, *et al*, 2008). This research concluded that different types and ages of accommodation can have a significant impact on individual tourist water consumption.

In the more water abundant destinations of Canada and New Zealand research by Draper (1997) and Cullen *et al* (2004) respectively has identified some interest in sustainable water use because of the highly seasonal nature of tourism. These studies show that the tourism industry places significant pressure on water resources in relatively small communities on a seasonal basis (Cullen *et al* 2004).

In Australia, pertinent research in sustainable water use in tourism was undertaken in Queensland and New South Wales, where there is a significant tourism industry with larger scale operations (Kavanagh, 2003). This research focussed on those enterprises that possessed an independent supply of water and were principally concerned with waste management (Kavanagh, 2003).

In reviewing the literature, the increasing focus on climate change has heightened interest in sustainable tourism issues, and to date the focus has largely been on carbon emissions rather than changing water regimes. The recent UNWTO Global Summit in Davos (UNWTO & UNEP, 2008), drew further attention to concerns about the future supply of water and the potential impacts of reduced water supplies in some regions. The final report identified a number of gaps in the literature on climate change and tourism relating to water issues including the direct observed impacts of climate change upon tourism activity at any scale and the impact of changing water regimes in dryland regions.

The role of water in tourism

In developing an understanding of the role of water in the context of tourism, it has become apparent that water, by its very nature is ubiquitous in tourism, it plays a range of different roles across the sector and can be interpreted in a number of different ways.

Figure 1 summarises the different uses of water identified in the literature at a destination level (Gössling, 2001; Tourism Victoria, 2003, 2004, 2007, 2008; Hadwen *et al,* 2006*)*. The diagram highlights the difference between consumptive water use that removes water from the local supply compared to non-consumptive water use that does not and therefore maintains the same water quantity and quality despite tourism use.

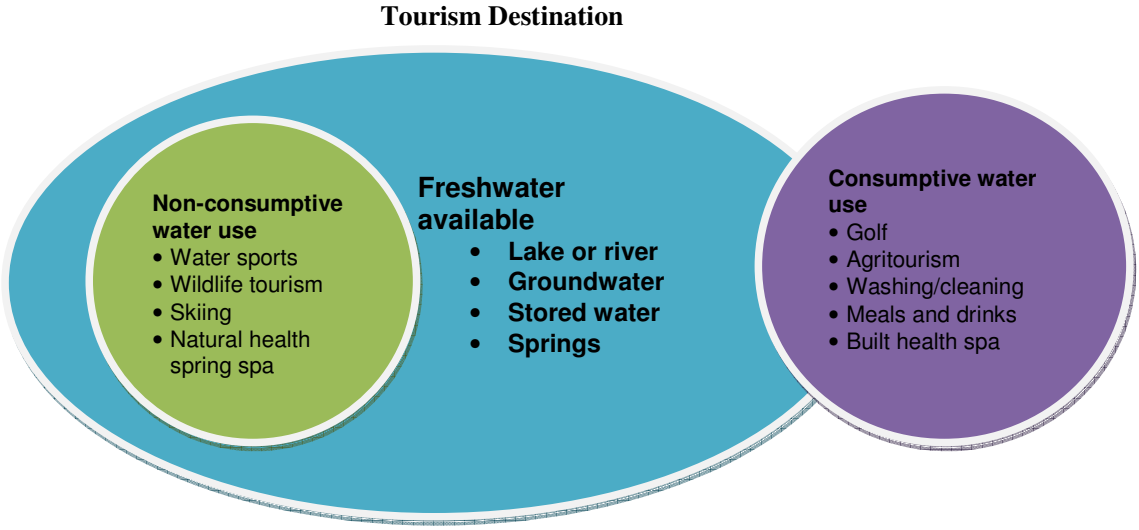

Figure 1: Consumptive and non-consumptive water use

While the current literature on water use in tourism discusses the diverse ways that tourism uses water (Gössling, 2005, 2006), there is no analysis of the impact that either consumptive or non-consumptive water use has on the tourism sector, the destination or community.

Gössling (2001) identified the direct and indirect aspects of tourism use in his Zanzibar island case study, although there is little published evidence that analyses the difference in the relationship between direct and indirect use of water and the implications for different types of accommodation and the mix of accommodation styles in a destination.

Although water use in tourism can be defined as direct or indirect or consumptive or non-consumptive, it is also often spasmodic in many tourism destinations. Spasmodic water use occurs as a result of tourism seasonality or special event tourism where there are large changes in the visiting populations at different times of the year or for short periods (De Stefano, 2004).

The way in which water is classified in tourism is critical to any analysis and interpretation of the overall relationship that water has with tourism. Two main approaches have been identified through the literature; consumptive versus non-consumptive water use and direct versus indirect water use. The difference between the two approaches is how tourism impacts on water. Consumption/non-consumption is largely a quantitative view of water whereas direct/indirect is about who has control of water use. While the literature has considered some aspects of these approaches, there is a gap in the literature where both of these approaches are brought together to consider both in one location.

Sustainable water use in the tourism sector

In the early to mid 1990s the tourism industry came under increasing pressure to develop a more sophisticated approach to marketing, accreditation, customer service and facilities. This was in part a reaction to the changing needs of the domestic population in their holiday activities. Holiday habits changed with the advent of cheaper flights to a variety of international destinations, smaller family units and the shift away from the annual family, summer, coastal holiday (Tourism Research Australia, 2008). At the same time many inland regions started to experience drier climatic conditions that have culminated in more than a decade of drought in many areas (Bureau of Meteorology, 2008).

It is also now well accepted that the tourism sector has a significant role to play in sustainable development and climate adaptation and mitigation (UNWTO & UNEP, 2008). A recent Australian report by Beeton *et al* (2007) into the environmentally sustainable practices of Victorian tourism enterprises recognised that while concerns about sustainability have been growing for the past 20

years and is a primary concern among tourism industry leaders, there were still some significant barriers to achieving practical sustainability at the enterprise level. At a general community level people have started taking the issue of sustainability seriously and in terms of water use at home very seriously indeed. Clarke & Brown (2006) showed that considerable effort has been put into a range of programs involving community education programs to encourage behaviour change and accessible technology for home use. Some evaluation of these programs has also been undertaken in recent years (Troy & Randolph, 2006, Spehr & Curnow, 2008).

Warnken *et al* (2004) highlighted that the 'mind set' of many tourists can result in quite different behavioural patterns while they are away on holiday. They suggest that the vacation experience is often viewed as a time to get away from the rigours of everyday life and indulge oneself. As a result tourists are likely to behave in ways that are less consistent with normal environmental practices they undertake while they are at home.

Thus, while the literature has identified a variety of issues relating to water sustainability in tourism at the enterprise level and the need to understand the holiday behaviours of tourists, there is no current research that has developed an approach to optimise the sustainable water use between enterprise management and technology and consumer education.

The value of water in tourism

It was Benjamin Franklin who said '*when the well runs dry, we'll know the value of water*' (Roddick & Briggs, 2004). Having established how the tourism sector uses water, it is then necessary to consider how to value that water.

While there has been a considerable body of literature on valuing water in a variety of contexts (Linsky, 2004; Young, 2005; King & Mazzotta, 2008), there has been very little research into how water should be valued specifically in tourism (Linsky, 2004, Young, 2005). In a presentation on the value of water, Linsky (2004) suggests that the real value of water should be related to how it is used. Table1 summarises the range of valuation methods that have been identified that highlight the diverse range of methodologies adopted and which have been applied in the tourism and recreation sector.

Adding to the complexity of valuing water in tourism is the need to identify the percentage of water that relates to tourism use compared to other uses. In areas where tourism is the most significant economic driver the calculation will be relatively simple. However in mixed economies where tourism is one of several competing water users, an assessment of the level of water use will need to be made. One method that may be appropriate in this context would be a bottom-up approach as applied in the measurement of carbon dioxide emissions in tourism and outlined by Becken and Patterson (2008). This bottom up analysis at industry level was combined with top-down analysis using integrated economic-environmental accounting. This approach may be transferable to valuing water in tourism and applicable to this research.

Table 1: Valuation methods for water

Valuation Method	Impact on tourism water valuation	Variables to be included
Revealed willingness to pay		
Market Price method (King & Mazzotta, 2008)	Estimates economic values for products or services that are bought and sold in commercial markets	Economic, environmental, recreational, health, cultural
Productivity method (King & Mazzotta, 2008)	Estimates economic values for products and services that contribute to production of commercially marketed goods.	Economic, environmental
Hedonic pricing (Young, 2005)	Estimates economic values for services that directly affect the market price of some other good.	Economic, environmental, health, water quality
Travel cost method (Young, 2005)	Value is reflected in how much people are prepared to pay to travel to a place.	Economic, recreational
Imputed willingness to pay		
Substitute cost (King & Mazzotta, 2008)	Estimate of cost to provide a substitute	Economic, environmental, recreational, health
Expressed willingness to pay		
Contingent value method (King & Mazzotta, 2008)	Estimates the value identified by people on their willingness to pay	Economic, environmental, recreational, health, quality

The current literature suggests that there is some common understanding of the role of water in tourism however there is little evidence of the interaction between different uses or the measurement of this interaction in the context of tourism destinations. It is also evident there are a number of different water valuation methods that have been applied to valuing water in some aspects of tourism however there appears little evidence of a holistic approach to water valuation.

In response to this identified shortfall in current tourism research, it is proposed that by mapping the various types of water usage (consumptive and non-consumptive, direct and indirect) and applying appropriate water valuation methods in tourism, it may provide the tourism sector with the means then to better manage and develop tourism destinations and enterprises in a changing and water-stressed environment. Furthermore by apportioning some commensurate value to water in tourism it will assist the industry in communicating water usage messages and how consumers can change their water usage expectations while on holiday.

The research question and aims

The relationship between water and tourism becomes more critical when considering the nature and breadth of the current drought situation in south eastern Australia. Evidence presented at the Climate Change and Tourism Conference held at Djerba in 2003 (UNWTO, 2003), brought to the attention of researchers the complexity of the inter-relationship between water and tourism in dryland regions such as the Great Horn of Africa region. However to date there has been little research into these relationships and how to address the issues presented. This has provided the rationale for the research question to be addressed in this PhD study.

How has an increasingly water constrained environment impacted on tourism in dryland regions?

Within the complexity of tourism's interaction with water, this research aims to develop a model to guide tourism policy and planning to achieve sustainable water use for tourism destinations, enterprises and communities. To achieve this aim the following objectives will be met:

- to identify the main issues associated with consumptive/non-consumptive and direct/non-direct touristic water use in dryland destinations;
- to map the uses and assess the value of water in tourism;
- to establish the relationships between industry, enterprise, tourist and water use;
- to identify those mechanisms that will most effectively impact on sustainable water management in dryland tourism regions at the destination, enterprise and tourist levels.

By comparing the experiences of tourism destination managers and a variety of enterprise operators in the Grampians and Wimmera Mallee regions of Victoria over the last ten years, this research will propose a model of effective water use. This model will encompass changing tourism consumer behaviour and expectations and provide tourism destinations and enterprises with the tools to understand the role and value of water in tourism and to optimally manage their own water resources.

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