# Analysis of Tourism Climate Index of Chaloos City

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**Abstract**—This study investigated the relationship between climate and tourism in the of Chaloos city. The study was conducted using data from synoptic stations of Noushahr city for the period 29 years (1977-2005). Tourism climate index (TCI) is the method used in this study. Tourist climate comfort using the 7 parameter; total rainfall, monthly mean of temperature, mean of relative humidity, mean of max of temperature, mean of min of temperature, mean of min of relative humidity, mean daily of sunshine hours and wind speed were assessed by TCI model, systematically. The result showed that the late fall to early spring; conditions are not suitable for tourists due to the temperature drop. But, there are the best conditions for tourists from mid-spring to early fall due to moderate temperature.

**Keywords**— Chaloos, Climate comfort, Climate parameters, Tourism climate index.

## I. Introduction

TODAY, tourism has become one of the world's biggest industries. The climate is one of the most important parameters in the development of this industry. Most tourists are concerned about the climate for tourism destinations. So far, there has been considerable research in the field of climate comfort for tourists. Mieczkowski was developed tourism climate index considering the 7 climatic parameters, and to assess the utility of the climate for tourists [1]. In other studies, Harrison et al studied the impact of climate change on tourism in Scotland [2]. Morgan et al were assessed using a questionnaire and the TCI index peak tourist season in Malta, Wales, Italy and Turkey [3]. Perry studied the climatic situation of tourism, especially in hot and dry areas of the Mediterranean and believed that the worst time is the arrival time of a wave of warm air [4]. Belen examined the impact of climate on tourism and recognized that climate change is essential in tourism [5]. Amiranashvili et al studied the tourism characteristics of Tbilisi, the capital of Georgia using TCI Index [6]. Hein examined the tourist climate comfort using TCI method and realized that summer is the country's best tourism climate comfort [7] and Yu et al used the TCI index for coastal tourism studies. In this regard, we tried to identify the suitable time for tourists in the city of Chaloos by appropriate data and methods [8].

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## II. Introducing the Research Area

Chaloos city is located on west part of Mazandaran province. This city from east is neighbor with Noushahr, which is well known for trading with Caspian Sea adjacent countries. From north it joins to the biggest and the most beautiful lake of the world, Caspian Sea, and from south joins to Alborz Mountains where Kandovan maeander road crosses and it has clean climate without any pollution in comparison with other cities. There is a place in this city named Namakabroud that attracts tourists and has modern constructions; it is located at 12 km of west of Chaloos (see Fig. 1).



Fig. 1 Geographical location of Chaloos city

The climate of Chaloos is Csb based on the Koppen-Geiger climate classification. The annual rainfall is 1041 mm. The driest month is July with 27 mm. Most precipitation falls in October, with 72 mm. The difference in precipitation between the driest month and the wettest month is 46 mm. The warmest month of the year is July with an average temperature of 18.2 °C. In January, the average temperature is 3.4 °C. It is the lowest average temperature of the whole year. The average temperatures vary during the year by 14.8 °C (see fig. 2).
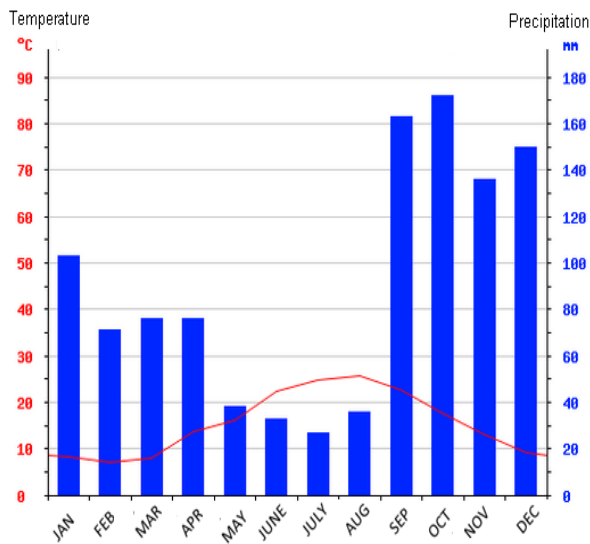
Fig. 2 Graph of annual precipitation and mean daily of temperature of Chaloos city

## III. DATA AND METHODOLOGY

TCI (tourism climate index) was used for the first time in 1985 by Mieczkowski to assess the tourism climate activities. First, he used to calculate the TCI 12 climatic variables and then dropped to 7 climate variables and the combination of factors was reduced to 5 indexes (see Table 1).

TABLE I
SUBINDEX CHARACTERISTICS OF TCI

| Subindex | Monthly Climatic Variable | Effect on Tourism | Scores |
|---|---|---|---|
| CID | mean of max of temperature, mean of min of humidity | shows the thermal comfort when tourists are most active. | 40 |
| CIA | mean daily of temperature, mean of humidity | shows the thermal comfort throughout the night and day, which is even bedtime. | 10 |
| P | total of precipitation | reflects the adverse effects of precipitation on the holiday fun | 20 |
| S | total sun hours | considered good for tourism and the other side has a bad effect on the risk of sunburn and discomfort on hot days | 20 |
| W | mean of wind speed | wind effect depends on the temperature. cooling effect of the wind is good in warm climates the cooling effect of the wind is bad in cold climates | 10 |

To calculate the TCI, we calculate the 5 subindexes and then put as in

$$TCI = 2[(4 \times CID) + CIA + (2 \times P) + (2 \times S) + W] = ? \quad (1)$$

Finally, the explanatory value of TCI is obtained from Table 2.

TABLE II
THE EXPLANATORY VALUE OF TCI

| Score of TCI | The Explanatory Value of TCI |
|---|---|
| 90 – 100 | ideal |
| 89 – 80 | Excellent |
| 79-70 | very good |
| 69-60 | Good |
| 59-50 | Acceptable |
| 49-40 | acceptable(a little) |
| 39-30 | Unsuitable |
| 29-20 | very unsuitable |
| 19-10 | extremely uncomfortable |
| 9 - -30 | Impossible |

## IV. RESEARCH FINDINGS

Winter is the lowest rank of the daily comfort of the CID. Spring, summer and autumn, the situation is better in terms of daily comfort due to more moderate weather. Specifically, May, June, July, August, September and October are the best months of daily comfort rating. The city has the lowest rating the climate comfort of day and night of the CIA in the winter, such as CID and is ranked the highest in spring and summer. June and September are the best of the climate comfort of the CIA. Wind ratings are nearly identical in all seasons because of its mild weather, which would lead to a climate comfort. Table 3 presents the results of each of the five indicators that calculated by using (1).

TABLE III
THE RESULTS OF EACH OF THE FIVE INDICATORS BASED ON THE EQUATION OF TCI

| Month | TCI | The Explanatory Value of TCI |
|---|---|---|
| J | 57 | acceptable |
| F | 59 | acceptable |
| M | 59 | acceptable |
| A | 68 | good |
| M | 87 | excellent |
| J | 81 | excellent |
| J | 73 | very good |
| A | 69 | good |
| S | 66 | good |
| O | 73 | very good |
| N | 54 | acceptable |
| D | 50 | acceptable |

May and June has the highest level of climate comfort due to less rainfall and optimum temperature. November and December has the lowest rated TCI due to low temperatures and increased rainfall. In other side, , according TCI index, climatic comfort condition is acceptable in November,

December, January, February and March due to the decrease in temperature and increase in rainfall. Generally, the climatic condition is good to excellent for tourists from February to August due to high temperatures, clear sky, without cloud, low rainfall and long sunshine hours in Chaloos city.

## V. CONCLUSIONS

This study investigated the effect of climate on tourism o Chaloos city. To achieve this goal, we needed to identify and evaluate the climate comfort using accepted scientific methods in order to systematically determine the impact of climate on tourism activities, so that they can be used by tourists, potential and capabilities climate of Chaloos city. Therefore, the TCI Index was used. TCI index assesses the quality of the climate and the tourist experience and suggests that at a time, combining various elements of the climate for tourists and travelers and even natives of an area is suitable or not? This method has evaluated the various elements of climate and different coefficients depending on the model and finally, a score is calculated for each month or any period that we consider. Results showed that climate comfort conditions is acceptable in January, February, March, November and December and in other months, climate comfort condition is good to excellent and is suitable for tourism activities.

## ACKNOWLEDGMENT

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