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THE INFLUENCE OF CLIMATIC CONDITIONS ON TOURISM IN SINAIA RESORT, PRAHOVA VALLEY, ROMANIA

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Abstract

The main purpose in carrying out this paper is to convey the way in which tourism is influenced by natural and anthropogenic factors in relation to climatic elements. Behind this paper is a careful documentation on each element presented, concrete information and close to the truth in order to create a precise picture of the relationship between climate and tourism in Sinaia. Climatic data provided by National Institute of Meteorology and Hydrology and also the statistical data provided by National Institute of Statistics were used. Following the processing of statistical data, it was found that the favorable climatic factors, characteristics for each season and the specific tourist infrastructure are elements that ensure tourist flows throughout the year. The qualitative aspects in this research were studied based on current scientific literature, official documents and observation method, and the quantitative research was carried out using statistical analysis of the processed data, graphic and cartographic method, the method of observation and interpretation. The results were presented in tables, graphs and then interpreted and analyzed. Data used in this study are part of the textbook on the desk. Being one of the most spectacular mountain areas in Romania, recognized internationally by the satisfaction of tourists who arrive in these lands, this paper aims to highlight the favorable climate conditions in relation to tourism in Sinaia considered the "pearl" of the mountain resorts in the Prahova Valley. This paper presents the capitalization of tourism potential, which highlights the number of tourists arriving in the two resorts, in the period 2009-2019. Also, the private accommodation infrastructure and the number of main accommodation units, hotels and pensions are presented in detail, the typology of hotels according to the degree of comfort and the presentation of tourism in the hot and cold period of the year. Finally, we find the conclusions that highlight the main ideas that emerged from the research.

Key words**:** *climate change, mountain tourism, Sinaia resort, Romania*

INTRODUCTION

The favorable conditions of the environment and of the climatic factors have influenced the inhabitation since ancient times. The Prahova Valley was one of the means of connection between the ancient Dacian and Romanian inhabitants on both sides of the Carpathians.
On the current site of Sinaia, there was a pastoral settlement being favored by the geographical position that provides a favorable environment for grazing.
Throughout the day, the inhabitants raised animals, practiced agriculture suitable for mountain areas, processed wood, from which they obtained shingles, beams, slats, wooden pots, barrels.
Much later, when Sinaia became a tourist resort, with facilities and tourist means, the interest to spend a stay in this resort increased and continue to grow proportionally.
Being situated at the foot of the Bucegi Mountains which are a branch of the Southern Carpathians, Sinaia climate is deeply influenced by the changes in the factors of climate in this area.
Tourism represents one of the most important economic sectors and the unfavorable climate conditions could strongly affect the economic and social development of the mountain communities and environment [18].
In this context, the paper aims to make a correspondence between the favorable natural elements and the tourist activity in the resort,

analyzing the dynamics of the frequency and the number of tourists throughout the year, and also of tourism infrastructure during the period 2009-2019.

MATERIALS AND METHODS

For a more concrete documentation, we analyzed and interpreted climate data from Sinaia in the period 2009-2019 [9]. We also used statistical data provided by NIS regarding the tourist infrastructure.

Also, it was consulted the Planning Plan of the inter-city PATZ zonal territory Sinaia-Bușteni-Azuga-Predeal-Râșnov-Brașov (Poiana Brașov) [12], a project realized within Babeș-Bolyai University of Cluj Napoca, having as project manager professor Pompei Cocean. In addition, other information about Sinaia and its tourist potential were used from another study carried out within the University Al. I. Cuza Iasi.

For the qualitative research, there were applied the following methods: documentation based on the consultation of current literature that could be accessed and official documents, and observation method. The quantitative research used the following research methods: analysis method and data processing, graphic and cartographic method, the method of observation and interpretation.

The data were processed and converted into tables, graphs and then interpreted and analyzed. Data used in this study are part of the textbook on the desk.

RESULTS AND DISCUSSIONS

The population in the resort of Sinaia, has undergone changes over time, so it was found that The highest value of the number of inhabitants in Sinaia was recorded in 2009, accounting for 12,525 inhabitants, following that in the rest years, this number to decrease significantly, so that in 2019 to reach only 11,037 inhabitants.

Regarding the evolution of the population, an impressive decrease can be observed in the area of Sinaia, due to the lack of young population which eventually led to a negative natural growth.

The network of roads plays an important role in the economic development of the city and is also an important factor for tourism. Therefore, the city of Sinaia also enjoys highways as well as railways. Regarding the railway transport, it can be done with domestic and international trains, which travel on the directions Bucharest-Ploiesti or Brasov [14].

The total length of the Romania railway is 8,338 km [14].

The arrangement of the relief and the visit of the numerous natural and anthropic tourist objectives, made the city of Sinaia to be of high attraction for tourists, as well as for the practice of several forms of tourism, tourism representing an important sector in the development of the local economy. Sinaia presents favorable conditions for practicing several forms of tourism like: mountain, sports tourism, cultural-historical, religious and spa [12, 13].

Natural sights are an important point in the development of tourism in Sinaia and attract millions of tourists every year.

The Bucegi Mountains are a point of tourist interest for the city of Sinaia. You can also go hiking on the Piatra Mare Massif (1,843 m), Postavaru Mountains (1,799 m). However, Sinaia remains known for its famous ski slopes, which are the main attraction for tourists.

The objectives of the natural setting, that attract tourists and the anthropic objectives belonging to the religious, historical, cultural heritage, which have a rich history, traditions are "the business card" of the city of Sinaia. The most significant monuments with architectural and cultural-historical value are The Royal Peles Castle, The Pelisor Castle, Sinaia Casino, Sinaia Monastery, Sinaia International Conference Center, "Carmen Sylva" Cultural Center, George Enescu Memorial House (Luminiș Villa), Nicolae Iorga's House, Dimitrie Ghica Park, Museum of the Bucegi Natural Rezervation, The Royal Railway Stations, Museum of train micro-models, Sinaia Heroes Cemetery [10].

The climatic characteristics of Sinaia from the perspective of their influence on tourism.

Favorable conditions for tourism activities involve certain values of climatic elements such as cloudiness, air temperature, winds, duration of sunshine.

Sinaia resort has a low intensity in terms of air currents, this being due to the location of the city within the county. The cold season in the resort is characterized by winters with mild frosts, the average monthly temperature is -3.9°C in January, -3.1°C in February and 15.7°C in July, which favors the practice of outdoor sports. winter and the duration of the days with snow cover suitable for skiing, snowboarding, sledding is about 100-120 days/year [14].

From the point of view of the relief, the Bucegi Mountains have an important role and present "bizarre" forms (Babele, Sphinx, Mushrooms) that were shaped by the wind together with the precipitation water, giving these forms through the processes of deflation and corrosion. The effects of this process are visible everywhere in Bucegi, the rocks of the peaks Caraiman, Furnica, Guțan, Bucșoiu, Țigănești present these "faces" shaped by the wind.

The average air temperature is between -2°C in the highest part of the Bucegi Mountains and over 10°C in the lower areas, the plains where there is an amplitude of approx. 13°C [15].

In the mountainous area, respectively the highest peaks (Ciucaș, Gîrbova, Grohotișu) the average air temperature is 1-2°C, while on the Bucegi bridge the temperature drops to 0°C and towards the Omu peak the temperature can drop to - 2°C [11].

After October 1, the first frost appears and the last frost usually appears at the end of April, the average duration without frost reaches 148 days.

In Sinaia, the average number of winter days is 46.8 which represent maximum temperatures above 0°C, 154 is the number of days with frost that includes minimum temperatures below 0°C, 18 represents the number of summer days which means temperature maximum of 25°C [17].

We notice that in the cold period of the year, the values are low, the lowest temperature being registered in the Sinaia area, of -2.2°C in February, followed by the increase of temperatures up to 20.1°C in August in Sinaia. These values are the result of 10 years of measuring temperatures in Sinaia (Table 1 and Fig. 1).

Table 1. Monthly average air temperature (°C) in Sinaia (2009-2019)

Month	Sinaia
January	-4.4
February	-2.2
March	2.4
April	8.5
May	13.2
June	17.8
July	19.7
August	20.1
September	15.3
October	9.2
November	4.4
December	-1.7

Source: World Weather Online, 2021, Sinaia monthly climate averages, https://www.worldweatheronline.com/sinaia-weather-averages/brasov/ro.aspx, Accessed on September 5, 2021 [17].

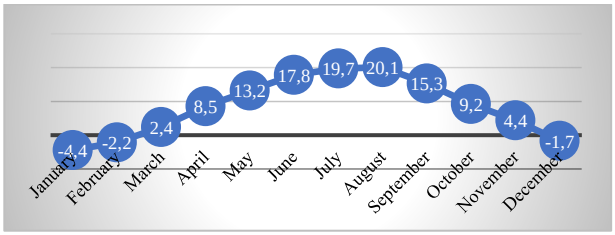

Fig. 1. The evolution of the average monthly air temperature in the period 2009-2019
Source: Own design and determination.

Table 2. Annual average air temperature (°C) in Sinaia (2009-2019)

Year	Sinaia
2009	7.58
2010	7.08
2011	6.41
2012	7.66
2013	8.16
2014	7.83
2015	7.25
2016	7.08
2017	7.25
2018	8.66
2019	10.91

Source: World Weather Online, 2021, Sinaia monthly climate averages, https://www.worldweatheronline.com/sinaia-weather-averages/brasov/ro.aspx, Accessed on September 5, 2021 [17].

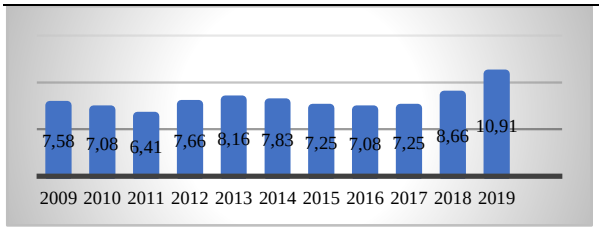

Fig. 2. Evolution of the average annual air temperature (°C) in Sinaia (2009-2019)
Source: Own determination.

Taking into account the average annual air temperature we may notice that it ranged between 6.41°C in the year 2011 and 10.91°C in the year 2019, and this reflects a trend of climate warming in Sinaia (Table 2 and Fig. 2).
The annual relative humidity has an important role in terms of tourism, it must meet a number of conditions conducive to tourism so values less than 70% indicate excellent conditions for tourism, the value of 70-80% indicates favorable conditions for tourism, 80-90% medium conditions, over 90% low conditions [3].

Table 3. Monthly average air humidity (%) in Sinaia during 2009-2019

Month	Sinaia
January	96.9
February	97
March	88.2
April	81.8
May	84.7
June	83.3
July	79.2
August	72.2
September	74.3
October	82
November	87.5
December	91.4

Source: World Weather Online, 2021, Sinaia monthly climate averages, https://www.worldweatheronline.com/sinaia-weather-averages/brasov/ro.aspx, Accessed on September 5, 2021 [17].

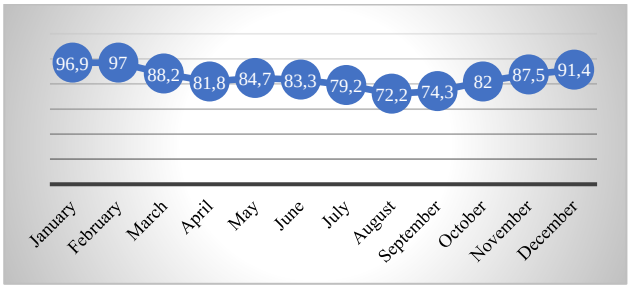

Fig. 3. Variation of the average monthly air humidity (%) in Sinaia during 2009-2019
Source: Own determination.

Table 4. Annual average air humidity (%) in Sinaia during2009-2019

Year	Sinaia
2009	91.9
2010	98.8
2011	93.9
2012	93.0
2013	92.9
2014	92.8
2015	91.4
2016	93.5
2017	91.6
2018	89.7
2019	89.0

Source: World Weather Online, 2021, Sinaia monthly climate averages, https://www.worldweatheronline.com/sinaia-weather-averages/brasov/ro.aspx, Accessed on September 5, 2021 [17].

Following the analysis of the two graphs (Fig. 3 and Fig. 4), it can be seen that Sinaia has low values of air humidity due to low altitude.

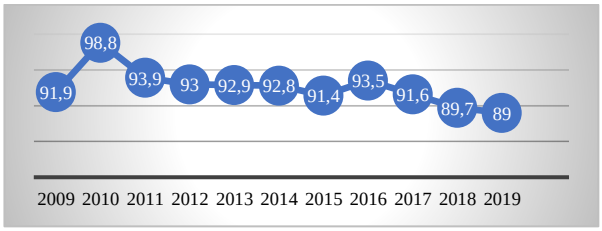

Fig. 4. Variation of the average annual air humidity (%) in Sinaia during 2009-2019
Source: Own determination.

As can be seen from (Table 3 and Table 4), The high degree of humidity in Sinaia was recorded in 2010 of 98.8%, thus preventing the practice of winter sports, which led to the appearance of fog, reducing visibility, and the lowest value was recorded in 2019 of 89.0% being average conditions for winter sports.
Nebulosity is an essential climatic parameter that determines the duration of the Sun's brightness and is defined as the degree of cloud cover. Nebulosity have an impact on all climatic elements but are influenced by the relief and the general circulation of the atmosphere [11].
It has certain limits for tourism specific to the mountain area such as the average seasonal duration with clouds with values less than 70% indicates excellent conditions for tourism, between 70-80% good favorability, 80-90% average conditions, over 90% tenth small conditions for tourism [3].

Table 5. Monthly average cloud cover (%) in Sinaia (2009-2019)

Month	Sinaia
January	54.8
February	58.1
March	48.3
April	46.4
May	43.4
June	37.1
July	30.4
August	24
September	31.4
October	38.5
November	43.3
December	48.8

Source: World Weather Online, 2021, Sinaia monthly climate averages, https://www.worldweatheronline.com/sinaia-weather-averages/brasov/ro.aspx, Accessed on September 5, 2021 [17].

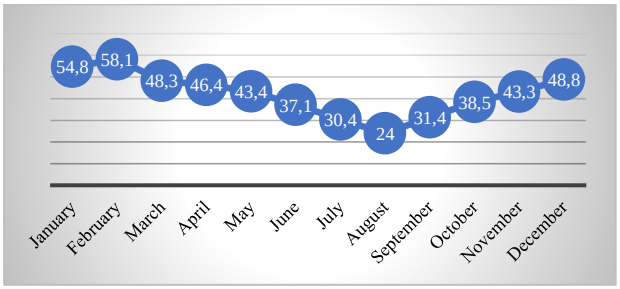

Fig. 5. Average monthly cloud cover variation (%) in Sinaia (2009-2019)
Source: Own determination.

Table 6. Annual average cloudiness (%) in Sinaia (2009-2019)

Year	Sinaia
2009	46.6
2010	54.1
2011	41.3
2012	39.9
2013	41.6
2014	47.1
2015	44.9
2016	45.4
2017	42.3
2018	46.0
2019	55.3

Source: World Weather Online, 2021, Sinaia monthly climate averages, https://www.worldweatheronline.com/sinaia-weather-averages/brasov/ro.aspx, Accessed on September 5, 2021 [17].

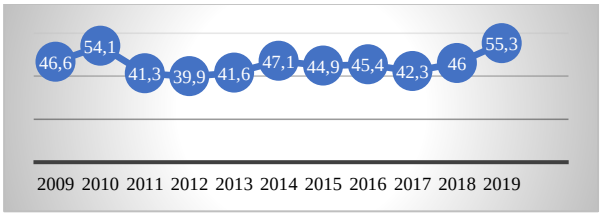

Fig. 6. Cloud cover, annual average (%) in Sinaia (2009-2019)
Source: Own determination.

Following the analysis of the graphs (from Figure 5 and figure, the mountain resort Sinaia presents low values of nebulosity, reason for which the tourist activity presents favorable conditions.

According to Table 6, the highest value of the nebula in Sinaia is 55.3% in 2019 indicating favorable conditions for tourism activities, and the lowest value being in 2012 of 39.9%.

The duration of the Sun's brightness is extremely low on high mountain peaks but also in intra-mountain depressions, this being due to the long duration of the fog and the stratiform nebula.

In the hilly and mountainous areas, the duration of the Sun's brightness is reduced from 1,900 hours and can reach values lower than 1,600 hours, where the altitudes are over 2,500m. During the warm semester, the duration of the Sun's brightness presents values between 1-800 hours in the low areas and in the high ones 1,300 hours.

Table 7. Monthly average sunshine duration (hours) in Sinaia

Month	Sinaia
January	154.7
February	143.6
March	250.0
April	303.7
May	336.2
June	353.9
July	388.2
August	393.9
September	331.1
October	210.8
November	195.8
December	182.6

Source: World Weather Online, 2021, Sinaia monthly climate averages, https://www.worldweatheronline.com/sinaia-weather-averages/brasov/ro.aspx, Accessed on September 5, 2021[17].

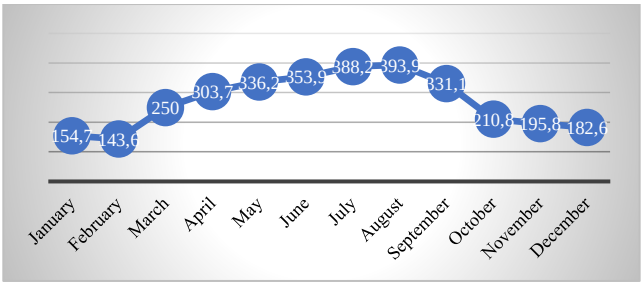

Fig 7. The variation of the average monthly duration of the sun (hours) in Sinaia
Source: Own determination.

Table 8. Annual average duration of sunshine (hours) in Sinaia

Year	Sinaia
2009	301.95
2010	273.152
2011	310.85
2012	312.7
2013	310.3
2014	292.25
2015	294.4
2016	297.4
2017	303.25
2018	297.95
2019	257.35

Source: World Weather Online, 2021, Sinaia monthly climate averages, https://www.worldweatheronline.com/sinaia-weather-averages/brasov/ro.aspx, Accessed on September 5, 2021[17].

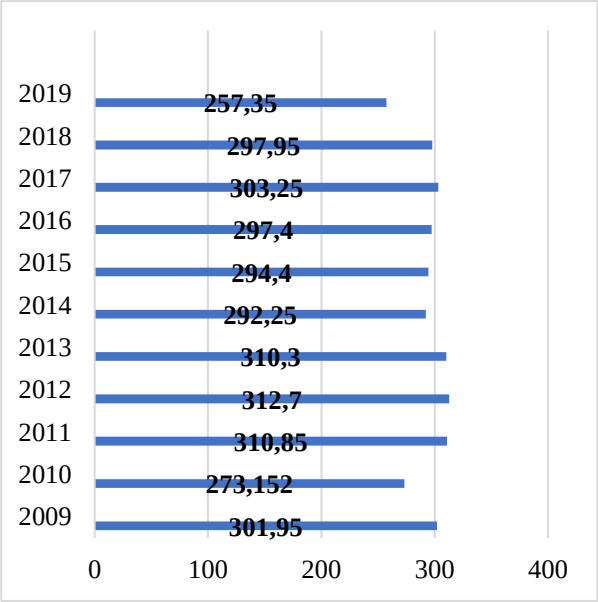

Fig. 8. Variation of the average annual duration (hours) of the Sun in Sinaia
Source: Own determination.

The duration of the Sun's brightness is strong in Sinaia (Table 8). Which favors the outdoor activities in this mountain resort, especially in August, as it appears from (Figure 8). Sinaia has high values in terms of annual and monthly average duration of sunshine. In this area, the practice of winter sports is affected by the strong sun, but this does not prevent tourists from fully enjoying the sun's rays here.

Following the analysis (Table 8) the longest duration of the Sun's brightness recorded in Sinaia during the 10 years was 312.7 hours in 2012, while the year 2019 did not enjoy a duration of brightness. of the strong sun, having only 257.35 hours.

Atmospheric precipitation depends largely on nebulosity, being a consequence of it. Being in liquid form, it has a negative impact on the development of tourism, representing a cause of psychological stress in the case of tourists.

If it manifests itself in the form of snow, it induces a state of well-being for tourists to practice winter sports (tobogganing, skiing, skating), the snow layer persisting over 64 days. The vertical area of the distribution depends on the altitude of the relief [3].

Monthly average rainfalls in Sinaia varied between 123.7 mm in the June and also in May another high level accounting for 117.8 mm and the lowest level 36.6 mm registered in September. Following the analysis of the monthly and annual average (Fig. 9 and Fig.10) of atmospheric precipitation, we deduce that the month with the most precipitation amounts for Sinaia is June.

Table 9. Monthly average rainfall (mm) in Sinaia

Month	**Sinaia**
January	48.8
February	37.9
March	49.5
April	81.6
May	117.8
June	123.7
July	92.6
August	55.5
September	36.6
October	53.1
November	44.8
December	53.1

Source: World Weather Online, 2021, Sinaia monthly climate averages, https://www.worldweatheronline.com/sinaia-weather-averages/brasov/ro.aspx, Accessed on September 5, 2021 [17].

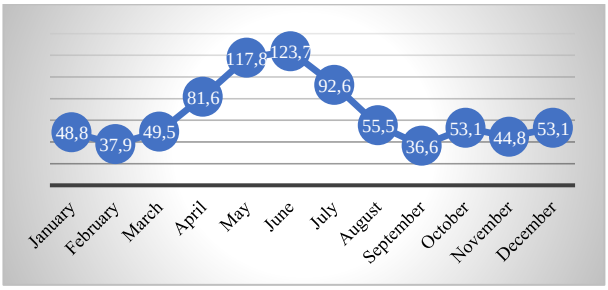

Fig. 9. The variation of the average monthly precipitation (mm) in Sinaia
Source: Own determination.

Table 10. Annual average rainfall (mm) in Sinaia

Year	Sinaia
2009	45.60
2010	62.2
2011	57.49
2012	69.69
2013	53.64
2014	60.32
2015	55.07
2016	63.17
2017	53.97
2018	78.44
2019	197.28

Source: World Weather Online, 2021, Sinaia monthly climate averages, https://www.worldweatheronline.com/sinaia-weather-averages/brasov/ro.aspx, Accessed on September 5, 2021 [17].

During the 10 years, 2019 recorded impressive values compared to the rest of the years, this being attributed to climate change, with high rainfalls in both the hot and cold periods of the year.

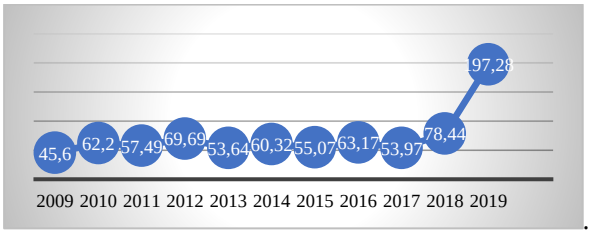

Fig. 10. The variation in annual rainfall (mm) in Sinaia
Source: Own determination

Wind is an important meteorological element that depends on the general circulation of the atmosphere, the movement of air currents depends on the activity of the centers of baric action as well as the different development of baric systems. It has three important features the direction from which it beats, the frequency and speed of movement expressed in m/s. In Sinaia the winds are heading from northwest to southeast [3].

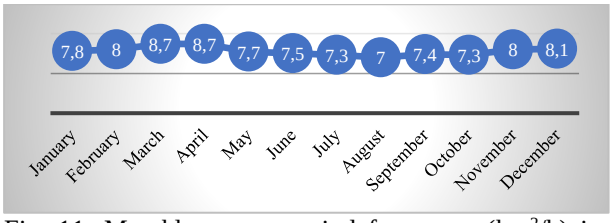

Fig. 11. Monthly average wind frequency (km^2/h) in Sinaia
Source: Own determination.

Thus, in Sinaia resort, the wind blows from the north with high frequency in July (43.4 of the total air movements), from the south in November (25.8%), from the east in June (2.5%), the one from west in June with (3.4%) and the highest frequency is in August with 28.4%. Annually it is registered over 29 days with speeds of 11-16 m/s, 3-4 days with over 16 m/s and the rest are with low speeds of 11m/s. The wind is very important for tourism, because it contributes to the way the human body feels the temperature. The higher its frequency, the higher the temperature felt by the human body, and tourists cannot fully enjoy it.

In Sinaia you can see in 2018 the lowest wind frequency of 6.8 kmph, while the highest value was observed in 2009 of 9.17 kmph.

Table 11. Annual average wind frequency (km/m^2) in Sinaia

Year	Sinaia
2009	9.17
2010	9.14
2011	8.95
2012	8.94
2013	9.14
2014	9.04
2015	8.01
2016	7.9
2017	7.71
2018	6.8
2019	7.19

Source: World Weather Online, 2021, Sinaia monthly climate averages, https://www.worldweatheronline.com/sinaia-weather-averages/brasov/ro.aspx, Accessed on September 5, 2021 [17].

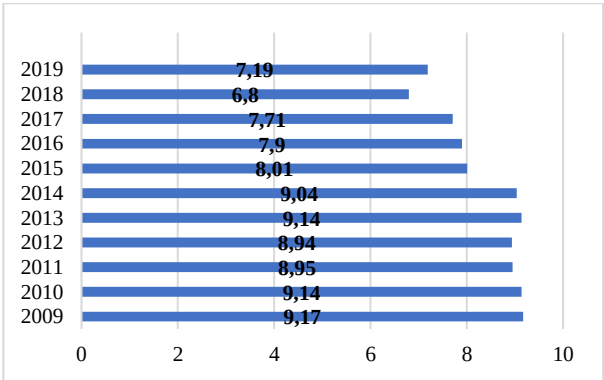

Fig. 12. Variation of the average annual wind frequency (km/m^2) in Sinaia
Source: Own determination.

Atmospheric risk phenomena

Atmospheric phenomena are a component of natural phenomena being influenced by relief, the altitudinal arrangement that has the effect of changing the intensity, character,

frequency, components of the environment. The relief of Sinaia is characterized by the presence of mountains Bucegi, Postavaru, Garbova, Piatra Mare which intensifies the occurrence of risk phenomena such as avalanches, landslides and the presence of woody vegetation that leads to uniformity of snow, reduced wind speed and are recorded in the alpine floor the highest amounts of precipitation resulting in the condensation of clouds [5].

Being a city located on the Prahova Valley, there are phenomena such as frost, frost, soil frost with negative effects on agriculture [3].

Frost represents the decrease of air temperature and soil surface temperature reaching negative temperatures, usually below 0°C. The frost phenomenon manifests itself in autumn, most often taking place before October 1, and the last period of frost occurs in early June in mountainous areas.

Altitude helps to determine the number of days with frost, and the advection of cold masses consists of temperature differences. Frost is frequent in the mountainous area, especially in Sinaia due to the negative temperatures that set in with the arrival of the cold season. The frost is influenced by the height, which is why in the areas with low altitudes, respectively depressions and valley corridors, the number of days with frost is higher.

This climatic phenomenon can generate negative consequences in terms of tourist activities in mountain resorts. It can create a nuisance for tourists in areas where the snow layer is not very thick.

Also, in this region the following phenomena are felt: frost, icing, snow, blizzard, avalanches, torrential rains, hail, fog. They negatively influence the tourist activity, both in terms of resort supply, transport and tourist flows.

The influence of climatic conditions on tourist facilities and flows

The tourist arrangement consists in improving the accommodation and food spaces by modernizing them in order to satisfy the preferences of all tourists. For the development of the accommodation and food infrastructure, the natural and anthropic potential of the resorts for a better development of the tourist activity was taken into account.

Given that tourism in the mountain area has developed extremely much in recent years, investors in tourist facilities have modernized, refurbished in order to provide tourists with favorable conditions to spend their vacation. An example in this sense are the resorts on the Prahova Valley such as Sinaia, Busteni, Predeal, Azuga which compete in the offers and which can satisfy even the most demanding requirements of the tourists who cross their threshold.

Climatic elements have an important impact on tourist facilities and flows, as they determine the number of overnight stays in accommodation capacities. The natural potential is highlighted by the tourism planning plan of the city of Sinaia, which implicitly led to the increase of accommodation and catering infrastructure, being capitalized by several factors such as geographical location, tourist function, landscape quality, size and type of tourist activity.

The accommodation infrastructure has gradually developed over the ten years, as can be seen in (Table 12).

This being based on the evolution of tourism, so that in 2009 Sinaia had a number of 77 structures tourist reception, in 2019 it reached 89 tourist reception structures but the maximum of the structure being reached in 2017 by 96 tourist reception structures, the biggest extension is the hotels and tourist villas followed by tourist chalets and motels.

At the same time we can see that at present, hostels, motels, student and preschool camps have remained at the same number and did not evolve from 2009 to 2019, also, the tourist cottages showed an increase in 2012-2014 following that during the ten years to decrease dramatically, currently reaching 3 tourist reception structures (Fig. 13).

Table 12. Tourist reception structures with tourist accommodation function in Sinaia (2009-2019)

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total tourist accommodation. units	77	77	83	84	89	89	87	85	96	95	89
Hotels	22	22	23	27	28	27	28	28	28	28	28
Hostels	2	3	3	3	2	2	2	2	2	2	2
Motels	2	2	2	2	2	2	2	2	2	2	2
Villas	22	23	21	15	13	12	11	10	13	13	12
Chalets	5	3	3	5	5	6	3	2	2	2	3
Camps for students and preschoolers	1	1	1	1	1	1	1	1	1	1	1

Source: National Institute of Statistics, 2021.

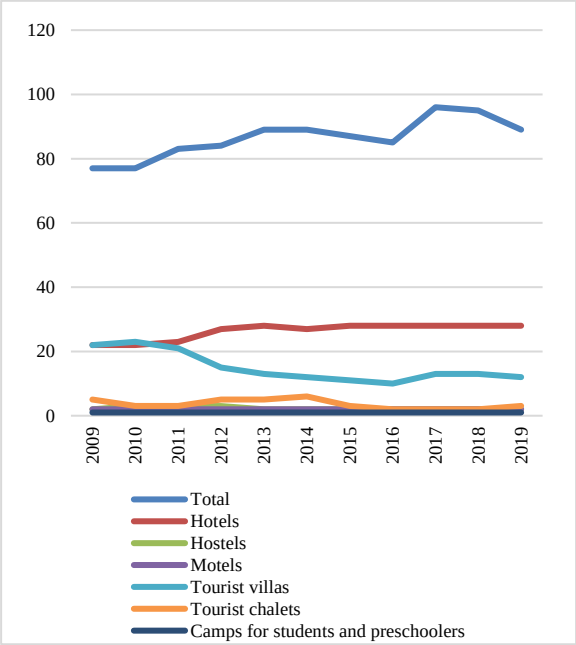

Fig. 13. Tourist accommodation structures in Sinaia (2009-2019)
Source: Own determination.

Table 13. Capacity and activity - Places- for tourist accommodation in Romania (2009-2019)

Hotels	Hostels	Motels	Tourist villas	Tourist chalets	Tourist pensions
2,869	110	72	479	189	373
2,877	195	72	462	119	378
2,543	195	72	411	119	518
3,110	218	72	320	161	579
3,131	189	86	322	161	708
2,984	189	86	272	173	708
3,124	189	86	253	75	765
3,108	189	84	257	45	771
3,110	201	108	290	45	826
3,105	201	108	276	75	797
3,099	201	108	262	73	738

Source: National Institute of Statistics [8].

Looking at the data from Table 13 we may notice that at national level se number of hotels is dominant, on the second positions are situated tourist guest houses, on the third position came tourist villas, followed by hostels, motels, and tourist chalets.

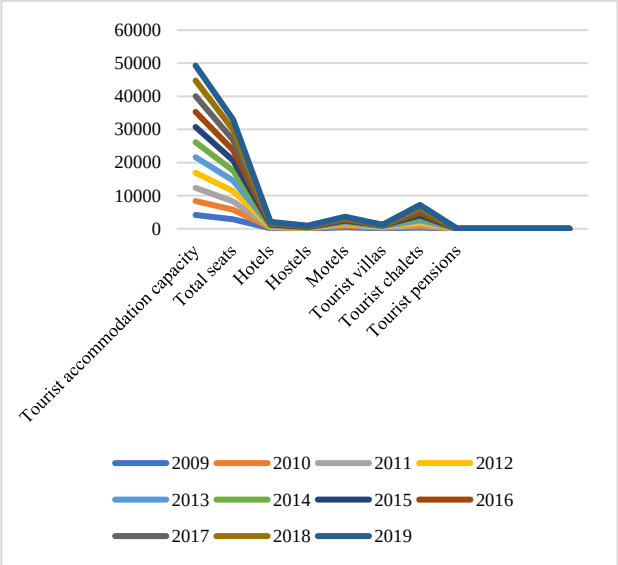

Fig. 14. Number of tourists distributed by accommodation units in Sinaia 2009-2019
Source: Own determination.

Tourist flows and the influence of climatic factors on them on the territory of Sinaia resort

Due to the climatic conditions and the relief, Sinaia resort offers tourists the opportunity to practice various forms of tourism, including winter sports, business and meeting tourism, hunting tourism and last but not least scientific tourism. Sinaia resort is known especially for weekend tourism, but also rural tourism being extremely widespread in the resorts [1].

As it can be seen from Table 14, in 2018 the arrivals of tourists who came to the accommodation units registered 305,800 compared only 165,233 in 2009.

Over the years, the resort of Sinaia has experienced an explosive growth, being currently among the most famous and visited resorts in the country. Compared to 2009, the number of arrivals has increased dramatically, this is highlighted by the impressive tourist

attractions, but also the splendor of the city, as well as the possibility of practicing various winter sports.

Table 14. Number of arrivals and overnight stays in accommodation units in Sinaia (2009-2018)

	Arrivals of accommodated tourists	Overnight stays in accommodation structures
2009	165,233	403,352
2010	166,862	391,996
2011	174,616	397491
2012	98,157	452,920
2013	197,813	438,868
2014	198,064	440,190
2015	267,789	528,906
2016	289,993	585,224
2017	293,408	596,594
2018	305,800	657,073

Source: National Institute of Statistics [8].

Regarding overnight stays, the maximum value was reached in 2018 (Figure 15), when 657,073 people were mentioned, being preceded by 2017 by 596,594 people, subsequently decreasing in 2009-2010, from 403,353 to 391,996, followed by an increase in overnight stays.

This is due to the diversified tourist potential that attracts from one year to another, millions of tourists, eager to discover the so-called "pearl of the Carpathians"[15].

The number of overnight stays in the ten years indicates that Sinaia resort is chosen by visitors even during the weekend, when tourists want to relax and enjoy a short vacation [16].

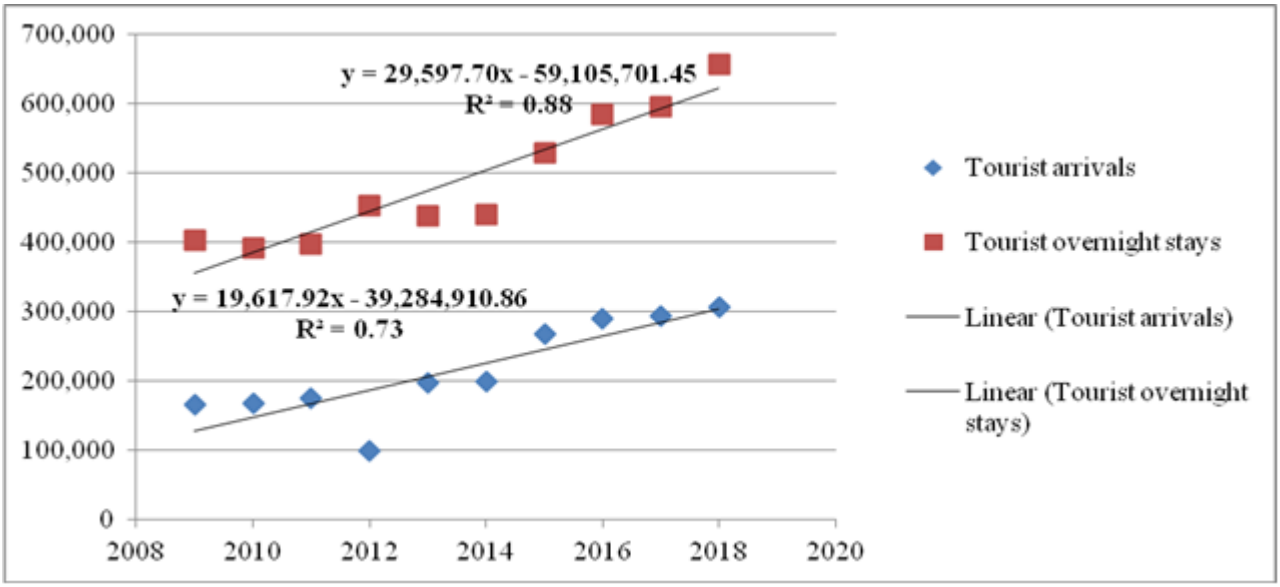

Fig. 15. Evolution of arrivals and overnight stays in accommodation units in Sinaia (2009-2018)
Source: Own determination.

Spa tourism and the influence of climatic factors on Sinaia resort

Spa tourism is one of the main forms of tourism found in Sinaia resort and is also the oldest type of tourism found in our country. It is highly exploited due to its natural potential and its location in a favored area.

Lately, spa tourism is also found in mountain areas, being much more beneficial due to the mountain air, free of allergens, clean, the mountain sun is a strong natural factor, which is indicated for strengthening and restoring the body.

Sinaia resort located on Prahova Valley, at heights between 767-1,055 m, offers tourists the opportunity to practice spa tourism due to the following therapeutic elements, namely clean bioclimate, without allergens, but also the existence of mineral water of Valea Câinelui spring, which has sulfur indicated for tourists with respiratory problems, for the treatment of hypertension, endocrinological and nervous disorders [7].

Tourists can enjoy baths with mineral water, carbon dioxide, herbs and electrotherapy that is achieved by exposure to ultraviolet radiation, as well as pulse currents or shortwave currents. For these therapies are provided to tourists qualified and authorized personnel for medical gymnastics, recovery,

psychotherapy, massage, diet therapy, but also specially designed bases.

Tourism related to winter sports and the influence of climatic factors in Sinaia

Sinaia resort has a relief represented by mountains, this is a main advantage in practicing winter sports, being among the most sought after resort in the country.

Sinaia resort has a favorable climate for winter sports, with mild winters and low air currents.

Due to these characteristics, Sinaia resort enjoys a diversified natural tourism potential, for tourism related to winter sports, climatic parameters being the main attraction, the most significant being represented by the thickness of the snow layer and its duration.

Within the resort, there are cable transport facilities that help to transport tourists in more inaccessible areas - cable cars, chairlifts, ski lifts. You can practice skiing, mountaineering, hiking, hiking.

Weekend tourism and the influence of climatic factors on it

Weekend tourism has become extremely popular lately, especially by tourists who live in urban areas and who want to enjoy a mini vacation in nature. An escape to the mountains is often dedicated to relaxation and rest, being practiced especially by tourists who do not have several days off. Weekend tourism is practiced in any season. Weekend tourism arose from the need of people to explore the new place, in a short period, choosing as the main structure of tourist reception the pensions due to the quality-price ratio [2].

Climatic factors play an important role in the realization of weekend tourism, especially in the winter season. The presence of the snow layer is the most important climatic element that attracts many tourists to practice winter sports. Also, wind speed and air temperature are important in order to perform optimally for winter sports. During the cold season, the resorts are crowded, Romanian and foreign tourists enjoy the slopes with varying degrees of difficulty, as well as mountain hiking on marked trails [2].

Distribution of private accommodation infrastructures within Sinaia resort

The private accommodation infrastructure in Sinaia (Table 15 and Figure 16) is represented by the tourist villas and tourist chalets. Thus, the tourist villas are the most numerous accommodation units of this type, while the tourist chalets are approximately equal. The largest share of tourist villas in Sinaia resorts is in 2010 and will decrease dramatically during that period.

Table 15. Private accommodation infrastructure in Sinaia 2009-2019

Sinaia	Tourist villas	Tourist chalets
2009	22	5
2010	23	3
2011	21	3
2012	15	5
2013	13	5
2014	12	6
2015	11	3
2016	10	2
2017	13	2
2018	13	3
2019	12	3

Source: National Institute of Statistics [8].

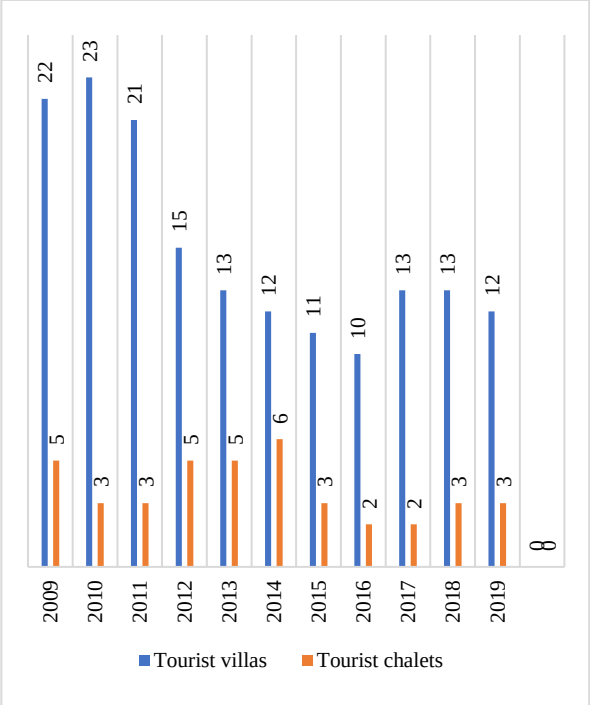

Fig. 16. Variation of private accommodation infrastructure in Sinaia 2009-2019
Source: Own determination.

The lowest number of private accommodation infrastructure is observable in 2016, and currently (2019) Sinaia has a relatively small number of tourist chalets. Tourist villas are the most used forms of accommodation, after hotels and tourist pensions due to the fact that they are more accessible and can be used by groups of families or friends.

Distribution of accommodation units in relation to their degree of comfort

The hotels in this area are classified according to the facilities expressed in number of stars and the pensions in number of daisies, in order to offer tourists the possibility to enjoy their benefits [4] (Table 16 and Fig. 17).

Table 16. The structure of the main accommodation units in the degree of comfort in Sinaia (2009-2019)

Degree of comfort	**Hotels**	Tourist pensions
1 star	0	
2 stars	4	
3 stars	12	
4 stars	8	
5 stars	1	
2 daisies	-	1
3 daisies	-	6
4 daisies	-	3
5 daisies	-	3

Source: Ministry of Economy, Antrepreneurship and Tourism, 2021, Tourism authorization, http://turism.gov.ro/web/autorizare-turism/, Accessed on Sept. 3, 2021 [6].

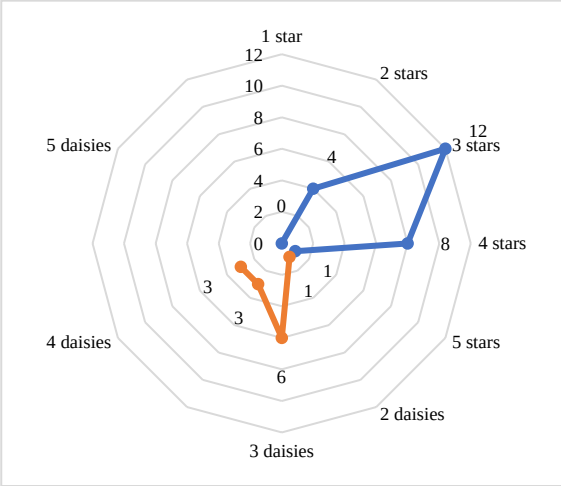

Fig. 17. Variation of the main accommodation units and degree of comfort in Sinaia (2009-2019)
Source: Own determination.

Tourist flows in Sinaia resort during 2009-2019 by tourist origin

In 2019, Sinaia resort was visited by 573,557 tourists, of which 442,911 Romanians (77.22%) and 130, 646 foreigners (22.78%) (Table 17).

Table 17. Number of tourists arriving in Sinaia (2009-2019)

Year	Romanian tourists	Foreign tourists
2009	181,423	64,782
2010	219,866	65,322
2011	267,603	80,109
2012	252,727	78,472
2013	273,494	89,693
2014	293,766	101,056
2015	349,676	115,876
2016	376,900	128,321
2017	400,630	139,502
2018	370,913	129,363
2019	442,911	130,646

Source: National Institute of Statistics [8].

Following the data collected, there is a higher number of Romanian tourists than foreigners who crossed the threshold of Sinaia resort (Figure 18).

Nicknamed "Pearl of the Carpathians", Sinaia is a luxury resort with tourist attractions worthy of envy by mountain resorts outside Romania [7].

The former residence of the kings, attracted the largest number of foreign visitors in 2017, while the maximum threshold reached by Romanian visitors was reached in 2019, being considered by the accommodation units, as the best year from an economic and tourist point of view [12].

With tourist attractions loaded with a rich history, a legend around the world and impressive building architecture, Sinaia has managed to conquer a remarkable number of tourists and become an attractive city that combines the beauty of nature with the castles that made it famous.

The diversity of natural and anthropic landscapes, the possibility of practicing winter sports, and the fresh mountain air are the key points that define the Sinaia resort.

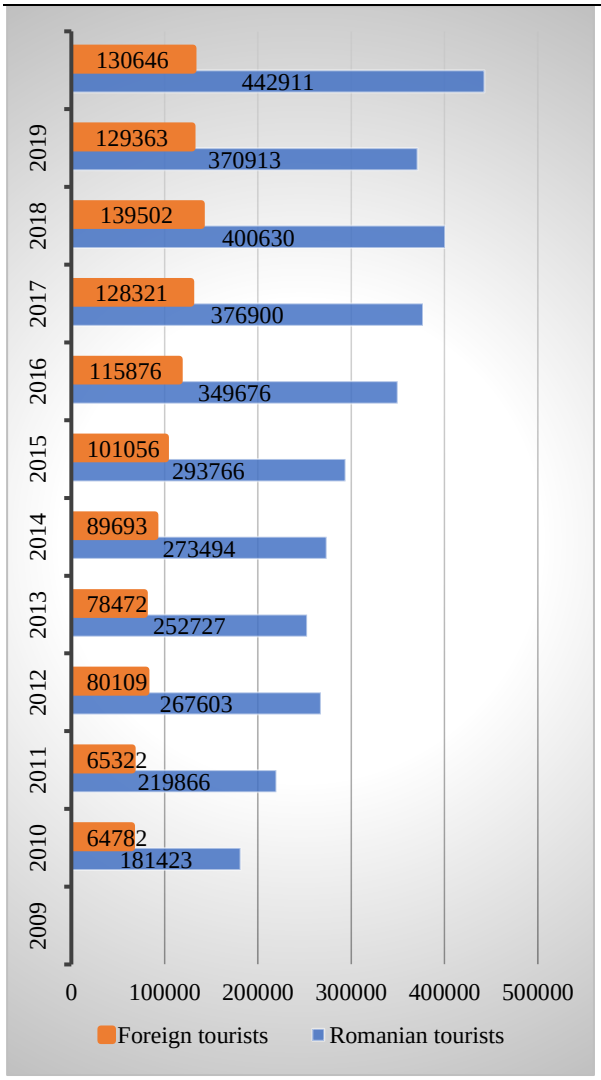

Fig. 18. Variation in the number of tourists arriving in Sinaia (2009-2019)
Source: Own determination.

CONCLUSIONS

The favorable geographical position and the relief complement the climatic framework that favors the development of the tourist activity throughout the year.

Tourism is based on spending time outdoors, practicing winter sports during the cold season, being the busiest time of year in Sinaia.

The exceptional mountain landscapes, the unique tourist objectives and the possibility to practice several mountain activities, make Sinaia the favorite resort of Romanian tourists and those from abroad.

Once they arrive here, tourists can admire the beauty of nature, can explore it through hiking but can also be cured of various ailments, by following the treatment in the spas found in the area.

The accommodation infrastructure has gradually developed over the ten years. This being based on the evolution of tourism, so that in 2009 Sinaia had a number of 77 structures tourist reception, in 2019 it reached 89 tourist reception structures but the maximum of the structure being reached in 2017 by 96 tourist reception structures, the biggest extension is the hotels and tourist villas followed by tourist chalets and motels.

The tourist accommodation capacity in Sinaia has a high share in 2017 of 4,769 places.

Regarding overnight stays, the maximum value was reached in 2018, when 657,073 people were mentioned, being preceded by 2017 by 596,594 visitors, subsequently decreasing in 2009-2010, from 403,353 to 391,996, followed by an increase in overnight stays.

The accommodation units are diversified, the tourist being able to choose according to his preferences, from campsites to more luxurious hotels, with more benefits so that each tourist's vacation is a unique and pleasant experience, to satisfy his desire to return, within these tourist resorts.

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