

Spatial Analysis of Settlement Typology Along the Komoran-Polluzhë Road Corridor in the Municipality of Glllogoc (Drenas), Kosovo

Analisi spaziale della tipologia degli insediamenti lungo il corridoio stradale Komoran-Polluzhë nel comune di Glllogoc (Drenas), Kosovo

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Abstract

[EN] This study analyzes the typology of settlements along the Komoran-Polluzhë road, focusing on demographic, functional, and economic aspects. The research examines population changes from 1948 to 2024, highlighting transformations in settlement categories due to natural population growth, migration, and the influence of urban centers. Settlements were classified based on population size, growth rate, and functional roles, including primary rural settlements, local rural centers, settlements near urban areas, and sub-centers.

The findings indicate that over the last two decades, some settlements have experienced population decline or stagnation, primarily due to small population size, peripheral location, and migration to larger urban centers or abroad. Conversely, settlements with favorable geographic positions, proximity to urban centers, and better access to infrastructure and economic functions exhibited faster population growth and morphological transformation.

Overall, the study demonstrates the dynamic interaction between demographic trends, functional roles, and urban influence in shaping the development of rural settlements. These insights can inform regional

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planning, local governance, and sustainable development strategies in Kosovo.

KEYWORDS: settlements typology, population dynamics, rural settlements, demographic change, functional classification, urban influence

[IT] Questo studio analizza la tipologia degli insediamenti lungo la strada Komoran-Polluzhë, con particolare attenzione agli aspetti demografici, funzionali ed economici. La ricerca esamina i cambiamenti della popolazione dal 1948 al 2024, evidenziando le trasformazioni nelle categorie degli insediamenti dovute alla crescita naturale della popolazione, alla migrazione e all'influenza dei centri urbani. Gli insediamenti sono stati classificati in base alla dimensione demografica, al tasso di crescita e ai ruoli funzionali, includendo insediamenti rurali primari, centri rurali locali, insediamenti prossimi alle aree urbane e sotto-centri.

I risultati indicano che, negli ultimi due decenni, alcuni insediamenti hanno registrato un declino o una stagnazione demografica, principalmente a causa delle ridotte dimensioni della popolazione, della posizione periferica e della migrazione verso centri urbani più grandi o all'estero. Al contrario, gli insediamenti caratterizzati da una posizione geografica favorevole, dalla prossimità ai centri urbani e da un migliore accesso alle infrastrutture e alle funzioni economiche hanno mostrato una crescita demografica più rapida e trasformazioni morfologiche più evidenti.

Nel complesso, lo studio dimostra l'interazione dinamica tra tendenze demografiche, ruoli funzionali e influenza urbana nel plasmare lo sviluppo degli insediamenti rurali. Questi risultati possono contribuire alla pianificazione territoriale, alla governance locale e alla definizione di strategie di sviluppo sostenibile in Kosovo.

PAROLE CHIAVE: tipologia degli insediamenti, dinamiche demografiche, insediamenti rurali, cambiamento demografico, classificazione funzionale, influenza urbana

INTRODUCTION

The study of settlement typology and population dynamics represents a crucial dimension in human geography, regional planning, and rural development. Settlements are dynamic entities whose size, structure, and functions evolve in response to demographic trends, economic opportunities, infrastructure development, and socio-political changes.¹ Understanding these changes is essential for sustainable planning, resource allocation, and improving the quality of life in both urban and rural areas.

Globally, rural settlements have experienced significant transformations over the past century. Population decline, migration to urban centers, and socio-economic restructuring have reshaped the demographic profile and functional roles of these settlements.² At the same time, settlements located near major transportation routes or urban centers often experience population growth and functional diversification due to their accessibility and economic opportunities.³ These phenomena highlight the close interrelationship between demographic trends, settlement hierarchy, and spatial organization.

In the context of Kosovo, rural and peri-urban settlements have undergone similar changes, particularly in regions influenced by proximity to municipal and regional centers. Ramadani (2014, 2016) provides a detailed typology of rural settlements, categoriz-

¹ CLOKE - GOODWIN 1992; CHAMPION 2001, pp. 155-168, on the dynamics of settlement transformation and the structural changes in urban and rural systems.

² BROWN - SHUCKSMITH 2006; SYKORA - BOUZAROVSKI 2012, pp. 43-60.

³ CLARK 2003, pp. 1-24.

ing them based on functional roles and spatial organization, such as primary rural settlements, community centers, and settlements near urban centers. Pushka (2000) emphasizes that population growth in rural settlements is strongly influenced by proximity to urban or municipal centers, with higher migration inflows observed in villages closer to these centers. Islami (1990) documents a demographic “boom” in the municipality of Gllgoc after the 1960s, identifying key drivers such as urban influence, economic opportunities, and access to regional transport networks.

This research focuses on the settlements along the Komoran–Polluzhë road corridor in Gllgoc municipality, analyzing demographic changes, functional transformations, and economic activities between 1948 and 2024. By comparing historical and recent population data, categorizing settlements according to size, and examining their functional roles, this study aims to reveal patterns of population growth, stagnation, or decline, as well as the factors driving these changes. The analysis contributes to a better understanding of settlement evolution in post-socialist regions and informs local planning and development policies.

Settlements represent a special physiognomy of the natural landscape, therefore they are a specific category for their treatment and research. Settlements, in particular rural areas, continuously present transformations from other areas in terms of physiognomy, morphology, economic, social, demographic, cultural development and in terms of social and technical infrastructure. These transformations occur as a result of numerous factors of natural influences such as relief, climate, geographical position, exposure, hydrography, wealth of lands and other natural resources, as well

as social factors such as demographic aspects, economic development, infrastructure, municipal services, their centrality, the development potential of certain areas which represent the basis for the development of spatial and strategic plans for the future.

In this paper, the main characteristics of the spatial and functional structure of rural areas near the road as an important factor, but also the urban area, which is also a municipal center, are discussed.

The settlements under treatment have their own gravitational influence on each other, which then affects changes in their internal organization and structure. The main purpose of this research is to analyze the factors of changes in the functional and spatial structure, to compare these changes in different time periods and to draw conclusions about the similarities between them. The temporal or historical aspect plays an important role both in the morphology or physiognomy of settlements and in the way of spatial organization in terms of time. Our analysis will also focus on the influences of geographical position, the centrality of any of the settlements to other settlements, the gravitational aspect of population attraction both in the horizontal and vertical spatial aspects, their impacts on the environment and on the quality of life of the population. Alluding to these conclusions, we conclude that our hypothesis is based on the transformations of settlements in continuity as a result of factors of mutual influence between natural and social factors. And as a result, modern-day urban and spatial planning necessarily leads to processes of regional interaction.

THEORETICAL BACKGROUND: URBANIZATION, SUBURBANIZATION AND PERIURBANIZATION

Urbanization represents a fundamental socio-spatial process characterized by the concentration of population, economic activities, and services in urban areas, leading to significant transformations in settlement systems and spatial organization.⁴ In contemporary spatial development, urbanization is increasingly accompanied by processes such as suburbanization and periurbanization, which reshape the structure and function of both urban and rural areas.

Suburbanization refers to the outward expansion of population and urban functions from the urban core towards surrounding rural or semi-rural areas. This process is typically driven by improved transport infrastructure, housing demand, and the search for better living conditions, resulting in the transformation of rural settlements into suburban zones with mixed land use and increasing functional complexity.⁵

Periurbanization, on the other hand, describes transitional zones between urban and rural areas, characterized by rapid and often unplanned spatial growth, heterogeneous land use, and dynamic socio-economic interactions. These areas are marked by the coexistence of agricultural and non-agricultural activities, as well as increasing pressure on land resources and infrastructure.⁶

⁴ CHAMPION 2001, pp. 155-168.

⁵ PHELPS 2012, pp. 633-654; POWE - SHAW 2004, pp. 23-36.

⁶ ANTROP 2004, pp. 9-26; SÝKORA - BOUZAROVSKI 2012, pp. 43-60.

In post-socialist and transitional contexts, including Kosovo, these processes have been particularly pronounced due to demographic changes, migration patterns, economic restructuring, and institutional transformations.⁷ The expansion of urban influence beyond administrative boundaries has led to significant changes in settlement typology, functional organization, and spatial structure.

Therefore, the analysis of settlements along the Komoran-Poluzhë road corridor should be understood within this broader theoretical framework. The observed demographic trends, functional differentiation, and spatial transformations reflect processes of suburbanization and periurbanization, where settlements closer to urban centers tend to grow and diversify, while more peripheral settlements often experience stagnation or decline.

This theoretical perspective provides a foundation for interpreting the spatial dynamics of settlements and for linking empirical findings with broader regional and global urbanization processes.

RESEARCH PURPOSE

The earliest definition in Europe of spatial planning comes from the «Charter of Torremolinos», adopted in 1983 by CEMAT (European Conference of Ministers responsible for Regional Spatial Planning):

Regional/spatial planning gives geographical expression to the economic, social, cultural and ecological policies of society. It is at the same time a scientific discipline, an administrative technique and a policy developed as an interdisciplinary and comprehensive approach aimed at a balanced

⁷ Ivi, pp. 43-60.

regional development and physical organization of space according to an overall strategy.

Space as a whole develops and changes over time, it exhibits continuous changes both in terms of natural phenomena and processes, as well as in social, economic and environmental aspects. Natural and social elements are found within the geosystem in space and are in relation to each other, which affects each other in the process over time. It has also been argued that all events occurring on the earth's surface are interconnected with the surrounding environment.

Settlements form, develop and disappear depending on the interests or needs of human society. Since the topic of our research also concerns the spatial and functional organization of settlements near the Komoran - Polluzhe highway, our main goal is to determine the indicators of change in the period after 2001 and until now.

Spatial planning is in the function of regulating and developing the entire public sector, the need for studies of geo-spatial elements is presented as a necessity of human society in the development and overall social, economic and environmental organization. Planning and drafting of spatial strategies, whether at the local or national level, carries with it the powers and mechanisms of the governing authorities to execute and monitor the implementation of spatial planning policies. During spatial development planning, the goal remains the most adequate and rational management of the territorial space of a settlement, municipality, region or the entire territorial space of a country. With this aim, municipal and central governments draft development plans and strategies for

certain periods of time, based on the progress of demographic, social, and economic changes, the use of natural resources, the impact on the environment, infrastructural development and various services for the community of that space.

Various scientific disciplines and local and foreign researchers have been involved in the typology of settlements, as it is a very complex field of study.

The science of geography is among the first and most competent sciences for the analysis of many characteristics related to the typology of settlements, such as: demographic analysis, morphology of settlements, functional and economic character and typification, development trends of settlements in spatial, functional and economic aspects, etc.

The typification of settlements by size has its indisputable importance in terms of their economic and urban development. In this regard, the authors argue that very small settlements do not have the capacity for economic self-sufficiency. In contrast, larger settlements tend to include more production units and benefit from more advanced organizational forms in agricultural production.

From an urban planning perspective, the size of a settlement is considered a key basis for planning decisions, since, as established in urban planning theory and practice, the organization of settlements is closely related to their size. Very small settlements, usually isolated, do not have the conditions for the rational organization of basic services and the implementation of settlement planning.

Therefore, this research aims to conduct a spatial analysis of settlement typology along the Komoran-Polluzhë road corridor in the Municipality of Gllugoc (Drenas), Kosovo by examining settle-

ment size, spatial distribution, and functional characteristics, with the intent of contributing to a more comprehensive understanding of settlement patterns and their implications for regional spatial planning and local development.

METHODS USED DURING THE RESEARCH

This study applies a combination of quantitative, comparative, and spatial analysis methods. Population data for the period 1948-2024 were obtained from official statistical sources and municipal records. These data were used to analyze long-term demographic trends and identify patterns of growth, stagnation, and decline among settlements.

The main methods applied include:

- Statistical analysis of population data (growth indices and temporal comparison),
- Comparative method (comparison between 2001, 2011, and 2024),
- Classification method (typology of settlements based on demographic size and growth rate),
- GIS-based spatial analysis (distribution, distance, and functional relationships of settlements).

These methods enabled the identification of spatial patterns and functional differentiation of settlements along the Komoran-Polluzhë road corridor.

STUDY AREA SETTLEMENTS

The settlements along the Komoran-Polluzha road, in the geographic coordinate system, extend between $42^{\circ}34'35''$ N (Figure 1), which is the southernmost point of these settlements (Komoran), and $42^{\circ}39'52''$ N, which is the northernmost point (Polluzha). Likewise, they lie between $20^{\circ}50'20''$ E, the westernmost point (Çikatovë e re), and $20^{\circ}54'53''$ E, the easternmost point of these settlements (Poklek). In terms of physical-geographical position, these settlements have a meridional (north-south) orientation, located in the lower part of the relief within the South Drenica basin.

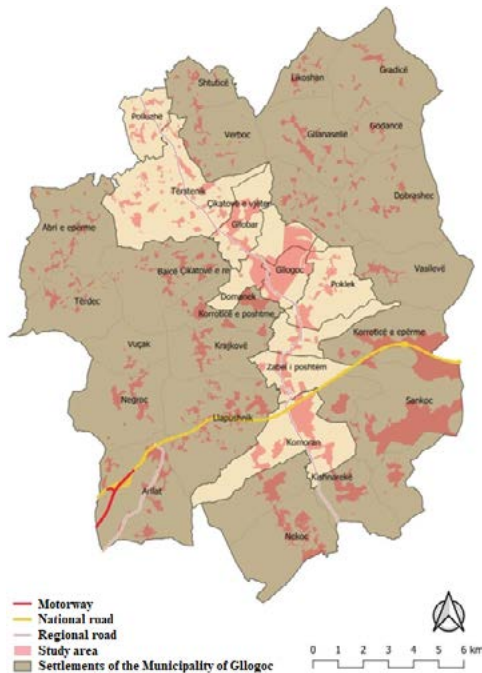


Figure 1. Map of the distribution of settlements along the Komoran-Polluzha road, in the municipality of Gllgoc. Source: Authors, 2026.

GENERAL GEOGRAPHICAL DISTRIBUTION

The geographical (territorial or spatial) distribution of settlements consists of:

- a. general distribution of settlements on the land surface and within specific regions,
- b. specific distribution of settlements, which is reflected in relation to various segments of the geographical environment,
- c. distances between settlements and their parts.

The spatial distribution of settlements can be analyzed using quantitative methods, which help in illustrating the distribution of settlements, their density in relation to area, the spatial distance between them, as well as various causal relationships explaining the phenomena and processes that have occurred over time and space.

First, we analyze the density of settlements relative to the area, as an important indicator of the geographical distribution of settlements. This indicator is expressed by the formula:

$$D=(n \cdot 100)/s$$

Where:

D=settlement density

n=number of settlements

S=area of the territory in km²

To provide a clearer perspective, the settlement density under consideration will be compared with the municipal and Kosovo-wide levels.

At the Kosovo level, the average settlement density is 13.2 settlements per 100 km².

At the municipal level:

$$D=(35 \cdot 100)/(275.6 \text{ km}^2)=12.7 \text{ settlements per } 100 \text{ km}^2$$

In our specific case, for the settlements under study:

$$D=(9 \cdot 100)/(61.06 \text{ km}^2)=14.7 \text{ settlements per } 100 \text{ km}^2$$

Based on these data, it can be observed that the settlements under consideration have a higher density than the average at both the Kosovo and municipal levels. This is explained by the fact that these settlements are located in lower, more suitable areas for habitation compared to other settlements in the municipality, which has led to greater population concentration and, consequently, higher settlement density.

Two other indicators that help illustrate the general distribution of settlements are the average area per settlement and population density, which is expressed by the formula:

$$D=s/n$$

Where:

D=population density

S=area

n=number of settlements

At the Kosovo level, this indicator is 7.5 km² per settlement.

At the municipal level: $D=(275.6 \text{ km}^2)/35=7.8 \text{ km}^2$ per settlement.

In our case: $D=(61.06 \text{ km}^2)/9=6.8 \text{ km}^2$ per settlement.

As observed, settlements along the Komoran-Polluzhë road have a smaller average area compared to the municipal and Kosovo averages. This occurs due to the higher density of settlements in a given spatial area.

The coefficient of settlement clustering (density) can be applied to smaller administrative units and is expressed as:

$$k=(E \cdot N)/T$$

Where:

- k =coefficient of settlement clustering
- E =population of the municipality (excluding the central settlement)
- N =total number of settlements (excluding the municipal center)
- T =total population of the municipality

At the municipal level: $k=(40998 \cdot 34)/48079=28.9$.

For the settlements under study: $k=(14214 \cdot 8)/21295=5.3$.

Since the settlements along the Komoran-Polluzhë road are linearly distributed along the north-south direction in the southern part of the Drenica basin, another important indicator of geographic distribution is the settlement network density, expressed via spatial distance:

$$D=\sqrt{(s/n)}$$

At the Kosovo level, the average distance is 2.76 km, while in areas below 700 meters above sea level, it is 2.5 km.

At the municipal level: $D=\sqrt{(275.6/35)}=2.8$ km.

For the settlements under study: $D=\sqrt{(61.06/9)}=2.6$ km.

As seen, the average distance of settlements along the Komoran-Polluzhë road is smaller than the Kosovo and municipal averages and is approximately equal to the average distance in areas below 700 meters above sea level, which is consistent with the fact that all these settlements are located below 700 meters elevation (Table 1).

Settlement	Area (km ²)	Population 2024	Distance from Urban Center (km)	Average Elevation (m)
Komoran	11.3	3,354	7	632
Zabel i Ultë	4.5	1,027	4	596
Korroticë e Poshtme	4.1	990	3	598
Poklek	6.96	1,875	2	595
Glllogoc	3.7	7,081	-	598
Çikatovë e Re	5.6	1,880	1	580
Gllobar	5.1	1,378	3	605.5
Tërstenik	15.6	3,017	5	628.5
Polluzhë	4.2	693	8	631.5
Total	61.06	21,295	-	-

Table 1. General Statistical Data for Settlements along the Komoran-Polluzhë Road.
Source: Authors, 2026.

TPOLOGY BY DEMOGRAPHIC SIZE

When classifying settlements according to demographic size, different authors propose varying categorizations. For example, rural settlements by demographic size can be divided as follows:⁸

- Small settlements (0-500 inhabitants), subdivided into:
 - a) Very small settlements: 0-99 inhabitants
 - b) Small settlements: 100-499 inhabitants

⁸ RAMADANI 2023, p. 51.

- Medium-sized settlements (500-2,000 inhabitants), subdivided into:
 - a) Small-medium settlements: 500-999 inhabitants
 - b) Large-medium settlements: 1,000-2,000 inhabitants
- Large settlements (over 2,000 inhabitants), subdivided into:
 - a) Large settlements: 2,000-3,000 inhabitants
 - b) Very large settlements: 3,000 or more inhabitants

Similarly, rural settlements are divided into three main groups and subgroups based on population size:⁹

- Small settlements: under 500 inhabitants
 - Medium settlements: 500-2,000 inhabitants
 - Large settlements: 2,000-5,000 inhabitants
- Subcategories:
- Very small: up to 200 inhabitants, and small: 200-500 inhabitants
 - Small-medium: 500-999 inhabitants, and large-medium: 1,000-1,999 inhabitants
 - Large settlements and towns: 2,000-4,999 inhabitants
 - Very large settlements and very small towns: 5,000-9,999 inhabitants

As observed, both authors present roughly similar classifications of settlements according to demographic size. According to the Spatial Planning Norms for Settlements, settlements in Glogoc Municipality are classified into five demographic categories:

- Small rural settlement: 200-500 inhabitants
- Small-medium rural settlement: 500-1,000 inhabitants

⁹ PUSHKA 2000, p. 24.

- Large-medium rural settlement: 1,000-2,500 inhabitants
- Large rural settlement: 2,500-5,000 inhabitants
- Very small urban settlement: 5,000-10,000 inhabitants

Based on this classification, the settlements along the Komoran–Polluzhë road corridor can be categorized accordingly (Table 2, Table 3):

Settlement Classification	Description	Classification According to Spatial Planning Norms	Number of Settlements
5,000-10,000 inhabitants	Very small urban settlement	High order center	Glllogoc
2,500-5,000 inhabitants	Large rural settlements	Medium order center	3 settlements: Komoran, Tersteniku, Çikatovë e Re
1,000-2,500 inhabitants	Large-medium rural settlement	Low order center	5 settlements: Poklek, Glllobar, Zabel i Ulët, Korroticë, Poshtme, Polluzhë
500-1,000 inhabitants	Small-medium rural settlement	Basic center	//
200-500 inhabitants	Small rural settlement	Basic center	//

Table 2: Classification of Settlements According to the Spatial Planning Norms Based on the 2001 Assessment. Source: Authors, 2026.

Settlement Classification	Description	Classification According to Spatial Planning Norms	Number of Settlements
5,000-10,000 inhabitants	Very small urban settlement	High order center	Glllogoc
2,500-5,000 inhabitants	Large rural settlements	Medium order center	2 settlements: Komoran, Tersteniku
1,000-2,500 inhabitants	Large-medium rural settlement	Low order center	4 settlements: Çikatovë e Re, Poklek, Glllobar, Zabel i Ulët

Settlement Classification	Description	Classification According to Spatial Planning Norms	Number of Settlements
500-1,000 inhabitants	Small-medium rural settlement	Basic center	2 settlements: Korroticë, Poshtme, Polluzhë
200-500 inhabitants	Small rural settlement	Basic center	//

Table 3: Classification of Settlements According to the Spatial Planning Norms Based on the 2024 Census. Source: Authors, 2026.

Based on Table 3, we observe that two settlements, Korrotica e Poshtme (990 inhabitants) and Polluzha (693 inhabitants), belong to the category of small-medium rural settlements. Four other settlements – Çikatova e Re (1,880 inhabitants), Poklek (1,875 inhabitants), Gllobar (1,378 inhabitants), and Zabel i Ultë (1,027 inhabitants) – are classified as large-medium rural settlements. Two settlements, Komoran (3,354 inhabitants) and Tërsteniku (3,017 inhabitants), are categorized as large rural settlements. The only settlement classified as a very small urban settlement is Gllogoc (7,081 inhabitants).

When comparing the demographic size changes of these settlements with the period of 2001, we notice some shifts. For example, while Korrotica e Poshtme and Polluzha are now small-medium rural settlements, in 2001 they were classified as large-medium rural settlements. This indicates a significant demographic decline, resulting in their reclassification to a lower category. A similar trend is observed with Çikatova e Re, which is now classified as a large-medium rural settlement, whereas in 2001 it was classified as a large rural settlement (see Tables 2 and 3).

TYPOLGY OF SETTLEMENTS BASED ON THE POPULATION GROWTH RATE ALONG THE KOMORAN-POLLUZHË ROAD CORRIDOR

Within this typology, settlements are differentiated according to categories and the rate of demographic growth or decline as a result of factors that have caused changes in demographic size categories. The main factors influencing changes in demographic size categories are assumed to be related to the geographical location of the settlements, their proximity or distance from the municipal or urban center, the influence of the regional road, the structure of economic functions, and others.

To develop this typology of settlements, the first step was to categorize settlements according to demographic size. For this categorization, the classifications proposed by authors I. Ramadani and A. Pushka have been used.¹⁰

Regarding the typology of settlements based on population growth rates in Kosovo, author A. Pushka differentiates settlements into six types:¹¹

- d. Negative growth rate type (decline to a lower category)
- e. Stagnant growth rate type (remaining in the same category)
- f. First-level positive growth rate type (advancing by one category)
- g. Second-level positive growth rate type (advancing by two categories)
- h. Third-level positive growth rate type (advancing by three categories)

¹⁰ RAMADANI 2016; PUSHKA 2000.

¹¹ PUSHKA 2000.

i. Fourth-level positive growth rate type (advancing by four categories)

To provide a clearer overview of changes and differentiation of settlements in terms of demographic growth or decline, a comparative method between the years 2001 and 2024 will be used.

Population changes and the transition of settlements along the Komoran-Polluzhë road corridor into different categories will be examined for the period 2001-2024 (note: population figures for 2001 are estimates, Table 4, 5, 6, 7). The changes in categories according to the size of settlements along the Komoran-Polluzhë corridor are presented in the following tables.

Settlement	Komoran	Zabel i Ulët	Korroticë e Poshtme	Poklek	Glllogoc	Çikatovë e Re	Glllobar	Tërstenik	Polluzhë
Year 2001 (est.) / Population	4,278	1,145	1,056	2,156	5,465	3,256	1,628	4,349	1,507
Year 2011 / Population	4,393	1,077	972	1,967	6,143	2,026	1,526	3,903	1,017
Year 2024 / Population	3,354	1,027	990	1,875	7,081	1,880	1,378	3,017	693
Index 2011/2001	102.7	96.1	92.0	91.2	112.4	62.2	93.7	89.7	67.5
Index 2024/2001	78.4	89.7	93.7	86.9	129.6	57.7	84.6	69.4	46.0

Table 4. Population Changes Based on the Index Between the Years 2001, 2011, and 2024 for Settlements Along the Komoran-Polluzhë Road Corridor. Source: Authors, 2026.

Next, we will present the typology of settlements for the years 2001, 2011, and 2024, showing the transition of settlements into different categories.

The observed population trends can be interpreted within the broader processes of urbanization and spatial restructuring. The population growth observed until 2011 is largely associated with natural population increase and the concentration of population in accessible and economically active areas.

However, the decline observed after 2011 in most settlements, except Gllgoc, reflects increasing migration towards major urban centers such as Prishtina, as well as international migration. This indicates a typical periurban dynamic, where central settlements maintain or increase population, while peripheral settlements experience depopulation.

These processes confirm that settlement development in the study area is not isolated, but part of wider regional urbanization and suburbanization trends.

Year 2001	1,000-1,999 inhabitants	2,000-4,999 inhabitants	> 5,000 inhabitants	Total
Type 3				
Type 4	4 (44.4%)			4 (44.4%)
Type 5		4 (44.4%)		4 (44.4%)
Type 6			1 (11.1%)	1 (11.1%)
Total	4 (44.4%)	4 (44.4%)	1 (11.1%)	9 (100%)

Table 5. Typology of Settlements Along the Komoran-Polluzhë Road Corridor for the Year 2001. Source: Authors, 2026.

Year 2011	500-999 inhabitants	1,000-1,999 inhabitants	2,000-4,999 inhabitants	> 5,000 inhabitants	Total
Type 3	1 (11.1%)				1 (11.1%)
Type 4		4 (44.4%)			4 (44.4%)

Year 2011	500-999 inhabitants	1,000-1,999 inhabitants	2,000-4,999 inhabitants	> 5,000 inhabitants	Total
Type 5			3 (33.3%)		3 (33.3%)
Type 6				1 (11.1%)	1 (11.1%)
Total	1 (11.1%)	4 (44.4%)	3 (33.3%)	1 (11.1%)	9 (100%)

Table 6. Typology of Settlements Along the Komoran-Polluzhë Road Corridor for the Year 2011. Source: Authors, 2026.

Year 2024	500-999 inhabitants	1,000-1,999 inhabitants	2,000-4,999 inhabitants	> 5,000 inhabitants	Total
Type 3	2 (22.2%)				2 (22.2%)
Type 4		4 (44.4%)			4 (44.4%)
Type 5			2 (22.2%)		2 (22.2%)
Type 6				1 (11.1%)	1 (11.1%)
Total	2 (22.2%)	4 (44.4%)	2 (22.2%)	1 (11.1%)	9 (100%)

Table 7. Typology of Settlements Along the Komoran-Polluzhë Road Corridor for the Year 2024

As observed from Tables 5, 6, and 7, over the course of nearly two decades, there have been changes in the rate of population growth or decline in these settlements.

In 2001, four of these settlements (44.4%) belonged to the type of second-level growth rate (an increase of two categories since 1948), while another four settlements (44.4%) belonged to the third-level growth rate (an increase of three categories since 1948). The only settlement classified under the fourth-level growth rate (an increase of four categories since 1948) was Glllogoc. The settlements belonging to the second-level growth rate were Zabel i Ultë, Korrotica e Poshtme, Glllobari, and Polluzha, whereas those classified un-

der the third-level growth rate were Komorani, Pokleku, Çikatova e Re, and Tërsteniku.

Based on the analysis of these facts, it is possible to identify the causes behind the faster growth rates in some settlements and the slower growth in others. First, we will examine the settlements that experienced the fastest population growth: Glllogoc, Komorani, Tërsteniku, Çikatova e Re, and Pokleku.

In settlements such as Glllogoc, Komorani, and Tërsteniku, several factors interacted. These settlements are large settlements or small towns with a considerable population. For Tërsteniku, the only factor influencing population growth was its demographic size in the past. In 1948, Tërsteniku had 1,111 inhabitants and was classified under the second-level growth rate.

Glllogoc and Komorani, in 1948, had 558 and 805 inhabitants respectively. In these cases, population size alone did not explain the accelerated growth. These settlements have a favorable geographic location relative to the road and railway network, higher centrality compared to other settlements, a larger number of secondary and tertiary economic functions, and lie on flat and low-lying terrain, making them attractive and suitable for habitation. For Glllogoc, another contributing factor is its role as a municipal center, providing nearly all administrative services, better healthcare facilities, more employment opportunities, and a higher standard of living.

Çikatova e Re and Pokleku had populations of 223 and 330 in 1948, respectively, increasing to 3,256 and 2,156 by 2001. These settlements clearly experienced significant population growth.

According to Pushka,¹² as the size of an urban (municipal) center increases, its influence on neighboring settlements also increases. Therefore, the main factor for the rapid population growth in Çikatova e Re and Pokleku was their proximity to the municipal center, Glllogoc. Their closeness to the urban center facilitated significant immigration from other peripheral settlements within the municipality.

Settlements characterized by slower population growth were Zabel i Ultë, Korrotica e Poshtme, Glllobari, and Polluzha.

First, we analyze Zabel i Ultë and Korrotica e Poshtme, located between the towns of Glllogoc and Komorani. Despite having a favorable geographic location and moderate distance from the municipal center, these settlements experienced slower population growth. The primary factor was their small demographic size. Additionally, these settlements received very few immigrants from other settlements, while emigration to other centers in Kosovo or abroad was present.

Glllobari and Polluzha are located along the Glllogoc-Skënderaj road. The reasons for their slower population growth include small demographic size, greater distance from the municipal center, and their long-standing character as typical rural settlements.

During the periods 2001-2011 and 2011-2024, changes in the rate of population growth or decline were also observed along the Komoran-Polluzhë road corridor.

Between 2001 and 2011, two settlements experienced negative growth (category decline). Korrotica e Poshtme dropped one cate-

¹² PUSHKA 2000.

gory, from Type 4 to Type 3. Similarly, Pokleku experienced negative growth, declining from Type 5 in 2001 to Type 4 in 2011. During this period, Zabel i Ultë, Gllobari, and Polluzha exhibited stagnation (remaining in the same category), specifically Type 4. Komorani, Tërsteniku, and Çikatova e Re also showed stagnation, remaining in Type 5.

Between 2011 and 2024, two settlements experienced category decline. Polluzha decreased from Type 4 in 2011 to Type 3 in 2024, and Çikatova e Re declined from Type 5 to Type 4. Pokleku remained in the same category (second-level growth, Type 4). The only settlement that maintained fourth-level growth (Type 6) across both periods was the urban center, Glllogoc.

According to Islami,¹³ the demographic “boom” in Glllogoc municipality became noticeable after the 1960s, showing both absolute and relative rapid growth. Across all census periods, the population of this municipality grew significantly faster than the Kosovo average and most other municipalities, except Prishtina and Prizren. The highest growth occurred between 1971 and 1981, with an absolute and average annual increase of 1,118 inhabitants, and the average growth rate of 32.0 per 1,000 inhabitants – the highest in Kosovo.

To provide a clearer overview of population trends in these settlements from 1948 to 2024, the following table and illustrative graph will be presented (Table 8 and Figure 2).

¹³ ISLAMI 1990.

Year/Settlement	1948	1953	1961	1971	1981	1991	2001	2011	2024
Komorani	805	915	1076	1404	2169	3080	4278	4393	3354
Zabeli i Ultë	319	355	433	647	736	1094	1145	1077	1027
Korrotica e Poshtme	300	289	355	465	644	808	1056	972	990
Pogleku	330	403	473	661	977	1345	2156	1967	1878
Gllogoci	558	658	836	1343	2440	4499	5465	6143	7081
Çikatova e Re	223	243	360	525	828	1431	3256	2026	1880
Gllobari	486	557	620	752	1106	1453	1628	1526	1378
Tërsteniku	1111	1170	1472	1956	2662	3525	4349	3903	3017
Polluzha	369	409	490	689	890	1119	1507	1017	693

Table 8. Numerical Population Movement of Settlements Along the Komoran-Polluzhë Road Corridor from 1948 to 2024. Source: Data from 1948-1981 and 2011-2024 were obtained from the Kosovo Agency of Statistics, while the data for 1991 and 2001 were taken from estimates provided by the municipal authorities of Gllogoc in 2001.

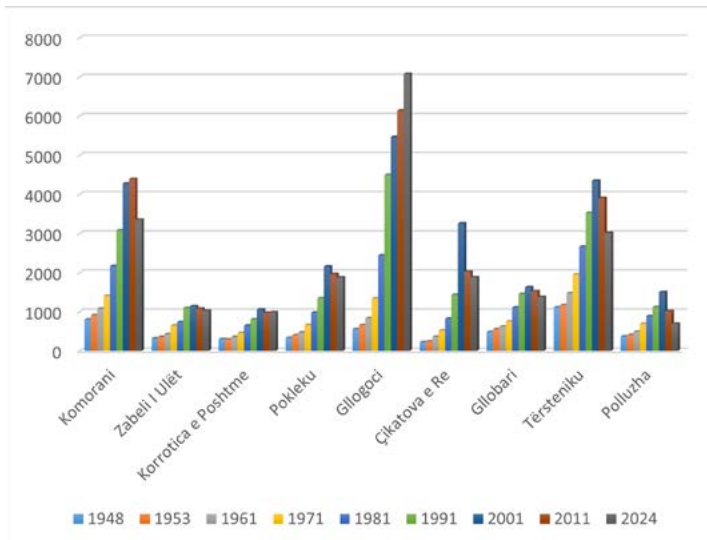


Figure 2. Graphical representation of the population changes in the settlements along the Komoran-Polluzhë road from 1948 to 2024. Source: Authors, 2026.

FUNCTIONAL TYPOLOGY OF SETTLEMENTS ALONG THE KOMORAN-POLLUZHË ROAD

According to I. Ramadani, the functional typology of rural settlements in Kosovo is based on both fundamental and special functions, though all villages, to a greater or lesser extent, exhibit agricultural functions. Through external functions, rural settlements are physically integrated with other settlements that gravitate toward them or vice versa. The settlement system within a municipality consists of both rural and urban settlements, including their cadastral units, built-up areas, and production zones, which are clearly delineated.

Based on the representation of these functions, rural settlements are divided into three functional categories:

- Primary rural settlements (without central functions)
- Rural community centers
- Centers of rural communities¹⁴

Meanwhile, according to core functions (various authors), rural settlements are categorized as:

- Tourist centers
- Regional centers
- Villages near urban areas

Based on the above, the settlements along the Komoran-Polluzhë road can be functionally classified according to their spatial organization, the functions that gravitate toward other settlements, and their proximity to the urban center, as follows (Table 9 and Fig-

¹⁴ RAMADANI 2016, p. 150.

ure 3): primary settlements, rural community centers, rural settlements near urban areas, sub-centers, and small towns.

Primary settlements without central functions are Polluzha, Gllobari, and Korrotica e Poshtme. Rural settlements near urban centers include Çikatova e Re, which also serves as a rural community center for several villages (Gllobari, Krajkovë, and Shtrubullojë), as well as Pokleku i Ri. Other rural community centers are Tërsteniku (covering Polluzhë, Shtuticë, and Vërboc) and Zabeli i Ulët (covering Korroticë e Poshtme, Poklek, Vasilevë, and Korroticë e Epërme). Komorani is considered a sub-center and a local rural community center for Nekocin and Kishnarekë (see Figure 1).

Primary settlements such as Polluzha, Gllobari, and Korrotica e Poshtme lack external central functions for other settlements and primarily produce agricultural, livestock, or forestry products. These settlements are smaller in size and located more peripherally relative to the urban center. Only internal functions that serve the needs of their residents are developed here. Their morphological and economic transformation is slower due to weaker influence from the urban center caused by their greater distance. What favors these settlements is their location along the regional Komoran-Gllogoc-Skenderaj road, especially Korrotica e Poshtme, situated between Komorani and Gllogoc.

Although Zabeli i Ulët and Çikatovë e Re are listed as local community centers within the spatial organization of Gllogoc municipality, some social functions cannot be provided locally, as they lack a municipal office, health facilities, cultural center, or police station. Therefore, residents of these settlements and surrounding

villages rely on Komoran or Glllogoc for administrative, health, and social services.

Komorani and Tërstenik are considered sub-centers and local community centers. Komorani has a favorable geographical position relative to national and regional roads and external centrality to surrounding settlements, which has enabled rapid morphological and functional-economic and social transformation. Administrative, educational, health, and cultural services are available, including municipal offices, police station, post office, family medicine center, primary and secondary schools, pharmacy, craft workshops, veterinary services, etc. Komorani is projected to potentially become a municipality in its own right.

Similarly, Tërstenik has a good position relative to the regional road, a large territorial area, and external centrality to surrounding settlements, leading authorities to designate it as a sub-center for the northern settlements of the municipality. It hosts municipal offices, family medicine centers, two primary schools, a veterinary center, and a grain collection and milling facility. Residents from this settlement and nearby villages rely on it for administrative, healthcare, and educational services.

Çikatovë e Re and Poklek i Ri are classified as settlements near the urban center, as they are located very close to the urban center of Glllogoc.

Settlement	Functional Typology	Notes / Villages Served
Polluzha	Primary rural settlement	No central functions; mainly agricultural/livestock/forestry
Globari	Primary rural settlement	No central functions; small, peripheral settlement
Korrotica e Poshtme	Primary rural settlement	Located along regional road; serves local agricultural functions
Çikatova e Re	Rural settlement near urban center / Rural community center	Serves villages Gllbari, Krajkovë, Shtrubullojë; relies on Komoran/Gllogoc for administrative/social services
Pokleku i Ri	Rural settlement near urban center	Close to Glllogoc; influenced by urban center
Tërsteniku	Rural community center / Sub-center	Serves Polluzhë, Shtuticë, Vërboc; provides administrative, health, educational services
Zabel i Ulët	Rural community center	Serves Korroticë e Poshtme, Poklek, Vasilevë, Korroticë e Epërme
Komorani	Sub-center / Local rural community center	Serves Nekocin and Kishnarekë; administrative, educational, health, cultural functions

Table 9. Functional Typology of Settlements along the Komoran-Polluzhë Road. Source: Authors, 2026.

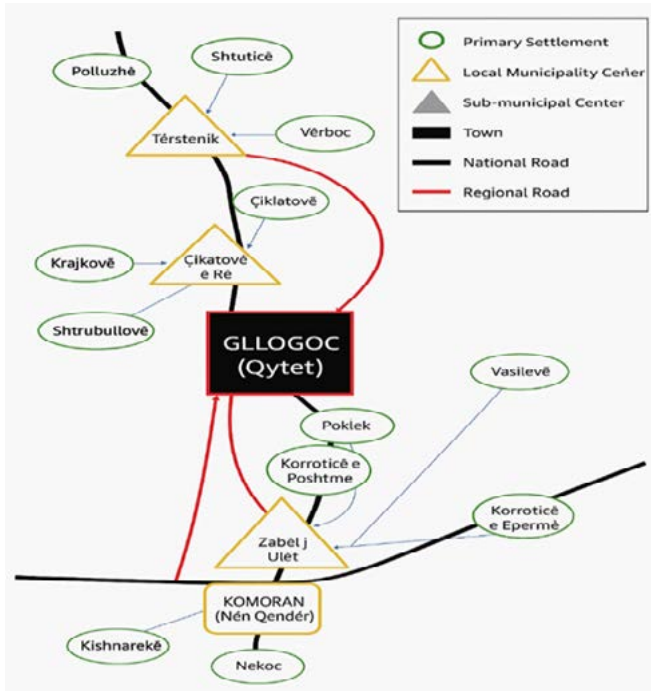


Figure 3. Functional-organizational typology of settlements along the Komoran-Polluzhë road corridor. Source: Authors, 2026.

The figure shows how settlements are organized in the municipality of Glllogoc according to their functions. It shows the city, four local central zones, and the primary settlements.

CONCLUSIONS

This study provides a comprehensive analysis of settlements as a spatial and functional system, highlighting the role of geographical factors, demographic dynamics, and socio-economic processes in

shaping their development. The findings indicate that settlements have undergone significant transformations in terms of population structure, functional characteristics, and spatial organization. These transformations are influenced by physical-geographical conditions, historical development, centrality, and socio-economic interactions.

These factors have shaped the geographical distribution of settlements, influencing their density, spatial expansion, morphological transformation, and functional interdependence.

The findings of this study have direct implications for spatial and regional planning. The identification of growing settlements (such as Glllogoc, Komoran, and Tërstenik) and declining settlements (such as Polluzhë and peripheral villages) provides a basis for targeted planning interventions. In particular, planning policies should focus on:

- strengthening sub-centers to reduce excessive migration to the main urban center
- controlling unplanned periurban expansion
- improving infrastructure and services in declining settlements
- preserving agricultural land from uncontrolled urban sprawl

Integrating these findings into municipal development plans can significantly contribute to balanced territorial development and sustainable spatial organization.

The results further demonstrate the relationship between geographical factors, particularly altitude and distance from the urban center, and the morphological and socio-economic characteristics of settlements. A key finding is the ongoing spontaneous and often uncontrolled spatial expansion of settlements, which creates significant challenges for spatial planning.

The analysis shows that settlements with favorable geographical positions and higher centrality, such as Komoran and Tërstenik, have experienced continuous growth and functional transformation, reinforcing their role as sub-centers. Similarly, settlements located in close proximity to the urban center, such as Çikatovë e Re and Poklek i Ri, are increasingly integrated into the urban structure, reflecting processes of suburbanization and periurbanization.

In contrast, settlements characterized by smaller demographic size, peripheral location, and greater distance from the urban center have experienced stagnation or decline, primarily driven by reduced natural population growth and increased migration.

Overall, settlement dynamics in the study area reflect broader processes of urbanization, leading to spatial concentration in central areas and functional weakening of peripheral settlements. This underlines the importance of integrated spatial planning approaches that address both growth and decline within the settlement system.

AUTHOR CONTRIBUTIONS STATEMENT

Ferim Gashi designed the study, conducted the spatial analysis, and wrote the main manuscript text.

Sonila Xhafa Sinjari contributed to the literature review, interpreted the results, and reviewed and edited the manuscript.

Ibrahim Ramadani provided conceptual guidance, supervised the study, and contributed to the interpretation of results and manuscript revision.

Elhami Isufi collected field data, performed data preprocessing, and prepared the figures and tables.

All authors have read and approved the final manuscript.

DECLARATION OF COMPETING INTEREST

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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