

# **A CHANGING CLIMATE – CHALLENGES AND OPPORTUNITIES FOR IRISH TOURISM**

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## **ABSTRACT**

This paper explores the issue of climate change in the Irish context and examines how a changing climate may present both challenges and opportunities for the Irish tourism industry. With increasing temperatures and reduced precipitation likely to be expected in summer months, followed by wetter winters and potential increases in likelihood and severity of extreme weather events, crucial challenges lie ahead for Irish tourism. These fall in the areas of environmental capacity particularly in relation to Ireland's prized landscapes which act as primary drivers of tourism demand. Further challenges include issues surrounding water resource management during peak tourism seasons and potential impacts of extreme weather events. Faced with such challenges, there is a need for the tourism industry to take immediate actions to respond to climate change. Coinciding with adaptation to negative climate change impacts, potential exists to maximise positive climate change impacts. Opportunities may include extending the existing tourism season in 'shoulder' periods, capitalising on projected increased visitor numbers offering a more diverse range of activities throughout the year and increasing the drive towards a sustainable tourism product to augment Ireland's esteemed image as a 'clean, green' destination among its visitors.

**Key Words:** Tourism, Climate Change, Impacts, Environmental Capacity, Adaptation

## **INTRODUCTION**

Climate change has become one of the core challenges of our time and is likely to be the critical challenge faced by humanity into the future. The United Nations World Tourism Organisation (UNWTO) has been fundamental in the development of a research agenda on the climate change/tourism issue, evident from the Djerba (2003) and Davos (2007) international conferences on climate change and tourism. The Davos conference was followed up by three further related events in the same year: Tourism Ministerial Summit, London; UNWTO General Assembly, Columbia; and UN Climate Change Conference, Bali. These key events combined to set up a framework for research and action. Tourism has been acknowledged as a two-way relationship, as both a vector and a victim of climate change. As a vector, tourism contributes to climate change through its greenhouse gas (GHG) emissions while as a victim; tourism resources, infrastructures and markets may be negatively impacted by changes in local climate. This paper focuses on the latter strand of the relationship - the impacts climate change may place on Irish tourism. Once an understanding of potential impacts has been established, the paper expands further on this by discussing adaptation issues for the Irish tourism industry, which are essential in preventing Ireland's tourism industry unduly suffer from this global challenge.

## **A CHANGING CLIMATE**

The publication of the fourth assessment report by the Intergovernmental Panel on Climate Change (IPCC, 2007) affirms the point that the global climate is changing. Global average surface temperatures have increased by 0.76°C over the 1850-1899 to 2001-2005 periods (Sweeney and Fealy, 2008, p.1). This change is now unequivocal and is likely that the changes are due to anthropogenic/human-induced change (greater than 90% probability). Ireland's climate is not like that of more traditional European holiday destinations. Owing to its temperate maritime climate and the influence of the Atlantic Ocean and Gulf Stream, precipitation rather than sunshine is its distinctive feature. As the world's climate continues to change under the various scenarios of global warming, Ireland too will see changes to its climate.

Researchers at the Irish Climate and Research Units (ICARUS) at the National University of Ireland, Maynooth have produced climate change projections for Ireland for 2041-2070 using climate data from 1961-1990 averages as a baseline period. Output from three global climate models (GCM) were statistically downscaled and incorporated the IPCC's Special Report on Emission Scenarios (SRES) A2 and B2 emission scenarios (Sweeney, J. *et al.*, 2008). Statistical downscaling is necessary because GCM output has a coarse spatial resolution that does not permit analyses at finer, more regionalised resolutions, which are necessary for useful impact studies. Below an outline of projected changes in temperature and precipitation for January and July will be examined, along with the likelihood of changes in the frequency of extreme events. These primary meteorological parameters are crucial for studies in tourism climatology as they can influence the tourist experience and satisfaction with the tourism product under consumption.

### **Temperature**

Ireland's climate is already changing. Six of the ten warmest years have occurred since 1990 and the mean annual temperature has risen by 0.7°C between 1890 and 2004 (EPA, 2008). Future scenarios projecting Irish temperatures for the period 2041-2070 show overall temperature is projected to increase with mean temperatures projected to rise 1.4-1.8°C by the 2050s and by 2°C or above in all seasons by 2070-2099 (Sweeney, J. *et al.*, 2008, p.26, Figure 1). Crucially for the peak tourism season in Ireland, July temperatures will increase by 2.5°C by 2050 and a further increase of 1.0°C by 2075 can be expected resulting in average maximum July temperatures of 22.5°C (present July average temperature is 19 °C). A 'continental' effect is likely to occur in all seasons and intensify into the future with the central Midlands of the country experiencing maximum July temperatures approximately 24.5°C. These projected temperature changes will impact upon the tourism industry. While tourism may become more desirable in summer months due to increased temperatures, there may be less desirable consequences when precipitation is accounted for.

## **Precipitation**

A shift will also occur in precipitation patterns, both in volume and spatial distribution (Figure 2). By the 2020s, winter precipitation may have increased by 3% and conversely, summer precipitation is likely to decrease by 3%. However, more pronounced decreases (10-16%) during the summer and early autumn months are projected across eastern and southern regions. As time progresses, these changes will become more pronounced. Winter precipitation will increase by 11% and up to 20% by mid-century in north-western regions especially. Reductions in precipitation may reach 25% with decreases up to 40% in some parts of the south and east. These reductions in the south and east of the island are significant since these regions are among the most frequented by visitors. Winter increases in precipitation may result in reduced visitor satisfaction from those who visit in the off-peak season, particularly November-March. Ireland's poor weather is cited as one of the main disadvantages of choosing Ireland as a destination to visit (Fáilte Ireland, Visitor Attitudes Surveys).

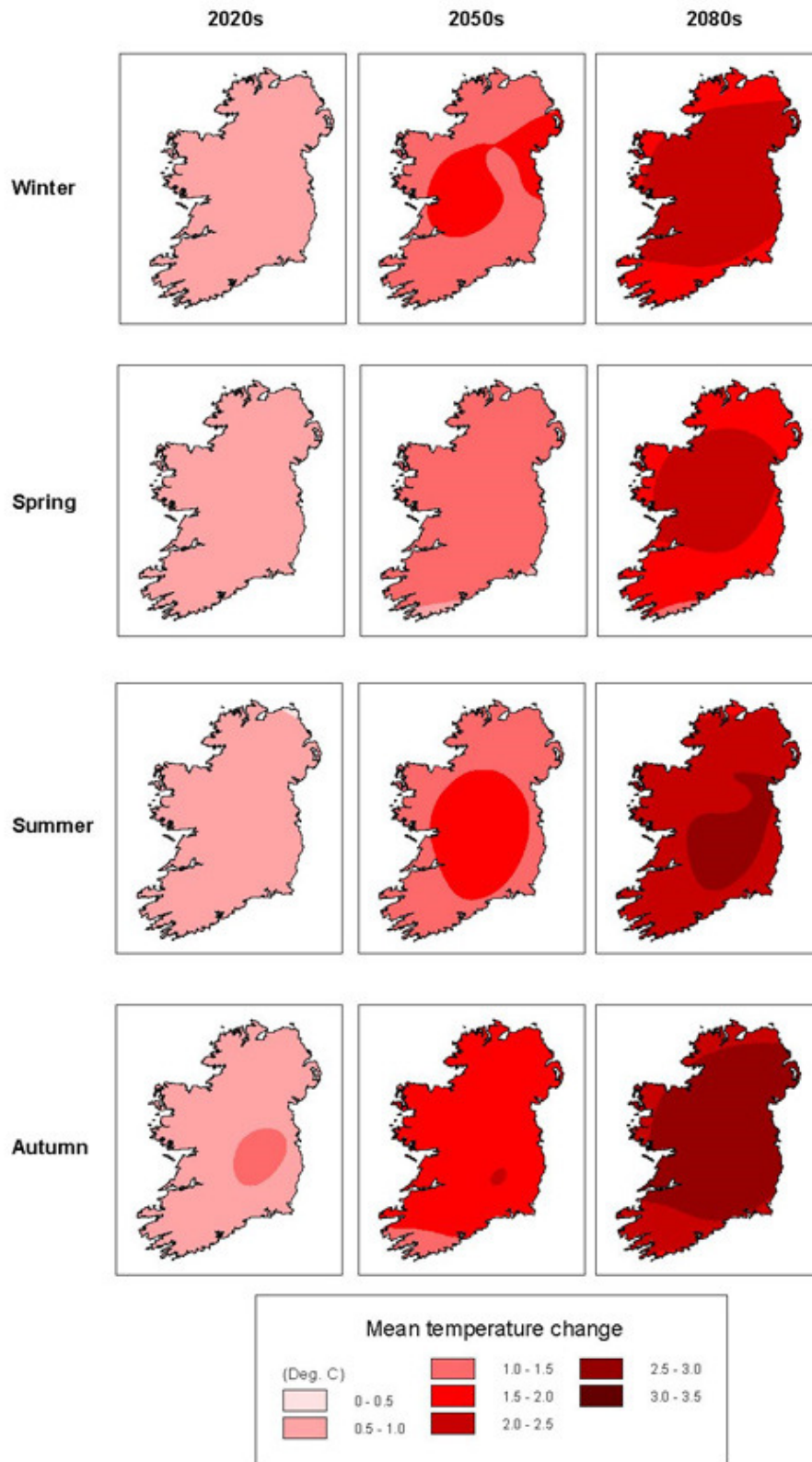


Figure 1: Ensemble mean seasonal temperature increases projected for the 2020s, 2050s and 2080s. (Fealy and Sweeney, in Sweeney, J., *et al.* (2008a), p.28).

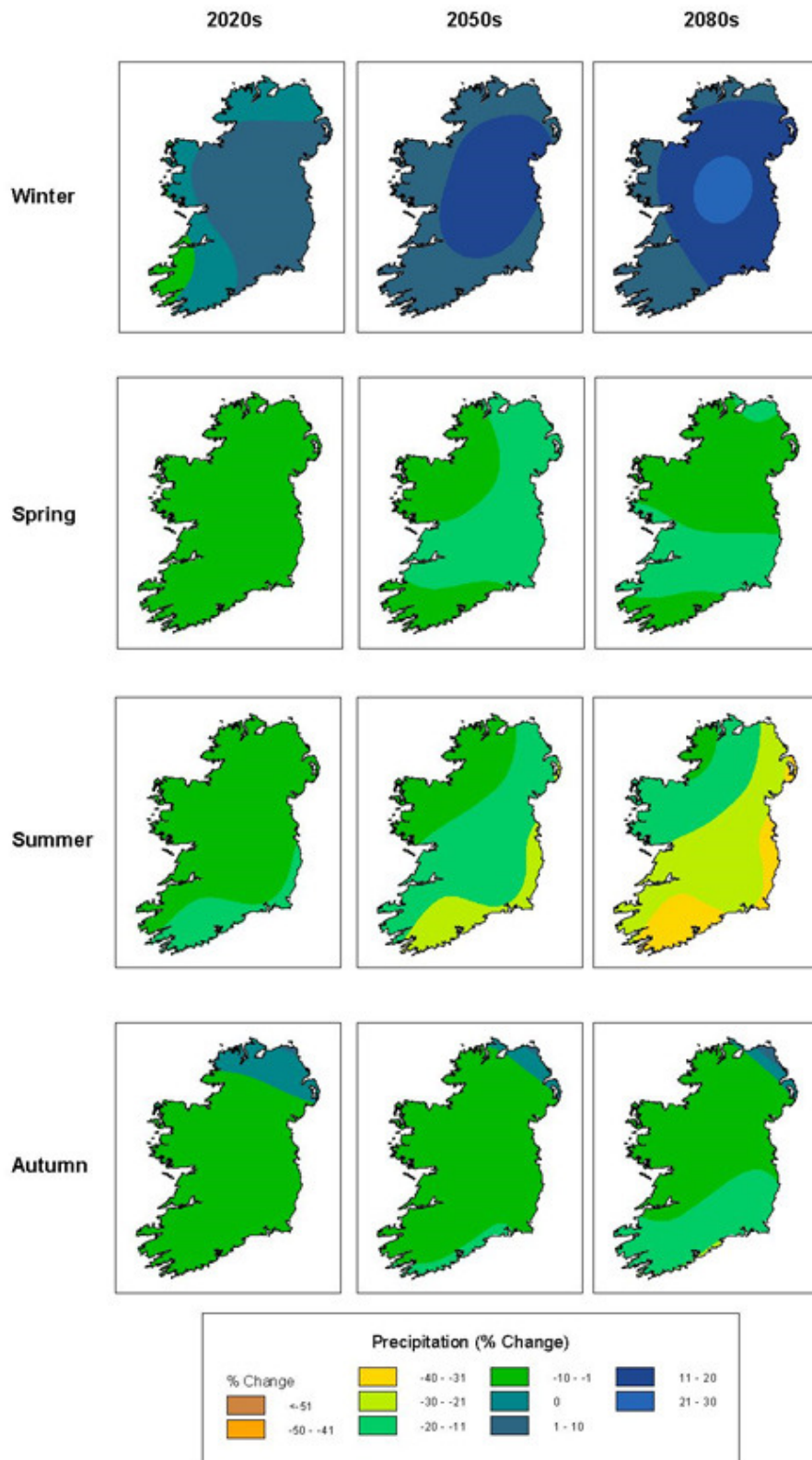


Figure 2: Ensemble mean seasonal precipitation changes projected for the 2020s, 2050s and 2080s (Fealy and Sweeney, in Sweeney, J., *et al.* (2008a), p.31).

## **Extreme Events**

Stemming from changes in the global climate system, Ireland will experience changes in the frequency and magnitude of extreme events, such as drought, flooding and storm surges (McGrath, *et al.*, 2008). Arising from increasing temperatures and reduced precipitation in summer months, more prolonged periods of drought can be expected (IPCC, 2007) and these will spread across a greater land area, such as the 2003 European-wide heatwave. Large quantities of water will be required for irrigation purposes but a challenge lies in where this water may be sourced in face of competing demand from users. On the other hand, the increased volume of precipitation in winter months may result in an increase in heavy rainfall events and consequently, increased risk of flooding, especially in western regions (Sweeney, J., *et al.*, 2008). Severe flood episodes of 2002 and 2009 are indicators of this. Extreme events are the ones most likely to have lasting damaging effects as opposed to long-term changes in mean conditions. However, one must note there is low confidence in projections of future extreme events so the uncertainty levels surrounding extreme events are high. Despite the uncertainty levels, it is unequivocal that the climate is changing and therefore societies need to urgently begin acting in ways which reduce their risk levels.

## **Summary and implications of projected climatic changes**

In general, climate change will bring a more reliable summer season to Ireland with warmer and drier conditions while Irish winters will become warmer and wetter. The likelihood of having ‘good weather’ is a key motivation in choice of holiday destination. Therefore, it is probable tourists will adapt their travel behaviours according to changes in regional climate and this may lead to seasonal and regional shifts in tourist flows (Deutsche Bank (DB) Research, 2008). Although Ireland will face competition from other Northern European countries, it is also likely to be in a strong position to attract new tourist markets. While increasing temperatures and reduced summer precipitation at first glance appear advantageous to Irish tourism, on closer inspection of likely impacts, we begin to see that climate change will pose both threats and opportunities to the success of tourism. Therefore, national tourism bodies must begin to reposition itself so that it can reap optimum benefits from this changing climate. The industry should also

endeavour to augment the adaptive capacity of all involved in tourism in Ireland so that they can better cope with inevitable negative impacts.

## **OPPORTUNITIES FOR IRISH TOURISM UNDER CLIMATE CHANGE**

### **Extension of tourism season**

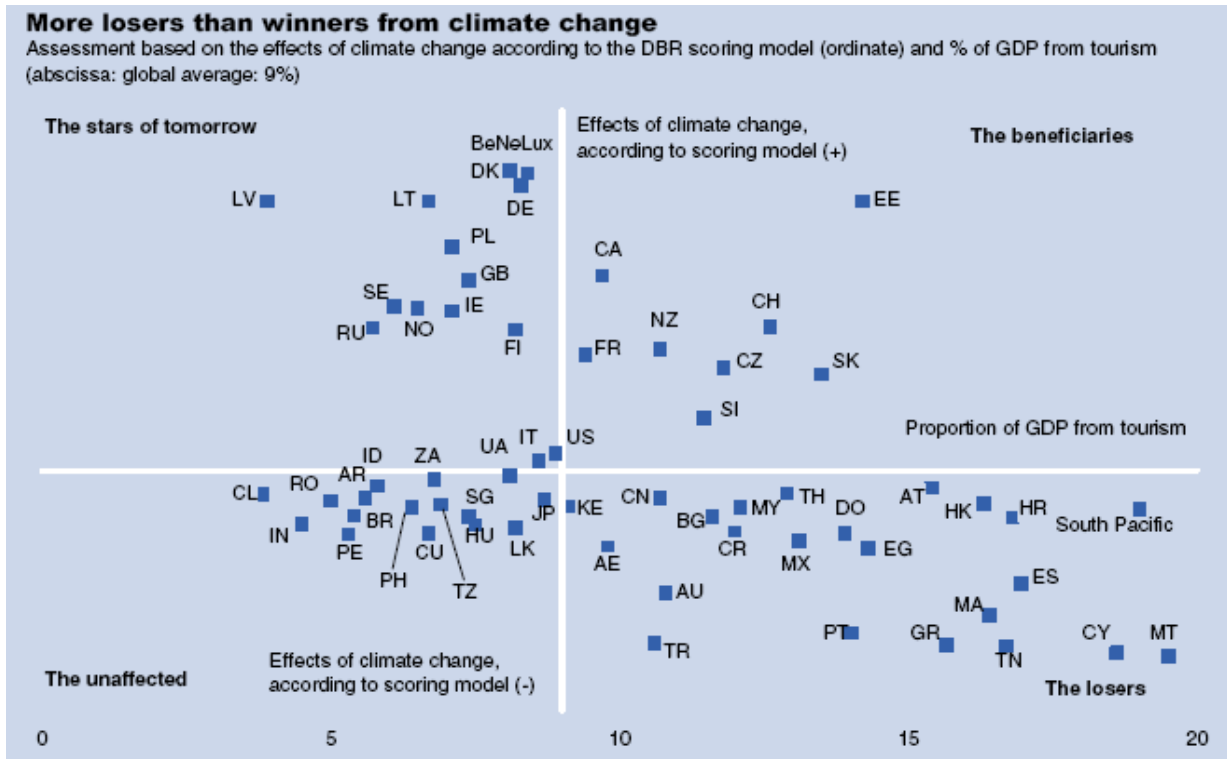
The chance of having ‘good weather’ is a key motive in choices of holiday destination, it is likely tourists will adapt their travel behaviour according to changes in climate over time. This is likely to lead to seasonal and regional shifts in tourist flows (DB Research, 2008, p.4). Smith (1990, p.179) states that “climatic change will make necessary some revision of tourist seasons”. The ‘shoulder’ periods are likely to increase in the higher latitudes because of this move away from the Mediterranean regions. However, the increased temperatures will allow for an increase in spring and autumn tourism to the Mediterranean. For Ireland, given the projections of a warmer, largely drier and more reliable summer season as the century progresses, the frequency of two excellent summer months being experienced will gradually increase. Furthermore, the opportunity for a more prolonged tourism season can be realised with expansion from the present peak-tourism months (May-August) into ‘shoulder’ months of April and September/October. Changes in reliability of the climate and expansion of the tourist season will not be immediate, but will become clearly evident within 20-25 years. The earliest beneficiaries will be tourism facilities along the southern and eastern areas of Ireland which are projected to have the significantly drier conditions.

### **Increased visitor numbers**

Climate assumptions help form established tourism flows particularly in the case of regions with favourable conditions for tourism (Holden, 2008, p.210). For example, tourism to the Mediterranean region has grown largely from the assumption of having warm and dry weather conditions in summer months and so tourism is at its peak here during this season. However with climate change, projections for tourist volumes to the Mediterranean region show a likely decline as temperatures become uncomfortably hot for many tourists during the present peak season. This combined with other climate change induced stresses such as water availability, means a shift away from this popular

tourism region is likely (Allen, 2006; DB Research, 2008; Perry, 2003). This shift will expand into the higher latitudes and higher altitudes which will also have warmed under climate change. Consequently, Northern European countries are likely to become more favourable destinations to holiday in (Amelung, *et al.*, 2007; Bigano, *et al.*, 2006; Perry, 2003).

Situated in the north-west region of Europe, Ireland will be one country expected to benefit from these regional shifts in tourist travel. Indeed, Ireland is touted as being a ‘Star’ of tomorrow in modelling research carried out by DB Research (2008) on the impact of climate change on global tourism (Figure 3, labelled IE). Furthermore, Hamilton and Tol (2007) employed an econometric model, the Hamburg Tourism Model (HTM), to simulate tourist flows to and from a selection of countries under different scenarios of socio-economic growth as well as climate change. Ireland, investigated as part of this study, is sparsely studied otherwise in this field and so the findings of this work are a crucial starting point in looking ahead to the future. International arrivals to Ireland are projected to continuously increase over the century across all scenarios used with saturation occurring around the 2080s in the (now most plausible) high emissions, economic driven A1 scenario. The Irish tourism industry should be preparing itself to battle with other competitors in Northern Europe to attract these newly migrating tourists to Ireland. An increased demand from domestic tourism is also likely to emerge, according to this study. Again, this highlights an opportunity for tourism industry stakeholders to capitalise on such projections and continue to encourage the uptake of domestic tourism and the notion of the ‘stay-cation’ which has been popularised in recent years.



**Figure 3: Position of tourism under climate change (DB Research, 2008, p.28).**

### Diversification of tourism activities

Other benefits for tourism derived from climatic change may include development of outdoor activities and the expansion of nature-based destinations (Fischer, 2007, p.17). Preliminary figures for 2009 show that cross-country walking/hiking (830,000 participants), cycling (114,000), golfing (143,000) and angling (132,000) were all popular outdoor activities undertaken by overseas visitors to Ireland and contributed a combined revenue of over €800 million (Fáilte Ireland, 2010, p.5). With a more stable summer climate and greater chance of dry weather conditions, the expansion of outdoor leisure and recreation activities will be possible. However, while drier, warmer weather may encourage such activities, the quality and satisfaction of these types of visitor experiences may also be jeopardised by climate change as safety concerns for stability of lands, walking trails and the occurrence of extreme events will increase also. Water-based activities such as surfing, boating, water-sports in Ireland's coastal and inland waterways will be given further potential to grow and attract both domestic and overseas users (Heritage Council and Fáilte Ireland, 2009). Further to this, the establishment of a continental style 'café' culture holds potential for restaurateurs (McEvoy, *et al.*, 2006). A

further extension of the diversification of tourism activities may be the development and consumption of sustainable tourism products.

### **Sustainable tourism markets**

The conceptual approach of sustainable development strongly emerged following the 1987 World Commission on Environment and Development (WCED) Brundtland report and has been adopted into many sectors of society to differing degrees of success. Sustainable tourism is a concept within the tourism industry which developed from a large body of impacts work carried out on the tourist industry during the 1980s (Coles, 2003). It became an issue in face of the intensification of mass tourism, viewed as extremely unsustainable for many regions, and which is specifically mentioned in the Agenda 21 action plan for sustainable development.

Hunter (1996) outlines four scenarios of sustainability within tourism. The first is solely orientated around economics and growth of the industry in economic terms. A second scenario is at the other end of the spectrum; a strong environmental ethic behind it and is concerned with the environmental conservation aspects to tourism activity and its resources. The third scenario suggested by Hunter is a medium between the previous two. This approach has been defined as ‘product-led tourism’, where growth of the industry is the main concern although environmental considerations are included to some extent. In the Irish context, it could be said the industry lies in the ‘product-led tourism’ scenario as many tourism businesses strive to develop and grow their products for economic benefit first and foremost. Awareness and conservation of the natural environment is considered after this. However, more sustainable minded initiatives such as the Greenbox area in the North-West region and the Burren Beo Project in Co. Clare are making strives towards Hunter’s second scenario of strong sustainable development of tourism where the natural environment is treated as a tourism resource but is also treated with due care. A fourth scenario, ‘neotenus tourism’, is concerned with actively limiting tourist numbers in areas of significant and sensitive ecological value. Into the future, should climatic change impact on our natural environment either directly or indirectly in severe ways (erosion of

beaches, threaten vulnerable ecosystems), this fourth scenario may become a reality in susceptible areas.

The sustainable tourism idea is the way forward as proposed by UNWTO and falls into Hunter's third scenario of environmentally conscious driven tourism. To maintain a competitive advantage over other tourist destinations in Northern Europe, Ireland must begin actively developing a more carbon neutral product offering so that the tourism industry can position itself in the best possible way to act on the opportunities brought about through a changing climate. The existing aforementioned initiatives in Ireland serve as a best-practice example to other aspiring sustainable tourism promoters around the country. Standardised education programmes to aid the development of sustainable tourism practices among tourism enterprises should be encouraged. As stakeholders seek to improve the overall environmental quality and impact of their services, Ireland can strive to become a truly environmentally 'green' destination as is anticipated from our visitors who take part in Fáilte Ireland's Visitor Attitudes Survey.

Should Ireland increase its visitor numbers and have greater scope for diversifying its tourism activities and offerings through the positive benefits of climate change, the industry should also be prepared to face some of the inevitable challenges climate change will present.

## **CHALLENGES FOR IRISH TOURISM UNDER CLIMATE CHANGE**

### **Supply and demand for water**

Broadly, climate change will result in serious water resource management issues. Future climate projections indicate volume and distribution of precipitation will be among the most challenging factors for Ireland in the coming decades. Overall, annual runoff will be reduced and eastern regions in particular will be severely affected. Tourism is highly dependent on a reliable water supply and this reliability may be compromised through climate change. Dublin ranks as the most visited tourist region in Ireland, followed by the South West, West and South East. High volumes of visitors to these regions create strain on the availability of water under the existing supply infrastructure particularly during

peak demand periods, such as the summer months. Water supply in Ireland is designed to cater for the permanent resident population as listed in Census population figures. It does not account for increased demand during peak tourist seasons when populations of some small towns can almost double due to tourist arrivals (e.g. Westport, Co. Mayo). It is important that an upgrade of water infrastructure is considered at pivotal locations to allow for a more sustainable consumption of water across all seasons.

Visitor attractions will be required to consider implementing and monitoring water use so that the quality of the attraction is not compromised for future users of the product. Among the most frequently visited attractions in Ireland are concentrated around the Dublin region (e.g. Guinness Storehouse, Dublin Zoo, and National Botanic Gardens). Thus is an area already under water supply stress and it is likely to be exacerbated into the future as population in the region continues to grow yet water availability is less. Additionally, the south and east coasts will become highly susceptible to drought periods during summer and early autumn months as the century advances. The need for irrigation of agricultural, recreational and municipal lands will become increasingly necessary and will lead to additional pressures on an already stressed water supply system. Demand may be amplified due to projected increases in tourist numbers (discussed above) and consequent increased demand for water to supply hotels, restaurants, leisure centres, golf courses and other facilities. Local Authorities and tourism boards in these regions need to be aware of this issue and will require information on how best to adapt to likely supply and demand issues.

Water bodies themselves act as a primary tourism and recreational activity with almost half of the Irish population taking part in some form of water activity in a given year. Most domestic and overseas visitors partake in water-based activities, generating an expenditure of €566 million in 2003 (Marine Institute, 2004). Activities include swimming, angling, surfing, inland sailing, cruising and other water sports. Under a changing climate, there is likely to be a general increase in the overall attractiveness of water resources for tourism. At the same time, one must acknowledge the potential negative impacts both from increased usage and also climate change. Changes in the quality of water is likely with a greater risk of eutrophication, low flows in water bodies,

marine ecosystems and fish stocks may be altered, and increased storminess may impact upon coastal activities (Heritage Council and Fáilte Ireland, 2009).

### **Landscape Aesthetics**

A contested concept, the geographer Carl Sauer (1925) understood the landscape to be an interaction between humans and natural environment and this is an understanding mirrored by the European Landscape Convention's definition. Aesthetics then is concerned with the visual characteristics of a landscape which make it appealing for those who view it, drawing in the notion of the tourist gaze, a concept developed by Urry (2002). A high quality natural environment is essential to the success of tourism in all destinations. Mieczkowski (1995, p.114) suggests 'the very existence of tourism is unthinkable without a healthy and pleasant environment, with well preserved landscapes and harmony between people and nature'. This is a particularly valid statement in the Irish context evident from the trends presented annually in Fáilte Ireland's Visitor Attitudes Survey. Consistently, visitor motivations to visit Ireland highlight the country's beautiful scenery, perceived unspoiled landscapes and range of natural attractions as key drivers of tourism. Our scenic landscapes and perceived high quality environment are our 'unique selling point' and the primary tourism driver next only to the Irish people. Therefore, concepts of 'landscape aesthetics' and the 'tourist gaze' are vital in studies of Irish tourism.

Any impacts on the natural environment, such as those posed through climate change, are likely to impact on tourism, tourists and perceptions of Ireland. Images of green, rolling landscapes are vivid among visitors. These landscapes and associated colours rely on Ireland's temperate and precipitous climate system and without abundance of rainfall; the green landscape associated with Ireland is vulnerable to change (Sweeney, K., *et al.*, 2008). Shades of brown are likely to become more prevalent during dry summer and autumn months. Tentative examples of this have been recalled from the prolonged dry summer period in 1995 for example. Further future impacts are likely to include increased risk of landslides, bog bursts, scarring of the landscape due to the increased occurrence of prolonged dry periods. When followed by intense downpours in

autumn/winter months, land becomes destabilised more easily and may result in bog bursts, landslides etc. resulting in long-term landscape scarring. The 2006 Derrybrien landslide in south County Galway is an exemplar of such an impact, with visible scars still remaining on the hillside.

## **RESPONSE TO CLIMATE CHANGE**

### **The concept of Adaptation**

Adaptation requires knowledge of vulnerability, risk and resilience. In the climate change context, adaptation is understood as actions taken to reduce vulnerability and risk and increase resilience from the impacts of climate change. Only when these are known can useful measures be adopted to combat the implications arising from climate change. Adaptation is complex because the severity of impacts can vary from region to region, depending on many factors such as physical vulnerability, degree of social & economic development and natural and human adaptive capacity. If there is no early response to climate change, forced reactive and un-planned adaptation results in mal-adaptation practices that may prove more costly than immediate, precautionary adaptive planning and implementation. The EU Commission's White Paper on climate change adaptation advises that for impacts where we have enough confidence in the forecasts, adaptation must start now (European Commission, 2009).

### **Adaptation and Irish tourism**

Smith (1990) highlighted the need for immediate planning and adaptation to the issue of climate change impacts on tourism and vice versa but many stakeholders involved in the industry are still yet to take heed of such suggestions. It is imperative that with a changing climate, a strong environmental ethic is at the heart of Ireland's tourism industry as we endeavour to maintain the quality and integrity of our tourism industry and natural environment as our principal tourist attraction. Impacts will vary from changes in environment, resource availability and changes in visitor patterns and preferences. Popular destinations may be impacted by climate change and existing infrastructure may be insufficient to deal with changing water, waste, energy and traffic demands (EPA, 2008). Therefore, successful adaptation to climate change will require extensive cross-

sector cooperation and integrated governance since tourism is linked with several other sectors in society. As highlighted earlier, the water supply issue is one that spans all sectors; agriculture, industry, households, sports grounds, biodiversity etc. Adaptation can take the form of both soft and hard measures. Soft measures are relatively inexpensive and don't require vast capital investments in technology. Examples include water, energy and waste conservation, raising customer awareness of issues public planning ahead through risk assessments, capacity building and updating disaster risk management strategies. So called hard measures are more costly and may be the only solution if delayed action occurs. Hard measures include defence and relocation measures such as sea wall structures to protect coasts, buildings, new power plants, more efficient, cleaner transportation modes. Appropriate adaptation planning and implementation measures will maximise Irish tourism's potential to capitalise on a changing climate. Future research will aim to extensively expand upon the adaptation options for the Irish tourism industry in face of the challenges and opportunities presented by a changing climate.

## **CONCLUSION**

Climate change will see a warmer, more reliable summer tourist season for Ireland. The frequency of two excellent summer months being experienced will gradually increase over the next two decades (though an occasional wet summer will also occur). There is a very real possibility the Irish tourist season can be successfully extended into 'shoulder' periods of April and October. Unlike Mediterranean regions, heat will not be overly oppressive and therefore, poses an opportunity for increased visitor numbers to Ireland (Hamilton and Tol, 2007). Benefits will not be immediate, but will be experienced near the end of the 2020s time horizon. Aside from the obvious benefits of a warmer climate, the look and feel of Ireland's landscapes, environment and unique ecosystems and habitats is expected to change (Sweeney, K., *et al.*, 2008). Since these are among Ireland's primary assets and key tourism drivers, it is imperative they are protected and their integrity maintained. The tourism industry should continue to proactively 'address its role and responsibilities toward the [natural] environment' (Holden, 2008, p.247). Overall reduced levels of rainfall is the key issue of concern and the extent of the more

negative changes depends greatly on the actions or inactions taken now by all the stakeholders involved, from public and private sectors of the government, industry and community. The European Commission's Green Paper Adapting to Climate Change in Europe-options for EU action highlights the need for early action in implementing climate change adaptation strategies. It argues that such strategies, if acted on now, will bring about clear economic benefits and minimise the threats to ecosystems, health, economic development, property and infrastructure. Ultimately, if undue damage is to be avoided, it is imperative forward planning begins immediately and appropriate adaptive measures are implemented and monitored in a sustainable manner.

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