

GEOGRAPHICAL CHARACTERISTICS OF THE UNA-SANA MESOREGION

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Abstract

Geographical characteristics of the Una-Sana mesoregion

Last geographically relevant attempt of adequate territorial differentiation of Bosnia and Herzegovina, based on the principles of complex geographical homogeneity, represents geographical regionalisation into four macroregional units: Peripannonian, Mountain-valley, macroregion of Bosnian and Herzegovinian high karst and Mediterranean macroregion. This paper particularly focused on geographical characteristics of one part of Peripannonian macroregion – the Una-Sana mesoregion. Natural geographical characteristics are elaborated, such as geographical position, geological composition and structure, geomorphological, hydrogeographical, climate, pedological and biogeographical characteristics, including also social geographical characteristics such as number of population, density, structure of population and economy. According to a field research, former findings, previously collected various information and documents, this paper inclines to present basic characteristics of this region of Bosnia and Herzegovina, pointing out certain problems that Una-Sana mesoregion faces with, specially the „white plague“, as a negative natural change and big emigration of population.

Keywords

Geographical regionalization, Una-Sana mesoregion, Bosnia and Herzegovina, white plague

1. Introduction

Bosnia and Herzegovina is located in Southeast Europe, in the central part of the Balkan Peninsula. It borders the Sava River in the northern part, and the Adriatic Sea in the southern part. Bosnia and Herzegovina has a unique state territory in Southeast Europe between: the Sava River in the north, the Adriatic Sea in the south, the Korana and the Una River in the west and the Drina in the east. Considering geographical coordinates, Bosnia and Herzegovina is located between 42° 26' and 45° 15' N and 15° 45' and 19° 41' E. It borders the Republic of Croatia to the north and west (931 km), Serbia to the east (375 km), and Montenegro to the southeast and south (249 km), including the border with the Adriatic Sea along its 20 km coastline. Bosnia and Herzegovina is mostly highland, with an average altitude of 500 m. The total area includes 5% of plains, 24% of hills, 42% of mountains and 29% of karst. Geographical area of Bosnia and Herzegovina had has been the object of the regional geography studies over a longer period. Last geographically relevant attempt of adequate territorial differentiation of Bosnia and Herzegovina, based on the principles of complex geographical homogeneity, represents geographical regionalisation done by S. Nurković (2005). This regionalisation reflects in two-stage regional structure, with macroregional units divided on smaller units such as mesoregions and microregional tertiary units. According to Nurković and Mirić, this physiognomic regionalisation is characterised as primary or „actual geographical regionalisation“ (Nurković, Mirić 2005). Henceforth, these authors mentioned four macroregions for the first stage of the regional-geographical differentiation of Bosnia and Herzegovina, as follows: Peripannonian, Mountain-valley, macroregion of Bosnian and Herzegovinian high karst and Mediterranean macroregion. For the second stage of regionalization, there are 12 mesoregions and 67 microregional tertiary units (Nezirović, Drešković, Mirić 2018).

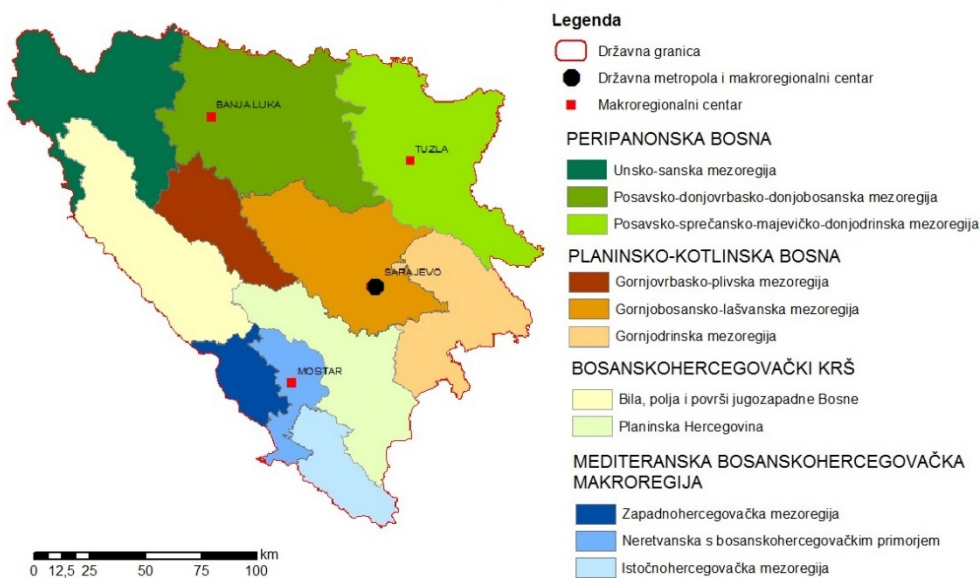


Figure 1: Geographical regionalization of Bosnia and Herzegovina.

Source: The map made by the authors according to source Nurković, Mirić, 2005.

Table 1: Demogeographic characteristics of macroregions of Bosnia and Herzegovina in 1991 and 2013.

Macroregions	Area (km ²)	Population		Density (population/km ²)		Density 1991/2013 % less in number (people per km ²)
		1991	2013	1991	2013	
Peripannonian Bosnia	21,860	2,432,941	2,049,751	111.3	93.5	-17.8
Mountain-Valley	12,882	1,374,377	1,027,018	106.7	78.2	-27.8
High karst	11,133	253,394	189,995	22.8	17.6	-5.2
Mediterranean	5,324	312,154	264,395	59.1	49.5	-10.1
Bosnia and Herzegovina	51,199	4,377,033	3,531,159	85.5	68.9	-16.6

Source: Authors of this paper created Table 1 according to: The 1991 Census of population, households and dwellings in Bosnia and Herzegovina; Statistical Report; Statistical Yearbook of Sovereign Republic of Bosnia and Herzegovina 1991; The 2013 Census of population, households and dwellings in Bosnia and Herzegovina.

Peripannonian Bosnia is bound by Croatian border in the west and north and Serbian border in the east. It covers the area from the Una River in the west to the Drina River in the east, from the Sava River in the north to the mountains Grmeč, Smetica, Manjača, Čemernica, Vlašić, Konjuh, Javor to the south. Northern area of the Peripannonian Bosnia is also called Northern Bosnia. Peripannonian Bosnia covers the total area of 21.860 km² or 42,8% of total territory and includes three mesoregions: the Una-Sana, the Posavina-Donji Vrbas-Donja Bosnia and the Posavina-Spreča-Majevica-Donja Drina.

The Una-Sana mesoregion comprises of the following municipalities and cities: the Una-Sana Canton Municipalities except for Bosanski Petrovac (the city of Bihać, Bosanska Krupa, Bužim, the city of Cazin, Ključ, Sanski Most, Velika Kladuša), the city of Prijedor, Bosanski Novi/ Novi Grad, Bosanska Dubica/ Kozarska Dubica, Oštra Luka, Krupa na Uni, Ribnik and Bosanska Kostajnica/ Kostajnica. The statistics shows that the Una-Sana mesoregion, in 1991, included the following municipalities: Bosanska Dubica, Velika Kladuša, Bosanski Novi, Bosanska Krupa, Cazin, Prijedor, Bihać, Sanski Most and Ključ.

After the Dayton Agreement was signed in 1995, new municipalities appeared: the Municipality of Bosanski Novi was divided into the Municipality of Novi Grad (Republic of Srpska) and Bosanska Kostajnica (Republic of Srpska). The Municipality of Bosanska Krupa was divided into Bosanska Krupa (Federation of Bosnia and Herzegovina), Bužim (Federation of Bosnia and Herzegovina) and Krupa na Uni (Republic of Srpska). Sanski Most was divided into the municipalities Sanski Most (Federation of Bosnia and Herzegovina) and Oštra Luka (Republic of Srpska), and the Municipality of Ključ, into Ključ (Federation of Bosnia and Herzegovina) and Ribnik (Republic of Srpska). This also included moving of the following eleven settlements from the Municipality of Drvar into Bihać: Boboljusci, Bosanski Osredci, Gornji Tiškovac, Mali Cvjetnić, Malo Očijevo, Martin Brod, Očigrije, Palučci, Trubar, Veliki Cvjetnić and Veliko Očijevo.



Figure 2: Administrative territory of the Una-Sana mesoregion.

2. Materials and Methods

According to the field research, former findings, various information and documents collected previously, this paper elaborates natural-geographical and social-geographical characteristics of the Una-Sana mesoregion. The complexity of the research required the data usage from various resources. Apart from the available literature, authors used planning documents, maps, field sketches and statistical indicators. During the field research, the identification of natural-geographical characteristics of the area was emphasized, especially presenting natural resources significant for the economic growth. Social-geographical characteristics of the area are provided with the statistical indicators according to the last two censuses in Bosnia and Herzegovina, in 1991 and in 2013, as registered within all other reports, bulletins, and drafts of state, entity and canton institutions. Birthrate (natality), death rate (mortality) and rate of natural increase calculations for the municipalities in Republic of Srpska, are results based on the report data. These report data are taken from „Demographic Statistics 2020“ as follows: the number of live births within one year (N), total number of population in the middle of the year (P), the number of deaths within one year (M), and absolute natural change within a year (Pp). Values are calculated in permils. Birthrates are calculated using the formula: $n = \frac{N}{P} 1000$, deathrates: $m = \frac{M}{P} 1000$ and rate of natural increase: $pp = \frac{Pp}{P} 1000$ or by subtraction of the birthrate from the deathrate. The methodology is primarily based on analysis and synthesis, induction and deduction.

Analyzing demographic characteristics of the area, this paper pointed out problems this mesoregion faces with. Primarily, it is indicated that this area is becoming empty (depopulated) by enormous emigrations of young population towards more developed parts of Europe, henceforth influencing decreasing of birthrates and increasing of death rates. Decreasing number of population can be caused by emigrations, low fertility rate and high mortality rate. Considering the Una-Sana mesoregion, and generally Bosnia and Herzegovina, all of the three above-mentioned factors play their roles. Bosnia and Herzegovina is among leading countries in the world in human capital flight (brain drain). Decreasing number of population and labor shortage are inevitably reducing opportunities for the future economic growth and economic competitiveness of the area. By decreasing number of population some very problematic ageing effects of population are becoming evident, and influence sustainability of pension, health and other social systems. If this trend continues without emergency measures, in a few years from now we are facing a completely depopulated area. Causes, which led to this situation, are complex, but primarily related to economics. Collected material and data are elaborated according to their structure, using contemporary methods with GIS technology

3. Results and discussions

3.1. Natural-geographical characteristics

Una-Sana mesoregion encompasses northwest part of Bosnia and Herzegovina, the Una River basin and its tributary Sana. The total area of the Una-Sana mesoregion results in 6.107,25 km² comprising of all the areas of municipalities and cities and towns. Considering other sources, this mesoregion is 5.871 km² in total. In this mesoregion, there are the most northern and the most western points of Bosnia and Herzegovina. The most northern point is at 45° 16' 30" N in the Municipality of Bosanska Dubica/Kozarska Dubica, in Donja Gradina. The most western point is in the Municipality of Bihać, in Bugar, at 15°43' E. Natural and social characteristics of this region are presented in this paper with its variety and diversity in characteristics.

Geological and geomorphological characteristics: The terrain is made of Paleozoic, Triassic, Jurassic, cretaceous, Eocene, Miocene and quaternary sediments. When considering morphology of Una-Sana region, it can be concluded that the structure is very complex. Morphological structure comprises of valley-basin and mountain forms. The oldest rocks appeared during the Paleozoic. This area has two Paleozoic locations: Sana-Una Paleozoic and Paleozoic of Ključ. The Sana-Una Paleozoic is located in the Una valley: Bosanski Novi – Piskavice – Bronzani Majdan – Kozice Valley – Sanski Most – Budimlić – Japare – Rudica. Upperdevonian sediments can be found on three locations: Paljevine, Blagaj (near Bosanski Novi) and Rasavci. The greatest parts of the Sana-Una Paleozoic are middle and lowercarboniferous sediments.

Dolomites and limestones (calcareous stones) are located in the northeastern part of Sanski Most. Clastic lowercarboniferous sediments from the Namur-Moskov phase are found in the south of Redak area and in some areas of the eastern part. Uppercarboniferous layers are found in the south of Ljubija ore locations and there are limestones, shales and sandstones. The Paleozoic of Ključ is located in the northwest of Ključ, near Pudin Han, Vojići, Ramići, Kopljenica, Muhamed-bey Prisjeka, Biljana, Pištanica, Budelja and Gornja Sanica. Carboniferous sediments are made of

clasts and conglomerate quartz sandstones. Permian-Triassic sediments are made of sandstones, alverolites, limestones, gypsum, and anhydrite.

Lower Triassic (T_1) is located in the Sana valley, the Japra River, in the south of Rudica, northern parts and middle parts of the Una River course. There are calcareous stones and clasts. Middle parts (southwest of Majdan Mountains), north parts and lower course parts of the River Sana comprise of limestones and dolomites of Middle Triassic age (T_2). Middle Triassic ladinian is located around the area of middle course of the River Sana (Kozica). There are limestones, cherts, dolomites, clasts, tuffs, and porphyrites. The area in the north of Grmeč mountain and the River Una (Ostrožac, Otoka, Jezerski, Bužim) including the area around Mala Kladuša are made of dolomites, calcareous stones, and clasts from middle-upper triassic ($T_{2,3}$). Upper Triassic can be found in smaller isolated areas of this mesoregion. These terrains are built of limestones and dolomites, and are located in the outmost southwestern parts of Majdan Mountains and around Una's tributaries, south of Rudica.

Generally, Jurassic can be found in southern parts of Una-Sana mesoregion. Early-middle Jurassic stones (the Lias and the Dogger Epochs) are built of limestones with cherts (minor part of Grmeč). Late Jurassic (J_3) is the most widespread in southern territory. It makes the major part around the upper course of the Sana River, and these areas are made of limestones, dolomites and breccias. Lower part of the Una river course are made of limestones, dolomites and cherts. These stones date from late Jurassic, precisely from Tithonian (J_3^3).

Cretaceous are divided into Early (K_1), Early-Late ($K_{1,2}$), Middle (K_2) and Late-Senonian (K_2^3). Early Cretaceous stones can be found on Gromila Mountain, west of Vijenac Mountain, around the area of Sanski Most and on the eastern slopes of Grmeč (limestones, dolomites and clasts). Limestones and dolomites represent middle Cretaceous. The terrain around Bosanska Krupa and east of the lower part of the Una River course is made of them. Sediments of Late Cretaceous Age are located in the northwest part, being made of limestones, dolomites and clasts.

The Eocene stones are located in the northern parts (Kozara and Knešpolje areas). The area around Bosanska Bojna is built of conglomerate, sandstones and carbon (Oligocene – Miocene). Miocene sediments are located in northern part, precisely north of the Sana and Una estuary, and minor western part. These sediments are greatly made of limestones and clasts. Quaternary sediments are found in the valleys of the rivers Una, Sana and Gomjenica (Čičić).

Morphological structure is made of valley-basin and mountain forms. A part of Grmeč mountain range and Osječnica are located in the southern part of this mesoregion. Plješevica is located in the west part, on the Croatian border. Kozara is located in the northern part. In addition, here we can note structures, which appeared as a result of volcanic activity during the tertiary period, as a system of isolated cones subsequently modified. This refers to Majdan Mountains, which made islands during the Paleozoic. Morphostructures of depressions are also a part of Dinaric direction. Mountains or ridges separate them. It is not rare for them to be filled with fluvial-limnic and terrigen sediments so they are often carbonaceous. We can name some: Bihać basin, Lušci field, composite expansion of the Una and Sana Rivers, Petrovac depression, Medenpolje depression and others, intermountain and intramountain

depressions. Here we can find very complex surface (peneplain - plateau) of karst and corrosion origin, so called Una-Korana plateau. Also, there are karst morphostructures: karst fields, coves, sinkholes, cracks, caves (Gigića Cave, Radića Cave, Martin Brod Cave, Dabarska Cave), ditches and so on. Apart from the karst, there is also a fluvial morphostructure. The core of the valley type of relief is the Una and the Sana Rivers, and the Unac with smaller tributaries. In the northeast, there is Knešpolje. The Mlječanica River, as a tributary of the Una River, flows through Knešpolje (Drešković, Mirić 2017).

Climate characteristics: C climate class appears in the mesoregion whose thermal regime is based on the warmest month July. An average temperature in July is $t > 10.0^{\circ}\text{C}$, considering that at least three months have average temperature: $t > 10.0^{\circ}\text{C}$. An average temperature of the coldest month is $t > -3.0^{\circ}\text{C}$. As continentality of some location rises, the level of annual temperature amplitude rises to over 22.0°C , too. This similarly happens on a daily basis. An average annual temperature for the total area is around 9.7°C . To be more precise, here we have Cf climate type. The basic climate characteristic of the average annual pluviometrical regime is that there is no extremely dry period. The driest month has an average rainfall of $p > 40.0\text{ mm}$ and more than $1/3$ of the rainfalls in comparison to the month of average maximum rainfalls. This area has average rainfalls of 1200 mm annually, which are proportionally distributed over the year (Drešković, Mirić 2017).

Hydrographic characteristics: There are two catchment areas here (basins) – the catchment area of the Una River and the catchment area of the Glina and the Korana. The Una river basin flows through major parts of west and northwest Bosnia and Herzegovina. Hydrologically, it comprises of the catchment area of the Una River and its main tributary Sana, with smaller tributaries and streams. The greatest watercourse and hydrographic basis of total area is the Una River. It is 212 km long. Considering predominant calcareous structure and dynamic relief, it can be concluded that hydrographic part of the Una River is weakened in course. The spring of the Una comprises of numerous watery karst natural springs. The main natural spring is located at the foot of Stražbenica mountain (Donja Suvaja), but it is important to mention other two springs watery significant for the area: Velika Neteka and Mala Neteka (Drešković, Mirić 2017).



Figure 3: Una National Park.

Source: Nezirović, May, 2019.

Forming travertine barriers is specific due to calcareous basis through which it flows in its upper course, travertine algae and mosses and specific physical and chemical conditions of the water. It should be noted that not all karst rivers, springs and natural springs are travertine. However, the river Una is abundant which makes it very significant river. According to Spahić M. (1998), creating carbon concretions around mosses leads to creating carbonised biomasses, additionally making quays, overflows and cascades along the longitudinal profile of the Una River. Apart from these, sedimentation of powerful travertine brings special hydrographic systems such as armbands, river islands, etc. Numerous rapids, waterfalls and cascades cause inconsistent longitudinal profile of the Una. The most significant concentration of travertine are located in Štrbački buk, Martin-Brod, Dvoslap, Ripački slap, Kostelski, Bukva, Halkića slap, Mand and Otočki slap. Spahić M. did detailed inspection of travertine and cascades on the Una River. According to this research, travertine cascades are primarily created on fault splits of longitudinal profile. Travertine morphosculptures include four low islands, Mala and Velika Otoka, located between right, middle and left branch of the Una River. There are also waterfalls to enlist here: Jalački, Srednji, Donji, and Veliki buk (Korjenić 2009).

The catchment area and river network of the Glina and the Korana, are only partially in Bosnia and Herzegovina, with its upper course, i.e. in the outmost northwest part of Bosnia and Herzegovina. Both watercourses represent spring courses of the Kupa River in Croatia. Hydrographic basis of the spring river heads of the Korana sub-basin area in Bosnia and Herzegovina is made of the rivers Toplica and Mutnica, whereas rivers Kladašnica and Glinica, with its tributary system, are creating watercourse of the Glina River.

Pedogeographical characteristics: The most developed soils come from automorphic distribution. The most widespread are mosaics calcomelanosol-luvisol, calcocambisol-luvisol, calcomelanosol-calcocambisol-luvisol and complex redzina-

calcocambisol-luvisol on limestones and dolomites. These soils are located around Grmeč Mountain and middle course of the Una River. The following soils are found in the northwest part (The Glina and the Korana watercourse): calcocambisol and mosaic calcomelanosol-calcocambisol on limestones, acric luvisol on limestones, dystrict cambisol on acid silicone stones, complex dystrict cambisol-eutheric cambisol on a series of carboniferous and silicone stones. Calcocambisol and mosaic calcomelanosol-calcocambisol on limestones can still be found east of Plješevica, around the Una river watercourse, Kozara Mountain and around the Strig River. Dystrict cambisol on acid silicate stones, except for the northwest part, are also developed on Kozara Mountain, Majdan Mountain, the Strig river valley, the Sana and Gomjenica. The complex rendzina-vertisol on marlstone lies along the lower course of the Una River (between Bosanski Novi and Bosanska Kostajnica). The Unac river valley, Osječnica Mountain and minor parts of the Una river valley have lithosols, calcomelanosols, mosaic lithosol-calcomelanosol on limestones and dolomites. In some smaller western parts, we can find vertisols, pelosols and complex lithosol-rendzina on clay and marlstones. In the southwest of Grmeč Mountain, rendzinas and complex lithosol-rendzina on dolomite has been developed. Pseudogley soils are located on Kozara, the Sana and the Gomjenica river valleys, and eugley can be found only in small parts in the upper course of the Una River (around Bihać). Fluvisols are typical soils evolving in the river valleys, so in this mesoregion they evolved in the river valleys of the Una, the Sana and minor segment of the Gomjenica. Semigley is in the river valley of the Sana, the Gomjenica and the Una (Bihać). The spring area of the river Bliha (a tributary of the Sana) is full of euthric cambisols based on silicate-enriched stones (Burlica, Vukorep 1980).

Biogeographical characteristics: The sessile forests and hornbeams are mostly widespread. In addition to these, there are forests of sessile and chestnut. Forests of pedunculate oak and hornbeam are located along the Gomjenica river valley and around Bihać. On Grmeč and Kozara, there are forests of fir only, and of fir and beech. The forests of beech are also widespread as smaller areals on the mesoregional territory and along the Strig river valley. Near the upper and middle course of the Una River, there are thermophilic forests of beeches in fragments. Forests of cerris are widespread around the Unac and the Una estuary. Sessile and cerris forests are also grown in the Una river valley (lower and middle course). If there were no human influence, potential vegetation would be grown. Then, almost the total area of mesoregion would be covered in forests of sessile and hornbeams, whereas other afore-mentioned forests would be highly widespread (Stefanović, Beus 1983).

3.2. Social-geographical characteristics

In 2013, the Una-Sana mesoregion had 408,531 residents. War and its casualties, as well as forced migrations, brought population decreasing in number (Table 2). Additionally, the difference in total number of population appeared after forming entity lines, which divided territories of certain municipalities.

Table 2: Demogeographic characteristics of the Una-Sana mesoregion.

Municipalities/ cities	Area (km ²)	Population 1981	Population 1991	Population 2013	Density 2013 (population/km ²)
Bihać	900	65,544	70,732	56,261	62.5
Bosanska/Kozarska Dubica	499.01	30,867	31,606	20,681	41
Bosanska Kostajnica	85.12	-	-	5,645	66.3
Bosanska Krupa	561	55,229	58,320	25,545	45.5
Bosanski Novi/Novi Grad	472.72	42,142	41,665	25,240	53.4
Bužim	129	-	-	19,340	149.9
Cazin	356	57,110	63,409	66,149	185.8
Ključ	358	40,008	37,391	16,744	46.8
Krupa na Uni	84.33	-	-	1,560	18.5
Oštra Luka	204.91	-	-	2,705	13.2
Prijedor	834.06	108,868	112,543	80,916	97.0
Ribnik	511.1	-	-	5,851	11.4
Sanski Most	781	62,467	60,307	41,475	53.1
Velika Kladuša	331	45,520	52,908	40,419	122.1
Total	6,107.25	507,755	528,881	408,531	69.0

Source: Institute for Statistics of FB&H, 1998; Institute for Statistics of FB&H, 2016; Republika Srpska Institute of Statistics, 2017.

Today, the city of Bihać is the biggest in area and in 2013, there were 56,261 residents. Prijedor is the second biggest in area. In 1981, there were 108,868, in 1991, there were 112,543, and in 2013, there were 80,916 residents. This was the most populated town of this mesoregion according to censuses from 1981, 1991, and 2013. The smallest municipalities are Krupa na Uni and Bosanska Kostajnica. The Municipality of Krupa na Uni has the smallest population in number (1,560), then Oštra Luka (2,705) and Bosanska Kostajnica (5,645). These municipalities mostly had the trend of growing in population before 1991. Cazin is the area, which reports growing number of residents in comparison to previous censuses, as well as Bužim. Comparing the last two censuses, municipalities/cities that faced the biggest loss of population in number are Bosanska Krupa (-32,775), Prijedor (-31,627) and Ključ (-20,647). Average density at this mesoregion is 69.0 per km². The largest population in density is reported in Bužim and Cazin, and the smallest in Ribnik and Oštra Luka.

Natural population movement: Natality rate is very variable determinant, depending on numerous natural and social factors and processes. Experience shows reasons why low natality rate is the consequence of developed or undeveloped society. Studying oscillations of natality rates requires approach that is more complex. For instance, over the past, industrial sector of the Una-Sana Canton was strengthening, influencing low natality rates. Another reason to mention is better life standard and education. However, today the biggest influence on decreasing birthrate comes from emigrations of young people, and even complete families, out of Bosnia and

Herzegovina. In 2019, the highest birth rate was registered in Bužim (9.4‰), Velika Kladuša (9.0‰) and Bihać (8.1‰). The highest mortality rate was registered in Oštra Luka (26.5‰), Krupa na Uni (26.1‰) and Ribnik (22.5‰). The least satisfying demographic image is related to Krupa na Uni (-23.9‰), and the most satisfying in Bužim (2.8‰). Bužim and Velika Kladuša are the only municipalities of this mesoregions with positive rate of natural increase.

Table 3: Natural increase characteristics of the Una-Sana mesoregion in 2019.

Municipalities/ cities	Evaluation of population number	Natality rate (permil)	Mortality rate (permil)	Rate of natural increase (permil)
Bihać	56,065	8.1	11.3	-3.2
Bosanska/Kozarska Dubica	19,220	5.1	18.3	-13.2
Bosanska Kostajnica	5,413	5.5	10.2	-4.6
Bosanska Krupa	24,804	6.5	9.7	-3.2
Bosanski Novi/Novi Grad	23,419	6.5	15.4	-8.9
Bužim	19,270	9.4	6.6	2.8
Cazin	65,500	5.6	7.1	-1.5
Ključ	15,810	3.4	8.5	-5.1
Krupa na Uni	1,380	2.2	26.1	-23,9
Oštra Luka	2,224	4.5	26.5	-22.0
Prijedor	78,334	7.4	13.6	-6.2
Ribnik	5,288	5.9	22.5	-16.6
Sanski Most	39,852	3	7.7	-4.7
Velika Kladuša	40,099	9	8.3	0.7

Source: Institute for Statistics of FB&H, 2020; Republika Srpska Institute of Statistics, 2020.

The structure of population

Age and gender structure: After revising the 1991 and 2013 census results, and categorising the population into groups: young (0-14), mature (15-64) and old (over 65), it can be concluded that predominant population is mature. This means that population is growing older with small portion of young population involved. In 1991, mature population held the number of 356,140 in age structure, 127,967 young and 44,774 old. According to the last census, the mesoregion held the total number of 66,493 of young, 299,728 of mature and 54,156 of old population.

Analysing gender structure in municipalities, in 1991 and 2013, there are oscillations. Namely, in 1991, Bihać, Bosanska Dubica, Bosanski Novi and Prijedor had more females than males. Other municipalities faced higher percentage of male population. This leads to a conclusion that males populated this mesoregion more as predominant gender group, although it was not very emphasized. The ratio was 264,801:264,080 in favor of males. Considering also age structure, male population dominates in young and mature group. Female population generally lives longer so it leads to higher

number in older group over 65. That can be specially noted in Bosanska Dubica where the number of females and males in older group over 75, ratio is 585/1,325 and in Prijedor 501:1,113 (70-74 ages) and 2,004:2,816 (over 75). However, in 2013, higher number of female population was recorded in a proportion 201,625:206,906, due to wartime. Municipalities/cities, where females were predominant, were Bihać, Bosanska Krupa, Cazin, Ključ, Velika Kladuša, Prijedor, Bosanska Kostajnica, Bosanska Dubica, Bosanski Novi and Ribnik.

Table 4: Gender structure in municipalities of the Una-Sana mesoregion in 1991 and 2013.

Municipalities/ cities	m (1991)	f (1991)	m (2013)	f (2013)
Bihać	35,168	35,564	27,041	29,220
Bosanska/Kozarska Dubica	15,361	16,245	10,094	10,587
Bosanska Kostajnica	-	-	2,780	2,865
Bosanska Krupa	29,401	28,919	12,548	12,997
Bosanski Novi/Novi Grad	20,472	21,193	12,580	12,660
Bužim	-	-	9,885	9,455
Cazin	32,194	31,215	33,072	33,077
Ključ	18,961	18,430	8,365	8,379
Krupa na Uni	-	-	841	719
Oštra Luka	-	-	1,386	1,319
Prijedor	56,093	56,450	39,418	41,498
Ribnik	-	-	2,900	2,951
Sanski Most	30,495	29,812	20,826	20,649
Velika Kladuša	26,656	26,252	19,889	20,53
Total	264,801	264,080	201,625	206,906

Source: Institute for Statistics of FB&H, 1998; Institute for Statistics of FB&H, 2016; Republika Srpska Institute of Statistics, 2017.

The structure of education within population: During the pre-war period, the highest percentage of illiterate people lived in Ključ (15.6%) and Sanski Most (15.1%). Bihać was the only municipality that did not have a certain percentage of illiterate people lower than 10 % out of the total number of population. Fortunately, in 2013, numbers changed for Bihać, which recorded the lowest rate of illiterate people (2.42%), whereas high percentage of illiteracy was, recorded in new municipalities Krupa na Uni (9.96%), Ribnik (8.5%) and Oštra Luka (7.94%). According to census, data from 2013 illiteracy rate at this region was very high and it was 4.4%, whereas females were predominant in comparison to males, which records showed during the post war period. High percentage of women out of total number of illiterate population comes as a consequence and result of less attention paid to education and schooling of females. According to the level of education, the highest number records population with secondary education finished (163.646). The second place goes to those with only primary education finished (92.149), and then there are those with incomplete primary education (34.897) and those with no education at all (20.066). 20.726 people finished higher or high education.

Table 5: Population over 10 years old according to literacy and gender.

Municipalities/cities	Number	%	m	f
Bihać	1,231	2.42	0.82	3.88
Bosanska/Kozarska Dubica	590	3.09	0.83	5.24
Bosanska Kostajnica	115	2.21	0.55	3.80
Bosanska Krupa	918	4.06	1.13	6.86
Bosanski Novi/Novi Grad	666	2.86	0.92	4.78
Bužim	575	3.47	1.12	5.92
Cazin	2,071	3.57	0.96	6.16
Ključ	565	3.71	0.70	6.71
Krupa na Uni	145	9.96	2.67	18.51
Oštra Luka	196	7.94	2.53	13.62
Prijedor	2,172	2.92	1.17	4.56
Ribnik	456	8.50	2.60	14.25
Sanski Most	1,109	2.92	0.79	5.08
Velika Kladaša	1,615	4.64	1.57	7.55

Source: Institute for Statistics of FB&H, 1998; Institute for Statistics of FB&H, 2016; Republika Srpska Institute of Statistics, 2017.

It is evident that there are more illiterate females than males during the pre-war period, as well as during the post-war. According to the level of education, the highest number records population with secondary education finished (163,646).

The second place goes to those with only primary education finished (92,149), and then there are those with incomplete primary education (34,897) and those with no education at all (20,066). 31,185 people finished higher or high education (20,726 finished university).

Migrations: One big issue in Bosnia and Herzegovina, including also this part of the country, besides negative natural growth, is emigration. After 1991, during the war period, enormous wave of emigrating has risen, mostly towards European countries and the USA. Nowadays, situation is disastrous in the Una-Sana mesoregion. This area resembles a deserted island more every day. Young population is trying to allude on and warn governing structures about a very popular trend of their peers leaving the country. This frequency and tendency of leaving will lead to a lack of workers and human resources. This situation was caused by numerous factors. Better life conditions abroad and unemployment in Bosnia and Herzegovina are the main reasons for more and more people leaving the country. Besides economic, there are political factors, too. This mesoregion faces the issues of leaving within a group of population of working age, but also complete families, which is highly recorded at the Labor Bureau evidence and at primary and secondary schools enrolments, as well as the budget deficit. Still, there are no official records or evidence on the number of emigrants in our country. 28,387 (10,38% of total number of population) citizens in the Una-Sana Canton, in 2017 and 2018, applied for the No-Criminal Record

Certificate at Criminal Records Office of the Police Department of Ministry of Internal Affairs, for the purpose of job-finding abroad (Internet 1). This means that almost every tenth citizen, during that period, left the country or was in the process of leaving. During 2018, 14,500 visas were issued in this Canton and the number of insured persons is decreasing. Nermina Čemalović, the Minister of Health, Labor and Social Affairs of the Una-Sana Canton, pointed out that during the 2017/18 school year, there were four schools less, 862 primary schools students and 150 secondary schools students less than during the previous school year (Internet 2). 2019/20 school year faced closing of 39 schools, mostly branch schools (Internet 3). Situation is no better over the Municipalities of Republic of Srpska. Decreasing number of population is mostly evident in Prijedor, where in 2019, „Water Supply and Sewage Utility Company“, Plc. Prijedor lost 7000 consumers who left for better and more secure life abroad (Internet 4).

Depopulation during the last year of coronavirus pandemic was neither reduced nor prevented. Unfortunately, the Una-Sana Canton has been facing enormous issues over the past few years - migrant crisis. Long-term conflicts over the past years in the Middle East and North Africa initiated mass migrations of mixed type towards European continent, so Bosnia and Herzegovina has become „country en route“ for migrants and refugees since 2016, and since 2018 the situation has been even more complex. The Una-Sana Canton has the greatest consequences due to migrant crisis, carrying the biggest burden due to border with Croatia, i.e. the European Union. At the beginning of 2020, migrants were located in five reception centers of this Canton. According to the last 2013 census, Bihać had the total number of population 56.261. Actually, that number is significantly lower if considering emigrations towards more developed parts of Europe. It is estimated that 20% out of total number of population in Bihać in 2019 were migrants.

Economic characteristics of the area

Industry growth is oscillating in intensity. Agricultural potentials of the Una-Sana mesoregion are significant, but are being unexploited. Dominating branches are farming, vegetable-growing, fruit-growing, bee growing, and fishing. Some estimates show that the Una-Sana Canton may grow agriculturally to provide food for 2 million people, but regardless of this import rate is higher every year (Internet 5). There is a low rate of applying modern agrotechnical measures and inadequate law regulations. There is a great portion of the agricultural areas under mines. Land for agriculture is mostly private property (approximately 94%) and it is characterized by the fragmentation in size (3-5 ha). Increasing agricultural production of goods is hampered by the lack of full infrastructure and the absence of the open market for agricultural products. Irrational deforestation, uncontrolled converting of agricultural properties into constructing areas and illegal waste dumps are the greatest cause of agricultural areas reduction (Development Agency of the Una – Sana Canton 2013).

Alluvial plains in the valleys of the Una, the Sana and the Gomjenica (the Bihać valley, the fields of Prijedor and Knešpolje) are more significant for crops and vegetable production. Potkozarje and other hillsides around the Una and the Sana, including Cazin-Kladuša area, are significant for fruit growing and cattle breeding. Fruit growing is the most developed in Potkozarje and around the Sana River where enormous quantity of plums is grown every year. Walnut and chestnut growth is also developed. The greatest areal of the chestnut in our country is in the municipality of Cazin and it

contributes continuous increment of the honey production. Branding of the chestnut honey of the Cazin Krajina has contributed to the quality, recognition and market placement of the honey (IPA programme of the European Union for Bosnia and Herzegovina 2013). Medicinal and aromatic plants for industrial processing are being grown in Kladaša area.

A cattle breeding is not proportionally developed to natural and geographical capacity. Sheep and cattle are mostly bred whereas other branches of cattle breeding are less present. Apart from Kozara and Grmeč, where foresting is highly developed, forests of this mesoregion are prostrated and converted into arable land and pastures, and scrubland is significantly grown. Fish and juvenile fish species are significantly produced as a part of primary agricultural growth in the area of Bihać.

Industrial production of this area is based on exploiting natural minerals, ores (manganese, carbon, bauxite, and dolomite) and forests, and additionally producing food products (meat products, dairy products, beer, fruit and vegetable products). During the wartime, industry facilities and buildings had been significantly damaged. Industrial capacities are unused due to closures or bankruptcy. Industrial production has been weakened, there are income reduction and lost job vacancies. Low technical-technological development, insufficient qualifications for using the new technologies and insufficient focus on products of bigger VAT have led to the loss of international market and low export rates. There is a lack of strategies for the managing of industrial development, including lack of development program and integrated policies for increasing competitive side of the industrial production.

Industrial branches are food, forestry and wood-processing, metal production, energy and mining, construction and constructing products, textile production and sanitary equipment production, chemical industry, tires and packaging products. Some of the best-known factories in this area are "Meggle", "Austrotherm", "Krupa-kabine", "Agrokomerc", "Kombitex", "Javor".

Some minerals and ore locations are found as follows: manganese – Bužim (exploitation rate annually in 2019 was 1,645.64 m³), bauxite – Sanski Most (0.0), brown coal – Kamengrad in Sanski Most (1,033.57 m³) and Cazin (0.0), gypsum/cast – Bukvarine (0.0) and Brešćić (9,909 m³) in Bihać, baryte – Velika Kladaša (0.0), tuf – Sanski Most (0.0), brick clay – Cazin (42,293 m³) and Sanski Most (0.0), Lisovac limestone – Cazin, quartz sand – Sanski Most. This area is full of limestone sites (Velika Kladaša, Bosanska Krupa, Sanski Most, Bihać, Ključ) and dolomites (Cazin, Sanski Most, Bosanska Krupa, Bihać, Velika Kladaša, Ključ, Bužim (Strategic platform of the Una Sana Canton Draft 2020). Energy basis of Pounje is very favorable but unexploited. Una-Sana basin records annually average 1,000-1,600 mm rainfalls and it is hydroenergy wealthy.

On the Una river, downstream of Bihać, hydroelectric power station „Una Waterfalls“ was built in 1954. Iron ore mines „Ljubija“ Plc. Prijedor were established with the purpose of ore exploitation in Prijedor and Sanski Most. Mineral rich area is approximately around 1,200 km². Exploring metallogenic area of Ljubija, it was recorded that there were 347 million of tons of geological reserves of iron ore and significant number of minerals like quartz, clay, limestone, dolomites, baryte, fluorite, zinc, lead. This mine has produced about 74 million of tons of iron ore for 85 years of

working (Internet 6). Brown coal deposits can be found in fields of Omarska, near Bosanski Novi.

The Una-Sana mesoregion is transit area well connected proportionally to other neighboring regions. Main road directions go along the Una and the Sana valley. From these, many roads lead towards Cazin and Velika Kladuša, Bosanska Dubica and Ključ. On major roads and crossings, main towns have developed: Bihać, Bosanska Krupa, Bosanski Novi, Prijedor, Bosanska Dubica, Sanski Most, Ključ, Cazin and Velika Kladuša.

The Una railroad (Bosanski Novi – Bihać – Knin) is 178 km long, was the most profitable way of transporting goods and passengers during the pre-war period, in the north – south direction. During the post-war period, this railway traffic has faded. The railroad Bosanski Novi – Banja Luka – Doboј connects Krajina with Bosnian valley and Tuzla basin. Nowadays, railroad connects Bihać with Sarajevo.

Bihać is amongst rare towns in Europe with three airports. Locations of these three airports, Golubić, Čoralići and ex-military airport Željava, enable long flying of paraglide and sailplanes over the year, and strong windward waves are suitable for high-altitude flights. Although, only Golubić airport is in use, there are different growing perspectives for the all three airports in Krajina. In Bihać, the decision has been finally made on reconstruction of the Golubić airport, i.e. putting into function other than being only „sports airport“ (Internet 7).

The Una-Sana mesoregion possesses great touristic potentials. Some of them are National parks „Una“ and „Kozara“, attractive rivers: the Una, the Sana, the Dabar, the Krušnica, the Klokot, the Unac and the Korana, resourceful forests, thermomineral springs (Gata in Bihać, Ilidža in Sanski Most, Mlječanica in Bosanska Dubica), various historical settlements, etc. These are all favorable preconditions for the development of different forms of tourism: excursions, historical tours, spa, sports and recreation (the Una rafting), hunting and fishing, cultural tourism and many others.

4. Conclusion

This paper analyses the main characteristics of the current state and future development of the Una-Sana mesoregion. Primarily, we have tried to present the problems and weaknesses of the current situation. We accentuated factors that detain the development and become the obstruction of the recovery of this part of BiH. The given indicators show that the industrial and economic potential of the Una-Sana mesoregion is significant, however not fully leveraged. Despite these potentials, it is evident that the country has been neglecting this mesoregion over the years. The Una-Sana mesoregion has not been included in the investments of the public funds aimed for the economy which would contribute to its development and achieve social objectives. Sarajevo, the capital of Bosnia and Herzegovina, and Bihać, the centre of the Una-Sana Canton, are connected neither by national motorway nor by a state highway. It is faster to get to Graz from Bihać than to Sarajevo. Although this Canton borders the European Union, residents are still using the roads built in Yugoslavia. A set of other data indicates that higher levels of governance and authority have not been sensible towards this less developed region. This led the Una-Sana mesoregion to have become an emigrating area of our country. Emigration in the Una-Sana

mesoregion, and the rest of Bosnia and Herzegovina, has become the burning issue demanding some urgent measures. Better living conditions and the inability to find jobs are the main reasons for the emigration of a big number of people. Bosnia and Herzegovina has been a collateral station for migrants and refugees since 2016. The migrant crisis has shown many weaknesses in the state's functioning. It highlighted weak institutions and inadequate accommodation units. Apart from this, the migrant crisis has again proven the state's negligence towards its northwest area because the Una-Sana Canton has been bearing the highest burden. In our opinion, it is high time that different structures of government start dealing with the economic care of people and to stop the emigration of the working people, which is evident for the whole country.

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GEOGRAPHICAL CHARACTERISTICS OF THE UNA-SANA MESOREGION

Summary

Being a very specific part of Bosnia and Herzegovina was the reason for detailed analysis of the Una-Sana mesoregion in this paper. It is located in northwest part of Bosnia and Herzegovina. It is a part of Peripannonian mesoregion of Bosnia. Natural and social characteristics of this area are various. The terrain is made of Paleozoic, Triassic, Jurassic, Cretaceous, Eocene, Miocene, and Quaternary sediments. Morphological structure comprises of valley-basin and mountain forms. Here are parts of Grmeč Mountain, Majdan Mountain, Kozara, Knešpolje, Bihać basin, the Una-Sana basin. The humid subtropical climate (Cf) is mostly found in the area. Rivers of this area belong to the Una basin and the Glina and Korana basin. Pedogeographical analysis shows the greatest presence of mosaics calcomelanosol-luvisol, calcocambisol-luvisol, calcomelanosol-calcocambisol-luvisol and complex redzina-calcocambisol-luvisol on limestones and dolomites, and biogeographical analysis shows the presence of sessile and hornbeam forests.

In 1981, the Una-Sana mesoregion had the population of 507,755 residents, in 1991 – 528,881, and in 2013 – 408,531. The highest number of residents was in the city of Prijedor, and the lowest was in Krupa na Uni and Bosanska Kostajnica. The highest density was recorded in Bužim and Cazin, and the lowest was in Ribnik and Oštra Luka. Average density of the Una – Sana mesoregion is 69.0 people per km². In 2019, the highest natality rate was recorded in Bužim (9,4‰), Velika Kladuša (9‰) and Bihać (8,1‰). The highest mortality rate was recorded in Oštra Luka (26,5‰), Krupa na Uni (26,1‰) and Ribnik (22,5‰). Bužim and Velika Kladuša are the municipalities with positive natural increase. In 1991, there were 356,140 mature residents, 127,967 young, and 44,774 old. According to the last census in the Una-Sana mesoregion, the total population of 66,493 young residents, 299,728 mature and 54,156 old. The 1991 census recorded for the gender structure higher number of male than female residents, and in 2013, there were more female residents than male. Illiteracy rate of this area is rather high with 4,4%.

The key aspects of the economic growth of the Una-Sana mesoregion are favorable geo-traffic position, plenty of natural resources and raw materials (forests, rivers, waters, and ores), pleasant climate and natural beauties and touristic benefits. In agricultural structure, farming is more significant than cattle-breeding. People mostly grow corns, vegetables, plums, chestnuts, walnuts, etc. Sheep and cattle are mostly bred whereas other branches of cattle breeding are less present. This area is mineral-wealthy. There are also various industry branches developed here (food, forestry and wood production, graphic, metal production). This area is well connected with other neighboring regions. It possesses major touristic potentials for the development and growth of different forms of tourism. Regardless of all the resources of this area, demographical image is very highly unfavorable. Dissatisfying basic life conditions, as health, unemployment, proximity of the European Union influenced emigrations of young people in big number every day. Unfortunately, there are no official records on the emigrants. Authors of this paper consider that it is high time for the government to pay attention more to a particular problem Bosnia and Herzegovina is facing with every day. Emigration in the Una-Sana Canton, including the rest of the country, is alarming issue requiring urgent measures.