

TOURISTIC VALORISATION OF KONJUH MOUNTAIN ON EXAMPLE OF SKI CENTER "KARAUŁA" KLADANJ

Semir Ahmetbegović, Fadila Kudumović Dostović i Željka Stjepić Srkalović

University of Tuzla, Faculty of Natural Sciences and Mathematics, Department of Geography, Univerzitetska 4, Tuzla, Bosnia and Herzegovina

Advantageous geographic position, natural resources, Konjuh mountain natural beauty, and rich cultural-historical heritage of this area, provide a great opportunity for tourism development in this part of Bosnia and Herzegovina. Today, the Konjuh mountain and Kladanj municipality are recognizable tourist area with an attractive natural basis, that has enabled the development of various forms of recreational tourism (sport - recreational, excursion - recreational, health - recreational) throughout the year. In recent years, winter tourism and ski resort in Kladanj, as the only tourist facility of this category in the northeastern part of Bosnia and Herzegovina, scores better results and becomes an interesting tourist destination. By analyzing the available sources and data, the activities of the ski resort from the opening till today, are presented, and field research has provided information of the infrastructure, technical characteristics and the organization of ski resort.

Keywords: tourism, recreation, ski center, tourist place, Kladanj, Konjuh

INTRODUCTION

The natural beauties of the Konjuh mountain and the area of Kladanj municipality undoubtedly provide great opportunities when it comes to tourism. Geographical position, interesting relief, favorable climate and rich and preserved vegetation are key benefits in the development of this branch of industry. When the rich cultural and historical heritage of this part of Bosnia and Herzegovina is added, it is clear that the area can be interesting to the tourist market.

There are great opportunities in the area of Bosnia and Herzegovina to develop various forms of tourism. When it comes to the area of northeastern Bosnia and Herzegovina, Konjuh mountain with its natural beauties and geodiversity and rich cultural and historical heritage is particularly prominent. The Konjuh massif is a central feature of the municipality of Kladanj, which due to its predominantly mountainous relief and climate is also suitable for winter sports. By building the facility and the accompanying infrastructure, ski tourism in this municipality becomes more and more interesting to tourists and recreational people. With additional investments in infrastructure and promotion of ski resorts in Kladanj, combined with other tourist resources of the surrounding area, the visits will increase, thus justifying the current investments and contributing to the self-sustainability of the only tourist object of this character in the region of the North-Eastern Bosnia region. Therefore, the subject of research of this work is Mount Konjuh, natural and cultural tourist motives and complementarity of ski tourism with other forms of tourist offer of the area.

The aim of this paper is to contribute to the development of tourism as a major promoter, both the municipalities of Kladanj and the Tuzla Canton, as well as the State, in the surrounding and beyond. The aim is also to enrich the tourist offer, and to raise

awareness about the importance of implementing the natural and cultural heritage in the tourist offer.

Several scientific and research methods and procedures were used for research purposes, starting from the analysis of available sources and information on the mentioned area and ski resort. Field research, surveys and surveys of people employed in tourism in Kladanj and its surroundings were carried out, and numerous information was obtained by direct observation method, which is indispensable in geographic research of space. In addition to this, the cartographic method was used, and for the needs of the morphometric analysis of the Kladanj ski resort and the ski slopes, GPS recording of terrain was carried out (Montana 600). The Adria Topo digital map was used, as well as satellite images from Google Earth Pro. In the absence of the legislation of the Tuzla Canton on this area, for the purposes of this paper, primarily for analysis of the technical regulation of the paths, the laws and regulations adopted for other areas in Bosnia and Herzegovina were used.

GEOGRAPHICAL AND TRAFFIC – TOURISTIC POSITION OF THE KONJUH MOUNTAIN AND SKI CENTER "KARAULA" KLADANJ

Mount Konjuh is located in the southwestern part of northeastern Bosnia and Herzegovina. With Ozren and Javornik, Konjuh is a part of the range of peripheral mountains, which together with Trebavac and Majevisa represent the transition of the Dinaric mountain system into the vast Pannonian Plain. The Konjuh morph-structural unit has a Dinaric direction (northwest-southeast), and according to the geotectonic re-identification of Bosnia and Herzegovina, it belongs to the zone of the Inner Dinarides (Čičić, 2002). As an integral part of the Dinaric mountain system, the entire area is composed of three parallel ridges, which are interconnected by the troughs, and these ridges separate the Mackovacka and Kladanj valleys. The central ridge gradually rises from the area of Banovići municipality and goes through Zelembroj, Zidine, Konjuh and Javorje to the Hrastić and Stanovi where it connects with Javornik. It is naturally limited by the Krivaj River in the west, Gostelja and Turija in the wider area of the Spreča Valley in the north, the mountainous areas of Javornik and Birač in the east, and the northwestern branches of Javor



Fig. 1: Geographic position of Kladanj municipality

and the northern slopes of Smolin in the south. It represents orographic and hydrographic watershed between the catchment areas of the rivers Krivaja, Spreča and Drinjača. The highest peak of the mass is Konjuh (1,326 m) located in the border belt between the territories of the municipalities of Banovići, Olovo and Kladanj under the coordinates of 44o18'06 " N and 18o32'45 " E. Although the Konjuh masif is a central feature of the

municipality of Kladanj, which, thanks to that has a dominant mountain relief, it is characterized by distinct passage and accessibility. Kladanj city settlement (560 m.n.v.), center of Kladanj municipality, located in the Drinjača valley, along the main route of M-18, makes traffic-geographical, and hence the tourist position of the area, very favorable because it connects the two major regional centers of Bosnia and Herzegovina, Tuzla and Sarajevo. This important traffic corridor connects the extreme north with the extreme southern parts of Bosnia and Herzegovina, but also with the border regions of neighboring countries

The observed administrative and political mountain masif of Konjuh is located in the far south of the Tuzla Canton, where according to the population census from 2013 there were 445,028 inhabitants, and Kladanj is one of thirteen municipalities of this administrative unit.

SKI RESORT IN KLADANJ

The municipality of Kladanj, which is made possible by natural conditions, primarily mountainous relief and adequate moderate-continental, pre-mountaneous and mountain climate, has conditions for the development of sports and recreational tourism, and some of the forms have already multi-decade representation. In recent years, especially ski tourism in Kladanj has recorded a growth in attendance, which is becoming increasingly recognizable in the tourist offer of the municipality of Kladanj, Canton and beyond. The first ski lift in Kladanj began operating in February 1985, built from the funds of the Olympic Committee of the then state. This area is still present today, thanks to numerous benefits, recognized and actively aimed at developing winter sports and recreational tourism in the area of Northeast Bosnia. Today, ski center "Karaula" is the only one in the region that has a functional ski lift and the necessary infrastructure and equipment. This winter center is managed by the Public Company "Karaula" d.o.o Kladanj which was established in 2006 for the development of tourism in the area (JP "Karaula" d.o.o Kladanj).

Thanks, most often, to the sufficient amounts of snowfall, the ski resort is well visited during the winter, and especially in January and February. Kladanj ski lift is 800 m away from the center of the city, with a ski track of relatively mild slopes, suitable for various types of skiing, with a total length of 1,700 m and a climbing track of a ski lift with length of 1,110 m. The ski lift capacity is 1,200 skiers per hour (<http://www.jpkaraula.com/>). The ski resort registers visits of recreational people, who want to have a rest in the beauty of the landscape and clean air.

The skiing and lift-operating season of the last three years lasted for 22 days on average, and about 1,000 tickets were sold during the ski season. In 2017, the ski lift had 23 working days with 872 purchased tickets; in 2018, 21 business days were recorded, with only 637 purchased tickets, while in 2019, in 22 working days of ski resorts, 1,335 tickets were sold (JP "Karaula" doo Kladanj).

Snowfall occurs here most in January and February, but the length of the snow cover depends on altitudes, so it lasts longer on mountain peaks or the slopes of the northern exposition. The thickness of the snow cover varies from 35 to 50 cm on average, and in the mountains is over 60 and 150 cm.

The maximum height of the snow cover for the Kladanj area ranges between 92 and 130 cm. Maximum measured heights, in the period 1961-1990. were in December with 92,

January 97, and February 129 cm. The snow cover is maintained during March and April, and the maximum height reaches 45 cm (Kudumović Dostović, 2017).

The ski resort does not have a system for artificial insemination, but there are needs for building it because of maintaining the continuity and prolongation of the ski season. Climatic predispositions, that is, a sufficient number of days, and even the whole month of January with an average temperature of -1.6°C (FHMZ, 2010) and the northern exposure of the ski slopes and trails provide artificial insemination. For this process it is also possible to provide sufficient quantities of water from a smaller permanent stream that flows along the path itself, or the water can be provided from the Drinjača catchment 580 m away from the beginning of the ski run.

Infrastructure and technical organisation of ski resort in Kladanj

Skiing in Kladanj is intended for recreational skiers, but the terrain also provides skiing competitions for younger skiers and the training of beginner skiers in the organization of ski clubs. The ski resort has a well-maintained ski slope served by a single lift (ski lift) whose starting point is at 655 m and swiveling at 892 m above sea level. The towline trail of the ski lifts next to the pillars of the starting and turning tracks has 12 liner pillars. The possibility of climbing or connecting to the tow rope exists only at pillar number 1. The descent from the trail route or the use of the ski slope is possible in 3 places, on pillars number 5, 10 or 12 (JP "Karaula" d.o.o Kladanj). Recommendation for younger skiers and those who are not skilled at skiing is to use ski lift only until pillar 5, because the higher parts of the track are with significantly higher inclination and more dangerous.

The total length of the ski slopes is 1,700 m. The main ski track, which begins at the turning station (892 m), is 1,320 m long. The average width of the track is about 20 m, the smallest width is about 10 m, and at the places the trail is wide and over 30 m. The ski trail has a stop surface of 150 m in length, 70-100 m wide, with minimal longitudinal and transverse fall, that is, almost horizontal surface. The sturdy surface of the ski



Fig 2. Ski lift "Karaula" Kladanj

Source: Google Earth Pro, US Dept of State Geographer, 2018; GPS Garmin – Montana 600

track is separated by a net from a part of the path intended for approach to the system of sloping transport. The ski trail, along the longitudinal profile, has mild, almost horizontal to steep sections, and is arranged on a pedological footprint covered with grass, with rare places where on the topographic surface appear the edges of a compact or fragmented rock (limestone). The total fall of this track is 20%, which is categorized as a group of light paths. However, the maximum slope on the overall profile is 38%, which is still classified in the group of medium heavy and heavy trails. The transparency of the ski slopes is satisfactory, since nowhere is not shorter than 60 m, which is the minimum for medium heavy ski trails. Tracing ensures sufficient transparency, which remotely reduces convex changes of longitudinal falls and noise. The trail is without major recesses and protrusions (Figures 2 and 3). The second (competitive) track starts at 710 m (from the fifth ski lift) and ends at the departure station. It is 360 m long, with a total fall of 17%, and in some parts it drops to 38% (Figure 2). In the Grand slalom race, a longer track from the pillar 10 is used.

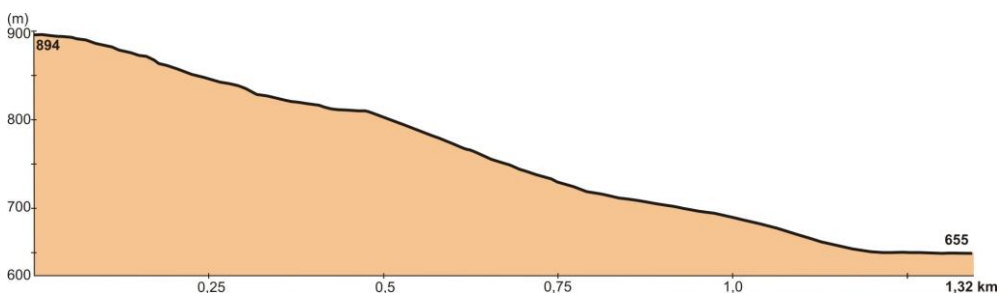


Fig 3. Ski trail profile in Kladanj

Source: Adria Topo, 2.1, GPS Garmin – Montana 600

Preparation of the terrain, snow throwing and skiing of the terrains are carried out with appropriate mechanization, ie one machine (ratrak), on a soil surface not threatened by erosion. The ski area has no surface that can be identified as ski routes, that is, the area that the Center does not provide from the risks and unexpected skiing hazards, but has short ski trails that link the ski trail to other ski resort facilities, primarily a ski lift.

The route does not require protection from avalanches, but additional security barriers are needed in front of trees, pillars, waterways, fences, streams and other dangerous places on the ski resort or in its immediate vicinity. The center immediately and in the course of its use marks the ski slopes, the ski and other trails. Marking involves marking of the boundaries of ski surfaces and ski trails by setting up networks that are visible. The ski resort does not have a permanent emergency medical station. The rescue station is established during the work of the ski lift or at the time of organizing competitions and other sports activities on the track.

In addition to these, in cooperation with the ski club "Kladanj 1982", whose headquarters is directly located at the starting elevator station, there is also a ski trail for teaching skiers of beginners (children), about 100 m in length and a slight inclination. On this track, a ski lift owned by the club is installed in the ski season. And the big elevator, to the first pillars, is used for the transport of beginner skiers, and in the case of smaller children they are accompanied by older skiers (JP "Karaula" d.o.o Kladanj).

Alongside the ski center, at the entrance to the ski resort, there is a space for car parking on an area of about 1,000m² (JP "Karaula" d.o.o Kladanj). This parking lot does not have enough capacity, according to the capacity of the trail itself and the ski lift, and it is steep, which complicates traffic in the winter. Also, the parking lot does not have the possibility to park the bus. This deficiency can be compensated by using parking spaces in the central part of the city settlement Kladanj, only a few hundred meters away from the trail itself.

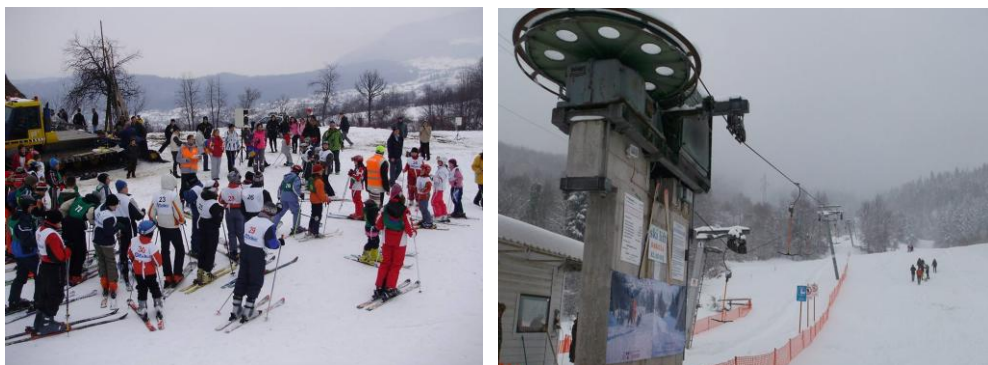


Fig 4, 5. Ski lift "Karaula" Kladanj

Foto: Amir Avdibegović

Within the Center, right next to the ski lift station, a catering facility was built, with 300m² of useful surface in three floors. On the ground floor there is a souvenir shop, a ski service for renting ski and other equipment, a space for medical staff and mountain rescue service, boiler rooms, warehouse and sanitary block. Upstairs there is a restaurant with a kitchen and another sanitary block, and in the attic there are 3 rooms with a bathroom and a laundry. The ski area is not lit, or there are no conditions for night skiing. At a time when the ski resort is not in use, the ski center takes care of the skiing, the maintenance of tracks and equipment.

The owner of the land on which the ski lift business is located is the municipality of Kladanj, while the land on which there is a towed and ski trail is in private ownership. This land is used on the basis of the Contract of Use made between the Municipality and each owner individually (JP "Karaula" d.o.o Kladanj). During the research, certain shortcomings and problems were also noted, primarily referring to the lack of legislation in the Canton, that is, the law on public skiing, such, for example, Canton Sarajevo has.

Complementary tourist facilities

Some tourist facilities, such as the ski center in Kladanj, can not, at this stage of development, be able to independently work on attracting a large number of users and tourists. This resource should appear in combination with other tourism resources of the environment, which increase the intensity of its attractiveness and attendance, and relate to the natural and cultural tourist motives of Konjuh. In the following analysis, only some natural and cultural-historical contents of the area of the municipality of Kladanj and immediate vicinity will be shown which have already recognized tourist value.

Conditioned by the geological structure of the Konjuh mountain, it abounds in numerous underground karst forms. In the municipality of Kladanj, it is the Bebrav cave whose entrance is at 882 m above the sea level. The total length of the cave cannals examined so far, including the final gallery, is about 500 meters. Nearby are the cave "Kućara" in the village Goletići as well as the cave in Tarevo, which is like the Bebravska cave, rich with stalaktites and stalagmites. The Maiden's Cave is located in the village Brateljevići, on the right valley side of the river Bukovica, the tributary of Drinjača (Group of Authors, 1990).

Hydrography of the Konjuh mountain consists of many, clean rivers, streams, springs, and artificial hydro-accumulations at the base. However, there are two streams that has the source on the mountain, which are Drinjača and Oskova. The spring head of the Drinjača river is located on the southwest side of the Konjuh Mountain, and its longest source is at an altitude of 1,135 m, while the waters of this spring at a height of 995 m merge with the waters of two smaller springs, forming the Drinjaca River. On the southeastern slopes of the Konjuh Mountain, at 650 m above sea level, there is also a forest lake (Mountain Eye) in the people known as Paucko Lake. On the slopes of the Konjuh mountain, in the municipality of Kladanj, there is the source "Men's Water", widely known for the traditions associated with it. Evli Čelebi, the famous Turkish traveler, wrote about this mineral water source in the 17th century and called it "The Source of Youth" or "Male Waters", attributing to it healing properties (Djedović, Ahmetbegović, 2011).

The area of the Konjuh Mountain is characterized by the preserved forests of oak and common grass oaks, and beside them are represented beech, fir and pine forests. Also, this area abounds with meadow and pasture vegetation. At slightly higher altitudes, the forest complex is well preserved. The floral value of this area is the habitat of endemic species, Bosnian pernicata (*iris-bosniaca*) and Bosnian lily (*lilium bosniacum*). There are also other rare plant species: sunovrat, iva, lincura, etc. Konjuh is a habitat for a variety of medicinal and self-contained edible herbs from which the most common is thyme. Some types of self-cultivated edible herbs appear in the form of fruits: blueberry, blackberry, raspberry, forest strawberry, pomegranate, wild cherry, wild pear, trunk, hawthorn,

The Fauna of Mount Konjuh is very diverse, specific and fairly preserved. Hunting ground "Oskov" extends on the slopes of the Konjuh mountain, on an area of 6,450.50 ha, at an altitude of 340 to 1,327 m and belongs to the mountain hunting grounds. This hunting area belongs to the municipalities of Banovici, Kladanj and Živinice (Group of Authors, 2008). Rich vegetation and favorable hydrography provide enough food and water for game throughout the year. Numerous hunting facilities were built here, which fulfilled the necessary conditions for dealing with modern hunting. Hunting houses, huts, checks, grocery stores and hunting trails meet the highest standards of hunting areas, and thanks to the

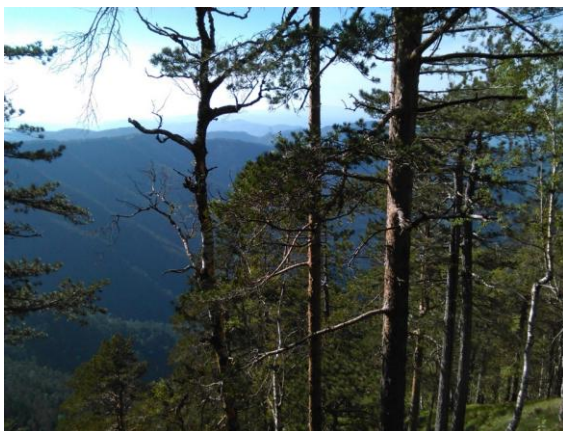


Fig 6. The view from the top of Konjuh Mt, (1.326 m)

planned work this hunting ground is rich in wildlife.

There are numerous sites with valuable assets of cultural, historical and spiritual heritage. The mentioned Maiden's cave has a long tradition behind it, from prehistoric cult site with ancient cave paintings to date, as one of the most popular havens in Bosnia and Herzegovina. The religious and cultural event "Days of the Maiden's Cave" every year at the end of August gathers thousands of pilgrims from the area of Northeastern Bosnia and beyond.

On Konjuh and its slopes there are archaeological sites of prehistoric, ancient and medieval age. Konjuh is characterized by numerous historical events that left material traces, the most important of which are necropolises of stećak tombs and remains of old settlements. The route of the ancient Roman road is extremely interesting. The remnants of this crammed communication can still be seen in the area of the highest and humidest parts of the Konjuh Mountains today.

In the municipality of Kladanj, 57 necropolises were registered with 598 stećak tombstones. The Commission for the Preservation of National Monuments proclaimed the 2005 necropolis in Olovci near Kladanj the national monument of Bosnia and Herzegovina. The monument is located at the Kuman site, and the necropolis, together with the mountainous, forested landscape, the mountain lodge Javorje and other cultural-historical and natural heritage of the nearby settlements Goletići and Tuholj, represents a significant potential in the development of tourism, excursions and recreation for the whole Tuzla Canton and beyond (<https://www.bastina.ba>). There are still preserved objects of traditional construction on the slopes of the Konjuh mountain. First of all, it is about numerous houses characteristic of the folk architecture of central Bosnia, which is the highest in the settlement of Tuholj. There are preserved and other auxiliary facilities characteristic for rural households of this region (Djedović, 2010). Mount Konjuh has tourist and recreational facilities, well integrated into the environment, as well as a number of receptive capacities. The central part of this system is separated as Protected Landscape "Konjuh", and includes the upper part of the Drinjača river basin and the Krabanje and Velika Zlača basins.

By proclaiming a part of the Konjuh mountain, the protected landscape "Konjuh", depending on the degree of protection, has identified three protected zones. The first protected zone (zone A) represents the area of the highest values, which must remain fully preserved. In the second protected zone (zone B), preservation and protection of the original state of nature is preserved, which is sufficiently preserved both for the conversion of the basic systems and the eco-system, and provides the possibility for research, education, physical and spiritual recreation, and the third protected zone (zone C) is intended for tourism, sport and recreation (Group of Authors, 2013).

And the space in which Kladanj ski area is located has potentials for developing tourism and tourist offer in the warmer part of the year, because natural motives (relief, pleasant climate and vegetation) catering and accommodation capacities allow the development of some picnic (picnics, camping) and sports and recreational forms of tourism (walking, running, hiking, mountain biking, etc.), which helps sustainable development of tourism in this region.

CONCLUSION

The previous analysis points to the great natural and cultural and historical potentials of the Konjuh Mountain and the area of Kladanj Municipality. Some of these potentials have long been put into the function of recreation and tourism, but there are many who are so poorly or by no means used so far. The Konjuh with its height and richness of relief forms provides the possibility of developing activities related to mountains such as: hiking, speleological research, skiing, etc. Clean air, flawless clean environment, nice view and other natural beauties characterize this mountain. Due to the mountain climate and the richness of the forest, the peaks of the Konjuh mountain can be called the air spa, and there are numerous sites with valuable assets of cultural, historical and spiritual heritage.

In recent years, this area has been curating the development of winter tourism thanks to the construction of a ski lift in the immediate vicinity of the town Kladanj. The availability of the location, the built infrastructure and the character of the ski slopes in Kladanj enable continuous increase of the visitors, ie the ski resort becomes increasingly recognizable in the overall tourist offer of the municipality of Kladanj, Tuzla Canton, and beyond. So, the ski resort has good enough predispositions that can be better used, but additional investments in infrastructure are needed and the promotion of this complex and the stronger promotion of this complex and other touristic contents of the Municipality of Kladanj.

References

- Kudumović Dostović, F. (2017). Sjeveroistočna Bosna - geografska monografija, Geografsko društvo Tuzlanskog kantona, OF SET, Tuzla;
- Djedović, R. (2010). Naselje Tuholj – antropogeografski prikaz, Baština sjeveroistočne Bosne, broj 2, Zavod za zaštitu i korištenje kulturno-historijskog i prirodnog naslijeđa Tuzlanskog kantona, Tuzla;
- Djedović, R., Ahmetbegović, S. (2011). Turistički potencijali planine Konjuh, Zbornik radova, Međunarodni naučni skup, Edukacija iz turizma i zaštita životne sredine kao preduvjet turističkog, regionalnog i prostornog planiranja, Odsjek za geografiju, Prirodno-matematički fakultet u Sarajevu, Konjic, str. 124-137.
- Digitalna karta Adria Topo, 2.1, integrisana u GPS Garmin – Montana 600 uređaj
- Čičić, S. (2002). Geološki sastav i tektonika Bosne i Hercegovine, Earth science institute, Sarajevo;
- Google Earth Pro, US Dept of State Geographer, 2018
- Grupa autora (1990). Elaborat Kulturno-istorijsko i prirodno naslijeđe opštine Kladanj, Zavod za zaštitu i korištenje kulturno-istorijskog i prirodnog naslijeđa Tuzla, Tuzla, 1990.;
- Grupa autora (2008). Prostorni plan za područje Tuzlanskog kantona 2005-2025, Ministarstvo prostornog uređenja i zaštite okolice, PrintCom doo, Tuzla.;
- Grupa autora (2013). Prostorni plan područja posebnih obilježja Zaštićeni pejzaž „Konjuh“ 2010 – 2030, Tuzlanski kanton, Ministarstvo prostornog uređenja i zaštite okolice, Tuzla.;
- JP "Karaula" d.o.o. za turizam, proizvodnju i usluge, Kladanj
- Zakon o javnim skijalištima, Skupština Kantona Sarajevo, 22. sjednica, održana 27.12.2012. godine, objavljeno u "Sl. novinama Kantona Sarajevo", br. 54 od 31 decembra 2012;
- Federalni hidrometeorološki zavod, Sarajevo, 2010.
- <http://www.jpkaraula.com/#>, 07.05.2019.
- http://www.rekreacija.ba/index.php/portal/mjesto_za_rekreaciju/ski-centar-igrista-vlasenica, 07.05.2019.

<https://www.bastina.ba/index.php/kulturno-historijsko-i-prirodno-naslijede-opcine-lukavac-zbornik-sazetaka/40-zavod/vijesti/543-jedina-nekropola-stecaka-sa-tuzlanskog-kantona-na-listi-svjetske-kulturne-bastine-unesco-a> (07.06.2019)

<https://www.oc-jahorina.com/pravilnik-o-uredenju-obiljezavanju-i-odrzavanju-skijalista/> (07.06.2019)

Authors

Semir Ahmetbegović, doctor of geographical science, assistant professor at the Faculty of Sciences and Mathematics, University of Tuzla, Bosnia and Herzegovina. In 2012. he defended PhD Thesis "Relief as population gathering factor in Bosnia and Herzegovina" at Geography Department of Faculty of Natural Sciences and Mathematics, University of Sarajevo. Author and coauthor of 31 scientific and technical articles and two scientific books.

Fadila Kudumović Dostović, doctor of geographical science, assistant professor at the Faculty of Sciences and Mathematics, University of Tuzla, Bosnia and Herzegovina, scientific field Regional geography. In 2012. defended PhD Thesis "Regional-geographic characteristics of North-eastern Bosnia" at Geography Department of Faculty of Natural Sciences and Mathematics, University of Tuzla. Author and coauthor of 20 scientific and technical articles and one scientific book.

Željka Stjepić Srkalović, master of geographical sciences, graduated at the Faculty of Sciences and Mathematics, University of Tuzla. Elected for senior associate assistant at the Faculty of Sciences and Mathematics, Geography Department in Tuzla, scientific field Physical geography. Author and coauthor of numerous scientific and technical articles published in scientific journals and one scientific book "Pedogeografija".