Coastal Tourism in the Mediterranean: Adapting to Climate Change

Issues – the need for adaptation

The Mediterranean is the world’s most popular destination, attracting 31% of international tourist arrivals and accounting for 29% of receipts from international tourism. In 2008, the Mediterranean countries received 300 million international tourists, a number that is expected to reach 368 million by 2020. Taking into account domestic tourism as well, coastal zones of Mediterranean countries were visited last year by an estimated 250 millions of international and domestic visitors and this number will increase substantially in line with the forecast outlined above. As sun-sand-sea experiences dominate travel motives, favourable climatic conditions and unsullied environmental resources are an important precondition for holidaymaking. In the future, climate change may have a wide range of negative consequences for tourism in the Mediterranean, including heat waves, spread of diseases, drought, the associated risk of fires, as well as sea level rise potentially leading to coastal erosion. In order to assess the consequences of these changes for tourism, it is important to understand their magnitude, the timelines under which these will occur, and how these would translate into increasing or decreasing tourist numbers given a variety of adaptation options. Considering that tourism related activities, in particular transport and accommodation, also contribute to the emission of greenhouse gasses and therefore to climate change, mitigation measures also need to be adopted and included in any future tourism strategy. These issues will be the focus of the workshop “Coastal Tourism in the Mediterranean: Adapting to Climate Change”.

Changing climate in the Mediterranean according to the IPCC 2007

The warming trend throughout Europe is well established at +0.90°C for the period 1901 to 2005. The recent period 1979-2005 shows a trend considerably higher than the mean trend at +0.41°C per decade. These trends are less pronounced in the Mediterranean, where temperatures are also increasing more in winter than in summer. However, under high emission scenarios, North Africa may experience temperature increases of up to 9°C in summer in the post 2070s period. Yearly precipitation trends are negative in the eastern Mediterranean, and water stress is projected to increase all around the Mediterranean. The following section provides excerpts from the IPCC (2007) report on Impacts, Adaptation & Vulnerability, chapter 9 (Africa) and 12 (Europe). Note that there are far fewer studies for North Africa, and uncertainty regarding the future climate conditions of this part of the Mediterranean is consequently greater.
**Trends: Very high confidence**

Winter floods are likely to increase in maritime regions of Europe, where coastal flooding related to increasing storminess and sea-level rise is likely to threaten up to 1.6 million additional people annually. On the other hand, warmer, drier conditions, especially in summer, will lead to more frequent droughts, as well as to a longer fire season and increased fire risk, particularly in the European part of the Mediterranean. Without adaptive measures, health risks due to more frequent heatwaves, particularly in central and southern Europe, and greater exposure to vector- and food-borne diseases are anticipated to increase. Climate scenarios indicate significant warming, greater in winter in the North and in summer in southern and central Europe. Mean annual precipitation is projected to decrease in the South. Crop productivity is likely to decrease along the Mediterranean. Forests are projected to retreat in the South of Europe, and tree mortality is likely to accelerate. Water stress will increase around the Mediterranean basin. In southern Europe, the percentage area under high water stress is likely to increase from 19% today to 35% by the 2070s. The most affected region is southern Europe, where summer flows may be reduced by up to 80%. The hydropower potential around the Mediterranean is expected to decline by 50% by the 2070s.

**Trends: High confidence**

Sea-level rise is likely to cause an inland migration of beaches and the loss of up to 20% of coastal wetlands. In the Mediterranean, many ephemeral aquatic ecosystems are projected to disappear, and permanent ones to shrink. Agriculture will have to cope with increasing water demand for irrigation in southern Europe, and with additional restrictions due to increases in crop-related nitrate leaching. Summer cooling demands are expected to increase: around the Mediterranean, an additional two to five weeks will need cooling by 2050.

Overall, climate variability and change already affect Europe’s production systems (agriculture, forestry and fisheries), key economic sectors (tourism, energy) and its natural environment. Some of these effects are beneficial, but most are estimated to be negative. The sensitivity of Europe to climate change has a distinct north-south gradient, with many studies indicating that southern Europe will be more severely affected than northern Europe. The already hot and semi-arid climate of southern Europe is expected to become warmer and drier. From these results it is clear that tourism in the Mediterranean will not only be affected by direct climate change related impacts; there will also be increasing competition with other sectors for scarce resources such as fresh water. This is likely to be true for the north African part of the Mediterranean as well.

**How will climate change affect tourism in the Mediterranean?**

A specific problem with scenarios regarding climate change and tourism is the comparability of timelines. Climate change is a long-term, non-linear process, with significant changes taking place over periods generally exceeding 20 years. Tourism as an economic sector, on the other hand, can be more easily affected by short-term economic change or trends. Both the financial
crisis in 2008/2009 and its consequences for long-haul travel (declining) as well as the emergence of low-fare airlines and their impact on travel patterns can here serve as examples. Any comparison of longer-term changes in the physical environment and socio-economic change is thus inherently difficult. In the following, the 2003 heatwave will be discussed as an analogue, i.e. a situation that could resemble of what will become “normal” in the future. Analogues can be useful even in other areas (forest fires, storms leading to erosion, algae blooms etc.) to illustrate the consequences of extreme situations for tourism and to identify suitable adaptation options.

An example: the 2003 heatwave in Europe

A severe heatwave affected large parts of Europe between June to mid-August 2003, raising summer temperatures by 3 to 5°C in most of southern and central Europe. The warm anomalies in June lasted throughout the entire month (increases in monthly mean temperature of up to 6 to 7°C), but July was only slightly warmer than on average (+1 to +3°C), and the highest anomalies were reached between 1st and 13th August (+7°C). Maximum temperatures of 35-40°C were repeatedly recorded and peak temperatures climbed well above 40°C. Average temperatures were far above the long-term mean, implying that this was an extremely unlikely event under current climatic conditions. However, it is consistent with a combined increase in mean temperature and temperature variability. As such, the 2003 heatwave resembles simulations by regional climate models of summer temperatures in the latter part of the 21st century. The IPCC concludes that human-induced warming may therefore already have increased the risk of heatwaves such as the one experienced in 2003 in Europe.

Figure 1: Temperature anomaly in Europe during the 2003 heatwave

Perry (2006: 371-372) reports the following impacts of the heatwave on tourism:
(1) The most vulnerable tourists seem to have been campers and caravanners. Forest fires threatened campsites and actually destroyed some and there were a number of injuries and fatalities. At several sites emergency evacuations were required. The worst fires were in southern France, Portugal, southwest Spain and southern Italy. These low-cost holidaymakers are also especially vulnerable to heat waves since there is no obvious access to air conditioning. There
were many reports of holidaymakers abandoning their holidays and returning home early to escape the great heat.

(2) Excess heat wave deaths reached 15,000 in France, 6000 in Spain and 4000 in Italy and the European total probably reached or exceeded 40,000. Although it is not known how many of these deaths involved tourists, the heatwave can be classed as a major public health incident.

(3) Local people, especially those living in cities such as Rome and Milan, tended to abandon their cities whenever possible and retreat to the coasts, lakes and countryside, joining the normal tourist influx and increasing congestion on roads and beaches.

(4) Infrastructure problems, including power cuts in Spain and Italy as a result of excessive demand for air conditioning, and train cancellations because of buckled rails, also affected tourists.

(5) British tourists travelling to the Mediterranean received very little advice or warning before their departures. It was often left to tour reps, themselves with very little medical knowledge, to warn of the dangers, especially from dehydration from excessive alcohol consumption.

Perry (2006) also reports substantially changing booking behaviour under the heatwave. This booking behaviour does not only seem to have changed during the heatwave, but has even affected travel planning in 2004: for instance, many Germans, obviously expecting similar summer conditions, decided to spend their holidays at home. When the summer proved to be cold and rainy in 2004, a last-minute rush on “warm destinations”, including the Mediterranean took place in late July/August 2004 (Gössling and Hall, 2006). Overall, this indicates a situation where travel decisions may increasingly consider climate conditions, potentially increasing the number of last-minute travellers. The example of the heatwave thus shows that adaptation to changing climate conditions is warranted, even though this is difficult due to the complexity of the issues at stake, including the variety of impacts such as drought, fires, and health risks, as well as changes costs of energy/emissions and their consequences for tourist mobility. The interaction of these issues in terms of tourist perceptions and concomitant changes in travel behaviour, as well as key uncertainties, such as the unpredictability of extreme situations, will be discussed.

**Purpose of the seminar**

The seminar will describe the range of climate change impacts as they relate to the future of tourism in the Mediterranean. Analogues will be discussed to illustrate situations that are likely to become common in the future. Upcoming changes in fuel prices as well as the European Union emission trading scheme and its consequences for the cost of tourist mobility will be discussed. Conclusions will be drawn from these to evaluate adaptive measures under the umbrella of Integrated Coastal Zone Management (ICZM). The overall goal is to provide information about the issues at stake, as well as principles and tools to deal with these. New and innovative planning tools for decision makers and tourism experts will be discussed and utilised by the participants. Adaptation and mitigation strategies and tools will be analyzed with a view to their practical application. The event will facilitate synergies and collaboration between attendees and promote networking to support sustainable tourism initiatives in the Mediterranean.