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**Impacts of Climate Change on
Tourism in the Mediterranean:
Adaptive Responses**

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Impacts of climate change on tourism in the Mediterranean: adaptive responses

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The Mediterranean is currently the world's most popular and successful tourist destination with 120 million visitors every year. Its climate is perceived, quite erroneously, by many tourists as idyllic, benign and delightful. They ignore the heatwaves, floods and strong winds that can plague the region at times. With its renowned radiance and clarity of light, it has remained seductive to north European visitors since the habit of escaping from the cold and dark of the northern winter became well established by the upper classes last century. Yeo (1882) described the weather of the Cote'Azure as "a tonic, stimulating and exciting". Several countries with Mediterranean shorelines, including Spain and France are now among the most visited countries in the world and in these countries international tourism receipts account for just over 2% of gross domestic product. In Greece 10% of total employment is in the tourist industry. Tourism is very significant in terms of core-periphery divisions within the EU. There is large scale capital transfer from the tourist demand areas of NW Europe to the generally poorer Mediterranean countries. Climate constitutes an important part of the environmental context in which recreation and tourism takes place and because tourism is a voluntary and discretionary activity participation will often depend on favourable conditions. Climate and weather are among the most important factors affecting participation in leisure and tourism activities, since for many activities there are critical threshold levels beyond which participation and enjoyment levels fall and safety may be endangered.

The Lure of the Sun

The betterment of health has been a common motive for travel for centuries. In Roman times during the height of summer, Rome was notorious for its unhealthy conditions and the city was deserted by all but the poor. By the eighteenth century a sojourn in winter by the shores of the Mediterranean, especially on the Cote'Azure by the rich aristocracy of northern Europe was deemed, if not to cure them, then at least to alleviate their condition (Kevan 1993). The "season" lasted from mid-October to early May (Howarth 1977). The curative worth of Italian climates, and especially the Italian Riviera was also recognised, although the inconvenience posed by cold winds from the N to the more delicate, was noted (Hoolihan 1989). When a summer respite was required these well off early tourists tended to flock to the mountains, and especially the Alps. In general, until the twentieth century there was a general aversion to seeking the sun and indeed pale, consumptive complexions were prized, a suntan being seen as evidence of lower class manual work. It

wasn't until the development of mass transportation systems and a change of cultural values in the 1940's and 50's that a sun-tan culture developed. Only then do we see the development of what has become known as "sun-lust" tourism. Starting in the west on the Spanish "Costas" and along the North Italian Adriatic coast, mass summer tourism has spread to ever more peripheral areas, preferably inaccessible to the mass, by fashion seekers searching for social segregation. Thus in turn, Italy, Greece, Cyprus and Turkey became the new focus of seasonal migrations from northern Europe by large numbers from all social classes in the summer months, in search of more certain sunshine than could be expected at home. Until very recently a holiday in the sun has been perceived by increasing numbers as vital to their well-being and the acquisition of a sun tan as important as the acquiring of consumer durables. For the home we would be deluding ourselves if we thought that this desire to travel abroad was motivated by interest in other cultures or landscapes. A UK survey suggested that for over 80% of overseas holidaymakers better weather than can normally be found in the UK in summer was the primary reason for choosing an overseas holiday. Concern about skin cancer and worries about UV-B radiation has so far tended to modify behaviour rather than cause a change of destination. The beach has become a fun palace, a place of ease and entertainment. While the search for a salubrious, amenable climate was once the prerogative of the wealthy or privileged classes of society, the search for "endless summer" has now become a mass phenomenon

Key sensitivities to weather and climate

Major holiday decisions within many of the "tourist exporting" countries of Northern Europe (Figure 1) are subject to a push and pull effect. The higher temperatures and settled weather of the Mediterranean summer exerts a big attraction, but better summers at home will reduce overseas holiday bookings. Giles and Perry (1998) have shown that the exceptional summer of 1995 in the UK led to a drop in outbound tourism and a big reduction in demand in the peak summer season for Mediterranean package holidays. Large numbers of people indulged in short-term opportunistic decision-making and switched their normal holiday preferences to take account of the unusually favourable conditions at home. Such limited evidence does suggest that climate warming might alter the competitive balance of holiday destinations with adverse effects on high season tourism in the Mediterranean.

The Mediterranean is likely to become less attractive for health reasons in the summer. Apart from the dangers increasingly associated with skin cancer, many Mediterranean beach resorts may simply be too hot for comfort in the peak season, with a much higher frequency of severe heat waves (Perry, 1987). Carter (1991) has used an approximate index of climatic favourability to investigate changes of seasonal climate in Europe under possible future climate change. Results suggested that a climate warming of 4 degrees C would lead to a shift in the optimal summertime climate from the traditional southern coastal resorts northwards to currently less fashionable regions. This result holds true regardless of whether the warming is associated with moderate decreases or increases of precipitation. However the attractiveness of the southern coastal zone in spring and autumn would be enhanced relative to the present. It is in the months of October-

November that the lingering warmth and sunshine of the Mediterranean provides the biggest contrast with the weather in northern Europe. At this season maximum temperatures at present are 8-10C higher than in London whilst in April this difference is only 5-7C. Rotmans, Hulme and Downing (1994) suggest that the area suitable for sun-related tourism will decline in much of Italy and Greece as summer temperatures make beach tourism too uncomfortable. A few destinations (e.g. Cyprus and Corsica) offer the potential to commute from hot beaches to cooler mountains but the Mediterranean area is likely to face other climate-related problems, such as marine water pollution and the scarcity of fresh water supplies. The availability of water supply could become a major constraint and the quantity and quality of water available may not be sufficient to satisfy future tourist demands. Large scale expenditure on desalinization plants will be needed, especially in some island resorts if water supplies are to be guaranteed.

Drought

The Spanish drought of the early 1990's showed how island resorts like Majorca could become dependent on water being transported from the mainland with attendant political tensions (Wheeler 1995). In the last three decades there has been a decrease in spring rainfall in southern Spain and Portugal with the rainy season ending earlier and the dry season onset also occurring earlier. Small islands, for example in the Aegean, could be particularly affected if tourism is allowed to continue to grow. Nicholls and Hoozemans (1996) have shown that in the Mediterranean there are 162 islands exceeding 10 square km in size. Most have a low resource base but significant tourist development. Decline in rainfall and water supply availability, together with beach erosion could undermine their tourist industries and hence their local economies. It has been suggested (Karas 1997) that Crete could experience serious water shortages in 5 years out of 6 by 2010. There is likely to be an increase in friction, with a conflict of interest between local people and tourist authorities on the use of scarce water. It has been calculated that a luxury hotel consumes around 600 litres of fresh water per guest per night. Water-hungry land uses like golf courses and water parks will be seen as water-stealers by local people. Projected decreases in runoff will exacerbate the problem of salinisation of water resources. Increased degradation of the environment and spreading desertification is likely to make some areas less scenically attractive to tourists

Heatwaves

Extended heat waves, defined as 10 days or more, appear to be becoming more frequent in the Mediterranean. In the 15 years to 1994 Italy endured 8 such heatwaves. In addition short-duration heat waves of 3-5 days with temperatures 7 degrees C or more above normal have occurred on 33 occasions in the central Mediterranean between 1950-95. Individual heat wave days have increased from 52 days in the decade 1950-1959 to 230 in the decade 1980-1989. (Conte, Sorani and Piervitali 1999) Heat waves cause rises in the death rate, especially in urban areas, for example in one episode from 13 July - 2nd August 1983 in Rome 450 deaths above the normal average occurred. In 1987 more than 1100 residents died in Greece between 20-31st July (Katsouyanni et al 1988) with a combination of temperatures above 40C and poor air quality. In 1998 in Cyprus 45 deaths

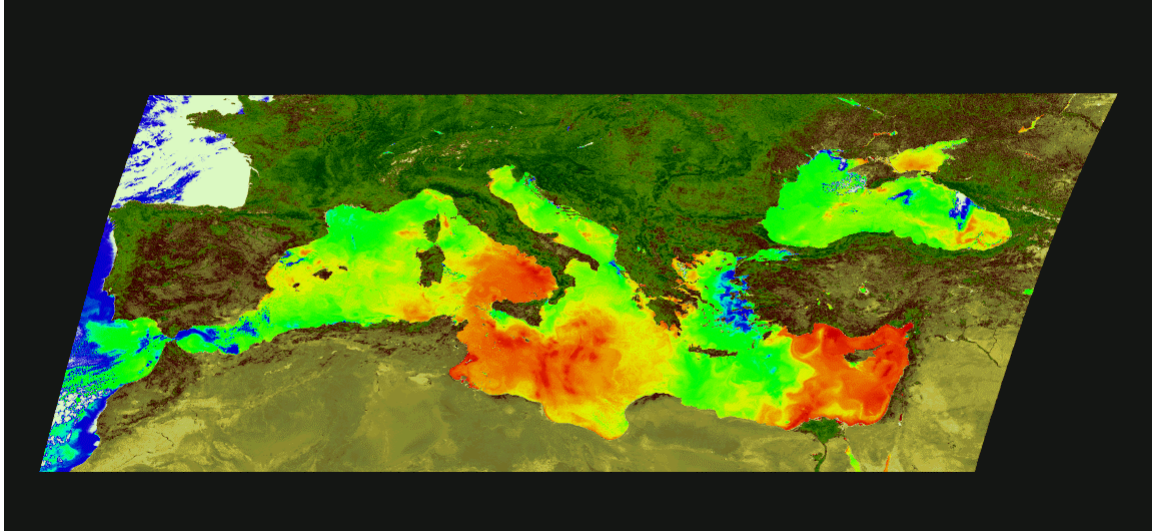
attributable to heat were noted when the maximum temperature exceeded 40C on 8 successive days. In Athens the National Weather Service of Greece forecasts heat wave emergencies and warnings are disseminated to the public. Extreme heatwaves and the deaths involved frequently get reported in the media of foreign countries and give a negative image to potential holiday-makers. It has to be remembered that holiday-makers from northern Europe will be unused to temperatures as high as 40C and may be more at risk than local people, who are used to long hot summers. Gawith, Downing and Karacotas (1999) have shown that at Thessaloniki in northern Greece the temperature-humidity index (THI) which assesses the impact of high temperatures and humidity will rise above a value of 84 (when nearly everyone feels uncomfortable) for more than twice as long as at present by 2050. In addition there will be significant increases in the shoulder warm periods suggesting a lengthening of the summer season. Forest fires, such as were very widespread in August 1994 in Tuscany, Corsica, Sardinia and France can lead to evacuation from tourist facilities such as camp sites. Pinol, Terradas and Lloret (1998) found that in coastal eastern Spain there has been increased fire activity and the number of days of very high fire risk is likely to increase further since there is a correlation between summer heat and fire occurrence.

The tourist industry is very vulnerable to natural disasters. The publicity given to heat wave deaths in Greece in summer 1998, if repeated regularly, could act as a deterrent to tourism. In that year there were stories in the UK press of holidaymakers staying in their hotel rooms to try to escape the intense heat on the beaches. Queues of Britons were reported at hospitals and pharmacies suffering from heatstroke and burns while others cut short their holidays and returned home early. Rising mean summer temperatures will inevitably be accompanied by more occasions of extreme maximum temperatures. Heat wave conditions are also implicated in the development and proliferation of algal blooms which can lead to closure of beaches, disfiguration of the coastal environment, and kills of fish as has happened in the Adriatic

Sea temperatures

Because of the concentration on beach holidays in the Mediterranean sea surface temperatures (SST) and the way they may change in the future is an important consideration. There is a general increase of SST from west to east as well as from north to south. (Fig 2).

Fig 2 Mediterranean sea temperatures in high summer



At present SST's in winter are too cold for swimming, except in the extreme East , around Cyprus and the Near East coast where they rarely fall below 17-18C. Given that for comfortable water activities SST should be 20-21 there is no prospect that, even with warming of 2-3C this figure will be met over most of the Mediterranean where winter SST;s are 14-16C..By May SST ranges from about 21C in the Eastern Mediterranean to about 15-18C in the west. A rise of 2-3C would allow swimming to begin earlier in the central Mediterranean. The greatest benefit for sea swimming of warming of SST would come late in the season in October –November, particularly in the central and eastern part of the Basin. Higher sea temperatures, especially in the early months of the cool season could lead to an increase in the number of “Bombs” – rapidly deepening depressions bringing severe gales and storms, which could impact adversely on tourists

Adaptive Responses

Background

Before we can consider adaptive responses to the projected climate changes we need to consider the socio-economic environment that will also play a major role in influencing Mediterranean tourism in the future.

Perhaps the most influential factor will be the increased proportion of older people in the European population. By 2001,one in four European will be over the age of 55 and the average age of retirement is also getting earlier. Many of these older people were the

mass travelers of the 1960;s and 70;s, and are today ‘s discerning and sophisticated travelers with the means and the will to travel. Increasingly they are looking at long-haul destinations, one of the fastest segments of the travel trade, since they are already familiar with many European resorts and cities. At the same time they are taking second, third and even fourth holidays or short breaks often with cultural or health interests paramount. Holidays will increasingly be about slimming bodies and broadening minds. In addition these sophisticated, discerning travellers will be alive to “green issues” ,and expect clean attractive environments and be familiar with the information technology to enable them to search for value for money. There will be a growing reluctance to buy holidays to destinations where beaches are polluted or where there are hazards of other types. Unfortunately on the Mediterranean coast there is a shortage of destinations perceived by consumers as green (Davidson 1998). Tourists looking for a superior holiday experience, of which clean beaches are but one aspect, will also demand other changes to the physical environment such as improved security, better air quality and traffic management. Initiatives such as the legislation in the Balearic islands to improve the tourist environment and infrastructure will be copied elsewhere. As it becomes less fashionable to have a golden tan and the small decline in beach holidays in the Mediterranean that has already been noticed becomes more marked, the traditional sea and sun beach holiday will decline at the expense of cultural tours, cruising and activity and skill based holidays. Probably the best chance of extending the season will be to capitalise on art and archaeological treasures and historic cities such as Florence and Athens that will be avoided in the heat of summer (Jenner and Smith 1993) More concern with self-improvement and self-expression will be reflected in holiday needs, especially of these older people. Elderly and ,retired people are more likely to take long-stay winter holidays. This market has been concentrated in a relatively small number of resorts, noticeably on the Costa Blanca in Spain and in Cyprus. This market is likely to grow and there is scope to extend to other more southerly resorts, for example in Crete A destination like Malta, with its rich historical ,colonial and military legacy and its poor beach resources has already managed to increase the number of winter tourists to 40-45% of the annual total. However the Mediterranean is likely to continue to be at a disadvantage to the Canary Islands and to long-haul destinations that offer less winter rainfall, even though winter temperatures in the Mediterranean are expected to increase. Harlfinger (1991) in a study of the holiday bioclimatology of Majorca. Spain found that in winter 86% of older German holidaymakers claimed that the change of climate benefited their health. And he suggested a bioclimatoloical calendar for the alleviation of particular complaints. Respiratory and skin diseases were most alleviated in winter and Psoriasis and muscle-joint rheumatism in summer.

Business and incentive travel, conferences ,trade fairs and conventions are likely to grow in importance, even allowing for the growth of video-conferences.. Further growth in low-cost airlines will promote short breaks and weekend “ad-ons” to such events.

Adaptive capacities

Tourism is a continuously adapting industry, responding to changing demographic and economic conditions as well as to new demands and technologies. Climate change will present new challenges but also lead to opportunities for tourist investment to capitalise on the new environmental conditions. Work has only just begun on “translating” the suggested future climate scenarios into their impacts on tourism but already some interesting adaptations are emerging:-

- 1 Higher air and sea temperatures are likely to encourage a longer tourist season. If the summer becomes widely perceived as two hot the season could become “doughnut shaped”, with peaks in spring and autumn months and a hole in high summer. Resorts need to discourage a closing down attitude at the end of summer. Higher temperatures will allow a prolongation of the season and if possible added cultural and sporting attractions such as arts festivals, regattas, food or drink events and local fiestas can help this process. Breaking the traditional seasonal patterns has as much to do with changing consumer attitudes as with developing new attractions and more targeted advertising could help in this respect. A longer tourist season would allow quicker returns on investment with more intensive utilization of facilities over a longer period. What in the UK is called the short-haul beach package has almost certainly peaked, but beach holidays will still be popular. They will be price-sensitive and probably booked later and we are likely to see greater segregation between resorts who continue to cater for this market and those who choose to chase other markets and become more diversified.. Some parts particularly of the Spanish coasts, have an inheritance of many 30 year old hotels, devoid of modern amenities and catering for a declining number of holidaymakers, many of whom will be low-spending, low-yielding Eastern European tourists. The demand will be for more individual “bespoke packages” offering a little more excitement than the “identikit” traditional IT. (Middleton 1991)
- 2 The larger numbers of older people in the population will still wish to escape the dark, dreary winters of northern Europe. More are likely to consider moving permanently to, or buying second homes in, Mediterranean areas. King, Warnes and Williams (1998) have shown that in several retirement destinations, including the Costa del Sol and Malta the most important reason given for moving to the chosen destination was climate. Thus the climate of the receiving region for these migrants has been considered to be the most important pull factor.. There are considerable planning implications if the growth of new apartments, villas and bungalows is not to cause environmental blight in some of these coastal areas. Along with this development will come increased demand for leisure pursuits such as golf courses and marinas. The search for the balance that comes from ecotourism will probably prove to be even more difficult to achieve unless the cultural and natural riches that often lie inland from the coast

- 3 Tourists will increasingly expect holiday accommodation to be air conditioned. Such accommodation will attract a premium price, whilst poorer quality self-catering apartments and rooms without air conditioning will be much less attractive in the summer. At present only a fifth of rooms in hotels in Mediterranean countries are in the 4 and 5 star categories. Increased demands will be made on electricity supplies from the demand for additional cooling systems.
- 4 There will be a higher risk of epidemics of cholera and typhoid as well as infectious diseases such as malaria, dengue fever etc. Adverse publicity would follow such public health scares and frighten tourists away as happened at Salou, Spain a few years ago. More care will be needed on hygiene matters, particularly in hotel and restaurant food preparation if the incidence of dysentery and e coli is not to dramatically increase. Adverse publicity for tourism would also accompany an increase in illegal refugees from North Africa. Fleeing environmental degradation in their home countries.
- 5 The beaches that are principal assets of coastal tourism will be at considerable threat from erosion as sea levels rise. (Nicholls and Hoozemans 1996). This will also apply in many cases where coastlines are flat with tourist accommodation and other infra-structure immediately behind the beaches. New tourist resorts should locate all long-life infra-structure inland from the coast and only place easily removed structures near the beach. Expensive beach nourishment schemes may be appropriate in some places. In some places there is a shortage of sandy beaches and their erosion or removal will severely disadvantage tourism. Additional costs would be incurred by escalating costs of coastal defense protection and repairs. Nautical tourism has stimulated the building of large numbers of marinas and berths which could be affected by sea level rise. Management efforts need to be expanded to consider the implications of climate change and to conduct vulnerability surveys.

Conclusions

The Mediterranean has long been familiar to tourists because of its perceived good climate. The Mediterranean region can justifiably claim to have been the focus of the modern tourism industry and yet in recent years it has begun to lose some of its gloss. The tourist industry is by its very nature fragile and susceptible to political, economic and social changes and the probability of climate change adds another element of uncertainty to planning future developments. More research is needed to quantify the climatic well-being of tourists by developing tourism climatic indices and beach comfort indices, which can be calibrated to include the effects of climate change. Past growth and attractiveness are not necessarily a guide to the future and the Mediterranean tourist industry cannot assume an untroubled and guaranteed future. The primary resources of sun, sea and beaches are likely to be re-evaluated in the light of climate change.

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