

SOME CHARACTERISTICS OF THE POPULATION DISTRIBUTION IN THE SETTLEMENTS OF THE MUNICIPALITY OF TETOVO

Mireme RUSHITI ¹, Merime MUSTAFI ¹, Resul HAMITI ¹

¹*Department of Geography, Faculty of Natural Sciences and Mathematics, University of Tetova, RNM*

Corresponding Author: e-mail: mireme.rushiti@unite.edu.mk

Abstract

The subject of this paper is the spatial distribution of population in the territory of the Municipality of Tetovo. The development of the population of the settlements depends on the influence of the different characteristics and conditions of the space where they are located. The paper analyzes the geographical distribution of the population in the settlements in the Municipality of Tetovo in terms of population number, population density, number of households and houses, the distance of settlements from the capital city – Skopje, and the distance of settlements from the municipal headquarters. The descriptive, analytical, comparative method, statistical, and cartographic methods were used in the preparation of this paper. The analyses and conclusions are based on the processing of data from the State Statistical Office of North Macedonia, from previous research, and the literature on the studied area and field research. Research on population and settlements is of great importance for economic and social development in the area, where the main factor for their development is the conditions where they are located.

The purpose of this paper is to study the population of the municipality of Tetovo and to present a clearer picture of the distribution of population depending on some geographical determinants, which represent an important prerequisite for the development of space, or settlements, through which the population can develop activities various economic, and to identify the conditions of the settlements as a factor for displacement of the population and households, as well as to determine the zones with higher or lower population.

Keywords: population, density, households, municipality, settlements.

1. Introduction

From the very title of the paper arises the subject of the research, which is the geographical distribution of the population in the settlements in the Municipality of Tetovo in terms of population number, population density, number of households and houses, the distance of settlements from the capital city – Skopje and the distance of settlements from the municipal headquarters, emphasizing the relationship between the natural-geographical characteristics of the settlements and the territorial distribution of the population within the study area.

The Municipality of Tetovo is a relatively small urban municipality located in the northwestern part of the Republic of North Macedonia. The territory of the settlements lies mainly in Lower Polog, and a part of it in the mountainous areas of Sharr, up to the border with Kosovo. It lies in the northwest-southeast direction. The municipality of Tetovo in the north, northwest, and west borders the municipality of Teartse and the areas belonging to the municipalities of Dragash and Prizren in Kosovo, in the northeast, east, and southeast with the municipality of Teartse, Jegunovtse, and Zhelino, and in the north with the municipalities of Bogovinje and Brvenica [11]. The total area of the municipality is 264.8 km². In terms of orographic conditions, in the municipality of Tetovo are located 10 lowland settlements, 6 hilly, and 4 mountainous settlements [2].

According to the 2002 census, a total of 86,582 inhabitants [12] lived in the 20 settlements, i.e. the average size of the villages was 4329,1 inhabitants and a population density of 327 b/km², while according to the 2021 census, the total population is 104504 inhabitants [13], i.e. the average size of the villages was 5225,2

inhabitants and a population density of 395 b/km². The density of settlements in the municipality of Tetovo is 7.55 villages per 100 km², with an average area of 13.3 km² per village. According to the size of the area, larger settlements are: Bozovtse, Veshsala, Vejtse, Tetovo, and Shipkovitsa, while smaller settlements are: Jedoartse, Mala Rechitsa, Setole, and Falishe. According to the population, larger settlements are Dzepchishte, Mala Rechitsa, and Tetovo, while smaller settlements are: Setole, Jedoartse, and Otunje which is depopulated.

Research on population and settlements is of great importance for economic and social development in the region, where the main factor for their development is the conditions where they are located. The main goal of the research is to identify the conditions of the settlements as a factor for the displacement of the population and households, as well as to determine the zones with higher or lower populations.

Depending on the studied characteristics, the settlements differ from each other and this further affects the spatial distribution of the population. In the following, we will analyze some characteristics of the population in the Municipality of Tetovo, mainly the number of populations, population density, number of households and houses, distance of settlements from the capital, distance of settlements from the municipal headquarters, etc.

Size of Settlements in the Municipality of Tetova by Population Number

Research on population and settlements is of great importance for economic and social development in the region. Based on the classification of settlements according to the number of inhabitants in 2002, we notice that we have more settlements with a population of 500-2000 inhabitants, there are 9 rural settlements: Falishe, Lisets, Bozovtse, Gjermo, Gajre, Sarakino, Vejtse, Brodets and Veshala. Regarding this classification, we must emphasize that the data on the number of populations in the settlements according to the census in 2021, we have only for the resident population, and according to these data we have 7 settlements with a population of fewer than 500 inhabitants, they are: Otunje, Jedoartse, Setole, Bozovtse, Veshala, Lavtse, Lisets and 7 settlements with 500-2000 inhabitants, they are: Gjermo, Falishe, Gajre, Brodets, Vejtse, Sarakino, Shipkovitsa.

Table 7. Size of settlements in the municipality of Tetova according to population number, 1994, 2002 & 2021

Classific according to the number of inhabitants	Census	No. of settl .	% of settle m.	Total area in km ²	% of the territor y	Total popul .	% of the popul.	Hous e holds	% of house holds	Settlements
under 500 inhabitants	1994	5	25%	41.1	15.50 %	678	0.84%	/	/	Otujne, Setole, Jedoartse, Lavtse, Vejtse
	2002	4	20%	16.5	6.20%	305	0.35%	312	1.50%	Otujne, Setole, Jedoartse, Lavtse
	2021	7	35%	118.6	44.79 %	1203 ¹	1.42%	338	1.42%	Otunje, Jedoartse, Setole, Bozovtse, Veshala, Lavtse, Lisets
500-2000 inhabitants	1994	8	40%	147.8	55.80 %	6942	8.65%	/	/	Falishe, Brodets, Lisets, Gajre, Sarakino, Gjermo, Bozovtse, Veshala
	2002	9	45%	172.4	65.10 %	8716	10.07 %	1909	9.50%	Falishe, Lisets, Bozovtse, Gjermo, Gajre, Sarakino, Vejtse, Brodets, Veshala

¹ The resident population in 2021 is 84,770 inhabitants

	2021	7	35%	90.5	34.17%	6089	7.18%	1618	6.78%	Gjermo, Falishe, Gajre, Brodets, Vejtse, Sarakino, Shipkovtsa
2000-4000 inhabitants	1994	5	25%	50	18.90%	15210	18.95%	/	/	Seltse, Shipkovits Poroj, Golema Rechitsa, Xhepchishte
	2002	4	20%	45.5	17.20%	12240	14.14%	2488	12.40%	Seltse, Shipkovitsa, Poroj, Golema Rechitsa
	2021	5	25%	33.3	12.56%	14302	16.87%	3944	16.54%	Seltse, Mala Rechitsa, Poroj, Xhepchishte, Golema Rechitsa
over 4000 inhabitants	1994	2	10%	25.9	9.80%	57445	71.56%	/	/	Mala Rechitsa, Tetovo
	2002	3	15%	30.4	11.50%	65319	75.44%	15516	77.60%	Xhepchishte, Mala Rechitsa, Tetovo
	2021	1	5%	22.4	8.46%	63176	74.53%	17947	75.26%	Tetovo

Source: MakStat database/Censuses/Censuses of population 1948-2002 by settlements. Census of population 2021 by settlements. Field research and processed by the author.

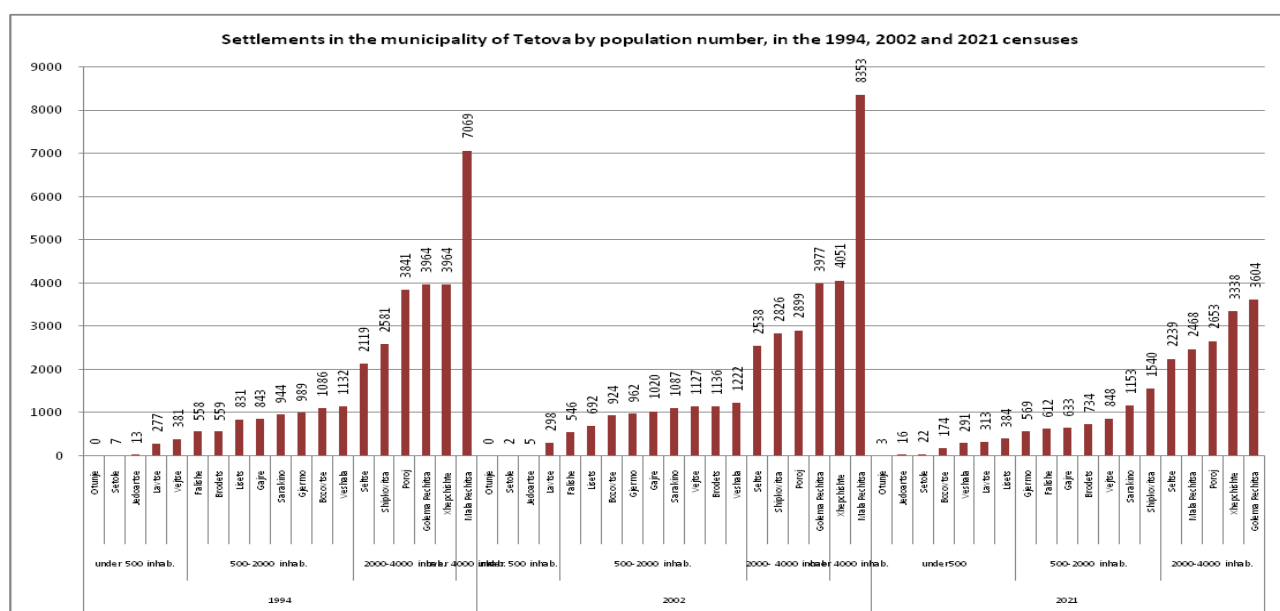


Figure 1. Settlements in the municipality of Tetovo by population number, in the 1994, 2002 and 2021 censuses

Based on the population according to the census of 2002, we identify two rural settlements with the largest population in the municipality of Tetovo and one urban settlement, where the total number reaches 65 319 inhabitants, they are: the villages Dzepchishte with 4051 inhabitants and

Mala Rechitsa with 8353 inhabitants and urban settlement Tetovo with 52915 inhabitants, while the settlements with a population of less than 500 inhabitants, according to the 2002 census are: Setole with 2 inhabitants, Jedoartse with 5 inhabitants and Lavtse 298 inhabitants. According to the 2021 census, the urban area Tetovo has the largest number of residents with 63176 inhabitants, while the smaller ones are: Otunje with 3 inhabitants, Jedoartse with 16 inhabitants, and Setole with 22 inhabitants.

The settlements with the largest increase in population from 1994 to 2002 are: Tetovo by 3.2% and Mala Rechitsa by 1.6%, while the settlements with the largest decrease in population are: Bozovtse for -0.20%, Lisets for -0.17%, Gjermo for -0.3%, and Falishe, Jedoartse, Setole for -0.01%. As for the 2021 census, although for the settlements we only have the number of the resident population, the settlement with the largest increase in the population is the urban settlement Tetovo by 11.78%, while the settlements with the largest

decrease in the number of the population residents are: Mala Rechitsa by -5,9%, and Shipkovitsa, Bozovtse, Veshala, and Dzepchishte by -1%.

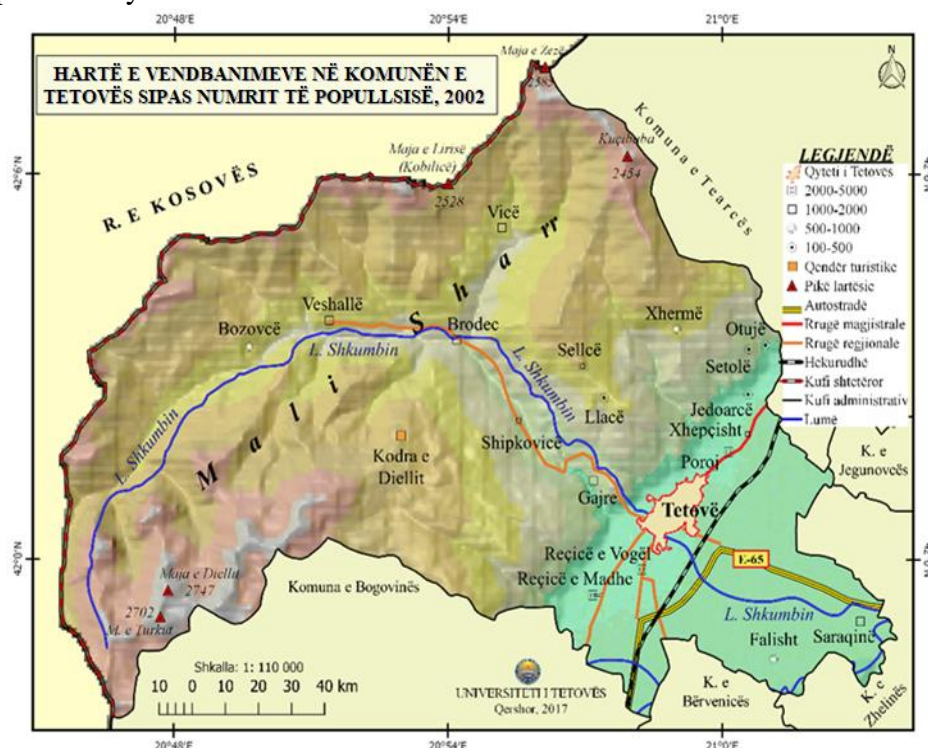


Figure 2. Map of the settlements in the municipality of Tetovo by population number, based on the population census of 2002

In the period from 1994 to 2002 in the Municipality of Tetovo we have an increase of 7.8%, while in 2021 with a total number of the population of 104,504² inhabitants mark an increase of 30.2%. The increase in population affects the faster development of settlements, while the decrease in population changes the location in the network of settlements and the spatial distribution of the population.

Settlements in the municipality of Tetova according to population density

Population density is the concentration of individuals within a species in a specific geographic locale. Population density data can be used to quantify demographic information and to assess relationships with ecosystems, human health, and infrastructure. Population density is calculated by dividing the number of people by the area. Population density is usually shown as the number of people per square kilometer [8]. The distribution of the population is related to the economic conditions of the area, infrastructure equipment, etc.

² The total number of the population in the Municipality of Tetovo, according to the 2021 census data, is 104,504 inhabitants, of which 84,770 are resident and 19,734 are non-resident.

Table 8. Settlements in municipality of Tetovo according to population density i/km², in the 1994, 2002 & 2021

Settlements	Bozovtse	Brodets	Falishë	Gajre	Jedoartse	Lisets	Lavtse	Otunje	Poroj	Golema Rechitsa	Mala Rechitsa	Sarakino	Seltse	Setole	Shipkovitsa	Tetovo	Veshala	Vejtse	Xhepchishte	Gjerno	Municipality Tetovo
Area - km ²	56.8	14.9	4	7.3	1.5	13.7	5.5	5.8	5.2	5.7	3.5	6.2	14.4	3.7	20.2	22.4	31.6	24.6	4.5	13.3	26.5
1994	19.1	37.5	14.0	116	8.7	60.7	50.4	0	52.0	67.4	202.0	15.2	147	1.9	128	224.9	35.8	15.5	88.1	74.4	30.3
2002	16.3	76.2	13.7	140	3.3	50.5	54.2	0	55.8	69.8	238.7	17.5	176	0.5	140	236.2	38.7	45.8	90.0	72.3	32.7
2021	3.1	49.3	15.3	86.7	10.7	56.28	56.9	0.5	51.0	63.2	705	18.6	156	5.9	76.2	282.0	9.2	34.5	74.2	42.8	32.0

Source: MakStat database/Censuses/Census of population 1948 – 2002/Censuses of population 1948-2002 by settlements. Field research and processed by the author.

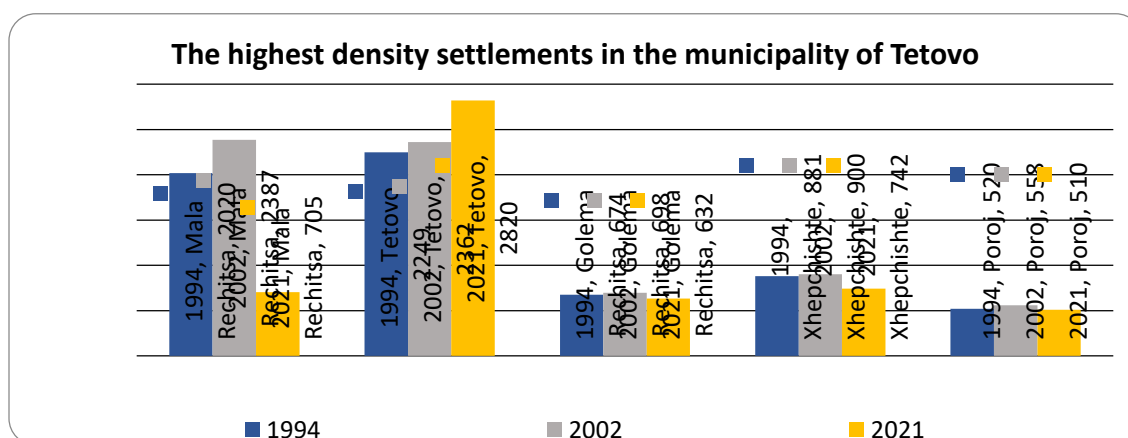


Figure 3. The highest density settlements in the municipality of Tetovo

The settlements with the highest population density in 1994 and 2002 are: Mala Rechitsa and Tetovo, in 2002, Mala Rechitsa is with 2386.6 inh./km², while Tetovo with 2362.3 inh./ km², whilst the settlements with the lowest population density are: Jedoartse with 3.3 inh./km², Vejtse with 45.8 inh./km², Bozovtse with 16.3 inh./km² and Veshala with 38.7 inh./km². The settlements with the highest population density by the 2021 census are: Tetovo with 2820³ inh./km², Xhepchishte with 742 inh./km² and Mala Rechitsa with 705 inh./km², while the settlements with the lowest population density are: Otunje with 0.5 inh./km², Bozovtse with 3.1 inh./km², Setole with 5.9 inh./km² and Jedoartse with 10.7 inh. km².

Settlements in the municipality of Tetova by number of households

A “Household” is referring to the people who are living in a housing structure and a “Housing Unit” is describing the actual structure in which residents live. It is important to note that a household can be made up of family householders or non-family householders [14].

By the census of 2002 in the municipality of Tetovo, the total number of houses was 22044 [12] with 3.9 members on average per house, while the total number of households was 19992 with 4.3 members on average per household. According to the data from the 2021 census, the total number of houses is 30167 houses with 2.8 members on average per house, while the total number of households is 23848 [13] with 3.6 members on average per household.

³ Referring to the resident population

Table 9. Settlements in the municipality of Tetovo according to the number of houses and households, 2002 & 2021

Census	Settlements	Bozovtse	Brodets	Vejtse	Veshala	Gajre	G. Rechitsa	Gjermo	Jedoartse	Lavce	Lisets	M. Rechitsa	Otunje	Poroj	Sarakino	Seltse	Setole	Falishe	Xhëpçisht	Shipkovitse	Tetovo	Municipality of Tetovo
2002	Houses	22	26	23	27	24	79	16	3	7	75	19	0	47	24	50	1	17	68	71	129	199
	Av. mem	4.1	4.3	4.7	4.4	4.2	5.0	5.8	1.7	4.0	9.2	4.4	0	6.1	4.4	5.0	2.0	3.1	6.0	4.0	4.1	4.3
2021	Houses	44	16	25	75	14	99	15	5	9	11	67	1	82	34	51	8	20	92	36	179	238
	Av. mem	4.0	4.4	3.4	3.9	4.4	3.6	3.7	3.2	3.3	3.5	3.6	3.0	3.2	3.4	4.3	2.8	3.0	3.6	4.2	3.5	3.6

Source: As table no.1. Processed by the author.

The largest number of households in 2002 was recorded in: Tetovo with 12 920 households and with 4.1 members on average per household and Mala Rechitsa with 1 916 households and with 4.4 members on average per household, while in 2021 was recorded in Tetovo with 17948 households and with 3.5 members on average per household.

The settlements which numbered up to 200 households in 2002 are: Lisets, Lavtse, Falishe, and Gjermo, while in 2021 are: Brodets, Gjermo, Gajre, and Lisets.

Distribution of the population in the municipality of Tetovo according to the distance from the capital city – Skopje

The nearest cities to the settlements on Municipality of Tetovo are the city of Tetovo and the capital Skopje and therefore we will show the distance from them. The settlements of the researched area according to the distance from the capital city are classified into 3 groups: under 49,9km, 50-59,9km, and over 60km. The data show that most of the settlements of the Municipality of Tetovo are in the distance under 49,9km from the capital city.

Regarding the distance of the settlements to the city of Skopje, it can be seen that most settlements are in the distance from 40km to 49.9km. At the shortest distance is the village Sarakino at 40 km, while at the furthest distance over 60 km are mountain settlements such as: Bozovtse at 67 km, Veshala at 64 km, and Brodets at 60 km [15].

Table 5. Distribution of the population in the Municipality of Tetovo according to the distance from the capital city, by censuses

City	Skopje								
	under 49,9 km			50-59,9 km			over 60 km		
Census	1994	2002	2021	1994	2002	2021	1994	2002	2021
Number of population	71866	76669	79572	5632	6629	3999	2777	3282	1199
% of population	89.50%	88.60%	93.87%	7.01%	7.60%	4.72%	3.50%	3.80%	1.41%
Number of households	/	17280	22532	/	1441	1029	/	763	287
% of households	/	86.40%	94.48%	/	7.20%	4.31%	/	3.80%	1.21%
Number of settlements	10			7			3		
% of settlements	50%			35%			15%		
Total area in km ²	72.9			88.6			103.3		
% of territory	27.50%			33.50%			39.00%		

Settlements	Sarakino, Tetovo, Falishe, Xhepchishte, Poroj, Lavtse, Jedoartse, Golema Rechitsa, Mala Rechitsa, Seltse	Otunje, Gajre, Setole, Gjermo, Shipkovitsa, Lisets, Vejtse	Brodets, Veshala, Bozovtse
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Source: <https://www.google.com/maps>, As table no.1. Processed by the author.

From the capital Skopje in 2002, 88.60% of the population of the municipality of Tetovo were at a distance of 40km to 49.9km, where the average size was 6970

inhabitants, while in 2021 it was 7234 inhabitants, with a share of 93.87% in the total population and 22532 households with an average of 3.5 members per household.

Communication infrastructure is an important prerequisite for the development of a space because it provides a link between settlements and their population, through which they can develop their economic activities.

Distribution of the population according to the distance from the headquarters of the municipality

Proximity to cities and municipal headquarters affects the development of the economy of settlements, as well as the increase of living standards of the population, thus guaranteeing a better life for residents by providing various employment opportunities, education, movement, and easier communication with other regions.

The most remote settlements from the seat of the municipality are the village of Bozovtse with 22 km and Veshala with 20 km [15]. From this data, we can see that at a distance over 20km from the city of Tetovo in 1994 were 2.8% of the population, with an average size of settlements of 1109 inhabitants, while in 2002 it was 1074 inhabitants, with a share of 2.5% in the total number of population and 501 households with an average of 4.2 members per household. Regarding the 2021 census, we have very low values in the total number of the population, because the population data record only the number of the resident population. But as far as the population in the mountainous settlements is concerned, another factor which has influenced the decrease in the number of the population is the large flow of migrations, both those which are oriented towards the city and those which aim at the states of Western Europe.

Table 6. Distance of the population in the Municipality of Tetovo from the seat of the municipalities, by censuses

Municipality	Tetovo									
	Census	No. of popul.	% of popul.	No. of househo.	% of househo.	No. of settlem.	% of settlem.	Total area km ²	% of territory	Settlements
under 5 km	1994	64268	80.05%	/	/	5	25%	46.8	17.70%	Tetovo, Mala Rechitsa, Golema Rechitsa, Lavtse, Poroj
	2002	68442	79.05%	16177	80.90%					
	2021	72214	85.19%	20543	86.14%					
5-9.9 km	1994	8441	10.50%	/	/	6	30%	37.9	14.30%	Xhepchishte, Falishe, Seltse, Gajre, Sarakino, Jedoartse
	2002	9247	10.70%	1856	9.30%					
	2021	7991	9.43%	2132	8.94%					
10-14.9 km	1994	4789	5.90%	/	/	6	30%	81.3	30.70%	Otunje, Shipkovitse,
	2002	5609	6.50%	1196	6.00%					

	2021	3366	3.97%	886	3.72%					Setole, Gjermo, Lisets, Vejtse
15km-19.9 km	1994	559	0.70%	/	/	1	5%	14.9	5.60%	Brodets
	2002	1136	1.30%	262	1.30%					
	2021	734	0.87%	168	0.70%					
over 20 km	1994	2218	2.8%	/	/	2	10%	88.4	33.40%	Veshala, Bozovtse
	2002	2146	2.5%	501	2.50%					
	2021	465	0.55%	119	0.50%					

Source: <https://> As table no.6. Processed by the author.

The data show that most of the population of Municipality of Tetova are in a distance under 5km from the municipal headquarters. In 1994, 80.05% of the population lived at this distance from the municipality headquarters, in 2002, 79.05% of the population lived, and in 2021, 85.19% of the resident population lived. As the closest settlements from the municipality headquarters, we have: Mala Rechitsa, Golema Rechitsa, Lavtse and Poroj. As for the distance between settlements, at the greatest distance is the village of Bozovtse with the villages of Setole, Otunje and Gjermo, for 32km, while at a shorter distance from each other are the villages of Dzepchishte and Poroj, for 1.1 km [15].

The importance of the traffic network and the distance from the capital and the municipality, lies in the need for easier movement and communication of the population with the surrounding settlements and beyond. In the future, it is necessary to improve the road network in the villages in order to improve the communication links between the settlements.

Conclusion

This paper focuses on the distribution of population and households in the municipality of Tetovo depending on some geographical determinants which represent an important prerequisite for the development of space, or settlements, through which the population can develop various economic activities.

The territory of this municipality lies mainly in the Lower Polog, and a part of it in the mountainous areas of Sharr, up to the border with Kosovo. It lies in the northwest-southeast direction. The total area of the settlement is 264.8 km², with a population of 104504 inhabitants and a population density of 395 b/km², by the census of 2021. The municipality has 20 settlements, of which 10 are lowland settlements, 6 are hilly and 4 are mountainous settlements, with a density of 7.55 settlements per 100km², with an average area of 13.3 km² per settlement.

Depending on the studied characteristics, the settlements differ from each other and this further affects the spatial distribution of the population. In the period from 1994 to 2002 in the Municipality of Tetovo we have an increase of 7.8%, while in 2021 with a total number of the population of 104,504 inhabitants' marks and increase of 30.2%. The increase in population affects the faster development of settlements, while the decrease in population changes the location in the network of settlements and the spatial distribution of the population. The settlements with the highest population density by the census of 2021 are: Tetovo with 2820⁴ inh. /km², Xhepchishte with 742 inh./km² and Mala Rechitsa with 705 inh./km², while the settlements with the lowest population density are: Otunje with 0.5 inh./km², Bozovtse with 3.1 inh./km², Setole with 5.9 inh./km² and Jedoartse with 10.7 inh. km². The distribution of the population is related to the economic conditions of the area, infrastructure equipment, etc. According to the data from census of 2021 the total number of houses is

⁴ Referring to resident population.

30167 houses with 2.8 members on average per house, while the total number of households is 23848 with 3.6 members on average per household.

According to what we analyzed in the paper, we note that from the capital Skopje in 2002, 88.60% of the population of the Municipality of Tetovo were at a distance of 40km to 49.9km, where the average size was 6970 inhabitants, while in 2021 it was 7234 inhabitants, with a share of 93.87% in the total population and 22532 households with an average of 3.5 members per household. From the above, it is noted that most of the population of the Municipality of Tetovo is at a distance under 5km from the municipal headquarters. In 1994, 80.05% of the population lived at this distance from the municipality headquarters, in 2002, 79.05% of the population lived, and in 2021, 85.19% of the resident population lived. Proximity to cities and municipal headquarters affects the development of the economy of settlements, as well as increasing the standard of living of the population, thus guaranteeing a better life for residents by providing various employment opportunities, education, mobility, and easier communication with other regions.

From these results, we can conclude that the population in the Municipality of Tetovo has significant changes depending on the spatial determinants that affect the territory of the municipality. Therefore, the spatial distribution of the population must be considered during the planning of future development, both in terms of infrastructure, as well as in determining economic activities.

Our recommendations aim to pay attention to the development of all settlements in the Municipality of Tetovo, mainly mountainous settlements where we have a drastic decrease in the number of people, adding different economic activities suitable for the settlements in question, since with the improvement of the economic conditions of settlements and more sustainable economic development, including infrastructure, tourism development, as a good opportunity for employment of the residents of the area, their revitalization would take place.

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