

***Investigating the Effects of Climate Change on the Number
of Visitors in Hengam Island***

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Received: 07/12/2013

Accepted: 27/04/2014

Extended Abstract

Introduction

Climate have strong impact on tourism and leisure time. Climate as a natural environmental factor plays an important role in tourism development in different regions of the world. Climate change and global warming, due to increasing greenhouse gases have many effects on procedure of tourism areas. Evaluation of predictions on future climate change can reduce these effects on tourism industry. Unfortunately, despite the obvious importance of climate change on tourism, researchers have paid little attention to this topic until the 1980s. Thus, one of the oldest researches in this region is the examination about the impacts of carbon dioxide on earth warming and its effects on tourism (skiing Laavrntyds area) discussed by Boyle and Wall. This research has been done in Canada in 1980. In this study, climate change phenomenon has been examined using two scenarios A and B. The effect of climate change on snow condition, snow cover of the region, and ski industry were examined. The results show that this phenomenon has impact on the ski industry and shorten duration of the ski season. It should be noted that among researches carried out, a few of the issues of climate change was about the effects of climate change on tourism activities.

In another study, climate change has been investigated according to the GCM and regression models. Then, the effects of climate change on the number of visitors have been investigated using economic models such as travel cost (TCM). In some of these studies suitable conditions of tourism in nowadays and in the future (of climate change) has been determined by

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TCI Index and also effects of time of climate comfort on the number of visitors have been studied. The results show that climate change has effects on the number of visitors (Scott *et al.*, 2007; Chotiyaputta and Pongkijvorasin, 2013; Amelung *et al.*, 2007; Hein, 2009; Yu *et al.*, 2010).

Few studies on the effects of climate and climate change on tourism have been conducted in Iran. In these studies, the relationship between climate impacts and tourism as well as the impacts of climate change on the tourism industry has been investigated. The results express the close relationship between climate and tourism activities and the impact of climate change on the industry (Mohammadi *et al.*, 2008; Ranjbar *et al.*, 2010; Kaviani *et al.*, 2007; Ramezani and Abraham, 2007; Ghaderi, 2010, Bonn, 2010; Ziai *et al.*, 2010; Haji Amini and Ghaffarzadeh, 2010; Bakhtiari, 2010). Rainfall and temperature changes and their impacts on tourism were examined by Ataee and Fanaee in 2011 in Shiraz. Results of the study indicate that Shiraz rainfall and temperature are in two states of without a process and with process, respectively. Temperature process is ascending. This matter could have a major impact on the amount of tourists of this city. Karimi in 2008 have also studies about the relationship between climate and tourism using climate tourism indices such as PET, PMV, SET, ET, and stress pressure index for Tabriz City. The purpose of this study is to investigate the effects of climate change on the visit level in Hengam Island.

Methodology

To achieve the purpose of this research, climatic factors are used as independent variables and the number of visitors as dependent variable in stepwise multiple linear regression models. In order to simulate climate change based on general circulation models (GCMs), LARS-WG downscaling tool is applied. This stochastic weather generator downscaled the climate of Bandarabass synoptic station by using HADCM3 model and A1B, A2, B1 emission scenarios, for 2040.

LARS-WG is one of the most popular models for random generation of weather data. This model is used for generating daily rainfall, minimum temperature, and radiation or sunshine hours in a station, for base data and future climate. Table 1-1 represents characteristics of three scenarios used in this study.

Table 1. Characteristics of scenarios as used in this study

characteristics	scenario
Rapid economic growth, population growth maximum at mid-century and then declined, the rapid development of modern technologies	A1B
Rapid population growth in the world, heterogeneity in economy and in line with the regional growth throughout the world	A2
The convergence of the global population, changes in the structure of the economy (Pollutions reduction and introduce clean and efficient technology resources,)	B1

Results and Discussion

The results show that there is a reverse relationship between temperature and the number of visitors in Hengam Island. The number of visitors decrease when temperature rise in warm seasons (spring, summer), and visitors increase with decreasing temperature in the cold season (winter, spring). The results also show that the number of visitors was affected by seasonal changes in the future. Generally, it is predicted that visits increase in summer and autumn seasons and decrease in spring and winter seasons. The highest visit frequency is predicted for autumn season in the A1B scenario and the lowest belongs to summer in the A2 scenario. The highest visit reduction is predicted for spring season in the A1B scenario and the lowest reduction belongs to winter in the B1 scenario.

Conclusion

The results show the greatest increasing changes of visits in autumn (according to scenario A1B) and the smallest increase in summer (according to scenario A2). The main results obtained in this study are consistent with similar studies by other researchers. The main results are increase of temperature in the regions (Ataee and Fanaei, 2011; Shah Karami, 2007; Abbasi *et al.*, 2010; Massah Bavanat *et al.*, 2010; Babaeian and Najafi Nick, 2010; Ashraf *et al.*, 2011; Abbasi *et al.*, 2010; Azizi and Roshan, 2008; Rahimi and Majd, 2011; Babaeian *et al.*, 2009; Azad Torabi *et al.*, 2010; Babaeian and Kuhi, 2012; Azizi *et al.*, 2008) and (Berrittella *et al.*, 2006; Hein, 2009; Giannakopoulos, 2009; Burki and Elsasser, 2002; Chotiyaputta, and Pongkijvorasin, 2013; Yu *et al.*, 2009). But the result is not consistent with the decrease of temperature in the summer and autumn, which could be due to the specific conditions of each region (latitude, location, topography, etc.).

Keywords: *Climate Change, Ecotourism, GCM Models, Hengam Island, Linear Regression Model.*