

TOURISM DEVELOPMENT POTENTIALS IN GOLUBAC MUNICIPALITY WITH A SPECIAL FOCUS ON ITS CLIMATE

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Abstract: *The aim of this paper is to present the potentials of Golubac municipality for tourism development. In fulfilling the stated aim, the first step is to outline the position of Golubac municipality on the geographic and tourism map. This is followed by defining municipality's environmental and anthropogenic tourism resources, focusing in particular on its climate, after which attention is turned to available accommodation facilities and tourist turnover. As regards the methodology used in the research, the statistical method has been employed to determine the weather conditions, tourism climate index (TCI) and water temperature regime of the Danube for the period 1991-2010. The same method has been used to calculate the number of accommodation facilities (units), tourists and overnight stays in Golubac municipality in the period 2009 – 2018, as well as the average length of stay, functionality index, occupancy rates, and functionality score. Other methods used are analysis and synthesis and the field method. Research results point to a conclusion that tourism potentials of Golubac municipality have not been fully realized and that the tourism industry has not been sufficiently developed in this municipality.*

Keywords: *Golubac Municipality, Potentials, Tourism.*

1. INTRODUCTION

The municipality of Golubac lies in the northeast of Central Serbia, in the east part of the Danube River Basin. It is surrounded by the municipalities of Veliko Gradiste to the west, Kucevo to the south and Majdanpek to the east. Running along its northern border is the River Danube, which forms a state border with Romania. The municipality covers an area of 367 square kilometres and belongs to the class of small municipalities. According to the 2011 Census, there were 8654 residents living in 24 settlements (Statistical Office of the Republic of Serbia). The territory of this municipality is rather sparsely populated, with twenty-five residents living on one square kilometre (Statistical Office of the Republic of Serbia). Golubac belongs to the class of municipalities in which agriculture is the main branch of industry, with high percentage of active population working in the primary sector. The growth of other types of industries, in particular tourism, has been fairly recent. A 102-kilometre network of classified roads stretches across the territory of Golubac municipality. The arterial road number 25/1, also known as the Iron Gates Thoroughfare (Serbian: *Djerdapska magistrala*), which links Pozarevac and Kladovo via Veliko Gradiste, Golubac and Donji Milanovac, runs along the northern border of this municipality, from the west to the east, along the Danube valley. Three regional roads, specifically Branicevo – Ljesnica, Golubac – Malesevo – Zelenik and Golubac – Turija, branch off from the arterial road. There are also local roads linking settlements to arterial and regional roads in the municipality. In Golubac municipality, inland waterways are used only for hauling away building stones. As regards railway transport, its relevance to tourist arrivals in Golubac municipality is marginal since there is only a two-kilometre single-track railway passing through the municipality from Pozarevac to Majdanpek, south-west of the village of Klenje (Group of authors, 1990).

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2. NATURAL TOURISM RESOURCES OF GOLUBAC MUNICIPALITY

The municipality of Golubac hosts a number of relief elements that can be classified as tourist attractions. Firstly, the Iron Gates consists of the Golubac Gorge, the Valley of Liubcova and a segment of the Gospodjin Vir (Lady's Eddy) Gorge. Then, there is a gorge of the River Brnjicka, with a road hewn into the rocks leading to Veliki Izvor and a lookout point on the Crni Vrh mountain peak. What is also worth mentioning are tufa deposits located in the vicinity of Tuman Monastery, as well as a scenic viewpoint in the village of Strmac, overlooking the Kozice Valley, and an observation point located on a saddle between the valleys of rivers Kozica and Pesaca. All these localities are situated within the bounds of the Iron Gates National Park, which covers a total of 63,608 ha. 28.5 percent, or 16,025 ha to be precise, of the surface area of this national park are situated in the municipality of Golubac, thus accounting for 49.3% of its total surface area (Group of authors, 1990). The park boasts exceptionally valuable geomorphologic, hydrologic, biogeographic, historical and archaeological features. The attractions listed above, as well as other resources, have been placed under a special protective regime, presently being managed in an organized way and increasingly used to promote tourism. With its natural, cultural and historical assets, the Iron Gates has a potential for growing transient tourism and increasing the number of longer-stay tourist. In addition, because of the fact that it lies within the bounds of a national park, it also has a potential for growing recreational tourism.

The Golubac Gorge forms the first of many narrowings of the Danube in the Iron Gates. This 13.5 km long ravine features 300-meter high steep rocky walls towering over the river. The rocky walls are especially high along limestone stretches. Remains of river terraces created when the level of the Danube used to be higher have been preserved on both sides of the valley, in particular on the Serbian side. Cave entrances can be seen in a number of places and there are also several karst springs. The average width of the Gorge is 400 meters. It actually varies between 230 meters at its narrowest point and 1600 meters at its widest point, nearby the village of Brnjica (Lazarević R, Kirbus B, 1996; Lukić D, 2005, a; Lukić D, 2015). Several, rather small tributaries flow into the Danube in the Golubac Gorge. These side streams are the Begbunar and Dubasnica streams on the Serbian bank and two streams on the Romanian side called Alibeg and Sumice. The largest tributary flowing in the gorge is the River Brnjica, which runs for 23 km and whose basin covers an area of 77.4 square kilometres. The Brnjica River is formed at the confluence of two streams, Kljucata and Radenka. From that point on, the canyon of the Brnjica is between 250 and 420 meters deep, running all the way to the mouth of the Rakovica. The Brnjica river valley is best described as ravine-like downstream of the mouth of the Rakovica. A number of rocky masses and screes appear on both sides of the valley, resulting from erosion, rock disintegration and gravitational processes (Mihajlovski P, 1970).

The Danube flows through **Liubcova Valley** for twelve kilometres, stretching from the mouth of the River Cezava on the Serbian side to Suva Reka on the Romanian side of the border. The valley was formed by separation of tectonic plates. It has been deepened between the fault lines running along the meridian and cutting through the Danube riverbed (Lazarević R, Kirbus B, 1996; Lukić D, 2005, a; Lukić D, 2015). The valley has been carved into limestone, shale, andesite and gneiss rocks, while its central part is made of clay and sand dating back to the Neogene period. The sides of the valley rising over the river to a height of 150 meters have been cut through by the valleys of several streams such as Glavicica, Turski, Slanski, Birkin and Cvetni on the Serbian side and Kamenica, Oravica, Berzaska and Suva Reka on the Romanian side of the border. Inlets have formed at the mouths of these tributaries by means of accumulation,

which is the reason why their banks are very dissected. Before an artificial lake was created at the mouths of these side streams, the majority of which are torrents, it was possible to see alluvial fans, but they are presently under the water. The longest tributary flowing into the Danube in Liubcova Valley is the River Dobra. The basin of this 14-kilometre long river has a surface area of 55.7 km². Although the Dobra River has carved a gorge in its upper course, downstream, it has a regular valley with a wide alluvial plain known as “Dobrasko Polje” (400 m) (Mihajlovski P, 1970; Lukić D, 2005, a; Lukić D, 2015).

The second narrowing of the Iron Gates is known as **Gospodjin Vir** (Lady’s Eddy). It is 13 kilometres long and carved in limestone, sandstone, gneiss and porphyritic rocks rising 300 to 500 meters over the river. At this stage of the river course, the width of the Danube ranges between 220 and 380 meters. A number of underwater rocks emerge from the Danube riverbed in this gorge. The most notable ones are Kozla and Dojke formed from Neocomian limestone, then Bivoli, Izlaz and Tahtalija built of quartz-porphry and finally, Vran, which is made of limestone. There used to be many whirlpools between these underwater rocks. Deep, giant potholes also have names. The most notable ones are Mackov, Veliki and Mali Simin. They were created by powerful water erosion processes and measure five to six meters in diameter. They are also very deep. For instance, a giant pothole near Greben measures 30 meters in depth, while the greatest river depth of 82 meters was measured at another pothole nearby the bluff known as “Pjatra Lunga” (A Long Stone) before the creation of a reservoir. If those giant potholes have not been filled by deposits after the formation of the artificial lake, the water in them is surely more than 100 m deep. Before the building of a dam and formation of Lake Djerdap, the strongest whirlpool in the Iron Gates named Girigari was located one kilometre downstream of Pjatra Lunga. The River Boljetinska is the most noteworthy of all tributaries that flow into the Danube at Gospodjin Vir. Its composite river valley is made of a number of narrowings and widenings. This is another river that has an alluvial fan created at its mouth and enters into the Danube in the form of a cup (Mihajlovski P, 1970; Lukić D, 2005, a; Lukić D, 2015; Cvijić J, 1926).

Tufa deposits located in the vicinity of Tuman Monastery lie to the south of Golubac, in a valley carved by the Kamenica stream. The valley of the Kamenica is narrow and deep, and because it faces north and is covered in forest, it is very shady. Rather small-scale tufa deposits have been formed at the centre of the valley, at some 250 m a.s. l. and 1.1 kilometre downstream of the place at which the Kamenica flows into the River Tumanska, at the foot of the right side of the valley. They have a shape of a fan-like terrace and scale approximately 14 m in height, covering a surface area of 8550 square meters. The deposits were created at a place where a karst spring comes up and limestone and schists come into contact with each other. They represent a geomorphological and hydrological natural monument of national importance that has been placed on the inventory of Serbian geo-heritage (Gavrilović D, Kovačev N, 2009).

The River Danube represents the backbone of the Serbian Danube Basin. The Danube runs through Serbia for 588 km. Its left bank belongs to Romania starting from the mouth of the River Nera. The right bank belongs to Serbia, all the way to the mouth of the River Timok. A boathouse called Kisiljevo is located at the river kilometre 1062 and it leads to an embankment that separates Silver Lake (Serbian: *Srebrno jezero*) from the Danube. A town of Veliko Gradiste, the mouth of the River Pek where it flows into the Danube, Pozezeno and Vinci are located downstream of Kisiljevo, each at a distance of two kilometres of each other. The Isle of Moldova Veche (Serbian: *Moldavsko ostrvo*), which belongs to Romania and whose both branches are navigable, extends therefrom to Golubac. A regatta venue, where Serbian sailing

championships are organized every year because of the windiness of the site, is located just outside Golubac. Two villages, Brnjica and Dobra, are situated downstream of Golubac. Results of a water-level analysis show that the section of the Danube flowing through Serbia belongs to the nivo-pluvial type of river regimen (Botev Lj, Dojkov V, 1980; Dunavska komisija, 1989; Lukić D, 2015). Since the “Djerdap I” Hydropower and Navigation System was built and the artificial lake called Lake Djerdap was formed, these Danube waters have no longer been subject to the natural river regime. Data obtained at the Veliko Gradiste stream gauge during the period 1991-2010 were used to analyse the temperature regime of the Danube. The mean annual temperature of the River Danube over the observed period was 13.3°C. The peak high temperature of 23.9°C was recorded in August, while the lowest temperature of 2.4°C was recorded in January. High temperature of water during the summer is favourable for the bathing season, which lasts for two months, during July and August, when the temperature of the water exceeds 20°C. Or, in case of those less sensitive to the cold, it may last for even four months, from June to September, when water temperature is around 18°C (Lukić D, 2015). The Danube littoral belonging to the municipality of Golubac extends along 44 kilometres (Group of authors, 1990).

Undoubtedly, climate is a natural factor that has a considerable impact on tourist movements and attractiveness of the municipality. It determines the types of tourist movements, duration of the high season and tourism development of a specific region. Climate can be either a direct or an indirect tourism asset. It is regarded as a direct tourism asset when it has a direct impact on tourist activity, as in the case of seaside tourism, spa tourism and mountain tourism. On the other hand, it becomes an indirect asset when it has an influence on attractiveness of other attractions, such as bodies of water, flora and fauna, etc. (Jovanović G, 1999).

3. FACTORS INFLUENCING CLIMATE IN GOLUBAC MUNICIPALITY

The right bank of the Danube belongs to Serbia and due to its orientation to the north and northern exposure, the Serbian bankside has less favourable climatic conditions than the southern bank of the Danube that belongs to Romania. Those disadvantages are manifested in lower solar irradiance (insolation) and lower air temperatures, while the snow cover lingers longer than on the Romanian riverbank. However, during summer, when the Sun is high above the horizon, Serbian side of the gorge receives enough light and heat because sunrays reflect off the Romanian side of the gorge (Rakićević T, 1968).

Distance from the sea is an important climatic factor as it determines the degree of continentality of Golubac municipality and affects precipitation, cloud cover, air humidity and temperature. Although that distance is not great, maritime influence cannot penetrate to the municipality due to high mountains surrounding Golubac to the southwest, south and southeast. The municipality of Golubac is open most to the east, to the Black Sea to be exact, but maritime air masses from that direction reach the area only from time to time because of opposite directionality of air masses at middle latitudes. The Mediterranean has greater influences on the distribution of precipitation than on the thermal regime. Despite the fact that are set at great distance from one another (the North Sea – 1,400 km, the Bay of Biscay – 1,800 km), weather conditions in Golubac municipality are under significant influence of the Atlantic Ocean brought about by air masses coming from that direction. The municipality is more exposed to continental influences from Central Europe through the Pannonian Basin, while cold air masses from Arctic are known to penetrate into the area during winter (Maćejka M, 1985).

The climate of Golubac municipality is influenced in many ways by the direction in which the mountain arch formed by the Carpathians stretches, as well as by its sheer height. “The Transylvanian Alps prevent direct penetration of air masses from the North and Northeast and so they are forced to bypass them and travel across the Black Sea and Wallachian Plain. In that process, air masses are transformed to a certain extent and have slightly modified characteristics when reaching the Iron Gates” (Maćejka M, 1985:15). The Carpathian Mountains located in the Iron Gates stretch in the direction North-South and represent a climate boundary between the Morava Basin and Krajina with Kljuc, *i.e.* regions having temperate continental climate and those that have continental climate, respectively. That is most likely to affect qualitative characteristics of the microclimate of western and eastern parts of the gorge, although those would be difficult to determine reliably due to insufficient number of weather stations along the Iron Gates.

The lake and forests have more dominant influence on the climate than different types of soil. The impact of the lake is such that it brings about an increase in air humidity, mitigates contrasts in temperature and leads to an increase in precipitation and fog. At the same time, forests result in an increase in air humidity, reduce the speed of wind, reduce temperature amplitudes, purify and refresh the air (Lukić D, 2005, a).

What also affects the climate in Golubac municipality, in particular the pluviometric regime, are the Vc and Vd cyclone tracks. Cyclones move along the Vc track along the line the North Adriatic – the River Sava Valley and the Danube – the Black Sea. Those cyclones bring about unstable weather conditions and occurrence of first maximum precipitation in May or June as recorded at the majority of weather stations in the Iron Gates. The Vd trail spans along the axis of the Adriatic Sea, runs along southern Macedonia and the Aegean Sea, whereas cyclones that move along this trail cause the second maximum precipitation from October to December (Lukić D, 2005, a; Maćejka M, 1985).

4. ANALYSIS OF ELEMENTS OF GOLUBAC MUNICIPALITY CLIMATE FROM THE ASPECT OF TOURISM

The landscape surrounding Golubac and Dobra is characterized by very favourable climate conditions, which may be used to promote sports and recreational tourism, medical (health) tourism and stationary tourism. Since there is no weather station in Golubac, data recorded at Veliko Gradiste weather station, which is located at a distance of 8 km from the boundary of Golubac municipality, were used to analyse how climate characteristics influence tourism during the period 1961-2010. *Air temperature* is an element of climate that plays a major role in evaluating tourist attractions. The bathing season lasts as long as the air temperature is above 20°C and the water temperature is above 18°C. Low air temperatures together with the duration of the snow cover have an impact on the duration of the winter tourist season. However, since the surrounding mountains do not reach high altitudes above sea level, significant opportunities for promoting winter sports tourism are lacking in Golubac municipality (Lukić D, 2015). The annual mean temperature in Veliko Gradiste was 11.2°C over the observed period. Golubac climate is most strongly affected by the east wind known as Koshava. Peak high temperatures are measured in July, 21.4°C, and August, 21.2°C. In addition to being the coldest month of the year, January is the only month in which average temperature drops below zero, to around -0.2°C.

Analysing temperature values per months is not sufficient to describe the thermal regime of an area. Therefore, mean minimum and maximum temperatures are therefore examined in

addition. The analysis of those parameters shows that temperature values in the same month of different years tend to fluctuate. During winter months, the weather station records mean maximum temperatures above zero degrees Celsius, while mean maximum temperatures in July and August are above 28°C. On the other hand, mean minimum temperatures in July tend to go below 16°C. The lowest recorded mean temperature in January was -3.3°C.

Table 1. Mean air temperatures (°C) in Golubac Municipality

| Weather station | J | F | M | A | M | J | J | A | S | O | N | D | Ann. | Period |
|-----------------|------|-----|-----|------|------|------|------|------|------|------|-----|-----|------|-----------|
| Veliko Gradiste | -0.2 | 1.6 | 6.1 | 11.5 | 16.7 | 19.9 | 21.4 | 21.2 | 16.7 | 11.4 | 6.2 | 1.2 | 11.2 | 1961-2010 |

Source: Meteorological Yearbooks, National Hydrometeorological Service

Table 2. Mean peak air temperatures (°C) in the Golubac municipality

| Weather station | J | F | M | A | M | J | J | A | S | O | N | D | Ann. | Period |
|-----------------|-----|-----|------|------|------|------|------|------|------|------|------|-----|------|-----------|
| Veliko Gradiste | 3.2 | 6.1 | 11.7 | 17.7 | 23.0 | 26.2 | 28.2 | 28.4 | 23.6 | 17.6 | 10.5 | 4.3 | 16.7 | 1961-2010 |

Source: Meteorological Yearbooks, National Hydrometeorological Service

Table 3. Mean minimum air temperature (°C) in Golubac Municipality

| Weather station | J | F | M | A | M | J | J | A | S | O | N | D | Ann. | Period |
|-----------------|------|------|-----|-----|------|------|------|------|------|-----|-----|------|------|-----------|
| Veliko Gradiste | -3.3 | -2.2 | 1.4 | 6.1 | 10.9 | 13.8 | 15.0 | 14.8 | 11.4 | 7.0 | 2.6 | -0.4 | 6.4 | 1961-2010 |

Source: Meteorological Yearbooks, National Hydrometeorological Service

Information about the number of days in which a certain temperature value is recorded greatly completes the picture of the thermal regime of an area. It is very important for tourism business to have available data about the number of summer days of the given locality. The period that has mean day temperatures above 15°C is considered high season in the summertime. Considering that the mean total number of summer days in the observed period was 97, and that on average, July and August had most summer days, 25 each, whereas there were 19 summer days during June and 12 in May and September, the municipality of Golubac has favourable conditions for sun and beach, sport and recreational and nautical tourism.

Table 4. Mean number of summer days ($T_x \geq 25^\circ\text{C}$) in Golubac Municipality

| Weather station | J | F | M | A | M | J | J | A | S | O | N | D | Ann. | Period |
|-----------------|---|---|---|---|----|----|----|----|----|---|---|---|------|-----------|
| Veliko Gradiste | - | - | - | 2 | 12 | 19 | 25 | 25 | 12 | 2 | - | - | 97 | 1961-2010 |

Source: Meteorological Yearbooks, National Hydrometeorological Service

Insolation is an important element of climate that plays the key role in heliotherapy, the duration of the bathing season, the appearance of the landscape and the like. As Golubac municipality is located in the zone of temperate continental climate, it has high insolation with more than 2,000 hours of sunshine per year (Lukić D, 2015). Lowest insolation is recorded in the winter-time, when cloud cover is highest and when days are shortest, whereas highest insolation is in

the summer months. Conditions related to solar irradiation in Golubac municipality are rather unfavourable, primarily because gorge sides face northward and the valley is narrow and deep, but also on account of the large lake, air humidity, cloud cover and frequent fogs. For that reason, tourist infrastructure (facilities and services) yet to be built in Golubac municipality should be located in places that are more exposed to sunlight and warmth of the Sun.

Table 5. Monthly mean insolation (h) in Golubac Municipality

| Weather station | J | F | M | A | M | J | J | A | S | O | N | D | Ann. | Period |
|-----------------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|--------|-----------|
| Veliko Gradiste | 69.4 | 100.5 | 161.1 | 187.3 | 237.2 | 265.4 | 292.5 | 280.3 | 198.2 | 150.4 | 91.8 | 56.8 | 2089.9 | 1991-2010 |

Source: Meteorological Yearbooks, National Hydrometeorological Service

The effect of *wind* on climate formation in an area or a locality is substantial due to the fact that it brings characteristics of the weather from the area from which it blows. In wintertime, Golubac municipality is exposed to the influence of cold continental air masses travelling from Ukraine, the Russian Plain and Siberia to the Western Mediterranean. Due to their heaviness, those air masses cannot move across the Carpathians. Instead, they accumulate in front of the mountain system and form lakes of cold air. They then flow westwards, through valleys, hollows and over mountain passes, gathering speed and increasing in force. That particular wind is known as *Koshava*, a local wind blowing in the Morava and Danube Basins and in the Pannonian Plain. Air currents from the Atlantic Ocean are prevalent in the summer-half year. They cause maximum precipitation in May and June, travelling from west and northwest towards the east. This indicates that wind has the role of climate modifier in Golubac municipality as it affects air temperature, humidity, cloud cover and precipitation (Lukić D, 2005, a; Maćejka M, 1985).

Direction and frequency of winds are directly related to changes in the distribution of atmospheric pressure over an area during the year, as well as to morphological conditions, air temperature, etc. River valleys and mountain ranges channel the movement of air masses, which makes them an important factor in determining wind direction.

Table 6. Mean wind frequencies (%) in Golubac Municipality

| Weather station | N | NE | E | SE | S | SW | W | NW | Mean | Period |
|-----------------|----|----|-----|-----|----|----|-----|-----|------|-----------|
| Veliko Gradiste | 44 | 39 | 203 | 239 | 27 | 42 | 145 | 129 | 135 | 1961-2010 |

Source: Meteorological Yearbooks, National Hydrometeorological Service

Koshava is a cold, squally, strong and stormy wind that brings about clear and dry weather. It blows in the colder part of the year, from October to April, although it may sometime occur in May or September. It comes in continuous gusts, with alternating strong and weak blasts, some of which may reach speeds greater than 150 km/h. It usually lasts three to seven days, although it can sometimes blow for up to three weeks. Coming down from the Carpathians, it can sometimes exhibit the characteristics of the Foehn wind as it can raise air temperature. Air masses blowing from the west and northeast quadrants and bringing dry and clear weather to Golubac at the same time cause precipitation and high cloud cover in Negotin. Travelling from east to west, those air masses reach eastern slopes of the Carpathians, ascending and cooling down, which results in condensation of water vapour and cloud formation. Part of them then returns

towards east as counter currents due to a whirlwind at the side of the mountain facing windward (Lukić D, 2005, a). Winds can be gusty and stormy in the Iron Gates, but are not as strong as those blowing in nearby areas outside the gorge. Wind is an element of climate with considerable value for tourism as it decreases high temperatures in the Danube littoral and lower-intensity winds are conducive to sport sailing. Strong winds hinder travelling and navigation, bring down air temperature and adversely affect nautical tourism. They also adversely affect the population as they cause breathing difficulties and respiratory infections (Jovanović G, 1999).

Table 7. Monthly mean wind speed (m/s) in Golubac Municipality

| Weather station | J | F | M | A | M | J | J | A | S | O | N | D | Ann. | Period |
|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|-----------|
| Veliko Gradiste | 2.6 | 2.6 | 2.9 | 2.7 | 2.2 | 1.8 | 1.6 | 1.7 | 2.1 | 2.6 | 3.2 | 2.6 | 2.4 | 1991-2010 |

Source: Meteorological Yearbooks, National Hydrometeorological Service

The best indicator of air humidity is *relative humidity*. Air humidity is inversely proportional to air temperature. It is therefore higher in the winter and during night than in summer months and in the daytime. Relative humidity is highest in December and January and lowest during summer months, specifically August and Jul. Mean annual relative humidity is 74%, so it can be said that air is moderately humid in the area.

Relative humidity, together with air temperature and wind, gives the area a certain sense of comfort. Relative humidity of 60% at the air temperature of 20°C is optimum for humans, meaning that people are most comfortable in those conditions. Based on percentage of relative humidity, bioclimatology distinguishes between these classes of air: very dry air has 55% relative humidity, dry air has 55% to 75% relative humidity, moderately humid air has between 75% and 90% humidity, and very humid air has more than 90% humidity (Lukić D, 2015). Monthly peak means values of around 80% are reached in November, December and January, while lowest values are recorded in spring and summer. Based on the classes of air enumerated above, periods of dry and moderately humid air alternate in the municipality of Golubac throughout a year. Together with air temperature and wind, relative humidity has an impact on comfort and well-being of people. For people, it is most difficult to bear heat along with high humidity as well as cold when humidity is high (Jovanović G, 1999).

Table 8. Monthly mean relative humidity (%) in Golubac Municipality

| Weather station | J | F | M | A | M | J | J | A | S | O | N | D | Ann. | Period |
|-----------------|----|----|----|----|----|----|----|----|----|----|----|----|------|-----------|
| Veliko Gradiste | 82 | 78 | 70 | 67 | 70 | 71 | 70 | 69 | 73 | 75 | 79 | 84 | 74 | 1961-2010 |

Source: Meteorological Yearbooks, National Hydrometeorological Service

Cloud cover is another important weather element as it impacts air temperature, in particular its fluctuations. It is inversely proportional to insolation that reflects on certain tourist activities. Daily temperature amplitudes are higher when the weather is clear than when it is cloudy. Considering that annual variations in cloud cover coincide with annual changes in relative humidity, cloud cover is highest in winter and lowest in the summer months (Lukić D, 2015). The cloud cover average recorded at the relevant weather station was 5.7.

Table 9. Monthly mean cloud cover (one tenth of the sky) in Golubac Municipality

| Weather station | J | F | M | A | M | J | J | A | S | O | N | D | Ann. | Period |
|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|-----------|
| Veliko Gradiste | 7.1 | 6.6 | 6.0 | 6.0 | 5.6 | 5.1 | 4.1 | 3.9 | 4.7 | 5.2 | 6.6 | 7.4 | 5.7 | 1961-2010 |

Source: Meteorological Yearbooks, National Hydrometeorological Service

Humidity is higher in the parts of the municipality that lie within the bounds of the Iron Gates because the air moves up the sides of the gorge, causing it to cool down and leading to condensation of water vapour and cloud formation. There is a major relation between cloud cover and tourist movements as it can affect aesthetic qualities of tourist attractions. Landscapes are certainly more beautiful when the sky is clear. Cloud cover mainly impacts insolation and thus sun and beach tourism (Jovanović G, 1999).

Table 10. Mean number of foggy days in Golubac Municipality

| Weather station | J | F | M | A | M | J | J | A | S | O | N | D | Ann. | Period |
|-----------------|---|---|---|---|---|---|---|---|---|---|---|---|------|-----------|
| Veliko Gradiste | 5 | 3 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 4 | 4 | 5 | 27 | 1961-2010 |

Source: Meteorological Yearbooks, National Hydrometeorological Service

As a weather phenomenon, *fog* has major relevance to evaluation of an area from the perspective of tourism. It can prove a serious obstacle to tourist movements as it hinders traffic, makes landscapes aesthetically unpleasing and has a negative effect on nautical tourism. There are 27 days with fog on average at the observed weather station per year. Winter months have the highest number of foggy days, from four to five. During winter, fog usually covers the Iron Gates part of the municipality during the entire day and can be rather dense. During summer months, fog comes down very rarely, early in the morning.

Table 11. Monthly mean precipitation sum (mm) in Golubac Municipality over the period 1991-2010

| Weather station | J | F | M | A | M | J | J | A | S | O | N | D | Ann. | Period |
|-----------------|------|------|------|------|------|------|------|------|------|------|------|------|-------|-----------|
| Veliko Gradiste | 39.4 | 41.0 | 35.7 | 60.3 | 58.2 | 78.5 | 67.7 | 57.2 | 65.7 | 57.4 | 49.0 | 50.8 | 641.0 | 1991-2010 |

Source: Meteorological Yearbooks, National Hydrometeorological Service

Another weather element, *precipitation*, has an effect on characteristics of an area, primarily on maintenance of bodies of water, vegetation and even tourism. Days without precipitation are more relevant in terms of tourism, in particular to promoting types of tourism such as sun and beach tourism and sports and recreational tourism. Over the observed period, the average sum of precipitation amounted to 641 mm of rainfall (Lukić D, 2015).

Distribution of precipitation per seasons and months over a one-year period is very significant from the practical point of view. It is not irrelevant if highest rainfall occurs in winter or in spring and summer, which is when plants that grow in Serbia are in greatest need of moisture. What is also important is if an area is characterised by markedly rainy and dry periods or precipitation is more or less evenly distributed throughout the year.

As regards the observed period, the average sum of precipitation amounted to 641 mm of water sediment. Two maximum and two minimum precipitation occur annually. The main maximum precipitation occurs in May or June, whereas the main minimum occurs in September. The secondary maximum occurs in November and December and the secondary minimum occurs in January and March. That means that the territory of Golubac municipality belongs to the continental pluviometric regime, specifically the Danube region variant of that type (Lukić D, 2005, a; Rakićević T, 1968). The spring maximum precipitation adversely affects tourist movements during the related part of the year, although the landscape is more attractive at that time. Minima precipitation and frequency of precipitation occur in August and September, which makes them suitable for rest and recreation. The annual distribution of precipitation per month is fairly even.

Snow is a regular occurrence in Golubac municipality, as it tends to snow there from November through late May. The snow cover lasts shorter there than in Negotin region because two large bodies of water, the Danube and Djerdap Lake, are located nearby. Due to the short duration and small depth of snow cover in Golubac municipality and on surrounding mountains, there are no favourable conditions for building winter sports centres. However, snow cover is undoubtedly relevant to opportunities for rest and recreation and adds to the aesthetic value of the gorge's scenery in the winter.

Being an element of climate, precipitation has influence on characteristics of an area, in the first place in terms of maintenance of bodies of water, vegetation, air purification from dust particles and different bacteria. However, the pluviometric regime of an area has greater influence on tourism than the amount of rainfall. Precipitation-free days are more relevant when tourism is concerned, in particular with respect to development of different types of tourism, such as sun and beach and sports and recreational tourism.

5. TOURISM CLIMATE INDEX

Tourism climate index (TCI), developed by Mieczkowski (1985) as a means for evaluating climate as a resource for tourism development, is based on two bioclimate indices and three individual climate indices. Bioclimate indices used in evaluation are the daytime comfort index (tk – a relation between maximum daily temperature and minimum daily relative humidity) and daily comfort index (tk_{24h} – a combination of mean daily temperature and mean daily relative humidity). The three individual climatic variables are insolation, precipitation and wind (speed).

Tourism climate index (TCI) is computed using the formula given below:

$$TCI = 8 \times tk + 2 \times tk_{24h} + 4 \times R + 4 \times S + 2 \times W \quad (1)$$

All sub-indices added together can make the maximum TCI score of 100. According to the tourism climate index, weather can be ideal (90-100), excellent (89-89), very good (70-79), good (60-69), acceptable (50-59), possible (40-49), unacceptable (30-39), very unacceptable (20-29), extremely unacceptable (10-19) and impossible (-30-9) for tourism (Mieczkowski, Z, 1985).

According to TCI scores, it is possible to identify periods of favourable climate for tourist activities in Golubac municipality. TCI scores at the observed weather stations fall within the range from 39 (possible) to 92 (ideal). None of the values are within the categories of very unaccept-

able, extremely unacceptable or impossible for tourism, indicating that there is a potential for developing all-year-round tourism, without the seasonal tourism pattern. Maximum TCI scores are achieved in the summer months, while minimum scores are obtained in the winter months. That means that summer is the most suitable season for tourism in Golubac municipality. Excellent and ideal TCI scores (92 to 88) are obtained in June and July, while May, August and September also have achieved excellent and ideal TCI scores (84 to 90). Weather conditions for outdoor stay and activities in November and February are possible and acceptable (TCI score of 48 to 53), while the weather is unacceptable and merely possible for tourist activities (with a TCI score of 39 to 42) in Golubac municipality in December and January, respectively.

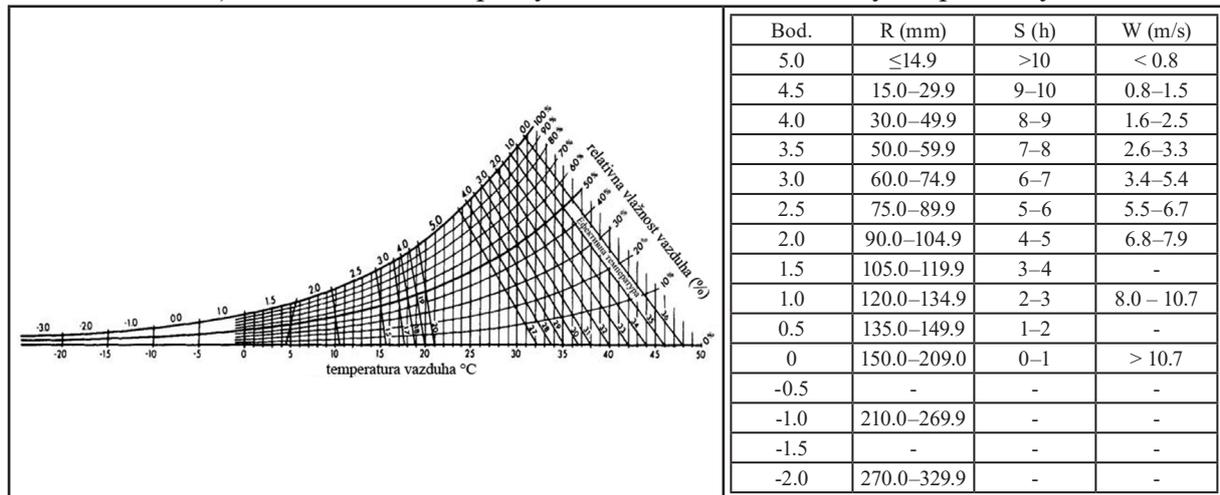


Figure 1. A chart to evaluate thermal comfort (relative humidity %, air temperature °C) and a table to evaluate mean monthly sums of precipitation (R), mean daily insolation (S) and mean monthly wind (W) (Mieczkowski, Z, 1985).

Table 12. TCI scores for the period 1991-2010 for Golubac Municipality

| Weather station | J | F | M | A | M | J | J | A | S | O | N | D |
|-----------------|----|----|----|----|----|----|----|----|----|----|----|----|
| Veliko Gradiste | 42 | 48 | 57 | 68 | 84 | 92 | 88 | 90 | 80 | 66 | 53 | 39 |

Source: Meteorological Yearbooks, National Hydrometeorological Service

6. ANTHROPOGENIC TOURISM RESOURCES OF GOLUBAC MUNICIPALITY

A Roman legion camp called *Novae* lies 18 kilometres downstream of Golubac, at the place where the River Cezava flows into the Danube. The camp was set up at this site in the 1st century AD and existed until the 6th century AD. A total of seven cultural layers have been discovered at this locality. First three layers date back to the period of the rule of Tiberius and Claudius (14 AD to 44 AD), then to the period of the rule of Nero and the civil war that broke out thereafter (54 AD to 69 AD), as well as to the Flavian age (69 to 97 AD). First wooden structures were built most probably during the rule of the Flavians, but only during the rule of Emperor Trajan was the fortification rebuilt using stone and began to be used to conquer new territories. The camp covered an area of 140x120 m and a headquarters building (*principia*) and army barracks were unearthed inside the camp walls. The fortification was reconstructed during the rule of Septimius Severus (193 to 211 AD), when a granary was added and towers on the east gate were expanded. In the 4th century AD, the width and length of the *Novae* fort were expanded by additional 3 meters. When the north and south gates were walled up and towers built at fort

corners and all gates except the eastern one, the camp became a defence fortification. During the invasion of the Huns in the mid-5th century AD, the fort suffered considerable damage. It was rebuilt for the last time under the rule of Justinian (from 527 to 565 AD), but the attacks of Avar and Slavic tribes from the north eventually ended its existence in the late 6th century (Stanković S, 1985; Ćirković S, 2005)

Golubac Fortress is located at the very entrance to the Iron Gates gorge. It was built at the site of a Roman stronghold called *Cuppae*, measuring 165 m in length, with 2.5-metre thick walls. Bricks bearing identifying stamps of the Roman Seventh Legion, various items and metal coins discovered at the site are the evidence that a stronghold used to be there. The Golubac Fortress has nine towers built of stone. A cylindrical keep - donjon is located at the highest point. The upper courtyard, which is narrower than the lower one, lies beneath the keep. The fortress was constructed for battles fought using cold weapons, whereas embrasures can be found only on the tower that was added later on by the Ottomans. The fortification is protected by the Serbian Government. The majority of the site has been conserved since it represents one of the best preserved and most picturesque medieval fortresses in Serbia. The earliest mention of the Golubac Fortress in written records dates back to 1335, when it was referred to as a fortification with a Hungarian garrison. However, it was built much earlier, but it is unknown exactly when or by whom (Stanković S, 1985; Lukić D, 2015; Lukić D, 2017). Since 1948, the fortress has been under the protection of the National Institute for the Protection of Cultural Monuments as immovable cultural heritage of exceptional importance based on the 1979 system of classification. It is located in a special nature reserve called “Golubacki grad” (Golubac Fort), which belongs to the Iron Gates National Park.

Tuman Monastery belongs to the Serbian Orthodox Eparchy of Branicevo and lies at a distance of nine kilometres from Golubac. There is a lack of reliable written sources about its construction. The monastery was built a long time ago, but the new church was erected at the foundations of the old monastery in 1924. It is dedicated to St Gabriel, the Archangel. It lies amidst a beautiful, picturesque scenery, surrounded by a forest, with a beautifully clear river flowing before its front gate. First reliable information about Tuman Monastery dates back to the first half of the 18th century and is found in the work of Maksim Ratkovic, the exarch of the Metropolitan of Belgrade. A description given by Joakim Vujic in 1826 offered a bit more information about the monastery. Vujic stated that its narthex was added in 1796, but attached no major importance to the monastery, which was similar in that way to Vitovnica, Nimnik or Rukumija. In Habsburg-occupied Serbia (1788-1792) and during the First Serbian Uprising (1804-1813), Tuman played a significant role, which was the reason why it was flooded, plundered and razed by the Turks. The monastery was rebuilt only later, during the rule of Prince Milos Obrenovic, through the efforts of Pavle Bogdanovic, obor-knez (the senior chief of a district) of Golubac. The oldest inscription in the monastery is found in the proskomedia. The Romanesque-style church, with a bell-tower on the west side, was razed to the ground somewhere around 1910. Soon thereafter, the Balkan Wars broke out, followed directly by World War I. When the First World War ended, the Monastery of Tuman lay in ruins. The rebuilding of the monastery from the ground up commenced immediately thereafter. The church within the monastery was constructed and consecrated in 1924 by the then-Bishop of the Eparchy of Branicevo, Mitrofan (Lukić D, Joksimović A, 2017).

It belongs to the style of architecture known as Moravian, characteristic of Medieval Serbia. It has an octagonal dome and a square-base tower located on a richly decorated and even more ornately adorned west facade. This 19-meter long and 17-meter wide church building measures more than 15 meters in height. It has a tin, oval roof. Whereas the dome roof is multifaceted, the

tower has a four-pitched roof. The church has a cruciform plan, clearly reflected in its interior. The narthex, the naos and the altar, including prominent semi-circular apses, the one to the left inside the altar, and the other, the choral apse, to the right, are all clearly distinguishable. A wooden iconostasis bearing only five icons separates the altar from the nave. The altar apse is deep and semi-circular, with a window and an oculus towards the top. The iconostasis is made of wood, beautiful and decorative with ornamental woodwork. Sovereign tier icons show Christ, the Saviour and the Theotokos, while the Resurrection is placed above the North Door and the Ascension of Jesus above the South Door. The icon depicting the Last Supper is painted above the Royal Door. The Royal Door of the iconostasis show the Theotokos and the Archangel Gabriel, accompanied by a number of cherubs and seraphs. The Annunciation icon shows both the Heaven and Earth. Saint Sava, the first Serbian Archbishop, is depicted on the South Door, while the North Door have a panel showing the Holy Archangel Michael. Pillars divide the naos into two segments. The part closer to the altar is larger of the two and features choral apses. The main entrance to the church is on the west, but there are also side, auxiliary entrances. The frescoes at the monastery were painted between 1988 and 1991, under the management of the fresco painter Gavriilo Markovic. A fresco showing Christ Pantocrator, the Almighty and Sustainer of the World, located in the calotte of the church dome, is impressive in its beauty. Frescoes depicting the four evangelists, John, Luke, Matthew and Marco, are painted in triangular segments of a sphere, called pendentives, used as devices to allow the placing of a circular dome over a rectangular base. Scenes from Christ's life are painted in the altar apse, with a fresco *The Holy Communion of the Apostles in Emmaus* standing out among others. The Theotokos and the Ascension of the Lord are painted in the semi-calotte of the altar apse, while the Resurrection of the Lord is painted in a lunette above the altar. A fresco showing Holy Martyrs is painted on the south wall, with John the Baptist in a medallion featuring as the most prominent one. *The Presentation of Christ at the Temple* is painted in the semi-calotte of a choral apse, whereas the lunette features a fresco showing a Nativity scene. Episodes from the life and passion of Jesus Christ are painted on the north wall in this particular order, *The Entry into Jerusalem*, *The Last Supper* and *The Crucifixion*. Frescoes showing the Dormition of the Mother of God and the Descend of the Holy Spirit upon the Apostles are painted on the west wall that separates the narthex from the main nave of the church. The walls of the transept have the frescos of the House of Nemanjic and the Lazarevic Dynasty painted on them, including two frescos presented by the ktetor and showing Milos Obilic and Tsar Lazar (Lukić D, Joksimović A, 2017).

The church building forms a pleasing and consistent whole. Unlike its interior, the church's exterior is very decorative. On the outside, zigzag walls consist of two triple rings made of horizontally laid bricks, with double sills, arcades, pilasters, ornate windows, décor above them and stone rosettes. The west façade is the most beautiful. All its door and windows are decorated with stone trelliswork and low relief resembling the most delicate lace. The monastic quarters were built in 1935, following the arrival of a Serbian-Russian fraternity from the Monastery of Miljkov in 1934. The most precious piece of the chapel is an icon of the Theotokos of Kursk, brought to the monastery by the Russian monks. Aside from the monastic quarters, the monastery has a number of farm buildings. The area surrounding the monastery has favourable conditions for organizing picnic areas (Lukić D, Joksimović A, 2017).

An ethno house located in the village of Sladinac lies at a distance of 5 kilometres from Golubac. It has a number of exhibits from late 19th century and early 20th century on display. This ethno house, owned by Zivojin Stokic, hosts a number of artefacts, such as old coins, rubber and wooden "opanci" (traditional Serbian shoes worn by peasants), woven sling bags, national

costume typical of the area, various crockery, wooden baby cribs, a hundred-year-old furniture, a wooden sofa and three-legged stools. The value of this ethno exhibit is reflected in the authenticity and originality of artefacts put on display.

There is a unique **ethnographic display at the village of Dobra**, hosted by its Cultural Centre. Its permanent exhibition shows several hundred artefacts tracing historical, cultural and folklore values of the area. In addition, the villages of **Dobra** and **Brnjica** are locations with favourable conditions for creating and organizing hospitality establishments, sports grounds, camp sites, and hunting and fishing grounds. At the same time, **Golubac**, with its hotel, restaurants, sailing venues, the marina and sports grounds, is suitable for promoting various types of **stationary tourism**.

The municipality of Golubac has very favourable conditions for growing **event tourism**. Tourist events, both sporting and cultural, can also be used to prolong the tourist season and thus improve the economy. These events include the Jackal of the Inland Dunes Hunt in January (Branicevo – Golubac), Days of Honey and Wine (Baric – Golubac) and Woolf Hunters' Meeting (Dobra – Golubac) in February. Then, there are the Folklore Ensembles' May Meeting in May (Branicevo), the Vlachs' Kolo Festival of Pentecost (Zitkovicica – Golubac) and the Danube Day (Golubac) in June and the Danube Fair (Golubac) in July. Events organized in August are the International Kayak Regatta (Golubac), the National Sailing Championship (Golubac) and the River Fishermen Gathering (Vinci). Finally, Zander Days (Golubac) are held in October.

Being located in the Iron Gates Gorge, the Municipality of Golubac possesses valuable natural resources and a wealth of cultural and historic monuments can be found in its territory. Therefore, forest school can be delivered in this municipality in various courses and for students of different ages. This also applies to student internship in tourism studies, geography, biology, forestry, geology, archaeology, art history, etc. **Youth travel** centres should be designed in such a manner to offer accommodation along with learning opportunities, sports activities, recreation and amusement all year round (Anđelković S, Stanisavljević Petrović Z, 2013).

Other advantages of this municipality are related to favourable conditions for promoting **hunting tourism** and **sport fishing**. It should also be noted that the village of Vinci is very attractive for promoting tourism and complementary activities such as trade and crafts, because of plans to organize a ferry service and provide transport to neighbouring Moldova in Romania. A cottage complex located between Usije and Vinci can offer its cottage accommodation not only to owners and users, but also to many other tourists.

7. LEVEL OF TOURISM DEVELOPMENT IN GOLUBAC MUNICIPALITY

To illustrate the level of tourism development in the Municipality of Golubac, we have analysed the following indicators for period 2009 – 2018: length of stay, index of functionality, occupancy rates and functionality score (Belij M, Milosavljević J, Belij J, Perak K, 2014). Length of stay (LS) represents a quotient of the number of overnight stays (OS) and the number of tourists (T):

$$LS = OS / T \quad (2)$$

The index of functionality (IF) represent a ratio of the number of available beds (B) to the population size (PS):

$$IF = B \times 100 / PS \quad (3)$$

The occupancy rate (OR) is a ratio of the number of overnight stays (OS) to the number of available beds (B) over one calendar year. It is used to determine the profitability of accommodation facilities:

$$OR = OS \times 100 / B \times 365 \quad (4)$$

A business is profitable if its occupancy rate exceeds 60%. If it ranges between 40% and 60%, it is borderline profitable. If it falls under 40%, it is considered unprofitable (Belij M, Milosavljević J, Belij J, Perak K, 2014; Lukić D, Berjan S. & El Bilali H, 2018).

Functionality score is a measure of the turnover of tourism industry achieved at a location over a specific period of time. It can be determined in relation to the size of an area, the population size or the number of accommodation units (Belij M, Milosavljević J, Belij J, Perak K, 2014; Lukić D, Berjan S. & El Bilali H, 2018). This paper takes into account the functionality score measured in relation to the population size of the given area:

$$FS = T \times 100 / PS \quad (5)$$

where FS denotes a functionality score, T represents the number of tourists and PS stands for the population size of the area.

The tourism industry is growing in importance not only in Golubac municipality, but in the entire region as well. This is evident from data showing an increase in the share of tourism in the structure of the product and employees in the region. Previously, there were not enough tourist facilities, but the situation has improved since the size of active fixed assets has increased in this particular industry.

In 2019, the Municipality of Golubac had two business units belonging to the basic type of accommodation facility. They were a two-star hotel and a lodging house. In total, both had 129 rooms with 349 beds, specifically 278 permanent and 71 spare beds. The hotel, called "Golubacki grad" (Golubac Fort), and "Pilot" studios in Golubac are both examples of modern architecture and the contemporary hospitality industry. Next to them, there is a two-kilometre long waterfront, affording a view of Lake Djerdap, which reaches its maximum width at this point, and of the Golubac Fortress as well. The peacefulness and tranquility of this place are ideal for vacation, rest and recreation.

A total of 5005 tourist arrivals were recorded in the Municipality of Golubac in 2018. Of that number, domestic tourists accounted for 3440 arrivals and international tourists for 1565 arrivals. There were, in total, 9047 overnight stays. Of that number, domestic tourists stayed 6832 overnights and international tourists 2215. A positive side of comparing the 2014 versus 2018 figures is a slight rise in the number of international tourists.

Table 14 shows that the average length of stay of tourists in Golubac municipality in 2018 was one day. Such short length of stay was due to a number of factors. An unfavourable situation in the Serbian tourism industry over the past years was accompanied by a decline in purchasing power of the population. In addition, the cost of tourism-related services had risen and tourist

attractions were insufficiently and inadequately promoted in the media, both domestic and international. Finally, there were not enough business units and rooms and beds available. The functionality index of Golubac municipality was 3.74%.

Table 13. Accommodation units in Golubac Municipality in the period 2009-2019

| Year | Business units | Rooms available | Total beds | Permanent beds | Spare beds | Number of households letting houses, flats and rooms |
|------|----------------|-----------------|------------|----------------|------------|--|
| 2009 | 3 | 116 | 315 | 263 | 52 | 15 |
| 2010 | 3 | 121 | 322 | 270 | 52 | 10 |
| 2011 | 3 | 132 | 356 | 301 | 55 | 20 |
| 2012 | 3 | 103 | 278 | 224 | 54 | 13 |
| 2013 | 3 | 104 | 673 | 278 | 222 | 56 |
| 2014 | 2 | 77 | 191 | 140 | 51 | 6 |
| 2015 | 2 | 80 | 223 | 172 | 51 | 15 |
| 2016 | 2 | 84 | 242 | 191 | 51 | 6 |
| 2017 | 2 | 95 | 256 | 200 | 56 | 15 |
| 2018 | 2 | 120 | 324 | 258 | 66 | 17 |
| 2019 | 2 | 129 | 349 | 278 | 71 | 23 |

Source: National Statistical Office of the Republic of Serbia

Table 14. Tourist turnover in Golubac Municipality in the period 2009-2018

| Year | Tourists | | | Nights spent | | |
|------|----------|----------|---------|--------------|----------|---------|
| | Total | Domestic | Foreign | Total | Domestic | Foreign |
| 2009 | 4,818 | 4,119 | 699 | 7,690 | 6,711 | 979 |
| 2010 | 5,323 | 4,879 | 444 | 8,061 | 7,513 | 548 |
| 2011 | 4,820 | 4,251 | 569 | 6,229 | 5,627 | 602 |
| 2012 | 5,416 | 4,706 | 710 | 6,787 | 6,056 | 731 |
| 2013 | 4,962 | 4,426 | 536 | 8,878 | 8,120 | 758 |
| 2014 | 2,766 | 2,152 | 614 | 4,000 | 3,258 | 742 |
| 2015 | 2,919 | 1,953 | 966 | 3,857 | 2,739 | 1,118 |
| 2016 | 3,186 | 2,470 | 716 | 4,540 | 3,606 | 934 |
| 2017 | 3,061 | 1,806 | 1255 | 4,509 | 2,752 | 1,757 |
| 2018 | 5,005 | 3,440 | 1565 | 9,047 | 6,832 | 2,215 |

Source: National Statistical Office of the Republic of Serbia

Table 15. Indicators of tourism development of Golubac Municipality in the period 2011-2018

| Year | Population size (2011 Census) | Tourists | Overnight stays | Beds | Length of stay (day) | Function. index (%) | Occupancy rates (%) | Function. score (%) |
|------|-------------------------------|----------|-----------------|------|----------------------|---------------------|---------------------|---------------------|
| 2011 | 8,654 | 4,820 | 6,229 | 356 | 1.3 | 4.11 | 4.78 | 55.70 |
| 2012 | 8,654 | 5,416 | 6,787 | 278 | 1.3 | 3.21 | 5.34 | 62.58 |
| 2013 | 8,654 | 4,962 | 8,878 | 673 | 1.8 | 7.77 | 3.61 | 57.34 |
| 2014 | 8,654 | 2,766 | 4,000 | 191 | 1.4 | 2.21 | 5.74 | 31.96 |
| 2015 | 8,654 | 2,919 | 3,857 | 223 | 1.3 | 2.58 | 4.73 | 33.73 |
| 2016 | 8,654 | 3,186 | 4,540 | 242 | 1.4 | 2.80 | 5.14 | 36.82 |
| 2017 | 8,654 | 3,061 | 4,509 | 256 | 1.5 | 2.96 | 4.82 | 35.37 |
| 2018 | 8,654 | 5,005 | 9,047 | 324 | 1.8 | 3.74 | 7.65 | 57.83 |

Source: National Statistical Office of the Republic of Serbia

Such extremely low functionality index was not only a result of a small number of beds available to tourists. It was also due to a relatively small population of the municipality. However, even if the actual number of beds intended for accommodation of tourists were reported to the competent authorities, the functionality index would still remain in the low range. This implies that efforts should be made to improve the overall tourism offer in the municipality of Golubac. Such situation is also related to the low occupancy rate of 7.65%, which points to utter unprofitability of accommodation facilities, and to a low functionality score, amounting only to 57.83%.

8. CONCLUSION

The Municipality of Golubac has natural and anthropogenic tourism resources, which, however, need to be managed and organized in a proper manner. The climate in Lake Djerdap littoral has a sedative effect. It can have an influence on the nervous, cardiovascular and respiratory system of tourists. In spring and summer, when the area is visited by tourists the most, its climate provides them with a sense of pleasing warmth during day and comfortable freshness in the evening and during the night. Favourable characteristics of the climate in Golubac municipality, together with its attractive landscape, provide opportunities for providing the so-called landscape therapy. As a direct tourism asset of Golubac municipality, its climate has been evaluated through development of various types of tourism. In the summertime, which is the best season for tourist activities according to the obtained TCI scores, a favourable combination of air temperature, precipitation, duration of insolation, low cloud cover, are conducive to the development of congress tourism, sports and recreational tourism, geotourism, nautical tourism, youth tourism, mountaineering, etc. Indirect importance of the climate is reflected in the fact that it impacts the attractiveness of municipality's tourist attractions. There are no weather stations in the municipality to monitor relevant weather elements, which is why the climate of the area cannot be monitored and spatial planning activities cannot be performed for the purpose of tourism development nor tourism development can be aided. When that issue has been resolved in the municipality of Golubac, other elements of bioclimate will have to be examined more thoroughly, such as cooling power, drying power, comfort zone, stimulative and sedative effects of the climate or effects of individual elements of climate on the human organism. Access roads to such attractions need to be constructed, not limited only to those from existing routes, but also from new roads that would be built by cutting through an area of mountainous land. Despite all the potentials that have been mentioned above, the level of tourism development is still rather low. What should be expected in the future is that the area along the Danube bank will be used more as a tourist attraction given that presently, there are some accommodation facilities that can accommodate more tourists than they actually do at the moment since their occupancy rates are still pretty much low. What also needs to be enhanced are the media promotion and interpretation of this area. This should be done by improving the tour guide service, creating and printing promotional material, giving presentations of tourism potentials of Golubac Municipality at trade fairs and relevant gatherings and by creating a proper website. In addition to the resources mentioned in the paper, other attractions should be made available to tourists, offering amusement, recreation and education to stimulate their interest in visiting the municipality as much as possible.

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