

GLOBAL TOURISM AND CLIMATE CHANGE; CONCERNS AND STRATEGIES

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Climate change is one of the most important global environmental challenge facing humanity. Global tourism is deeply influenced by global climate change. This paper aims to study the impacts of climate change on global tourism in general and in selected countries and island nations. The increasing incidence of natural disasters is the major manifestation of climate change. Outbreak of epidemics is also considered as a consequence of climate change. These disasters pose great danger and cause severe damage to the basic infrastructure which supports tourism related activities. How global tourism is influenced by major natural disasters will be examined. Melting glaciers and rising sea levels are posing great challenge to global tourism as they are impacting several countries and islands. This aspect will also be examined. Climate change is impacting the biodiversity, which is the basic resource for tourism. Some of the instances of impacts of climate change on biodiversity and tourism will also be provided. Several countries and island nations have drawn up strategies to cope with climate change and are also implementing them. This includes the strategies to cope with climate induced disasters and protecting the tourism related infrastructure.

Global tourism, climate change, strategy

INTRODUCTION: EMERGING AWARENESS TO CHANGING CLIMATE

Climate change represents one of the most significant challenges to humanity in the 21st century. Climate change is now a scientifically established fact. It is a global challenge to achieve the UN Millennium Development Goals. Climate change is impacting on the lives of people. The UN World Tourism Organization has declared climate change as priority issue. In order to make the tourism sector aware to face this challenge, UNWTO called to respond to the challenge of climate change in its year-long campaign during 2008, beginning from World Tourism Day on 27 September 2008 in Peru. ***Tourism: Responding to the Challenge of Climate Change*** was at the centre of the theme of 2008 World Tourism Day. Like several other sectors of the economy, tourism industry is also impacted by climate change. Climate change phenomenon affects the tourism sector in various ways. In fact, climate change is a fundamental issue with major implications for tourism. The relationships between tourism and climate change are emerging as the most important tourism research and policy issues. Tourism industry is distributed world over. Many remote but extraordinary locations have emerged as popular tourist attractions. Nature-based tourism is becoming increasingly popular in all the countries. An increasing number of tourist destinations are gravely affected by global warming, e.g. the

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Mediterranean countries and the tropical islands remained popular tourists destinations since long. Their 'perfect climate' was the major ingredient behind their popularity. This very basic resource is impacted by global warming which poses challenges to the economies of various countries.

This paper examines the concerns associated with the global challenge of climate change in tourism sector and how the tourism industry is responding to this challenge. The paper focuses on the impacts of climate change on tourism sector and adaptation strategies and policy responses of tourism industry. The increasing incidence of natural disasters is the major manifestation of climate change. Outbreak of epidemics like malaria and influenza is considered as a consequence of climate change. These disasters pose great danger and cause severe damage to the basic infrastructure which supports tourism related activities. How global tourism is influenced by major natural disasters like cyclone, earthquake, tsunami, floods and global epidemics will be examined.

TOURISM: A GROWING INDUSTRY

Tourism is now a key component of the global economy, particularly vital for the developing countries including small island developing states. Tourism is a global industry with growing impacts on the environment. In developed and developing countries tourism provides new opportunities, employment and economic benefits to local communities. Tourism promotion is adopted as a strategy by several island nations for showcasing their natural areas, local indigenous culture and attracting foreign direct investment as an instrument for economic development. A tourist stays at least for a night or at the most one year. Tourists include holiday makers, visitors to friends and family, and pilgrims. Tourism includes both business and leisure travel. Tourism is currently organised by long chains and complex networks of actors operating at different spatial levels. As per the United Nations World Tourism Organization (UNWTO) estimates, international tourist arrivals have increased from 25 million in 1950 to over 842 million in 2006. According to UNWTO there were nearly 900 million international arrivals in 2007. They are expected to increase to 1.6 billion by 2020. During the past decade, tourism industry has been growing at a faster rate. The arrivals of tourists are growing at higher rates in poor countries. International tourists are readily counted as they pass through transport and customs bottlenecks. However, domestic tourism accounts for 86% of total tourism. In general, the number of domestic tourists is less than the population of the origin country. The tourism receipts of the Least Developed Countries increased from US\$1 billion to 5 billion dollars between 1990 and 2005. International tourism earned receipts of US\$733 billion in 2006 worldwide. Approximately 75 countries earned at least US\$1 billion from international tourism.

TOURISM IN NATIONAL ECONOMIES

Tourism is an increasingly important sector for national, regional and local economies throughout the world. In a message on World Tourism Day 2008, the UNWTO Secretary-General stated that "Tourism is one of the few sectors that cuts across a whole range of

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economic and social activities, and a key economic and job driver in the developing world.” Tourism industry has a powerful role in shaping economic development, and ecological conditions of the global environment. It is a major industry over the world and contributes to trade and development, particularly of underdeveloped countries. Poor countries are benefited more by tourism. International tourism brings foreign currency and income to the destination country. For developing countries, tourism is one of the largest sources of foreign exchange revenues. It helps to reduce their foreign debt and to diversify their economies.

Tourism is the principal service sector activity. It helps in employment generation, particularly in rural areas and helps in rural regeneration, cultural preservation and nature conservation. Tourism-related occupations, including hotels and restaurants, employ 10.8 per cent of workers globally. Tourism is recognized as a labour intensive industry with a market for unskilled employees. Rapid growth of tourism has boosted the local economic development. Tourism development has a multiplier effect on the country’s economy as it benefits agriculture for supplying tourism demand, handicraft industries, local small business networks, financial services and so on. Tourism can play a major role in improving the standard of living of populations in developing countries and helps them to come out above the poverty line. In developing countries, tourism makes a major contribution to the local economy and helps them to combat poverty. The reduction of extreme poverty and hunger as well as the attainment of sustainable development are prime objectives of the UN Millennium Development Goals.

Tourism represents about one quarter of all exports of services in several countries. “Tourism GDP in the Northern Territory of Australia was estimated at \$740.6 million in 2003-04. This worked out to 7.8 % of the Territory’s Gross State product. This was higher than the Australian average of 4.2% . It shows Northern Territory’s higher than average reliance on the tourism industry”.² According to a Canadian study conducted in 2006, tourism is one of Canada’s largest industries. In 2003, tourism generated US \$52 billion in revenues and was the sixth largest employer of Canadians.

VULNERABILITY OF TOURISM TO CLIMATE CHANGE

Climate is the physical element that has a major effect in the tourist development. Climate change has an impact on all kinds of tourism by changing travel and tourist destination patterns and tourist decision making. Certain destinations are particularly affected by climate change. Climate change related hazards have the potential to destroy the existing tourism capital. The impacts of climate change vary and are likely to manifest themselves in a variety of ways. Climate influences the mobility of the people to a great extent and determines the utilization of the tourist resources. Changing weather patterns affect the planning of programmes, day to day operations, health and safety of tourists. Several tourism products directly incorporate some conditions that are vulnerable to climate change, e. g. winter sports, sun and sea, ecotourism are all at risk. Nature-based tourism undergoes significant changes. Due to global warming, glaciers and ice caps are melting and snow cover is reducing. Mountain resorts are affected due to snow line shifting. Low ski resorts

² Australian Tourism and Climate Change By Hans Hoegh-Guldberg, Economic Strategies Pty Ltd (8 February 2008)

and winter tourism will be more vulnerable. As the snow season would be shortened, the typical character for ski sports will get lost in winter. Major lakes in tropical and temperate regions which are the favourite tourist destinations are impacted by climate change. Consequently the bird watching activity is affected. Biodiversity is threatened and cultural heritage is also in danger. Several low lying areas of tourist interest are facing the fury of floods or the permanent alteration of landscapes. Desertification and deforestation is affecting ecotourism sites. Aurora borealis viewing opportunities are getting reduced due to increases in cloud cover.³ The summer season will get importance for tourism in higher latitudes. As the summer becomes drier and warmer in higher latitudes, there will be increasing opportunities for swimming and hiking in certain areas.

DIMENSIONS OF CLIMATE CHANGE INFLUENCING TOURISM

There are climate related risks for tourism industry directly through climate variability. The following elements of climate directly influence tourism related activities.

Temperature: Global warming is a reality and the temperature all over the world is projected to increase. Tourism appears to be the first and foremost victim of global warming. It contributes through its very existence, and through its own excesses, to the warming process. The assets on which this massive industry is based are endangered by global warming. The natural environment that represents both a key attraction and a basic resource for tourism is affected by global warming. Temperatures vary in mountainous areas and near the coast. Daily temperature ranges are expected to widen. The number of days recording above 35° C is projected to increase in several cities.

Sea temperature: The magnitude of the sea surface temperature change will become increasingly dependent on the emission scenario. The sea surface temp is likely to increase by 1 to 1.5°C. The arctic is very sensitive to both changes in solar heating and to greenhouse warming. Research reveals that Arctic temperatures are now higher than anytime in the last 2000 years. (DNA, Ahmedabad, 05-09-09) Temperatures of the world's oceans in the months of July 2009 were at an all time high as per data released by US based National Oceanic and Atmospheric Administration (NOAA). The mean ocean temp. recorded in July was 0.59degree C above the 20th century average of 16.4 degree. (The Times of India, 20-08-09) Rising sea temperatures pose a threat to a variety of marine life such as corals.

Ocean acidification: The increase in sea temperatures will lead to increases in ocean acidity. The largest increase will be in the high- to mid-latitudes. As a result of climate change, increasing quantities of CO₂ are dissolved, and may have an impact on coral reefs. When under-saturation of calcium carbonate occurs in sea water, marine organisms are unable to form calcium carbonate shells.

Sea level rise: Global sea level rise is projected by the IPCC to be 18-59 cm by 2100. Melting of ice sheets will make an additional contribution of 10 to 20 cm. Many low lying coastal zones and small islands destinations are vulnerable to rising water levels. Small islands and coastal zones are suffering in a variety of ways under the impacts of climate

³ NWT Impacts and adaptation report, 2008.

change. Low-lying coastal areas supporting tourism are more vulnerable to climate change. Seaside tourism is suffering damage from the effects of climate change, which are associated with beach erosion, rising sea levels, increasing damage from sea surges and storms. Climate change could redraw California's coastal map with beach front real estate ending up under water, sea walls collapsing and cliffs eroding. (Govt of California, 2006) Scientists predict that sea level will rise by about one metre this century in Netherlands. The Dutch are now adapting to sea level rise. They are now creating natural flood plains for rivers as well as rebuilding mangrove swamps as buffers against the sea. Instead of raising the dykes the Dutch want to reclaim land and build public recreation area that can absorb storm surges. Marshes may be renewed to break the power of incoming waves. With the melting of glaciers in Switzerland, The Netherlands may face sustained pressure from its rivers raising the water level of the Rhine. River discharge is expected to rise 12.5% in the coming years. It is apprehended that the dykes could collapse if the sand and clay that form the barriers absorb too much water over time. Hence they are looking for longer term solutions. (DNA, Ahmedabad, 5-09-09) As per the Arctic Impact Assessment Report 2004, many coastal communities and facilities face increasing exposure to storms. Reduced sea ice is very likely to increase marine transport and access to resources. Storm surges occurring in conditions of higher mean sea levels will enable inundation and damaging waves will penetrate further inland. Studies show the potential for increases in inundation due to higher mean sea level. The water supply is also affected due to inundation.

Rainfall: The variations in rainfall are likely to be more complex in the 21st century. The seasonal variations, intensity and duration of rainfall are also likely to be affected. The impact of climate change is visible in the Indian monsoon rainfall. Indian monsoons have always been unpredictable and variable. The variability is growing and predictions are becoming more impossible. Variability in rainfall has increased making it difficult to predict or plan. New models predict the impact of climate change will be seen in terms of increased sub-regional variations and more extreme rain events. Several places in India are experiencing more rain in lesser rainy days. This has disastrous consequences on the Indian economy. The erratic rainfall and subsequent floods damage the transport infrastructure which is the foundation of tourism industry. The occurrence of drought is projected to increase over most parts of the world. This leads to an increase in forest fire risk. This may present dangers to plant communities that are not adapted to fire, such as rainforest.

Storm activity: Several regional studies indicate a likely increase in the number and intensity of tropical cyclones. Cyclones have a huge destructive power and damaged the tourism infrastructure in the affected areas.

Snow: Glaciers cover the high mountains of Himalayas, Andes, Alps, as well as Alaska and Greenland. A study of 15,000 glaciers worldwide by the World Glacier Monitoring Service has revealed that glaciers have shrunk since the beginning of the past century and predicts that glaciers may recede faster in the present century. Melting glaciers form lakes on mountain sides. The snow cover on mountains is expected to reduce. The expected reduction will affect sensitive alpine plant and animal communities as well as winter sports.

As the above parameters are affected, the sectors identified as requiring urgent attention are agriculture, biodiversity, buildings and settlements, water supply, energy, tourism, fishing and forestry. Areas that support climate sensitive industries may experience reduction in demand from the leisure traveler. Some currently less important tourism destinations are

likely to get more prominence. Some changes favour an increase in tourism- such as warmer, drier summers in northern Europe lead to greater domestic travel and a reverse flow of tourists from the south- so that one destination's loss is another's gain. Tourists have a tendency of "Chasing the elusive"- visiting to places which are expected to vanish or deteriorate due to climate change. They are choosing their vacation destinations based on what they fear as fated to destruction. Scientists forecast that Mt Kilimanjaro will melt in the next 25 years. Therefore, the ascent of Mt Kilimanjaro is attracting the adventure lovers. Travel agents report that clients are increasingly requesting trips to see the melting glaciers of Patagonia. Organisers of mountain hikes are realizing that warming and receding glaciers are very much affecting the recreation potential and dangerousness of it on all sides of the mountain. The glacier feeding the Amarnath cave in the state of Jammu and Kashmir (India) has reduced by over 100 metres in a year. (The Economic Times, Ahmedabad, 26 September 2007) This is impacting the annual pilgrimage to Amaranth cave, which attracts lakhs of devotees.

POLAR TOURISM AND CLIMATE CHANGE

Global climate change is likely to have significant impacts on the highly climate-sensitive polar tourism sector. Tourism in polar regions is a relatively new phenomenon. Arctic and Antarctic territories are emerging as the most popular tourist destinations with the global warming. The appearance of tourism is considered as an actual and potential source of greater damage to polar regions. It is also described as "Tourism of Doom". The Arctic is the home of about 4 million people, one third of them are indigenous. Climate change in the region poses a particular challenge to their traditional ways of life, which depends mostly on the icy ecosystem. It is predicted that sun bathing may be possible and the region could one day be warm enough for swimming. As the summer ice shrinks in the Arctic, previously unknown islands not shown on any maps are appearing. The UN panel of 2,500 scientists have predicted that "there may be an ice free Arctic by the middle of the century." Global environmental change affects the basis of tourism and other human system in polar regions. Climate Impact Assessment (ACIA), released by the Arctic Council in 2004, provides a more detailed review of climate change impacts in northern regions. Key findings of the ACIA were:

- The Arctic climate is now warming rapidly and much larger changes are projected.
- Arctic warming and its consequences have worldwide implications.
- Arctic vegetation zones are very likely to shift, causing wide-ranging impacts.⁴

The Antarctica is vital for the study of climate change. It is the place that invigorates global climate and oceans and controls the very sustenance of humankind on earth. The Antarctic peninsula is thinning at an alarming rate due to global warming. The climate in the region has warmed by more than 2.5°C in the past 50 years. Consequently the ocean is warming and this is responsible for the melting of ice. Operators taking expeditions to the Arctic doubled their capacity for 2008 season. All the Antarctic cruise ship tours run with full capacity. Growing tourism in the icy continent of Antarctica and possible threats to the environment was a major issue before the 30th Antarctic Treaty Consultative Meeting held in New Delhi in April 2007. The necessity to give a fresh look at the growth of tourism in

⁴ NWT Impacts and adaptation report, 2008.

Antarctica in the context of exploitation of resources as well as the imperative of protecting the Antarctic environment and the need to develop a framework of regulation to contain tourism activity was highlighted.

Tourism here represents new kind of industry that is becoming more and more important for the survival of countryside. It is also bringing new attitudes and expectations for land use. We do not have proper knowledge of many aspects of how polar tourism operates and its interaction with polar environments, ecosystems and societies. However, tourism is providing well-being and tools for regional development in the peripheral communities in the polar regions. Declining sea ice is threatening the species as well as the longevity of the polar bear viewing industry in Manitoba, (Canada)⁵ Over the past fifteen years, the number of tourists to Antarctica has increased twelve-fold. This has raised concerns about the sustainability of this development. In the view of the developments in the Antarctic tourism industry, several experts and organizations feel that in order to safeguard its sustainable development, a more rational and long-term perspective on Antarctic tourism development and governance is needed. Due to the rapid changes that are predicted in the Polar areas, this is a research field in need of attention.

THREATS OF CLIMATE CHANGE TO LAKE TOURISM

Climate is the most important factor controlling biodiversity and distribution of aquatic organisms in the lakes. With climate change the lakes' temperature, pH and oxygen level are likely to change. These variations separately or in combination influence the health of the lakes, e.g. the health of the fish and other organisms and their availability. Certain changes are already taking place with global warming. The average water temperature of several lakes has increased. In temperate regions ice break up occurs earlier in summer. It is predicted that warming waters could cause cold water fish species to die out or become less productive. Invasive species may also pose challenge.

Lake Winnipeg in Canada is the world's 10th largest fresh water lake . It is vulnerable to climate change because of its location near the Arctic circle. The lake is known for commercial and sport fishery. Climate change will impact the health, composition and availability of fish. Therefore, the interests of all those associated with these activities-lodge owners, cottage owners, are likely to be affected due to climate change impacts. The stakeholders in this fresh water lakes are municipalities, park department, federal and provincial government and the general public.

ADAPTING TO CLIMATE CHANGE IN THE AREA OF TOURISM

As climate change is expected to pose an increasing threat to tourism operations in many destinations, World Meteorological Organization urges governments and private sector to make use climate information more frequently. It also encourages them to take additional steps towards incorporating climate considerations in their management plans and tourism policies. European ski industry provides an example of adaptation to climate change. Snow

⁵ Tourism and Global Change in Polar Regions, Abstracts, 2007.

cover in European Alpine areas is retreating fast. The Swiss ski industry has 'adapted' by investing heavily in artificial snow making machines. Rising temperatures and rising sea levels are posing risks in Japan to ports, harbours and tourism infrastructure. Therefore, Japan has one of the world's most highly developed flood defense infrastructure. Climate change involves additional costs for those trying to cope with the new situation. Plans developed by the Japanese government to provide more effective defense in the face of sea level rise of 1 meter estimate costs at US \$ 93 billion. (Government of Japan) Climate change will mean increased costs of transportation. Increase in winter snowfall means more de-icing material is required to clear roads and to maintain road safety. This involves increased expenditure from cities. It has been observed that little attention is paid to ecological problems such as climate change until it is perceived as a threat to personal happiness. Visitors are always more demanding. Once the change becomes noticeable, the visitor either adapts or moves on to somewhere else. "New Zealand faces potential risk from changes in consumer preference away from long-haul travel, and specifically away from travel to New Zealand."⁶

It is clear that the tourism sector has to make itself adaptable to changing conditions. Adaptation is a 'no-choice' option. Adaptation actions taken in advance can reduce the risks and limit the human development damage caused by climate change (HDR, UNDP) To adapt to climate change and to mitigate GHG emissions, both tourism service providers and tourists themselves have to take specific steps. To minimize harmful emissions, the tourism sector has to encourage sustainable, carbon neutral transport solutions. This should be supplemented with low carbon market destinations to improve the use of natural resources like water and energy. The ultimate goal of the tourism operator should be the conservation of natural areas. By applying new technologies, tourism sector like other sectors, is capable of substantial reduction in its carbon emissions. Accommodations and restaurants can make use of renewable energy like solar and wind; land transport can use cleaner energy like CNG (compressed natural gas) and hybrid engines.⁷

Climate change impacts on tourism require adaptation, with medium and long term planning by the industry to minimize the impacts and to adjust in the best ways possible to the phenomenon. This is most important in poor countries where tourism is the basis of economic development and a major source of livelihood for the local communities. In the more advanced countries favourable framework conditions for adapting to climate change in the area of tourism already exists. Some nations quickly adopt new technologies from overseas. They soon introduce more fuel-efficient vehicles. Many governments are trying to control emissions through sustainable planning and transport policies for emission reduction programmes. Compulsory emissions testing of all rental and passenger transport vehicles is practiced in several countries. Companies are trying to minimize their climate impact by adopting new ICT technology. They are adopting and implementing transport strategies to introduce low carbon vehicles into their fleets and encouraging car sharing. It needs to be realized that technology is a fundamental component of the evolution of aviation and tourism. Therefore, new approaches to help adaptation should be focused and they should get a continuous support from the governments.

⁶ New Zealand's climate change solutions: An overview, September 2007.

⁷ 2nd Conference on Climate Change and Tourism, Davos (Switzerland), 1 - 3 October 2007
Welcoming address

TOURISM AND CLIMATE CHANGE - INDIAN SCENARIO

Travel and Tourism Competitiveness Report 2008 published by World Economic Forum provides the ranking of 130 countries according to travel and tourism competitiveness index. According to this report, the overall index for India is 65.⁸ Domestic tourist sector in India is the fastest growing in the world. As living standards improve, domestic tourism will rise rapidly. At world level hotels, restaurants and allied tourism-related occupations, employ 10.8 per cent of workers. In India this proportion works out to only 5.6 per cent. There is a huge untapped potential for international tourism in India. International tourist arrivals in India in 2006 increased by 13.5% and this is increasing every year.⁹ “It is estimated that development of India’s tourism infrastructure such as roads, airports and medium priced hotels, combined with modifications in air and hotel pricing and tax policies, could generate more than 20 million additional employment opportunities in tourist related businesses within a decade.”¹⁰ In the long run, India’s major metropolitan areas need a rail-based mass transport systems. This will be able to provide an alternative to the problems of urban transport. The railways will have to be expanded to handle a three-fold increase in traffic. A huge increase in demand for both railways and road transport will require massive investments.

India is aware of the considerable challenge the country faces from climate change. The Government of India has announced a plan to replace 5 per cent petrol by ethanol and 20 per cent diesel by biodiesel by 2012. Ethanol is produced by fermenting sugarcane juice and biodiesel is manufactured by the trans esterification of vegetable oil obtained from oilseeds such as Jatropha. The major sources of greenhouse gas emissions in India are the energy sector (61 per cent), the agricultural sector (28 per cent) and industrial processes (8 per cent). Transportation is included in the energy sector and constitutes 11.75% of the energy sector. Of the 80 projects approved by the Indian CDM authority, 44 are in renewable energy, 25 in energy efficiency.

CONCLUDING OBSERVATIONS

The main function of 30th anniversary of World Tourism Day -27th September 2009 was held at Accra, Ghana in Africa. Ghana is one of the founding members of United Nations World Tourism Organization. The day was also celebrated by several countries and tourism organizations by arranging various activities. “Tourism celebrating diversities” was the theme of this years World Tourism Day. It draws attention to the more positive side of tourism. The secretary General of UNWTO hopes to help countries realizes the importance of biodiversity when developing tourism. But we cannot overlook the troubling dimension of modern tourism, which is impacted by climate change. It is the biodiversity everywhere around the globe which is getting adversely impacted by climate change. Conservation of biodiversity while facing the threats of global warming, rising sea levels and increasing incidences of natural disasters presents a challenge for sustainable tourism development

⁸ World Economic Forum

⁹ PIB Press Release, Nov 21, 2007.

¹⁰ India Vision 2020

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