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THE ANALYSIS OF CLIMATIC CONDITION OF KHASH COUNTY WITH EMPHASIS ON TOURISM

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ABSTRACT

Preparation of tourism environmental calendar based on climatic conditions of region is one of the most important foundations of planning Tourism; because the role of climate in tourist attraction is very important in days that is tourists arrivals. Therefore, the first step in planning the supply tourism product to demand market is estimation of indicators the region climatourism. In this paper using weather station statistics of Khash during a period have been analyzed climatourism based on bioclimatic models and indicators. Khash county with dominates pattern of nature-based tourism particularly in alongside Taftan mountains have the unique capabilities that climate indicators study indicates that during the months of April, May, September and October in the range of climatic comfort are important for tourist attraction. It is therefore necessary that nature-based tourism during the Norouz vacations attempt and in the field of planning and administration of health tourism take action on the basis of springs and thermal comfort in the months of September and October and November. The results of this study in the county of Khash can guide managers and policy makers in the field of Tourist in order to planning the development of tourism based on nature exploited as the dominant spatial pattern of area.

Key words: Tourism, Nature, Climatourism, County of Khash.

INTRODUCTION

Tourism knowledge-based nature as one of the most popular and yet most profitable dependent sciences on natural resources and environmental deemed to be and strongly considered as a tool for increase of national income in less industrialized countries (Negahban, 2009: 12). On the other hand our daily life is including steps such as activity, fatigue and revitalizing. Intellectual reinvigorate using recreations as relax and sleep to create a mutual balance against mental and physical fatigue of daily activity is considered critical. Adverse climatic conditions can often prevented correct do process and imposes pressure on the body and mind which resulted in inconvenience and loss of efficiency and finally may disrupt human health. So the impact of climate on

human is important and significant factor (Kasmaee, 2007: 65). Many tourist activities depend on weather conditions and natural resources and more tourists a great flexibility to adjust their holiday destination in particular it is important for tourism sector that the effects of climate change to be determined in two different locations in departure and destination places (Lars Hein, 2009: 170). The order of welfare conditions, set conditions that are in terms of heat is good at least 80 percent of people or in other words the man in the circumstances not too cold and not feel warm. Some researchers believe that terms of thermal neutrality more accurate interpretation because human does not feel cold and heat and localized discomfort due to climate issues (Mohammadi, 2007: 119). In the formation of human comfort conditions from climatic perspective have a major role the element four including temperature, humidity, wind and radiation. These elements include temperature, humidity, precipitation, wind and radiation. Among the elements of climate temperature and humidity have greater impact on human health and comfort and therefore the more models to measure human well-being have been based on these two elements (Jahanbakhsh, 1998: 68). air as atmospheric transient conditions and as prevailing climate of a region are of important factors natural environment that in many human activities play a major role. Climate in tourism activities plays an important role at various levels. Climate can act as a local indicator for the attractiveness of region as well as affect on the periodical activities, structures and functions and on comfort of tourists. Therefore tourism and leisure activities considerably affected of climatic conditions in the various regions (Ranjbar, 2009: 146). Among the factors affecting in tourism and the enjoyment of environmental comfort which includes topography, geographical location, culture, environmental capacities, climate and etc; weather conditions plays a very important role. Therefore considering to this that understanding human response to climatic conditions and climate components are essential in this research we try that using bioclimatic indicators of Terjung (Convenience factor and cooling factor) and Olgay bioclimatic chart is analyzed thermal comfort conditions in different months of Khash county.

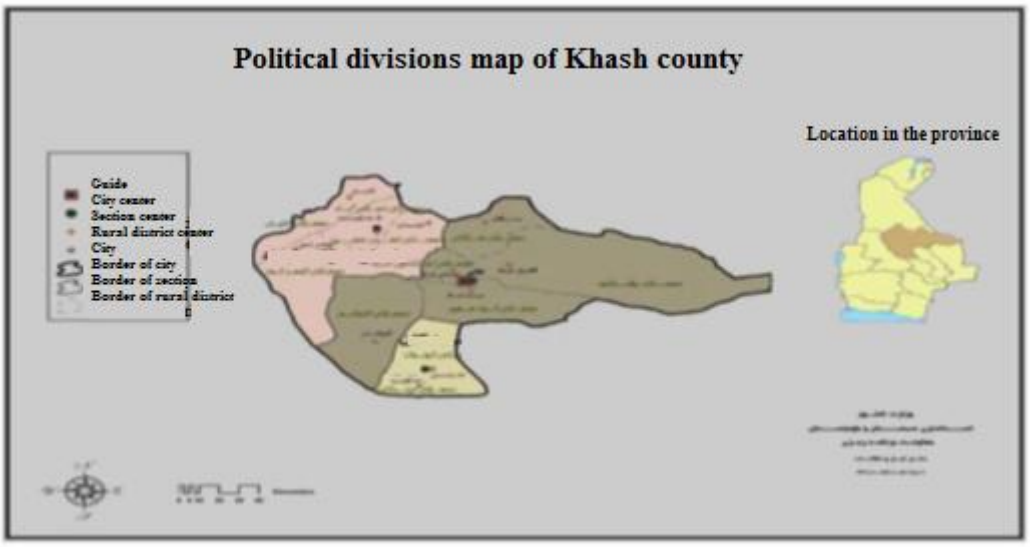
Literature Review:

In this regard numerous studies have been conducted both inside the country and abroad and for this purpose have use different models and techniques. Mohammadi and Saeedi (2008) climate-environmental factors affecting on human comfort studied's with emphasis on Qom province and suggest that the use Of an index alone is not effective for the province of Qom; So to achieve the goals should be used of integrating the various indicators. In this ways the Terjung index in terms of comfort conditions determined due to its suitability for hot zones and according to the characteristics of the study area has satisfactory results and Bakerindex has approximately the same results; as well as methods of stress, and Termo-hygrometric and Chilvind according to the evaluation and obtained results in next ranks placed and are suitable. Bazrpash et al. (2008) in the article examines the outdoor thermal comfort for Ecotourism in the county of Babolsar using bioclimatic indicators of Terjung, Mahani and Baker and conclude that the county of Babolsar of May to late November the optimal qualified for nature and outdoor tourism in terms of thermal comfort. However, in the two months of July and August sultry mode is dominated in this county due to rising temperatures and high relative humidity, but with the wind blowing was tolerable situation be converted the optimal conditions. Mohammadi (2007) in the book of its application Climate study types of Tourism and indicators of environmental climate affecting in tourism industry and also notes to the phenomenon of global warming and climate change on tourism. Neghahban (2007) in the his master's thesis study estimation models to climatic comfort in Yazd city and states that climatic comfort months in Yazd to move toward cold season.

Martino et al. (2009) studied the relationship between climate and site selection for a holiday in abroad or within the country according to the weather conditions and concluded that the climate is a strong determining factor for the select the destination for holidays in accommodation region. Chen et al (2008) looked climatic conditions for Chongqing tourism by Terjung index the results showed that the distribution of weather and convenience for tourism in Chongqing basically in accordance with real situation. Daniel and colleagues (2006) in Rocky Mountain region studied the impact of climate change directly or indirectly on tourism park and concluded that with climate change (warming) is less family visit. Gion (1989) in an article entitled urban design and different climates and a book called Cities and architecture to provide information on the relationship with climatic comfort, climate and architecture and impact the climate on urban design.

Location of study area:

The city of Khash is county center that its height of sea level is 1394 meters. Khash city Located in 61 degrees and 14 minutes east longitude and 28 degrees and 13 minutes north latitude in north the province of Sistan and Baluchistan.



Map 1: The study area

Population: According to the latest population and housing census is its population 129,569 people and the its relative density 6.5 people per square kilometer and is the most sparsely populated of county in Baluchistan.

The study area: This county is limited from the north and northwest by county of Zahedan, from East and North East by Pakistan, from West and South-West by the county of Iranshahr and from south and southeast by county of Saravan.

Data and Method: In this study components of the relative humidity, the average maximum temperature, average maximum relative humidity, mean minimum relative humidity, sunshine and wind from Khash county synoptic station in a 20-year period (from Website Meteorological Agency) were collected and were analyzed for review the condition of comfort and discomfort in the county of Khash. Then using Terjung (coefficient of comfort and wind Cooling power) and Olgay bioclimatic chart During the two study period (2007- 1986) calculated and determined conditions of comfort and discomfort in different months.

Discussion and Findings: Bioclimatic conditions review of the most important factors in environmental planning along with other climatic conditions. The influence of weather elements on types of construction, economic, social, cultural activities in various areas is of practical aspects of climatewhich in recent decades has been considered by relevant experts. Nowadays due to the expansion of tourist activities and in order to determine suitable and with tourism potential areas that man feel the comfort and convenience, Climatology has become increasingly important in the world (Saeedi, 2008: 3). Thus given that weather conditions are the most important factor among the factors affecting tourism. Now tourism is growing in the world and the country. Try to be in this study weather conditions of Khash county examined using climate indicators for tourism in terms of comfort and discomfort during the year.

Bioclimatic model of Terjung: Terjung index is one of the most important human bioclimatic techniques for evaluating human comfort. Rating this method compared to other methods is that of all the features of climate, such as temperature, humidity, wind, solar radiation and sunshine hours is used simultaneously that control conditions collection the human body temperature. Using this indicator can identify the most appropriate area to accommodate people with allergies and related diseases that suffer from sort of weather and climate (Kaviani, 1993: 78).Terjung index is based on the comfort coefficient and cooling effect coefficient of wind That according to data of the region were studied and its results are presented in tables and charts.

Table 1: concepts, symbols and marks of comfort coefficient

Symbol group dominant feels			
-6Uc			Ultra cold
-5	Ec		Extremely cold
-4		Vc	Very cold
-3Cd			Keen
-2K			Cold
-1C			Moderate
0M			Warm
+1W			Hot
+2aH			Very hot
+2bS			Extremely hot
+3Eh			

Source: Mohammadi and Saeedi, 2007: 76

Table 2: Evaluation of human comfort in Khash station with comfort coefficient of Terjung

Mar Feb Jan Dec Nov Oct Sep Aug Jul Jun May Apr
0 0 +1+1+1 00 - -12 -2-2-2
Comfort coefficient Khash
Moderate, Moderate ,Hot, hot ,hot, Moderate, Moderate Verycool, verycool, verycool, verycool

Source: Authors calculation, 2015

Findings analysis in Khash area on Table 3 show that in the Khash region four months of the year which represents a very cool is Means months of December, January, February, March, is in the range of -2. However, the months of April and May, September and October were in the range 0 that represents the normal physiological and Environmental climatic conditions are appropriate in Terjung index for tourism exploitation with human comfort conditions of suitable. Months of June, July, August located in the region +1 that shows hot situation.

Determine the coefficient of day comfort based on Terjung method: In the different months at Terjung model for determining comfort coefficient of day this is done that day comfort coefficient used from average of daily temperature maximum in Fahrenheit degrees and the average of relative humidity minimum of daily in percent. Table 4 shows as well as the results of coefficient analysis of day comfort based on Terjung index in Khash.

Table 3: day comfort coefficient of for Khash station by Terjung method

Mar	Feb	Jan	Dec	Nov	Oct	Sep	Aug	Jun	May	Apr	Mar
-2	-2	-2	-1	0	+1	+1	+ 2a	+ 2a	+ 2a	+1	0
Comfort coefficient of Khash											
Very cool, very cool, very cool, temperate, warm, warm, hot, hot, hot, warm, temperate											

Source: Authors calculations, 2015

According to Table 4 in the region Khash placed in the range of -2; three months of the year (January, February, March) that represents condition of very cool and three month of the year (May, September, October) is located within +1 that have hot conditions. The another three months is placed in the range of + 2a that situation is hot. While the month of December is placed in the range of -1 that has relatively cool and mild conditions and only April and November is in the range of zero (0) which indicates moderate conditions. Based on Terjung method according to this data and local condition April and November are the best bioclimatic conditions and December are also somewhat appropriate in day to Touristic exploit in the Khash region.

Determine the coefficient of night comfort based on Terjung method: According to Terjung index is calculated the comfort coefficient of nights from minimum average of daily temperature in degrees Fahrenheit and the maximum average of relative humidity of daily in percent and Table 5 shows comfort zones in terms of nightly in Khash area.

Table 4: the comfort coefficient of night based on Terjung index in Khash station

Mar	Feb	Jan	Dec	Nov	Oct	Sep	Aug	Jun	May	Apr	Mar
-2	-2	-2	-2	-2	-2	-1	0	0	-1	-2	-2
Comfort coefficient of Khash											
Verycool,verycool,verycool,verycool,verycool,,verycool,cool,temperate,temperate, cool,verycool,verycool											

Source: Authors calculations, 2015

According to Table 5 the Khash area all months of the year is located in the range of -2 except June, July, August and September that show very cool condition and the months of July and August is in the range 0 that reflects the mild conditions and June and September is in the range of -1 that represents a pleasant relatively conditions at night.

Bioclimatic model of Olgay:

Victor Olgay proved that at the very hot time that movement least of metabolic can cause discomfort relationship between dry weather and man feeling of heat situation is more sensiblefrom relationship the effective temperature and thermal statushe presented bioclimatic tablethat human comfort around is determined based on changes the two elements of climate temperature and relative humidity of air.In addition extent of spread that two other climatic element of the radiation and air flowis to determine that in zone cause comfort (Watson et al., 1993).For the use of bioclimatic charts of Olgaymust be determined relative humidity and temperature value in the desired stationand moved on gra and finally measured situation point of imagine on the graph relative to comfort graph. This is calculated From the four elements means temperature maximum and minimum of relative humidity for day and temperature minimum and relative humidity maximum for night.

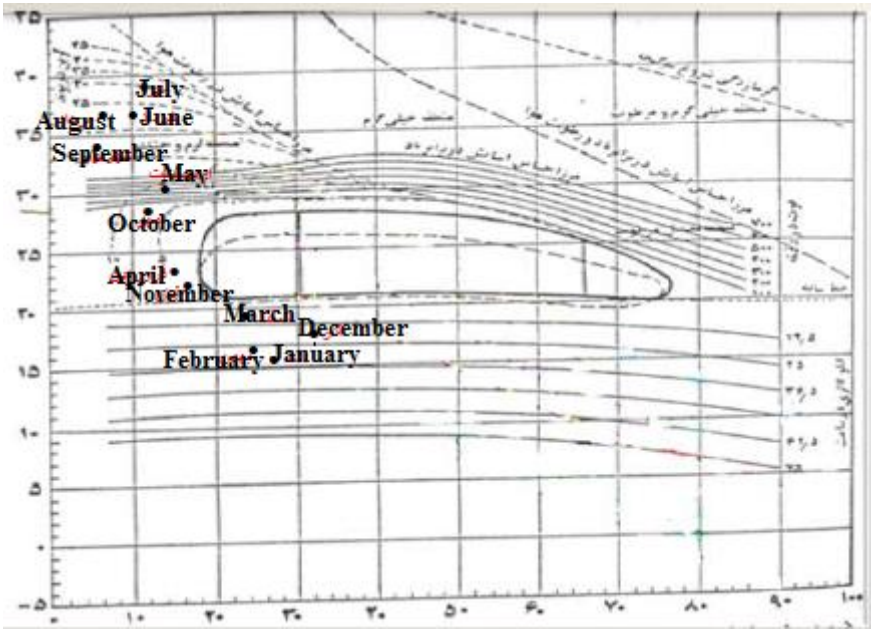


Figure 1 human - bioclimatic index of Olgay in day the county of Khash

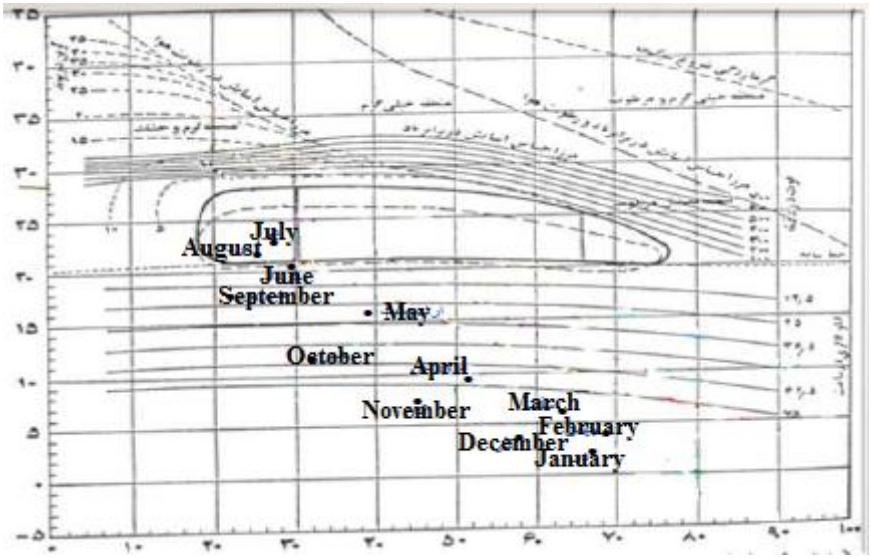


Figure 2 Human - bioclimatic index of Olgay in night the Khash county

As you can see different parts of the graph show the different climatic conditions. This graph is composed From two perpendicular axes means temperature axis and the horizontal axis is relative humidity. Through these two axis have been set the exact location of day and night conditions and is drawn respective line segment. As you see the central part of climatic comfort zone is in center of the graph. This point is where the temperature is not high and amount of moisture is medium. Therefore is comfort zone. To upward increased temperature and, of course, becomes more unfavorable conditions. To right risen the relative humidity and air is sultry and uncomfortable. Therefore In upper right section prevail unfavorable conditions where is high the temperature and relative humidity and in graph is identified as very hot, humid, hot and heatstroke areas. The downward temperature has fallen and cold is negative factor in comfort. Subsequently to the left dropped the relative humidity and the air drier and therefore becomes lower satisfaction. Therefore lower areas left side are cold and dry and have inadequate condition. The upper left corner are hot and dry areas and lower right corner are cold and wet regions. The rest are relative comfort zones. Wind speed lines are also In the top of the comfort zone that show comfort border against wind and water. Now, day and night conditions placed in any point of graph is placed condition of climatic comfort the same of graph.

Table5: Evaluation of human comfort in Khash station with comfort coefficient of Olgay

Month	Mar	Feb	Jan	Dec	Nov	Oct	Sep	Aug	Jul	Jun	May	April
comfot coefficient of Olgay night	Down comfort Cold Wet	Down comfort Cold	comfort	comfort	comfort	Down comfort Cold Dry	Down comfort Cold Dry	Down comfort Cold	Down comfort Cold Wet	Down comfort Cold Wet	Down comfort Cold Wet	Down comfort Cold Wet
comfort coefficient of Olgay day	Comfort	Top of comfort warm and dry	Top of comfort Very warm	Top of comfort Very warm	Top of comfort Very warm	Top of comfort warm and dry	comfort	comfort	Down comfort Cold	Down comfort Cold dry	Down comfort Cold dry	Down comfort Cold dry

Source: Authors calculations, 2015

Review the comfort coefficient of Khash station by Olgay method shows that at year nights the months of June, July, August are in comfort zone and the rest of the months of the year In the bottom of the comfort zone and located in cold and wet cold conditions.Olgay comfort coefficient for the day In this station show that months of April, October and November are the climatic comfort and the months of May, June, July, August

and September placed at the top of comfort and prevail very warm and dry warm conditions and the rest of the months of the year are in the low region of comfort.

Conclusion

The results of this study indicate that in order to plan and development of tourism one of the very important and influential variables, climate and performance caused by its is on tourism activities in different geographical areas. In this paper, in order to measure the bioclimatic comfort for tourism planning used important indicators. The results show that analysis obtained from Terjung climatic index considering the climatic elements particularly temperature and relative humidity Greater accommodating with conditions both area and then to order are comfort of effective temperature, wind cooling index, index of equivalent temperature and eventually Olgay index. Tourism is one of the forms of leisure that function of two variables of time and space, according to these two variables occur ways of different of leisure and tourism. In terms of time can be divided short-term, medium-term and long-term but in terms of place is imagined for them short, medium and far way that there is a direct relationship between them. From this perspective, activate any of forms the planning is required.

The final results of research indicate that bioclimatic conditions in Khash is variable in different seasons of unfavorable conditions the much cooler to hot conditions. However, the months of April, May, September and October in terms of desirability of bioclimatic conditions to exploit of tourism in the region during day and night.

Table 6: Results of combined indicators the desirable physiological comfort in Khash

Olgay indicators	Terjung indicator	Indicator
Comfort	Comfort	Comfort range in the year
April, October, November	April,May,September, October	

Source: Authors calculations, 2015

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