LOCAL POPULATION ANALYSIS IN THE FUNCTION OF THE PROTECTED AREA SUSTAINABLE DEVELOPMENT

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Abstract: The research focus of the paper is set on the socio-economic potential of a protected area, as a key factor and a prerequisite for its development. The spatial framework of the research includes five settlements in the vicinity of Special Nature Reserve "Carska Bara" (Northern Serbia). For the purpose of this research, they are classified into two groups, based on their distance from the fundamental phenomenon. The demographic characteristics analyses of the study area include basic demographic determinants such as population structures and migration characteristics. Population data related to the change in the number of inhabitants and the types of the total population movement were collected and analyzed, and a comparative analysis of the aging index was performed as well. In order to better understand the condition of the economic structure, the economic activity, and the structure of the active population performing occupation were analyzed by activity sections. The current state of the social infrastructure (schools, primary health care facilities, pharmacies, post offices, sports, and recreation facilities) was also considered, as one of the qualities of life indicators of the local population. The obtained results indicate an unfavorable demographic picture of the analyzed areas. These are smaller population areas, predominantly inhabited by population of the old age groups. Although they are in protected areas which, in the context of tourism, are abounding in natural potentials, but without implementing significant steps and certain measures, no progress and improvement of the demographic condition can be expected.

Keywords: local population; protected areas; sustainable development; Ramsar area; Special Nature Reserve "Carska Bara"

Introduction

Rural areas placed under the legal protection for their valuable and attractive nature can turn their natural potentials into a resource that will provide the local population an additional source of income and enable them to remain active in that area. Tourism is one of the sustainable activities that can make this possible (Stanković, Filipović, & Obradović, 2003). Along with agriculture as a kind of additional activity, it can add to developing sustainable types of tourism (rural tourism, ecotourism, ethno, fishing, hunting, cycling tourism) through the placement and direct sale of food and non-food products.

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Community-based ecotourism has become a popular tool in biodiversity conservation, especially in developing countries (Kiss, 2004). It has its positive sides (generating income for local communities, improving the attitudes of local people about environmental protection) and negative sides (limitations in terms of small area size, small number of people involved, limited earnings, weak links between biodiversity benefits, and commercial success, competitive tourism industry, a modest addition to local communities that have remained dependent on external material assistance for a long time) (Kiss, 2004). But primarily, like any other activity, it implies the existence of an educated and preferably younger workforce. At the same time, the population of rural areas of Serbia is decreasing and getting older (Josipović, 2019).

These valuable areas rich in natural resources are not a rarity in Serbia. There are currently 11 of them, and the Institute for Nature Protection has compiled a list that includes another 68 potential Ramsar sites. These protected rural areas deserve special attention because of all the changes they have experienced in recent decades—population aging, depopulation, migration, changes in traditional lifestyles and work, the appearance of new demographically vulnerable areas left behind after abandoning the small industrial plants. All of these and similar changes have affected their sustainability.

The key factor in their sustainable development is the local government and local population, more precisely, their ability to attract external capital, but at the same time to be environmentally aware and responsible, in order to achieve the necessary balance between the development of such areas on one hand and their vulnerability on the other (Ancuta, Olaru, Popa, Isfănescu Ivan, & Jigoria-Oprea, 2015).

The aim of this paper is to analyze the demographic state of these protected areas in order to see if this is one of the factors that hinder their development. They are protected as places of rare and valuable nature (primarily as habitats for wetland birds, but most of them have other natural qualities—the richness of forests, water, ichthyofauna and wildlife, attractive landscapes, recreational, and tourist values), but also the areas with a particularly high depopulation rate.

Study area

Special Nature Reserve (SNR) "Carska Bara" is located in the northeast part of Serbia, in particular, in Vojvodina Province, on the territory of the City of Zrenjanin. It includes parts of the cadastral municipalities of Belo Blato, Knićanin, Lukino Selo, Perlez, and Stajićevo. Until 2010, it was called "Stari Begej – Carska Bara" and under this name it is still listed on the Ramsar List. It is a protected area of exceptional national and international importance. In 1955 a part of the Reserve called Vojtina Mlaka was first protected. In 1986, the regional nature park "Stari Begej" was declared a strict natural reserve, and in 1994, the area was declared a special nature reserve named "Stari Begej – Carska Bara". As one of the 11 sites currently in Serbia, this one, under the name of SNR "Stari Begej – Carska Bara" was first declared as a Ramsar site in 1996 (Ramsar Sites Information Service, 2021). The Ramsar site still has the same name and the Reserve itself changed its name in 2011 to SNR "Carska Bara", according to a new regulation (Uredba o proglašenju Specijalnog rezervata prirode Carska bara, 2011). Also, it is an Internationally Important Bird Area (RS011IBA), a Significant Botanical Area of Europe (IPA), as well as the Emerald Area of Serbia.

The settlements of the protection zone and the immediate surroundings of SNR "Carska Bara" are rural. Besides additional income, the development of tourism, would provide the market for the placement of domestic agricultural products. Also, as Milenković (1995) points out, agriculture would contribute to the development of tourism by providing the necessary areas for its development, through giving away or selling infertile agricultural land which would then serve as land for building tourist infrastructure.

Lukino Selo, Perlez, and Stajićevo are traditionally oriented towards agricultural production. They have a large share of the active agricultural population and are well-positioned in terms of traffic. Belo Blato has long been recognized as a tourist destination and its future development is based on tourism. Knićanin has a less favorable position than other settlements, but with the river Tisza, as a possible corridor nearby, it has everything needed for the future development of nautical tourism.
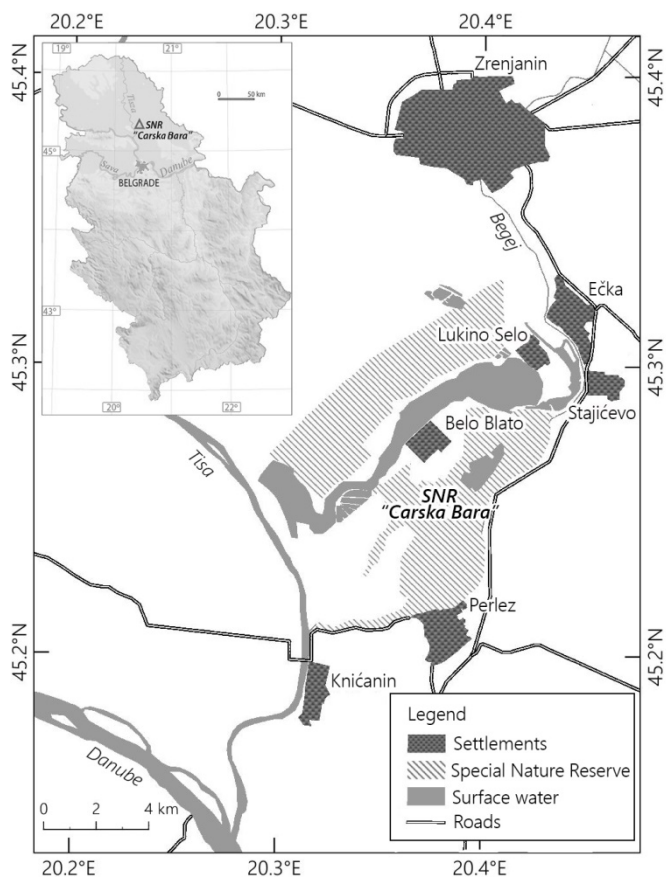

Figure 1. Settlements in the surroundings of SNR "Carska Bara".

Physical geographical features of SNR "Carska Bara"

In the area of the Reserve and the wider surroundings, sedimentary rocks of Neogene age are present. Beneath the Quaternary formations—sands and clays, rocks from the Neogene (sediments with the appearance of coal and gaseous hydrocarbons), Mesozoic (limestone and sandstone), and Paleozoic (shales and granites) lie. The settlements of Belo Blato, Knićanin, and Lukino Selo were formed on the alluvial plain of the rivers Begej and Tisza (Figure 1). Stajićevo is on the diluvial (loess) terrace, while Perlez is at the contact of the alluvial plain and diluvial (loess) terrace. There was an

anthropogenic influence in this area which reflected the change of the local relief over time: first, in the 18th century, by regulating the Begej riverbed, and then in the 19th century, by building 4,000 ha of fishponds (Pokrajinski zavod za zaštitu prirode, 2010). Data on the values of the climatic elements from the meteorological station Zrenjanin (45°24′ N, 20°25′ E, 80 m above sea level) show that the average annual air temperature, for the period 1966–2010, was 11.3 °C. The month with the highest average temperature was July (21.7 °C) and the month with the lowest average temperature was January (−0.3 °C). The average annual humidity, calculated for the period 1961–2010, was 74.4%. It was the highest in December (86.5%) and the lowest in May (68.1%). The average annual cloud cover, for the period 1961–2010, was 5.5. The average annual precipitation, for the same period, was 574.9 mm, with the highest amounts in the spring and summer months (June 84.4 mm, July 60.2 mm). The dominant wind is Košava, which blows from the southeast (20.3), but winds from the west (15.5) and northwest (14.1) are also frequent (Milovanović, Radovanović, Stanojević, Pecelj, & Nikolić, 2017). The richness and diversity of vegetation and fauna is a direct consequence of the soil type diversity (Pokrajinski zavod za zaštitu prirode, 2010). Puzović, Sekulić, Stojnić, Grubač, and Tucakov (2009) point out the existence of a mosaic of different habitats composed of marshes, meadows, pastures, forests, intersected by ponds and lakes and surrounded by fields. It is home to about 500 species of plants (Puzović et al., 2009), 150 species of insects, 27 species of fish, 11 species of amphibians, five species of reptiles, and 30 species of mammals (Pokrajinski zavod za zaštitu prirode, 2010). The Reserve is specific and recognized primarily by its ornithofauna. The richness and diversity of ornithofauna are largely contributed by the nearby fishponds "Ečka" because they represent an excellent source of birds' food. Puzović et al. (2009) confirmed the existence of 230 present bird species, of which about 120 are nesting species.

Materials and methods

The paper is part of a wider research which is focused on the possibility of sustainable development of local communities in the protected areas of Serbia, taking two Ramsar sites as an example. The presented results refer to SNR "Carska Bara" and were obtained by analyzing official statistical data for the settlements from the last three censuses provided by the Statistical Office of the Republic of Serbia (SORS).

In order to analyze the socio-economic potential of the settlements in the surroundings of the Reserve, basic demographic indicators were considered. These are the parameters used by Šulc and Valjak (2012), which refer to population dynamics (population change or analysis of population change index, types of total population change, and comparative analysis of the population aging index) and basic population structures (sex and age, economic activity, structure of the active population engaged in occupation that they practice as their activity). According to Šulc and Valjak (2012), important indicators of economic sustainability are the tourism indicators (number of beds, overnight stays, etc.). However, these indicators could not be analyzed due to a lack of data or a very small number of categorized households (only two) and households engaged in tourism.

For a more precise perception of the age structure of the Reserve's population, the aging index (I_s) was calculated according to Penev (1995) and it represents the ratio between the population older than 60 ($P_{(60+)}$) and the population younger than 20 ($P_{(0–19)}$). The formula for the aging index is:

$$I_s = \frac{P_{(60+)}}{P_{(0-19)}} \cdot 100 \tag{1}$$

According to the obtained results for the aging index, the types of aging (five of them) were derived. If the value of the aging index is higher than 40 percent, the population is considered to be in the stage of the deep or the deepest demographic age (Penev, 1995).

In order to determine whether the location, that is, the proximity of the phenomenon, is an important factor, settlements within SNR "Carska Bara" are divided into two groups. Belo Blato and Lukino Selo are in the Reserve's protection zone, while Knićanin, Lukino Selo, and Stajićevo are in the Reserve's immediate surroundings. To gain a complete picture of the social conditions that prevail in the researched area, social infrastructure (elementary schools, primary health care facilities, pharmacies, post offices, libraries, cultural centers, sport, and recreation facilities) was also noted.

Results

Population change

The population change according to the results of the censuses conducted between 1948 and 2011 indicates a continuous depopulation. The City of Zrenjanin is the largest municipality of Banat, and a political, economic, cultural, and sports center with, consequently, the largest number of attractive factors (Kicošev, Bubalo-Živković, & Ivkov, 2006). The attractive factors include high schools, health services, theaters, cinemas, jobs, administration, etc. Nevertheless, the number of inhabitants in the settlements around the Reserve is, from census to census, decreasing (Figure 2a and 2b).
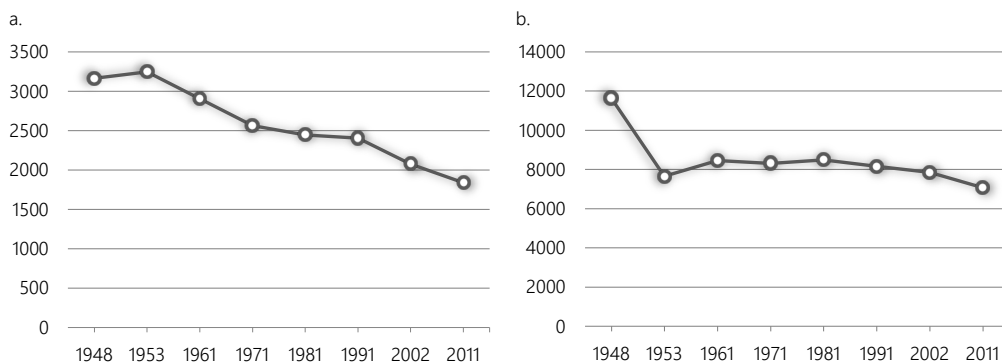

Figure 2. The total population change of the settlements of SNR "Carska Bara" protection zone (a) and its immediate surroundings (b) according to the censuses 1948–2011. Adapted from *Geoecological evaluation of Ramsar sites in the function of sustainable community development in Serbia* [Unpublished doctoral dissertation] (pp. 39–40), by T. Jojić Glavonjić, 2020, Belgrade, Serbia: University of Belgrade, Faculty of Geography. Adapted with permission. The data in the charts are calculated based on *2011 Census of Population, Households and Dwellings in the Republic of Serbia: Book 20. Comparative overview of the number of population in 1948, 1953, 1961, 1971, 1981, 1991, 2002 and 2011 – Data by settlements*, by SORS, 2014 (https://publikacije.stat.gov.rs/G2014/Pdf/G20144008.pdf). In the public domain.

For a more precise perception of the change in the number of inhabitants of the analyzed area, the population change index was calculated. Since the beginning of the observed period (1948/53), an increase in the number of inhabitants was registered in three settlements (Belo Blato, Perlez, and Stajićevo). Even then, a decrease in the number of inhabitants was noted in two settlements

(Lukino Selo and Knićanin). In the last inter-census period, a total population decrease was recorded in all the settlements as the largest decrease was in the settlement of Lukino Selo (16.7%).

In the settlements of the Reserve's protection zone (Belo Blato and Lukino Selo), in 1991, the number of inhabitants was lower by 1.8% than in 1981, in 2002 it was reduced by 13.7% compared to 1991, and with the last 2011 Census a decrease of 11.3% was recorded compared to 2002. In the settlements of the immediate surrounding area of SNR "Carska Bara" (Knićanin, Perlez, and Stajićevo), in 1991, the number of inhabitants was by 4% lower than in 1981, in 2002 it decreased by 3.9%, and in the last census from 2011 a decrease of almost 10% was recorded compared to 2002 (Table 1).

Table 1
Change in the number of inhabitants by groups of settlements in the Reserve area 1948–2011

Year	Population change index in the Reserve's protection zone			Population change index in the Reserve's immediate surroundings			
	Belo Blato	Lukino Selo	Total	Knićanin	Perlez	Stajićevo	Total
1953/1948	115.3	75.2	102.5	30.1	102.1	108.5	65.8
1961/1953	81.6	115.7	89.5	120.4	105.6	115.0	110.6
1971/1961	90.6	82.4	88.2	103.8	91.3	113.7	98.3
1981/1971	94.8	97.4	95.5	98.8	96.1	124.0	102.2
1991/1981	100.9	91.5	98.2	100.0	90.6	103.3	96
2002/1991	83.8	93.0	86.3	91.3	98.4	97.1	96.1
2011/2002	90.8	83.3	88.7	86.2	88.6	97.1	90.1

Note. Adapted from *Geoecological evaluation of Ramsar sites in the function of sustainable community development in Serbia* [Unpublished doctoral dissertation] (p. 40), by T. Jojić Glavonjić, 2020, Belgrade, Serbia: University of Belgrade, Faculty of Geography. Adapted with permission. Data in the columns are calculated based on *2011 Census of Population, Households and Dwellings in the Republic of Serbia: Book 20. Comparative overview of the number of population in 1948, 1953, 1961, 1971, 1981, 1991, 2002 and 2011 – Data by settlements*, by SORS, 2014 (https://publikacije.stat.gov.rs/G2014/Pdf/G20144008.pdf). In the public domain.

Types of population dynamics

The components of the total population, but also of the natural population change are unfavorable in all the five settlements of the protection zone and the immediate surroundings of the Reserve for the period (1991–2011). By observing the total population change and the component of natural change (monitored through total natural increase), it can be concluded that all the settlements have negative values. This indicates that the decrease in the number of inhabitants is partly caused by the negative natural increase.

During the observed period (1991–2011), a decrease in the number of inhabitants was recorded in all the settlements of the Reserve. Observed by settlements, the largest decrease in absolute terms was recorded in the settlement of Perlez (−435). The other components of population change (natural increase, migration rate) have a negative sign as well. Putting all the three components together (Friganović, 1987), it can be noted that almost all the settlements in this area are in the E4 type, i.e., "dying out" (Table 2).

Table 2

Population change in the settlements of SNR "Carska Bara" 1991–2011

Settlement	Total population change 1991–2002	Total population change 2002–2011	Natural population change 1991–2002	Natural population change 2002–2011	Net migration		Type of total population change
					1991–2002	2002–2011	
Belo Blato	−285	−135	−15	−9	−300	−144	E4
Knićanin	−193	−281	−16	−20	−209	−301	E4
Lukino Selo	−45	−100	−12	−11	−57	−111	E4
Perlez	−62	−435	−55	−61	−117	−496	E4
Stajićevo	−59	−58	−5	−22	−64	−80	E4
Total	−644	−1,009	−104	−123	−747	−1,132	E4

Note. Adapted from *Geoecological evaluation of Ramsar sites in the function of sustainable community development in Serbia* [Unpublished doctoral dissertation] (p. 42), by T. Jojić Glavonjić, 2020, Belgrade, Serbia: University of Belgrade, Faculty of Geography. Adapted with permission. Data in columns are calculated based on *2011 Census of Population, Households and Dwellings in the Republic of Serbia: Book 20. Comparative overview of the number of population in 1948, 1953, 1961, 1971, 1981, 1991, 2002 and 2011 – Data by settlements*, by SORS, 2014 (https://publikacije.stat.gov.rs/G2014/Pdf/G20144008.pdf). In the public domain; *Vital statistics in the Republic of Serbia, 1991, 2002, 2011* [Unpublished data], by SORS, n.d.-b; *Internal migration in the Republic of Serbia, 1991, 2002, 2011* [Unpublished data], by SORS, n.d.-c.

The negative trend in the number of inhabitants, but also in the natural population change, indicates that in these areas, in addition to the insufficient number of births (low birth rates), there is also a trend of continuous emigration. The same tendencies regarding the population change in the protection zone of the Reserve are present in its immediate surrounding as well. Negative values of all the population changes were recorded in all the three settlements. Determining the types of population change showed that all the settlements belong to the E4 subtype.

The age and sex population structure

According to all age components, the population of Serbia ranks among the oldest populations in Europe (Nikitović, 2015). The 2011 Census indicates that the population of Serbia is exposed to an intensive aging process, which is especially reflected in the decreased share of the young population and the increased number of elderly people (over 65). Insufficient births and emigration, especially of young people, can be identified as the main causes of the intensive aging process (Devedžić & Stojilković Gnjatović, 2015).

The process of urbanization or deruralization of Vojvodina Province, which began after World War II and was most intense in the period 1961–1991 (Predojević, 2001), left great consequences on the population age structure. At that time, the so-called primary urbanization, i.e., migrations of the population from rural to urban settlements dominated. The rural population predominated in the emigration of people going to work abroad. However, urbanization has not had a decisive impact for some time when it comes to the aging of the rural population. The age and sex structures, birth rate, and mortality have more influence nowadays. A study conducted by Predojević (2001) at the end of the 20th century showed that the population of rural Vojvodina Province was already at higher stages of demographic age, with a large shortage of middle-aged women and an unfavorable age structure. This situation of the last decades on the territory of the former SFR Yugoslavia was caused by the war and the political turmoil since the refugees were mostly settled in the urban settlements of Vojvodina Province.

The average age of the population in all the settlements of the study area, by the 1991 Census data was 36.7 years, with no significant difference in average age between the two study zones. The share of young people in the total population was 26.6% (the national average was 21%; SORS, 1993), with a minimal difference between the zones. The share of the elderly in the total population was 11.5% (the national average was 16.1%; SORS, 1993), with a visible difference between the two zones. The share of the female population was slightly higher than the share of the male population (Table 3).

Table 3

Basic indicators of the population age-sex structure in the settlements of the protection zone and the immediate surroundings based on 1991, 2002, and 2011 Censuses

Settlement	Average age			The share of population under 20 years of age (%)			The share of population over 65 years of age (%)			Femininity ratio			Masculinity ratio		
	1991	2002	2011	1991	2002	2011	1991	2002	2011	1991	2002	2011	1991	2002	2011
Belo Blato	36.6	39.4	41.5	27.2	22.7	20.5	12.0	14.6	15.5	101.6	98.8	100.6	98.4	101.2	99.4
Knićanin	35.2	39.2	43.7	27.5	24.3	18.3	7.5	14.6	19.3	95.6	100.2	96.3	104.4	99.8	103.8
Lukino Selo	37.4	39.4	42.7	25.3	23.4	18.5	13.8	13.7	17.3	97.2	93.5	96.1	102.8	106.9	104.1
Perlez	39.2	41.3	43.2	24.8	21.6	19.9	15.0	18.6	18.3	106.8	102.5	100.5	93.6	97.5	99.5
Stajićevo	35.3	38.8	41.5	28.2	22.7	21.8	9.2	13.6	15.7	103.1	101.7	101.7	96.9	98.3	98.3
Total	36.7	39.6	42.5	26.6	22.9	19.8	11.5	15.0	17.2	100.8	99.3	99.0	99.2	100.7	101.0

Note. Adapted from *Geoecological evaluation of Ramsar sites in the function of sustainable community development in Serbia* [Unpublished doctoral dissertation] (pp. 44–46), by T. Jojić Glavonjić, 2020, Belgrade, Serbia: University of Belgrade, Faculty of Geography. Adapted with permission. Data in the columns are calculated based on: *Population census, 1991: Age and sex* [Unpublished data], by SORS, n.d.-a; *2002 Census of Population, Households and Dwellings: Book 2. Age and sex – Data by settlements*, by SORS, 2003 (https://publikacije.stat.gov.rs/G2002/Pdf/G20024002.pdf). In the public domain; *2011 Census of Population, Households and Dwellings in the Republic of Serbia: Book 2. Population by age and sex – Data by settlements*, by SORS, 2012 (https://pod2.stat.gov.rs/ObjavljenePublikacije/Popis2011/Starost%20i%20pol-Age%20and%20sex.pdf). In the public domain

In the 2002 Census data, an average age of the population of 39.6 years was recorded. The lowest was in Stajićevo—38.8, and the highest in Perlez—41.3 years. By zones, it was slightly higher in the settlements of the protection zone (Belo Blato and Lukino Selo)—39.4 versus 39.8 in the settlements of the immediate surrounding zone (Knićanin, Perlez, and Stajićevo). The share of young people in the total population decreased by 3.7% compared to 1991 (by 3.15% in the settlements of the protection zone and by 3.9% in the settlements of the immediate surroundings). On the other hand, the share of the elderly increased by an average of 3.5% (in the settlements of the protection zone by 1.6%, and in the settlements of the immediate surroundings by 5%) and in most of the settlements of the research area it exceeded the national average of 14% (SORS, 2003) (Table 3). According to the 2002 Census data, the femininity ratio was 99.3, while the masculinity ratio was 100.7, which indicates a higher number of men than women.

According to the 2011 Census, the average age of the population in all the settlements of the Reserve was 42.5 years. While the average age in 1991 and 2002 indicated demographic aging, in 2011 it indicated deep demographic old age in all the settlements. The share of young people in the total population was 19.8% (the national average was 14%; SORS, 2012), without a significant difference between the two observed groups of settlements. The average share of the elderly in the

total population in all the settlements was 17.2% (the national average was 17%; SORS, 2012), with a higher share of the elderly than the young being recorded for the first time in one settlement (Knićanin). The analysis of the sex structure data indicated a slight advantage of the male population over the female, according to the 2002 and 2011 censuses. Only the 1991 census data showed a slightly higher share of the female population (femininity ratio of 100.8). In three settlements (Belo Blato, Perlez, and Stajićevo) the share of the female population was higher, while in the remaining two settlements (Knićanin and Lukino Selo) the share of the male population was slightly higher in 1991 (Table 3).

The analysis of census data on demographic statistics showed that in the period 1991–2011, in the settlements of SNR "Carska Bara", the average age increased from 36.7 to 42.5 years, the share of young people decreased from 26.6% to 19.8%, and the share of the elderly increased from 11.5% to 17.2% (Table 3). Taking into account the criteria established by Penev (1995), the population of the settlement of SNR "Carska Bara" is in the deep or the deepest demographic old age, depending on the indicator observed. If only the share of people under the age of 40 were observed, all the settlements would belong to the category of the deepest demographic old age. Taking into account only the share of young people under 20 years of age, the population of Belo Blato and Stajićevo belongs to the category of deep demographic old age, and Knićanin, Perlez, and Stajićevo of the deepest demographic old age. Likewise, observing the share of people older than 60, Belo Blato and Stajićevo are in the category of deep, and the other settlements are in the category of the deepest demographic old age (Table 4).

Table 4

Indicators of the population demographic aging in the settlements of SNR "Carska Bara", according 2011 Census data

Settlement	Indicators of the population demographic ageing			
	Population under 20 years of age (%)	Population under 40 years of age (%)	Population over 60 years of age (%)	The ageing index
Belo Blato	20.5	25.9	23.0	112.4
Knićanin	18.3	23.5	26.5	144.8
Lukino Selo	18.5	25.5	25.5	134.8
Perlez	19.9	24.5	26.8	134.7
Stajićevo	21.8	25.6	23.5	108.0
Total	19.8	44.9	25.4	126.8

Note. Adapted from *Geoecological evaluation of Ramsar sites in the function of sustainable community development in Serbia* [Unpublished doctoral dissertation] (p. 48), by Jojić Glavonjić, T, 2020, Belgrade, Serbia: University of Belgrade, Faculty of Geography. Adapted with permission. Data in the columns are calculated based on *2011 Census of Population, Households and Dwellings in the Republic of Serbia: Book 2. Population by age and sex – Data by settlements,* by SORS, 2012 (https://pod2.stat.gov.rs/ObjavljenePublikacije/Popis2011/Starost%20i%20pol-Age%20and%20sex.pdf). In public domain.

The population pyramid (Figure 3) just confirms the previously presented analysis of the age structure. The pyramid shape is typical for countries in which the middle-aged and older population predominates. The narrow base indicates a small share of the age groups of the population, younger than the age group of 50–54 when the pyramid begins to expand. The largest shares in both sexes were recorded in these two age categories: 50–54 and 60–64.
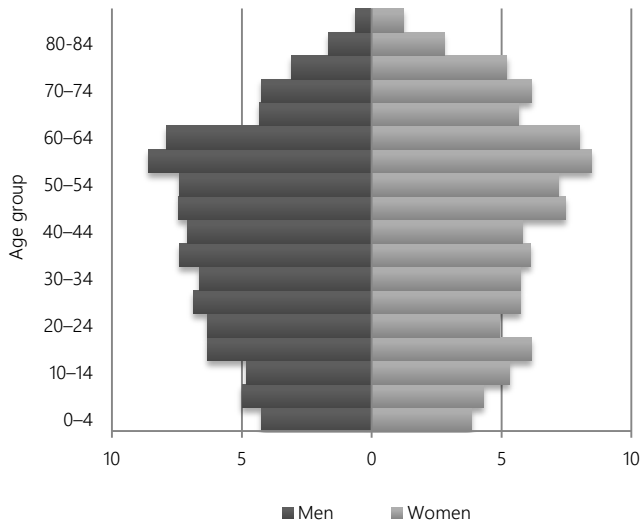
Figure 3. The population pyramid of SNR "Carska Bara" according to the 2011 Census data Adapted from *Geoecological evaluation of Ramsar sites in the function of sustainable community development in Serbia* [Unpublished doctoral dissertation] (pp. 45–47), by T. Jojić Glavonjić, 2020, Belgrade, Serbia: University of Belgrade, Faculty of Geography. Adapted with permission. Data are calculated based on *2011 Census of Population, Households and Dwellings in the Republic of Serbia: Book 2. Population by age and sex – Data by settlements,* by SORS, 2012 (https://pod2.stat.gov.rs/ObjavljenePublikacije/Popis2011/Starost%20i%20pol-Age%20and%20sex.pdf). In public domain.

Comparative analysis of the population aging index

The population aging index in Serbia (excluding Kosovo and Metohija Region) is increasing. With the 1991 Census data, an aging index of 73.1 was recorded, and based on the 2002 Census data, the index was 99.1. According to the 2011 Census data, the aging index of the population in Serbia was 121.9 (SORS, 1993; SORS, 2003). The aging index had approximately the same value in all the settlements within the study area (126.8), considering the fact that in the settlements of the immediate surroundings, the value was always less favorable (Table 5).

Table 5

Comparative analysis of the population aging index (I_s) of SNR "Carska Bara" 1991–2002–2011

Settlement	1991			2002			2011		
	0–19	60+	I_s	0–19	60+	I_s	0–19	60+	I_s
Belo Blato	480	318	66.2	335	291	86.9	275	309	112.4
Lukino Selo	163	131	80.4	140	118	84.3	92	124	134.8
Reserve's protection zone	643	449	69.8	475	409	86.1	367	433	117.9
Knićanin	613	314	51.2	494	446	90.3	321	465	144.8
Perlez	962	911	94.7	826	959	116.1	674	908	134.7

Table 5
Continued

Settlement	1991			2002			2011		
	0–19	60+	I_S	0–19	60+	I_S	0–19	60+	I_S
Stajićevo	581	322	55.4	457	399	87.3	423	457	108
Reserve's immediate surroundings	2,156	1,547	71.7	1,777	1,804	101.5	1,418	1,830	129.0
Total	2,799	1,996	71.3	2,252	2,213	98.3	1,785	2,263	126.8

Note. Adapted from *Geoecological evaluation of Ramsar sites in the function of sustainable community development in Serbia* [unpublished doctoral dissertation] (p. 43), by T. Jojić Glavonjić, 2020, Belgrade, Serbia: University of Belgrade, Faculty of Geography. Adapted with permission. Data in columns are calculated based on *1991 Census of Population, Households and Dwellings: Book 4. Population by age and sex – Data by settlements*, by SORS, 1993 (https://publikacije.stat.gov.rs/G1991/Pdf/G19914023.pdf). In public domain; *2002 Census of Population, Households and Dwellings: Book 2. Age and sex – Data by settlements,* by SORS, 2003 (https://publikacije.stat.gov.rs/G2002/ Pdf/G20024002.pdf). In public domain; *2011 Census of Population, Households and Dwellings in the Republic of Serbia: Book 2. Population by age and sex – Data by settlements,* by SORS, 2012 (https://pod2.stat.gov.rs/ ObjavljenePublikacije/Popis2011/Starost%20i%20pol-Age%20and%20sex.pdf) In public domain.

Population economic structure

The analysis of the number of employees showed a continuous decrease through the last three censuses, in all the settlements of SNR "Carska Bara". In 1991, on average, 85.7% of the active population, in all the settlements, performed an occupation. In 2002, that share decreased by 8.2%. The largest decline in the number of employees was recorded in Perlez. In 1991 it was the settlement with the lowest unemployment rate, while in 2002 it reached the highest unemployment rate among all the settlements (Table 6). The 2011 Census data showed a significant decrease in the share of the active population performing occupation (by 7.9% compared to 2002), i.e., the highest unemployment rate so far (30.3%), was detected which exceeded the national average by 7.9% (Table 6).

Table 6
Economic activity in the area of SNR "Carska Bara" settlements, 1991, 2002, and 2011 Census data

Settlement	Active population in total (%)			Active population performing occupation (%)			The unemployment rate		
	1991	2002	2011	1991	2002	2011	1991	2002	2011
Belo Blato	38.2	46.4	43.5	84.1	85.1	77.6	15.9	14.9	22.4
Knićanin	37.1	38.7	31.8	81.3	78.1	65.2	18.7	21.8	34.8
Lukino Selo	35.8	44.9	43.6	88.3	84.7	79.3	11.7	15.2	20.7
Perlez	41.1	40.2	38.1	89.3	74.2	62.5	10.7	25.8	37.5
Stajićevo	40.03	46.9	41.3	84.0	74.5	75.9	16.0	25.5	24.1
Total	39.3	42.5	38.7	85.7	77.5	69.6	14.3	22.5	30.3
Republic of Serbia	49.2	45.3	41.3	90.2	77.8	77.6	9.8	22.2	22.4

Note. Adapted from *Geoecological evaluation of Ramsar sites in the function of sustainable community development in Serbia* [Unpublished doctoral dissertation] (pp. 48–49), by T. Jojić Glavonjić, 2020, Belgrade, Serbia: University of Belgrade, Faculty of Geography. Adapted with permission. Data in the columns are calculated based on: *Economically active population performing occupation by activity sections in settlements surrounding SNR "Carska bara", 1991, 2002, 2011 Censuses* [Unpublished data], by SORS, n.d.-d.

Considering that the last three censuses differ in data classification regarding the economically active population performing activities (1991 Census records 14, 2002 Census 17, and 2011 Census 21 types of activities), for the purpose of this research they are grouped into three main sectors of activity and are presented in Table 7 as such.

According to 1991 Census, the share of employees in the primary sector in all the settlements of the research area was 45.6%. The 2002 Census data recorded a drop of less than 6%, while the 2011 Census data showed a decline to 25.3%. In the same period, the share of employees in the secondary sector increased from 30.7% in 1991 to 33.6% in 2011. The 2011 Census data in all the settlements, except Lukino Selo, show a larger share of employees in the secondary and tertiary sectors for the first time. The largest increase was recorded in the tertiary-quaternary sector of activity, which improved in terms of the number of employees (from 22% in 1991 to 40.1% in 2011). In some of the settlements, the tertiary sector, according to the number of employees, ranked at the top for the first time (Table 7).

Table 7

Structure of the active population engaged in occupation by activity in the settlements of SNR "Carska Bara", 1991, 2002, 2011

Settlement	Activity sector (%), 1991		
	Primary	Secondary	Tertiary and Quaternary
Belo Blato	60.6	20.7	18.7
Knićanin	48.4	27.2	24.3
Lukino Selo	60.7	21.9	17.4
Perlez	48.4	30.9	20.7
Stajićevo	24.5	47.2	28.3
Total	45.6	30.7	22
Settlement	Activity sector (%), 2002		
	Primary	Secondary	Tertiary and Quaternary
Belo Blato	58.5	27.5	14
Knićanin	35.5	34.5	29.9
Lukino Selo	65.9	18.8	15.3
Perlez	35.3	33.3	31.4
Stajićevo	28.5	37.7	33.8
Total	39.7	32	27.1
Settlement	Activity sector (%), 2011		
	Primary	Secondary	Tertiary and Quaternary
Belo Blato	35.9	35.5	28.6
Knićanin	18.9	34.4	46.7
Lukino Selo	57.9	18.7	23.8
Perlez	23.8	34	42.2
Stajićevo	15.2	36.8	48
Total	25.3	33.6	40.1

Note. The activities are classified as they used to be, in three sectors, in order to simplify the presentation, i.e, this was a better way of showing what share of the population works in productive and non-productive activities. In 2010, Serbia adopted the Decree on the Classification of Activities (2010), which supports the international statistical classification of economic activities, divided into sectors (A–U), areas (01–99), branches (01.1–99.0) and groups (01.11–99.00), with activity codes. Adapted from *Geoecological evaluation of Ramsar sites in the function of sustainable community development in Serbia* [unpublished doctoral dissertation] (p. 50), by T. Jojić Glavonjić, 2020, Belgrade, Serbia: University of Belgrade, Faculty of Geography. Adapted with permission. Data in the columns are calculated based on *Economically active population performing occupation by activity sections in settlements surrounding SNR "Carska Bara", 1991, 2002, 2011 Censuses* [Unpublished data], by SORS, n.d.-d.

Further analysis showed that the share of people involved in agriculture decreased in both the total population (from 18.9% in 1991 to 8% in 2011) and in economically active population (from 32.6 % 1991 to 11.2% 2011) in all the settlements of the study area. During the entire observed period, the share of people involved in agriculture in comparison with the total population was higher in the settlements of the protection zone (Belo Blato and Lukino Selo), but still experienced a drastic decline (from 30.1% in 1991 to 11.0% in 2011). The share of the population involved in agriculture also decreased in comparison with the economically active population, with a larger decline in the settlements of the protection zone (from 47.5% in 1991 to 16.5% in 2011) compared to the settlements of the immediate surroundings (from 28.5% in 1991 to 9.4% in 2011) (Table 8).

Table 8

Changes in the total and active agricultural population of SNR "Carska Bara" settlements, 1991, 2002, and 2011 Census

	Settlement	Agricultural population in total population (%)			Active agricultural population performing occupation in economically active population performing occupation (%)		
		1991	2002	2011	1991	2002	2011
Reserve's protection zone	Belo Blato	30.7	22.1	8.9	46.4	41.4	11.9
	Lukino Selo	32.8	29.8	16.5	50.7	54.8	28.5
	Total	30.1	24.3	11.0	47.5	45.2	16.5
Reserve's immediate environment	Knićanin	14.2	12.4	4.7	23.7	23.2	4.9
	Perlez	18.6	13.1	9.3	36.8	26.1	14.1
	Stajićevo	11.5	10.8	6.1	16.04	18.9	5.7
	Total	15.6	12.3	7.3	28.5	23.4	9.4
Total		18.9	14.8	8	32.6	28.8	11.2

Note. Adapted from *Geoecological evaluation of Ramsar sites in the function of sustainable community development in Serbia* [Unpublished doctoral dissertation] (p. 51), by T. Jojić Glavonjić, 2020, Belgrade, Serbia: University of Belgrade, Faculty of Geography. Adapted with permission. Data in the columns are calculated based on: *1991. Census of Population, Households and Dwellings: Book 8. Population: Households, Agricultural population and Household Agricultural Funds – Data by settlements and municipalities,* by SORS, 1994 (https://publikacije.stat.gov.rs/ G1991/Pdf/G19914017.pdf). In public domain; *2002 Census of Population, Households and Dwellings: Book 7. Agricultural population – Data by settlements,* by SORS, 2004 (https://publikacije.stat.gov.rs/G2002/Pdf/G20024007.pdf) In public domain; *Agricultural population in settlements surrounding SNR "Carska Bara"*, 1991, 2002, 2011 Censuses [Unpublished data], by SORS, n.d.-e.

Discussion

The analysis of the official data from the last three censuses showed that all the settlements of the Reserve record a constant population decline. The last census recorded 15.6% of inhabitants less than the 1991 Census. A higher decrease of 23.5% was recorded in the two settlements of the protection zone while in the three settlements of the surroundings, it decreased by 13.3% for the same period. The situation is also unfavorable when it comes to the population age structure. According to the 2011 Census data, the average age of the population in the study area was 42.5 years which indicated a deep demographic old age. The share of the population older than 60 years in the total population was higher than the share of the population under 20 years of age (25.4% vs. 19.8%) and indicated the deepest demographic old age.

The economic structure is also very unfavorable. In addition to the large percentage of unemployed people, which is about 8% higher than the national average, the study area is

characterized by a declining number of the active agricultural population performing occupation. Data analysis from the last three censuses indicated that the age and economic structure of the population are far more unfavorable today than they were before the area was declared as protected. However, this is not related to the process of being declared as protected, but to the unfavorable social processes that began in rural Serbia in the 1960s. Depopulation and emigration left these settlements without basic communal and social infrastructure. For decades, they have been cut off from modern trends, underdeveloped, poor, with a large number of old and unemployed (Jojić Glavonjić, 2020). Still, it should be taken into consideration that the data from the last Census are a decade old. The new Census, planned for 2022, will bring a clearer picture of whether there is hope for the development of this protected area, at least when it comes to human resources.

The area of SNR "Carska Bara" is well studied, both from the aspect of natural basis and from the aspect of tourism, while the population of the Reserve and the immediate environment was the subject of only a few works and monographs, usually by the same authors. All these studies (Stojanović, 2005; Stojanović, et al., 2011; Stojanović, Pavić, & Ristanović, 2009) have indicated a decreasing trend in population numbers in all the settlements. The results of the analysis of the local population characteristics conducted here coincide with their conclusions. Analyzing the characteristics of the domicile population, the study from 2011 (Stojanović et al., 2011) predicted that, based on the projections of future population movements, the age structure in the Reserve settlements will be worse from year to year, and emphasised that the population in Reserve's environment has characteristics of the regressive population type. And our research has confirmed that.

Conclusion

The area of the protection zone and the immediate surroundings of settlements of SNR "Carska Bara" have natural potentials which, as such, are protected. Turning these potentials into a resource requires one necessary precondition—population of a certain number and favorable structure, willing to engage in these activities.

Prospects for a better future for this area can still be brought by its location in the immediate vicinity of the City of Zrenjanin, as well as the proximity of Belgrade and Novi Sad. There are also ways that have been present in more developed countries of Europe for a long time, to settle a new population of a specific profile (artists, young educated people—painters, architects, digital nomads, organic food producers, etc.). They can initiate the arrival of people from all over the world, but also animate the local community, especially the youth, by teaching them some traditional but forgotten skills. The local community also benefits from this, because the organizers refer visitors to residents when it comes to accommodation, and attending workshops is free for them. The management of the City of Zrenjanin is aware of the Reserve's importance and in cooperation with the non-governmental sector, and supported by European funds, invests a lot in its rural settlements, primarily in improving infrastructure (in the past two years, all the settlements in the Reserve's area have been gasified). Also, the City of Zrenjanin encourages the inclusion of local people in making decisions that are concerning their communities. The practice of so-called "participatory budgeting" has recently started, designed to involve the local population as much as possible in the functioning of the community. Every year, the population of rural local communities votes for the projects that, in their opinion, are most needed by their communities.

The stay of the population in the rural settlements requires good social infrastructure and care for the cultural and social life of the inhabitants. The analysis of the social infrastructure facilities condition

in the settlements of SNR "Carska Bara" showed that the current situation is solid. Every settlement has a primary school. Libraries operate within the schools. All the settlements have primary health care facilities, pharmacies, and post offices, but they only work a few days of the week. The area of the Reserve also has a significant cultural potential, which has not yet been completely used and shaped as a tourist product. Although it does not have a high degree of attractiveness, with already recognized and protected natural values, it could be a popular tourist destination in the future, only with better promotion (Jojić Glavonjić, Todorić, Doljak, & Golubović 2017).

The general conclusion is that in the specific area of the settlements within SNR "Carska Bara", there is no one to deal with the development of tourism and economic activity. The overall demographic state is not in the function of sustainable development of the protected area. A protected landscape that remains without a population is a great challenge for the managers since, with the departure and aging of the population, traditional activities typical of such an area are also dying out.

Acknowledgement

References

Ancuta, C., Olaru, M., Popa, N., Isfănescu Ivan, R., & Jigoria-Oprea, L. (2015). Evaluation of the sustainable development of rural settlements. Case study: Rural settlements from Romanian Banat. *Carpathian Journal of Earth and Environmental Sciences, 10*(3), 67–80. Retrieved from http://www.cjees.ro/viewTopic.php?topicId=549

Devedžić, M., & Stojilković Gnjatović, J. (2015). *Popis stanovništva, domaćinstava i stanova 2011. u Republici Srbiji: Demografski profil starog stanovništva Srbije* [2011 Census of Population, Households and Dwellings in the Republic of Serbia: Demographic Profile of the Old Population of Serbia]. Retrieved from https://publikacije.stat.gov.rs/G2015/Pdf/G20154007.pdf

Friganović, M. (1987). *Demogeografija. Stanovništvo svijeta* (3rd ed.) [Demogeography. The population of the World]. Zagreb, Croatia: Školska knjiga.

Jojić Glavonjić, T. (2020). *Geoekološko vrednovanje Ramsarskih područja u funkciji održivog razvoja lokalnih zajednica u Srbiji* [Geoecological evaluation of Ramsar sites in the function of sustainable community development in Serbia] (Unpublished doctoral disertation). University of Belgrade, Faculty of Geography, Belgrade, Serbia.

Jojić Glavonjić, T., Todorić, J., Doljak, D., & Golubović, N. (2017). Analysis of tourist motifs in the function of the development of cultural tourism in the settlements surrounded by protected natural resources. *Journal of the Geographical Institute "Jovan Cvijić" SASA, 67*(3), 333–340. https://doi.org/10.2298/IJGI1703333J

Josipović, S. (2019). Potencijali i izazovi razvoja ruralnih područja Srbije [Potentials and challenges of the development of rural areas of Serbia]. *Ekonomski vidici, 24*(1–2), 59–77. Retrieved from http://www.deb.org.rs/wp-content/uploads/2019/09/Ekonomski-vidici-1-2-2019-1.pdf

Kicošev, S., Bubalo-Živković, M., & Ivkov, A. (2006). *Stanovništvo Banata* [Population of Banat]. Novi Sad, Serbia: University of Novi Sad, Faculty of Science, Department of Geography, Tourism and Hotel Management.

Kiss, A. (2004). Is community-based ecotourism a good use of biodiversity conservation funds? *Trends in Ecology and Evolution, 19*(5), 232–237. https://doi.org/10.1016/j.tree.2004.03.010

Milenković, S. (1995). Ekonomska i prostorna valorizacija poljoprivrede u turizmu pograničnih područja Srbije [Economic and spatial valorization of agriculture in tourism in the border areas of Serbia]. *Glasnik Srpskog geografskog društva, 75*(1), 60–62. Retrieved from https://digitalna.nb.rs/wb/NBS/casopisi_pretrazivi_po_datumu/glasnik_srpskog_geografskog_drustva/1995/b075#page/29/mode/1up

Milovanović, B., Radovanović. M., Stanojević, G., Pecelj, M., & Nikolić, J. (2017). Klima [Climate of Serbia]. In M. Radovanović (Ed.), *Geografija Srbije* (Posebna izdanja, Knjiga 91) [Geography of Serbia (Special issues, Book 91)] (pp. 94–156). Belgrade, Serbia: Geographical Institute "Jovan Cvijić" SASA.

Nikitović, V. (Ed.). (2015). *Popis stanovništva, domaćinstava i stanova 2011. u Republici Srbiji: Populacija Srbije početkom 21. veka* [2011 Census of Population, Households and Dwellings in the Republic of Serbia: Population of Serbia at the Beginning of the 21st Century]. Retrieved from https://publikacije.stat.gov.rs/G2015/Pdf/G20154006.pdf

Penev, G. (1995). Stanovništvo po starosti i polu [Population by age and sex]. In S. Radovanović (Ed.), *Stanovništvo i domaćinstva SR Jugoslavije prema popisu 1991. godine* [Population and households of SR Yugoslavia according to 1991 Census.] (pp. 117–144). Belgrade, Serbia: Savezni zavod za statistiku; Centar za demografska istraživanja Instituta društvenih nauka.

Pokrajinski zavod za zaštitu prirode. (2010). *Specijalni rezervat prirode „Carska bara" – Predlog za stavljanje pod zaštitu kao zaštićeno područje I kategorije – Studija zaštite* [Special nature reserve "Carska Bara" – Suggestion for proclaiming the area as the protected area of the 1st category – Study of protection]. Novi Sad, Serbia: Pokrajinski zavod za zaštitu prirode.

Predojević, J. (2001). Starenje seoskog stanovništva Vojvodine – stanje i tendencije [Aging of the rural population of Vojvodina – situation and tendencies]. *Zbornik Matice Srpske za društvene nauke, 110–111*, 117–128. Retrieved from https://www.maticasrpska.org.rs/zmsdn110111/

Puzović, S., Sekulić, G., Stojnić, N., Grubač, B., & Tucakov, M. (2009). *Značajna područja za ptice u Srbiji* [Important bird areas in Serbia]. Belgrade, Serbia: Ministry of Environment and Spatial Planning; Institute for Nature Conservation of Serbia; Provincial Secretariat for Environmental Protection and Sustainable Development.

Ramsar Sites Information Service. (2021, April). *The List of Wetlands of International Importance*. Retrieved from https://rsis.ramsar.org/ris-search/?f[0]=regionCountry_en_ss%3ASerbia&pagetab=1

Stanković, S., Filipović, D., & Obradović, D. (2003). Zaštićena prirodna dobra u funkciji razvoja turizma [Protected natural assets in the function of tourism development]. In R. V. Pantović (Ed.), *Ekološka istina 2003.* (pp. 390–393). Retrieved from https://eco.tfbor.bg.ac.rs/download/Zbornici/2003.pdf

Statistical Office of the Republic of Serbia. (1993). *Popis stanovništva, domaćinstava i stanova 1991: Knjiga 4. Stanovništvo prema starosti i polu – Podaci po naseljima* [1991 Census of Population, Households and Dwellings: Book 4. Population by age and sex – Data by settlements]. Retrieved from https://publikacije.stat.gov.rs/G1991/Pdf/G19914023.pdf

Statistical Office of the Republic of Serbia. (1994). *Popis stanovništva, domaćinstava i stanova 1991: Knjiga 8. Stanovništvo: Domaćinstva, poljoprivredno stanovništvo i poljoprivredni fondovi domaćinstava – Podaci po naseljima i opštinama.* [1991. Census of Population, Households and Dwellings: Book 8. Population: Households, Agricultural population and Household Agricultural Funds – Data by settlements]. Retrieved from https://publikacije.stat.gov.rs/G1991/Pdf/G19914017.pdf

Statistical Office of the Republic of Serbia. (2003). *Popis stanovništva, domaćinstava i stanova u 2002: Knjiga 2. Pol i starost – Podaci po naseljima* [2002 Census of Population, Households and Dwellings: Book 2. Age and sex – Data by settlements]. Retrieved from https://publikacije.stat.gov.rs/G2002/Pdf/G20024002.pdf

Statistical Office of the Republic of Serbia. (2004). *Popis stanovništva, domaćinstava i stanova u 2002: Knjiga 7. Poljoprivredno stanovništvo – Podaci po naseljima* [2002 Census of Population, Households and Dwellings: Book 7. Agricultural population – Data by settlements]. Retrieved from https://publikacije.stat.gov.rs/G2002/Pdf/G20024007.pdf

Statistical Office of the Republic of Serbia. (2012). *Popis stanovništva, domaćinstava i stanova u Republici Srbiji 2011: Knjiga 2. Pol i starost – Podaci po naseljima* [2011 Census of Population, Households and Dwellings in the Republic of Serbia: Book 2. Population by age and sex – Data by settlements]. Retrieved from https://pod2.stat.gov.rs/ObjavljenePublikacije/Popis2011/Starost%20i%20pol-Age%20and%20sex.pdf

Statistical Office of the Republic of Serbia. (2014). *2011 Census of Population, Households and Dwellings in the Republic of Serbia: Book 20. Comparative overview of the number of population in 1948, 1953, 1961, 1971, 1981, 1991, 2002 and 2011 – Data by settlements.* Retrieved from https://publikacije.stat.gov.rs/G2014/Pdf/G20144008.pdf

Statistical Office of Republic of Serbia. (n.d.-a). *Population census, 1991: Age and sex* [Unpublished data]. Belgrade, Serbia: Statistical Office of the Republic of Serbia.

Statistical Office of the Republic of Serbia. (n.d.-b). *Vital statistics in the Republic of Serbia, 1991, 2002, 2011* [Unpublished data]. Belgrade, Serbia: Statistical Office of the Republic of Serbia.

Statistical Office of the Republic of Serbia. (n.d.-c). *Internal migration in the Republic of Serbia, 1991, 2002, 2011* [Unpublished data]. Belgrade, Serbia: Statistical Office of the Republic of Serbia.

Statistical Office of the Republic of Serbia. (n.d.-d). *Economically active population performing occupation by activity sections in settlements surrounding SNR "Carska Bara", 1991, 2002, 2011 Censuses* [Unpublished data]. Belgrade, Serbia: Statistical Office of the Republic of Serbia.

Statistical Office of the Republic of Serbia. (n.d.-e). *Agricultural population in settlements surrounding SNR "Carska bara", 1991, 2002, 2011 Censuses* [Unpublished data]. Belgrade, Serbia: Statistical Office of the Republic of Serbia.

Stojanović, V. (2005). *Održivi razvoj u Specijalnim rezervatima prirode Vojvodine* [Sustainable development in the Special Nature Reserves of Vojvodina]. Novi Sad, Serbia: University of Novi Sad, Faculty of Sciences, Department of Geography, Tourism, and Hotel Management.

Stojanović, V., Lazić, L., Pavić, D., Panjović, B., Košić, K., Dragin, A., & Ivanović, L. (2011). *Studija izvodljivosti razvoja ekoturizma u zaštićenim prirodnim dobrima Vojvodine (sa posebnim osvrtom na Ramsarska područja)* [Feasibility study of ecotourism development in protected natural assets of Vojvodina (with special reference to Ramsar sites)]. Novi Sad, Serbia: University of Novi Sad, Faculty of Sciences, Department of Geography, Tourism, and Hotel Management.

Stojanović, V., Pavić, D., & Ristanović, B. (2009). The implementation of the Principle of Sustainable Development in the Special Nature Reserve "Stari Begej – Carska Bara" (Vojvodina, Serbia). *Geographica Pannonica, 13*(1), 11–16. https://doi.org/10.5937/GeoPan0901011S

Šulc, I., & Valjak, V. (2012). Zaštićena područja u funkciji održivog razvoja hrvatskog otočja – primjer otoka Mljeta [Protected Areas as a Factor in Sustainable Development of the Croatian Islands - the Example of Mljet Island]. *Croatian Geographical Bulletin, 74*(1), 161–185. https://doi.org/10.21861/HGG.2012.74.01.09

Uredba o proglašenju Specijalnog rezervata prirode Carska bara [Decree on the proclamation of Special Nature Reserve Carska Bara]. Službeni glasnik Republike Srbije, No. 46 (2011).

Uredba o klasifikaciji delatnosti [Decree on the classification of activities], Službeni glasnik Republike Srbije br. 54 (2010). Retrieved from https://www.paragraf.rs/propisi/uredba_o_klasifikaciji_delatnosti.html