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MORPHOGENESIS OF SUBURBAN SPACE: ARCHITECTURAL AND URBAN TRANSFORMATIONS OF THE PERIPHERY OF BANJA LUKA

Abstract:

This paper analyzes the morphogenesis of suburban settlements within the periphery of Banja Luka, tracing their development from the mid-twentieth century to the present. The research identifies several phases of suburban growth shaped by social crises, migration, post-war reconstruction, and transitional conditions. Through the examination of spatial structure, parcelisation, building typologies, and infrastructure, the study highlights a shift from extensive low-density expansion toward increasing densification and morphological heterogeneity. The results reveal a clear discrepancy between formal planning frameworks and actual development processes, emphasizing the need to interpret suburbia as an integral component of the contemporary urban system.

Keywords: suburbis, typology, criteria, transformation

МОРФОГЕНЕЗА ПРИГРАДСКОГ ПРОСТОРА: АРХИТЕКТОНСКЕ И УРБАНИСТИЧКЕ ТРАНСФОРМАЦИЈЕ ПЕРИФЕРНИХ ЗОНА БАЊА ЛУКЕ

Сажетак:

Овај рад анализира морфогенезу предграђа у периферији Бање Луке, пратећи њихов развој од средине двадесетог вијека до данас. Истраживање идентификује више фаза раста насеља, које су обликовале друштвене кризе, миграције, послеријатна обнова и транзициони услови. Кроз проучавање просторне структуре, парцелације, типологије објеката и инфраструктуре, рад указује на помак од екстензивног ширења ниске густине ка све израженијем згушавању и морфолошкој хетерогености. Резултати показују јасно разилажење између формалних планских оквира и стварних развојних процеса, наглашавајући потребу да се предграђа тумачи као интегрална компонента савременог урбаног система.

Кључне ријечи: предграђе, типологија, критеријуми, трансформација

1. INTRODUCTION

Human settlements have historically emerged through a continuous interaction between society, space, and the natural environment. Rural and urban forms developed as distinct yet interdependent spatial systems, shaped by different modes of production, social organisation, and patterns of everyday life. While rural settlements evolved through organic adaptation to territory and natural conditions, cities gradually imposed their own logic upon space, organizing territory through centralised functions, infrastructure, and institutional frameworks. Over time, the boundary between these two systems, once relatively clear, has become increasingly blurred [1], [2].

This zone of transformation—situated between the rural and the urban—has become the primary field of contemporary spatial change [3]. The emergence of suburban settlements reflects broader shifts in social values, economic structures, and cultural practices, particularly since the industrial period and intensifying throughout the twentieth century [4]. Instead of representing a stable or clearly defined spatial type, the suburb often represents an unresolved condition, shaped by overlapping urban and rural characteristics, incomplete infrastructure, and fragmented identities. In many post-socialist and post-conflict cities, suburban development has followed trajectories significantly different from those observed in Western contexts. Rather than resulting from coherent planning concepts, these areas often emerge through successive waves of migration, crisis-driven construction, regulatory discontinuities, and market-oriented transformations [5], [6]. Such processes generate heterogeneous spatial patterns and challenge conventional planning categories, raising questions about how these settlements function, how they relate to the city, and what kind of urban life they can sustain [7], [8].

The peripheral areas of Banja Luka demonstrate these dynamics in a clearly observable spatial context. Shaped by post-war reconstruction after Second World War and Yugoslav War, natural disasters, demographic shifts, and prolonged transition, its suburban belt has evolved as a layered spatial structure that simultaneously connects and separates the urban core from its wider territory. Although often treated administratively as a marginal zone, this peripheral layer accommodates a substantial share of the city's population and plays an active role in its everyday functioning. The central problem addressed in this research lies in the mismatch between formal planning divisions and the actual morphogenesis and functioning of suburban layer of Banja Luka. The hypothesis of the study assumes that suburban settlements form a continuous spatial and functional layer that cannot be adequately understood or managed through a rigid division into urban and rural zones. The objective of the research is to identify, classify, and interpret the development patterns of suburbia of Banja Luka in order to contribute to a more integrated and context-sensitive approach to future urban regeneration and planning.

Beyond physical form and infrastructure, the transformation of peripheral settlements is deeply influenced by cultural patterns of spatial use and perception [9]. The mentality of residents, inherited habits, and value systems significantly shape how space is occupied, modified, and experienced [10]. The paper therefore asks to what extent these factors contribute to the persistence of rural modes of spatial use within formally urbanised areas, and how they shape the identity of suburban settlements and their integration into the city as a whole. This paper addresses suburban areas not as residual or transitional anomalies, but as an integral component of the contemporary city. By focusing on the morphogenesis periphery of Banja Luka, the research seeks to clarify the spatial logic of suburban development, reveal its internal contradictions, and contribute to a more context-sensitive understanding of urban expansion in medium-sized cities of Southeast Europe [11], [12].

2. METHODOLOGICAL FRAMEWORK

This research adopts a comparative and multi-scalar methodological approach to the study of suburban settlements, treating suburbanisation as a spatial and socio-cultural process rather than a uniform urban model. The methodological framework is designed to examine how different suburban forms emerge, function, and transform under specific historical, economic, and cultural conditions, with particular emphasis on post-war and post-socialist urban development.

The empirical basis of the research consists of an analysis of strategic planning documents, including the City Development Strategy and the Draft Urban Plan of Banja Luka, in order to examine the formal planning vision and regulatory framework shaping suburban expansion. In parallel, a morphological map of the city was constructed, covering four key periods of urban development, which enabled the identification of distinct phases of suburban growth and their spatial logic. In addition, the analysis relies on cartographic materials, orthophoto imagery, and field observation,

which together support the interpretation of spatial structure, land-use patterns, and recent transformation processes.

At a finer scale, the study examines four representative suburban settlements selected as case studies. The selection of the four case-study settlements was based on a set of predefined criteria aimed at capturing the diversity of suburban development patterns within the peripheral zone of Banja Luka. The selected settlements represent different phases of development (post-war expansion, post-earthquake reconstruction, unplanned growth during the 1990s, and recent market-driven transformations), as well as varying spatial positions in relation to the urban core. This purposive sampling enables a comparative analysis of distinct morphogenetic trajectories within a shared urban context. Within each settlement, a typical urban block measuring approximately 200×200 meters was analyzed. This block dimension was adopted following the methodological logic proposed by Gómez Ordóñez [13], who emphasized the analytical relevance of intermediate-scale urban fragments for understanding structural transformations. The selected scale allows for the observation of changes in physical structure, parcelisation patterns, building typologies, and density within a manageable yet representative spatial unit. The analytical framework is based on a set of interrelated criteria that allow for a systematic comparison of suburban forms. These criteria include the manner of formation (planned or unplanned development), spatial structure and density, degree of functional diversity and autonomy, availability and completeness of infrastructure networks, connectivity and accessibility in relation to the urban core, integration of green and natural systems, as well as conditions of safety and opportunities for social interaction. These criteria are applied consistently across all case studies and form the basis for both the typological classification of suburban forms and the interpretative framework developed in the Discussion section. Methodologically, the research relies on an inductive–deductive approach. The inductive phase derives general tendencies from morphological and documentary analysis, while the deductive phase applies these insights to the selected case studies in the peripheral zone of Banja Luka.

3. TERRITORY

The development of the city of Banja Luka can be traced deep into history, from a Roman fortress, through the Bosnian medieval state, the Ottoman Empire, the Austro-Hungarian Monarchy, two Yugoslav states, and up to the present day. A place that has passed through various social systems and forms of governance represents an example of diverse construction principles and discontinuities in their implementation.

The total area of the City of Banja Luka covers 1,239 km², of which the rural area accounts for 1,055.68 km², representing 85.18% of the city's territory. Only 25.0% of the total population is located within this area, with a trend of gradual decline and migration toward the urban core. Settlements are organised into 57 local communities [14]. The Spatial Plan of the City defines the zoning of the urban area, with a total surface of 17,900 ha, into two urban zones. These include the inner urban area, covering 5,224 ha, where more intensive development is planned, and the wider urban area, covering 12,676 ha, which includes all suburban settlements that directly and daily gravitate toward the inner urban area. The wider urban area also encompasses suburban local centers such as Dragočaj and Karanovac-Jagare, as well as suburban settlements including Šargovac, Motike, Pavlovac, Prnjavor Mali (Saračica), and Debeljaci (Figure 1).

According to the official data of the 2013 Population Census of Bosnia and Herzegovina, 180,053 inhabitants lived within the territory of the City of Banja Luka, which is 15,086 fewer than in 1991, when 195,139 persons were recorded [15]. This difference occurred over the 22-year period between the two censuses and was conditioned by changes in the demographic structure as a consequence of the civil war in Bosnia and Herzegovina (1992–1995). Although the total population has been declining, certain settlements have experienced substantial expansion. Specific social conditions and the construction policies of that period created favorable circumstances for the emergence of parts of settlements, and even entire settlements, on the urban periphery, very often developed through unplanned construction processes. Greater availability and affordability of land, as well as the absence of property taxation, acted as incentives for the development of suburban settlements. Such trends have been recorded in the local communities of Kuljani, Šargovac, Dragočaj, Priječani, and Lauš. Accelerated construction in these areas has raised the dilemma of whether lenient legalisation practices serve to purchase social stability while simultaneously undermining the very process of legally acquiring building rights — a condition that Milica Topalović describes as the “stability of informality,” whereby tolerated or retroactively legalised practices become a structural instrument of governance rather than an exception to the system [7]. Although these settlements are physically

close to the city center, the lack of urban functions and poor infrastructural connectivity distance them functionally from the city.

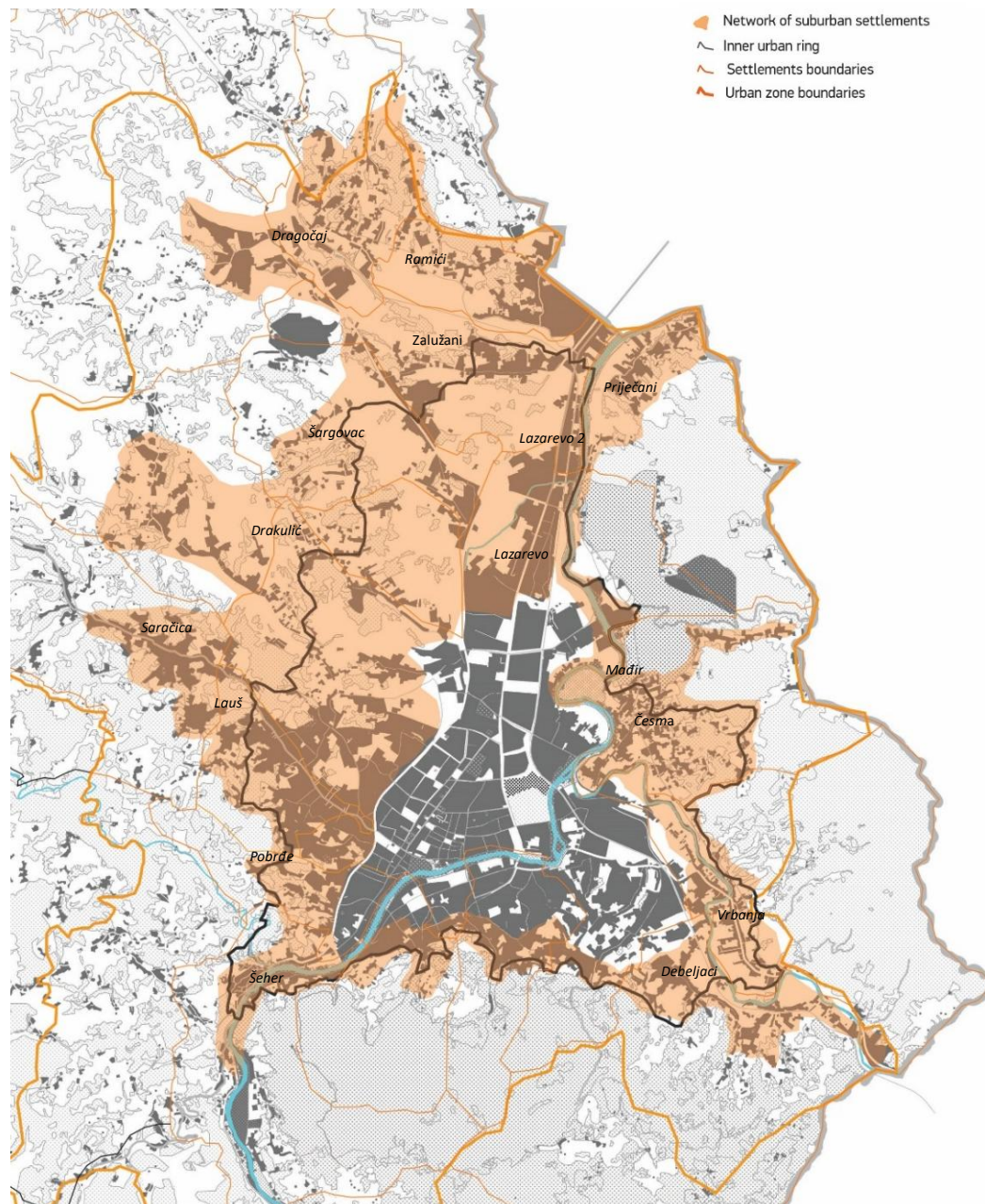


Figure 1. Built structure of the urban area of Banja Luka, source: author, based on the Spatial Plan of the City of Banja Luka

The Development Strategy of the City of Banja Luka for the period 2018–2027, through monitoring population trends, as well as the capacity and structure of business entities and public services, identifies a constant decline in population within rural settlements [14]. This decline is accompanied by a reduced number of schoolchildren and the closure of certain educational institutions. In contrast, urban settlements and the city center are experiencing growth, reflected in an increasing number of pupils and the construction of new educational facilities. Additionally, a trend of intensified construction and infilling of previously undeveloped areas can also be observed in suburban settlements, driven by newly settled populations and the expansion of the housing stock. The emergence of the aforementioned settlements is not solely a consequence of events at the end of the last century; rather, it represents a far more complex phenomenon. One of the significant influencing factors is local migration, driven by economic, educational, and other considerations. Local migration is primarily manifested through the movement of population from rural to urban areas, as well as to spaces directly adjacent to the city's urban zone. Over time, a suburban ring has formed

around the more densely built inner urban area. The formation of suburban settlements during the 1990s was largely shaped by processes of unplanned and self-initiated construction, emerging in a context of institutional fragility, rapid demographic change, and limited regulatory oversight. In the absence of effective planning control, residential development frequently occurred outside formal procedures, resulting in spatial patterns defined by incremental building practices, adaptive plot subdivision, and improvised infrastructural solutions. These processes significantly influenced the morphological structure of suburban areas, embedding irregular parcelisation, heterogeneous building alignments, and infrastructural deficiencies into their physical fabric. Only in the subsequent decade did institutional efforts intensify to address the consequences of this period, primarily through regulatory reforms and mechanisms aimed at formalizing previously constructed buildings and strengthening control over new development. Nevertheless, the structural integration of these settlements into the broader urban system has progressed more slowly, reflecting the long-term spatial implications of their initial informal genesis [16].

4. TIPOLOGY OF SUBURBIA

The Banja Luka periphery of urban zone can be divided into four groups, formed according to the conditions and periods in which they emerged. The time of their formation is linked to crucial moments in the socio-spatial context of the community, spanning from the mid-twentieth century to the present day. The following types of suburbia can be identified:

Table 1. Typology of suburbia in the city of Banja Luka

TYPE I	Suburbs after World War II	Suburban settlements emerge predominantly in two main clusters: to the north (Budžak, Petrićevac, and Rosulje) and to the west (Lauš and Pobrđe), with several smaller fragments developing in other directions.
TYPE II	Suburbs after 1969	It is characterised by a period of social crisis and an increased demand for housing. Suburban settlements were developed with both permanent structures (Lauš) and temporary housing units (Budžak).
TYPE III	Suburbs developed after the dissolution of SFRY and the civil war (1992–2013) <i>*This year was selected as a reference point, marking the period of economic recovery after the Great Global Economic Crisis, when conditions became favorable for more substantial investment</i>	During this period, large-scale population migrations occurred, accompanied by a rapid expansion of construction on the urban periphery. Settlements such as Debeljaci, Česma, Motike, Lauš, and Drakulić were developed.
TYPE IV	Suburbs developed after the transition period (2013–nowadays)	There is noticeable urban densification and construction in the previously open interstitial spaces, as well as an expansion beyond the boundaries of the urban zone toward Priječani and Krčmarice.

The following four maps presents the development of the suburban zone in Banja Luka, where the expansions of settlements identified during the observed period are marked in blue. From the illustration, it can be observed that in the first two phases there is a rapid territorial expansion with lower density, while in the later phases the structure becomes denser and building heights increase.

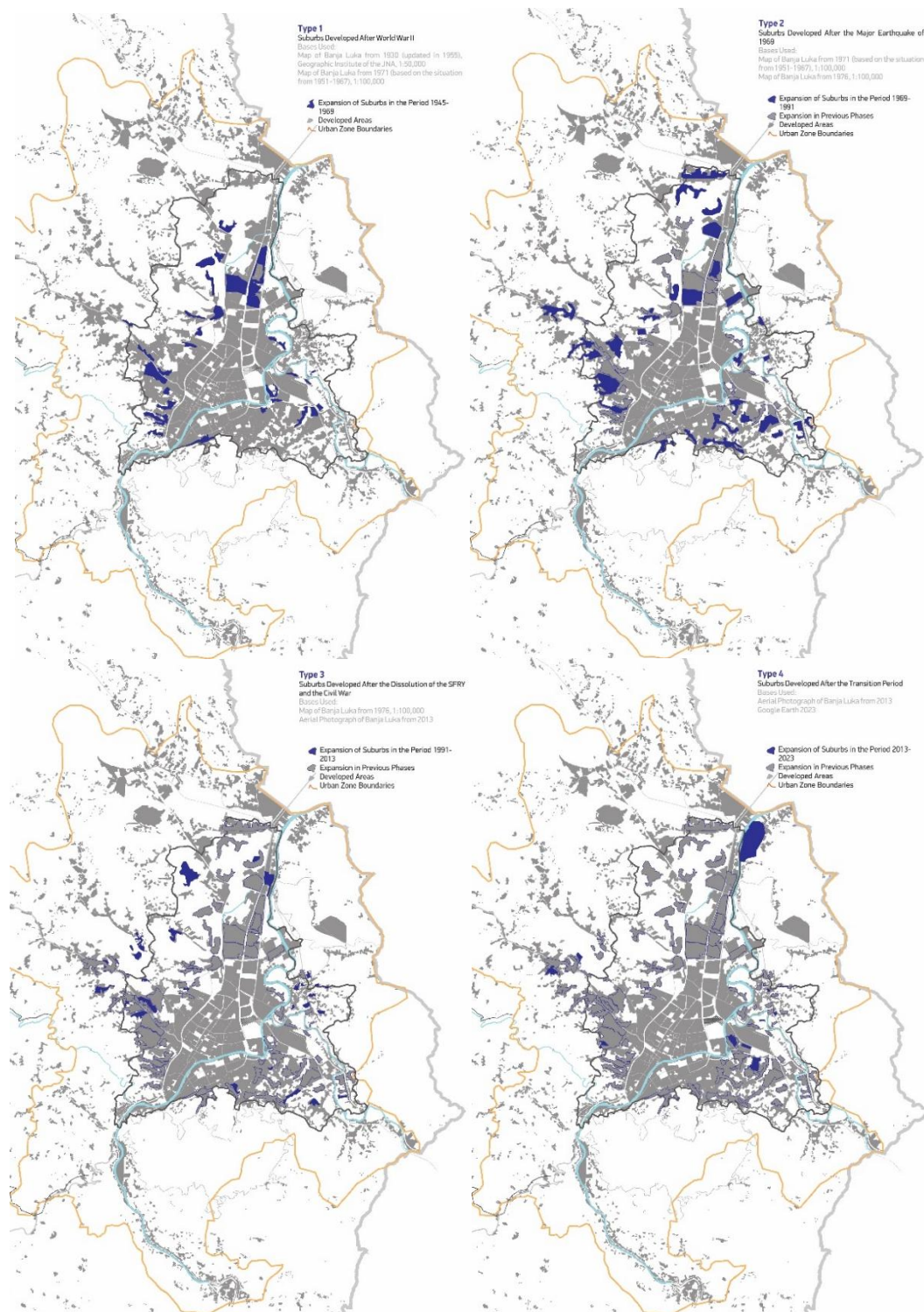
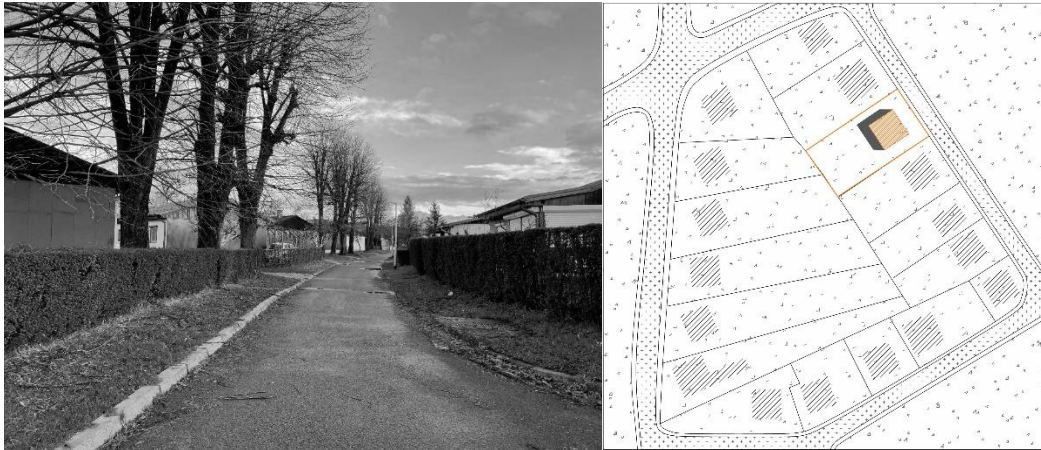


Figure 2. 2A) Type 1 of the Banja Luka periphery, source: author, based on the maps of Banja Luka 1930-1971
 2B) Type 2 of the Banja Luka periphery, source: author, based on the maps of Banja Luka 1971-1976
 2C) Type 3 of the Banja Luka periphery, source: author, based on the maps of Banja Luka from 1976 and an aerial photograph from 2013
 2D) Type 4 of the Banja Luka periphery, source: author, based on the 2013 aerial photograph and Google Maps

4.1. TYPE I - SUBURBS AFTER WORLD WAR II



*Figure 3. Present-day Lazarevo 1 settlement, source: author(left)
200 × 200 m base / Suburb, source: author, based on Google Maps1 (right)*

The emergence of periphery in Banja Luka can be traced to the period following the end of the Second World War, when the city faced extensive material destruction and significant changes in its demographic structure. There arose an urgent need for large-scale reconstruction and new construction, during which the basic directions for urban development were established and new settlements were planned, including Mejdan, Rosulje, and Nova Varoš.

This period is associated with the proposal of the General Urban Plan of Banja Luka [17], prepared in 1952 by architect Anatol Kiryakov within the Urban Planning Institute of the People's Republic of Bosnia and Herzegovina. The plan evaluated the existing physical structure and road network as sparsely built, with longitudinal expansion directed toward the north. It projected the city's development for the next 30 years and proposed a transversal axis of expansion along the Vrbas River via the Boulevard V. Ž. Mišić [18].

The post-war period was characterised by strong state administration with a clear regulatory system, guiding the planned expansion of the city. Suburban settlements primarily emerged in two clusters: the northern group (Budžak, Petrićevac, and Rosulje) and the western group (Lauš and Pobrđe), along with smaller fragments in other directions (Debeljaci, Ada, Kumsale, etc.), as shown in Figure 2A.

For the purposes of this research, one settlement from this period has been selected as a case study: Predgrađe (Lazarevo/Budžak), located near the Predgrađe railway station, which soon became the central station of Banja Luka.

The settlement was developed within a comparatively strict regulatory framework and, at the time of its establishment, was situated at a considerable distance from the city center. Owing to this spatial position, it was designated as a "Periphery," together with the newly constructed railway station. The parcel structure is characterised by a high degree of uniformity, with plots averaging approximately 500 m² (Figure 3A and 3B). Residential buildings are predominantly positioned along the regulatory building line, which results in a clear spatial hierarchy and allows the inner parts of the parcels to function as more private and semi-intimate domestic spaces. The prevailing building typology consists of single-floor and one-and-a-half-floor houses, while later phases of development introduced auxiliary structures, reflecting gradual functional adaptations over time. Private yards are commonly utilised for household agriculture and small-scale domestic economic activities, indicating the persistence of semi-rural practices within an urbanizing context.

The settlement is equipped with basic urban infrastructure, including private and public green areas, and maintains functional connectivity with the city center through public transportation. However, several spatial limitations are evident. The absence of a clearly defined central node or focal public space has resulted in a linear pattern of development predominantly aligned with the main traffic corridor. Additionally, the relationship between the settlement and the river remains insufficiently articulated, pointing to unrealised spatial and environmental potential.

4.2. TYPE II- SUBURBS AFTER 1969

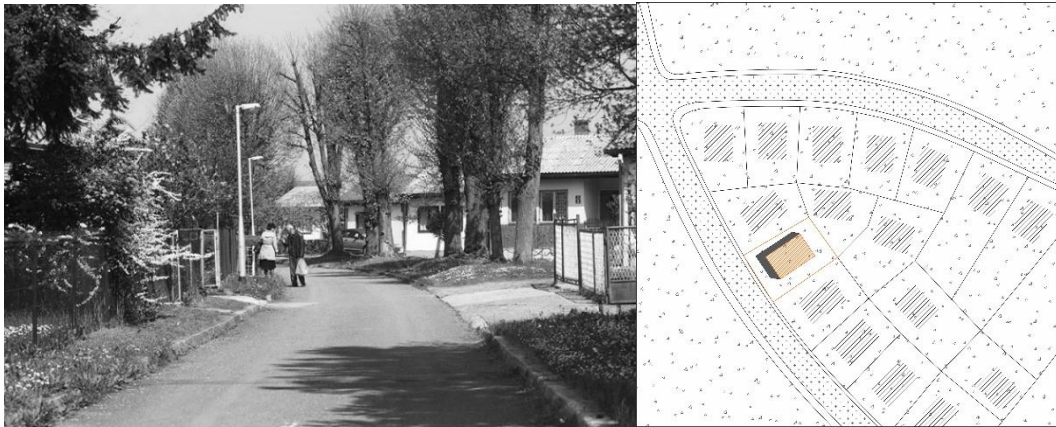


Figure 4. Present-day Lazarevo 2 settlement, source: *History of Banja Luka* (left) 200 × 200 m base / Budžak, source: author, based on Google Maps (right)

The second phase of the development of suburbs began after a series of destructive earthquakes in 1969, which interrupted the city's intensive growth and initiated a period of reconstruction and resettlement of the affected population. The disaster resulted in 15 fatalities, 1,117 injured, 86,000 damaged residential units, 266 educational facilities, 152 public administration buildings, 146 cultural institutions, 133 healthcare facilities, and 29 social institutions [19] (material damage data refer to the entire Banja Luka region). Many destroyed or damaged buildings were temporarily replaced with prefabricated structures, which, in numerous cases, have remained in use to this day, losing their original designation as "temporary." Examples of such structures can be found throughout the city, from the center and urban neighborhoods to the periphery (e.g., Budžak settlement; Figure 2B).

This period is associated with the 1975 General Urban Plan, which covered the city's development until 1990. The plan continued previous trends, promoting longitudinal expansion toward the north and establishing new district centers at relatively close intervals. However, implementation was inconsistent, resulting in fragmented urban space and discontinuities throughout the city. In the periphery, this inconsistency manifested in unplanned construction, driven by increased demand for housing due to an influx of residents from smaller rural areas following the opening of new factories and employment opportunities [18].

Following the earthquake, a series of settlements were developed within state-led social resettlement programs, characterised by a planned approach, spatial efficiency, and rapid construction processes—features typical of development undertaken in conditions of crisis. The parcels were relatively small, averaging approximately 300 m² (Figure 4A and 4B), with residential buildings positioned centrally within the plots. This layout resulted in limited yard areas and, in many cases, an absence of clearly defined property boundaries. The prevailing building typology consisted of single-floor housing units conceived as temporary structures. However, despite their originally intended short-term use and a projected lifespan that expired more than two decades ago, a significant number of these buildings remain in continuous use for over fifty years.

The settlements are equipped with basic urban infrastructure, include green areas, and maintain satisfactory public transport connectivity with the wider urban system. Nevertheless, several structural limitations can be identified, including a high degree of functional uniformity, the persistence of the provisional character of the housing stock, and the constrained dimensions of private outdoor spaces.

4.3. TYPE III- SUBURBS DEVELOPED AFTER THE DISSOLUTION OF SFRY AND THE CIVIL WAR (1992–2013)

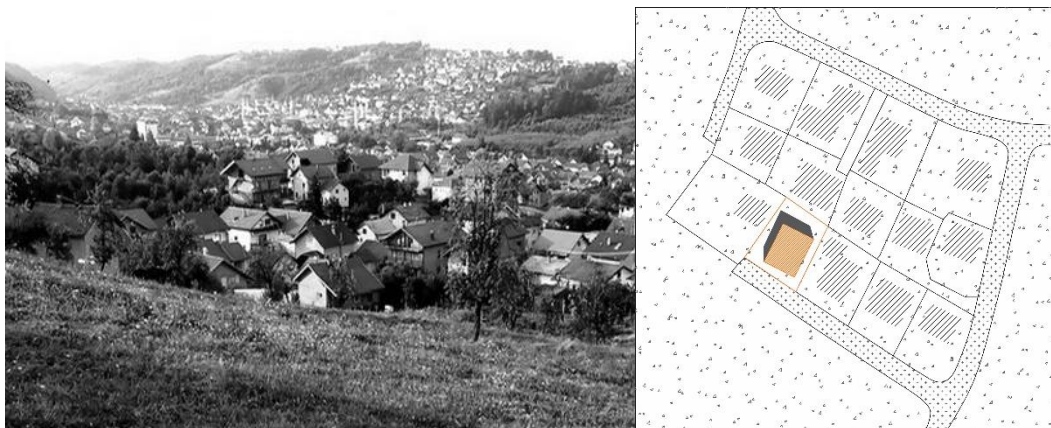


Figure 5. Panorama of Lauš, source: banjaluca.net (left)
200 × 200 m base / Lauš, source: author, based on Google Maps (right)

The specific social circumstances resulting from the dissolution of the former state and wartime events led to profound changes in the population structure and sudden migration flows. A large number of incoming residents required housing solutions, which were partly accommodated through already existing (but abandoned) residential units and partly through new construction. These shifts in social structure and population movement affected the use of domestic space, yards, and the overall organisation of settlements. New residents brought with them traditional ways of life and approaches to their surroundings, resulting in new patterns of space utilisation and different socio-cultural norms within these areas [20].

The overall crisis and weakened state apparatus led to uncontrolled urban expansion, with little planning or regulation. The coherent concept of city planning was lost, and the process shifted from the outdated 1975 General Urban Plan to local regulatory plans and their subsequent amendments [21]. This period is characterised by the subdivision of parcels into smaller fragments and the filling of urban gaps, particularly in suburban settlements, driven by the affordability of land. The trend of settlement expansion, which is not accompanied by the development of essential urban infrastructure (transport, water supply, sewage, electricity, and optical networks), can be observed in settlements such as Lauš, Petrićevac, Drakulić, Motike, Veseli Brijeg, Debeljaci, Česma, Mađir, and Kuljani (Figure 2C).

During the transitional period, a further significant spatial tendency emerged as a consequence of the absence of regulated land-use market mechanisms, manifested in the predominantly linear expansion of logistics, service, industrial, and commercial facilities along major transit corridors leading northward toward Laktaši [18]. Concurrently, certain suburban areas—most notably Lauš—experienced an intense phase of residential construction associated with large-scale population movements triggered by the civil war. Residential buildings were frequently constructed without approved planning documentation or building permits and were subsequently subjected to processes of legal regularisation. Agricultural land was systematically transformed into building plots, often subdivided into smaller parcels that were not dimensionally or functionally suited to the applied building typologies. Multi-floor residential structures, predominantly of two-and-a-half floor, were typically positioned centrally within individual plots, resulting in severely limited and functionally inadequate private outdoor spaces (Figure 5A and 5B).

This pattern of development generated a range of spatial and legal challenges, particularly in relation to building proximity, mutual orientation, and the so-called “right to view,” as parcel proportions would have been more appropriate for semi-detached or terraced housing configurations. Furthermore, the settlement continues to face persistent deficiencies in urban infrastructure, including insufficient street widths, the frequent absence of sidewalks, and a lack of street greenery, all of which adversely affect spatial quality and everyday functionality.

4.4. TYPE IV- SUBURBS DEVELOPED AFTER THE TRANSITION PERIOD (2013–NOWADAYS)



Figure 6. Priječani Settlement (left)
200 × 200 m base / Priječani, source: author, based on Google Maps (right)

Following the dissolution of the state and civil war of the late 1990s, Banja Luka entered a period of turbulent transition toward a capitalist society. This process included the privatisation of enterprises and the broader economy, previously under state control. Individuals in favored positions quickly acquired substantial capital, often investing it in the construction sector. This triggered significant changes in urban form and reinforced spatial segregation along economic lines [22].

Such transformations can be observed in the deeper peripheral settlements of modest construction, such as Priječani and Krčmarice, predominantly situated in attractive natural settings (rivers, forests, scenic views), which have gradually been transformed into residential areas for the newly formed economic elite. Another trend is the infill of numerous urban gaps within the city, resulting in multi-family buildings, blocks, and even entire new settlements (Figure 2D). Multi-family developments within suburban fabrics, such as Budžak, Veseli Brijeg, Ada, and Lauš, are particularly noteworthy. In these areas, new residential buildings are constructed at a rapid pace, often without concurrent expansion of infrastructure, leading to system overloads most visible in traffic congestion.

It is important to note that since 1990, following the expiry of the 1975 General Urban Plan, no new comprehensive urban plan has been successfully adopted. Spatial development has been managed fragmentarily through regulatory plans and countless amendments responding to the interests of large capital. This practice is intended to be addressed by the adoption of a new plan for 2020–2040, which was publicly reviewed in 2022 but has yet to be formally approved.

Over the past decade, suburban settlements situated in environmentally favorable locations—initially developed as an accessible housing solution for a predominantly lower-income population—have increasingly undergone a process of socio-spatial transformation, becoming preferred residential areas for a newly emerging economic elite. This shift has produced a pronounced contrast between the predominantly modest housing stock developed during the 1990s and the more recent, larger-scale, architecturally expressive, and contemporarily designed residential buildings (Figure 6A and 6B).

The resulting heterogeneity in both settlement morphology and building typology is particularly evident. Older, small-scale residential structures, often accompanied by auxiliary or temporary buildings, coexist within the same spatial framework as newly constructed, substantially larger residences characterised by pronounced spatial boundaries and formal articulation, frequently erected within relatively short timeframes. A critical spatial and environmental concern is the treatment of the Vrbas River corridor, where construction activities have increasingly encroached upon designated protective zones. This trend has intensified since 2020, raising significant questions regarding regulatory enforcement, environmental sustainability, and the long-term resilience of suburban development patterns in the area.

5. DISCUSSION

The division of the urban fabric into two zones—the inner and the wider urban area—can be justified only from an administrative perspective. The physical structure of the city is not so easily divisible by a single, clearly defined line, which loses any real significance within the urban space. Rather, it would be more appropriate to speak of a zone or an entire transitional layer that mediates the gradual shift from dense urban development to more tranquil suburban settlements.

Accordingly, the focus of this study is on the settlements that both separate and connect the inner and wider urban zones of Banja Luka. This belt represents the transition from urban to suburban environments, which does not begin after the so-called “imaginary planning line,” but very often before it, and in some cases even beyond it.

The map of the urban zone (Figure 1) is derived from the graphic materials of the Spatial Plan of the City of Banja Luka (settlements – boundaries of local communities), clearly illustrating the positions of the boundary settlements between the inner and wider urban zones. It is evident that this division does not follow settlement boundaries, which in most cases are roughly intersected and split into two different zones. Only in the case of the north-eastern boundary of the inner urban zone does the division correspond to the logic of settlement boundaries. From a critical perspective, the line dividing the city into two urban zones would be more appropriately treated as a zone (or layer) with a defined territorial extent and internal interrelations. In this regard, the mapped representation illustrates a belt of suburban settlements forming around the city’s urban fabric. For the purposes of this research, it is essential to identify and name suburban settlements, that is, to establish a clear set of criteria explaining how a settlement of this type was identified as such and subsequently classified within the suburban belt. The criteria according to which settlements were classified into this layer are based on the differences between urban and rural environments. Specifically, these are settlements that cannot be categorised as rural areas, yet according to certain criteria do not meet the conditions required to be classified as urban city settlements:

- A) The physical component (a visually perceptible characteristic of urban space) represents the urban form of a settlement, its internal structure of street and block networks, the degree of plot development, building typology, and their spatial relationships [18]. Settlements of the Banja Luka suburban type are characterised by a predominantly homogeneous physical structure and a relatively uniform typology, consisting mainly of low-rise, detached buildings—typically regular geometric forms with two to three floors and pitched gable roofs. This morphological pattern is partly rooted in traditions of vernacular architecture and local folk building practices, which historically shaped spatial organisation, construction techniques, and roof typologies in the region. In many cases, particularly during periods of rapid expansion and socio-economic transition, elements of unplanned construction and self-built housing have played a significant role in shaping the built environment, reflecting patterns often described in literature as “architecture without architects.” These practices contributed to incremental development, adaptive spatial modifications, and the persistence of semi-rural spatial logics within the suburban fabric. However, over the past decade, the construction of multi-floor and higher-density residential buildings has increased, gradually transforming these settlements toward a more heterogeneous physical structure and introducing new spatial hierarchies and volumetric contrasts.
- B) Infrastructure systems represent essential elements for the normal functioning of a city, providing the key support for the organisation of urban life. These include: (a) transport networks, which are expected to ensure optimal connectivity between settlements and their surroundings and the city center, as well as communication between different parts within a settlement and access to each individual plot; and (b) water supply, sewerage, electricity, and optical (telecommunication) networks, which connect individual buildings to urban services, the availability of which constitutes the essence of contemporary urban living. The absence or incompleteness of any of these services significantly distances a settlement from established urban patterns. In the case of periphery in Banja Luka, this is most often manifested through the lack of water supply and sewerage networks, which continue to expand at a much slower pace than the physical urban structure. A similar situation can be observed in transport infrastructure, which has failed to keep pace with the rapid expansion of construction. As a result, connections between certain settlements and the city have become overloaded, while internal street networks have remained narrow and underdeveloped, lacking adequate provision for pedestrian and cycling traffic.

- C) The centrality of urban functions represents an important segment of urban settlements, encompassing services of general public interest (including administrative institutions, education, healthcare, public safety, and similar facilities) as well as service activities (economic structures) through which residents can meet their daily needs without the need for significant travel from their place of residence. The existing administrative division of the City of Banja Luka into local communities that services of general public interest should be present in each local community, which often includes more than one settlement, while service activities primarily emerge in response to market conditions. The absence of some of these services is a characteristic feature of suburban areas, where single-family housing predominates.
- D) Cultural aspects present among the inhabitants of a given settlement define the ways in which space is perceived, used, and acted upon, reflecting an underlying system of values primarily shaped by the mentality of its residents. Sreten Vujović defines the mentality of urban citizens as “noble urban behavior of educated individuals whose core virtues are dialogue, tolerance, and empathy” [10], while Dijana Simonović states that “the city represents, to a certain extent, a projection of the state of mind of its citizens, that is, of their mentalities” [23]. Consequently, the structure of the population and their mentality are significant factors in shaping both the spatial configuration and the identity of a settlement, influencing not only its physical form but also how it is experienced and appropriated by its inhabitants. In the case of periphery of Banja Luka, these cultural influences are clearly manifested through rural patterns of space use, which often persist even in areas that satisfy other urban or infrastructural criteria. This observation suggests that the morphogenesis of peripheral settlements cannot be fully understood solely through physical or functional indicators; rather, the cultural and social behaviors of residents play a decisive role in reinforcing spatial differentiation and sustaining semi-autonomous suburban identities.
- E) The urban landscape and the image of the city constitute a unique and recognizable symbol of the city, reflecting its identity and shaping the perception held by its residents and visitors. The extent to which a settlement contributes to this image, and the manner in which it integrates into the urban fabric, provides insight into the very character of that settlement.

The morphogenesis of the peripheral settlements of Banja Luka cannot be fully explained by administrative zoning alone. The suburban belt is characterised by a relatively homogeneous physical structure, with low-rise, detached buildings and regular street networks that form a transitional layer between the dense urban core and the surrounding rural areas. Rapid construction in these areas has often outpaced the development of infrastructure, creating functional gaps that reinforce their relative distance from the city center despite their proximity. Residents’ patterns of space use and settlement identity contribute to this distinct character, often maintaining rural traits within a suburban context. The limited presence of urban services and public functions further defines these areas, resulting in semi-autonomous settlements that nonetheless gravitate toward the urban core. Together, these factors demonstrate that the peripheral development of Banja Luka is a complex process in which physical form, social practices, and functional dynamics interact, challenging the simple division of the city into inner and wider urban zones.

Cultural factors constitute an important cross-cutting component of the methodological framework. Particular attention is given to culturally embedded patterns of spatial behavior and space utilisation, as these strongly influence the form and perception of suburban environments. Norms, values, and everyday practices of residents are considered essential for understanding how space is appropriated, incrementally modified, and socially interpreted, especially in transitional suburban contexts where urban and rural modes of living intersect. Through this layered methodological approach—combining strategic document analysis, diachronic morphological mapping, block-level spatial examination, and multi-criteria evaluation—the research provides a comprehensive understanding of suburban development as a dynamic and context-dependent phenomenon, with specific relevance for the suburban zones of Banja Luka [24].

5.1. FURTHER IMPLEMENTATION FOR THE PRACTICAL USE

According to the Development Strategy of the City of Banja Luka for the period 2018–2027 and the Draft Urban Plan, one of the defined strategic goals is the balanced and integrated development of urban, suburban, and rural areas. A general concept for the organisation, management, and spatial planning of the city territory until 2030 has been outlined. From these documents, it is evident that the emphasis on balanced development across all aspects of the city—urban, suburban, and rural—is translated in the Spatial Plan primarily into the formation of a network of settlements intended to

improve conditions in rural areas, while only noting the existence of a denser belt of suburban settlements. The functional layer of the suburban zone, organised as a network of settlements (Figure 7), could provide a significant support for city development, as well as a moderate transition from dense urban structures to the dispersed rural landscape. However, in practice, the situation often differs, creating new challenges that are diametrically opposed to the strategic objectives.

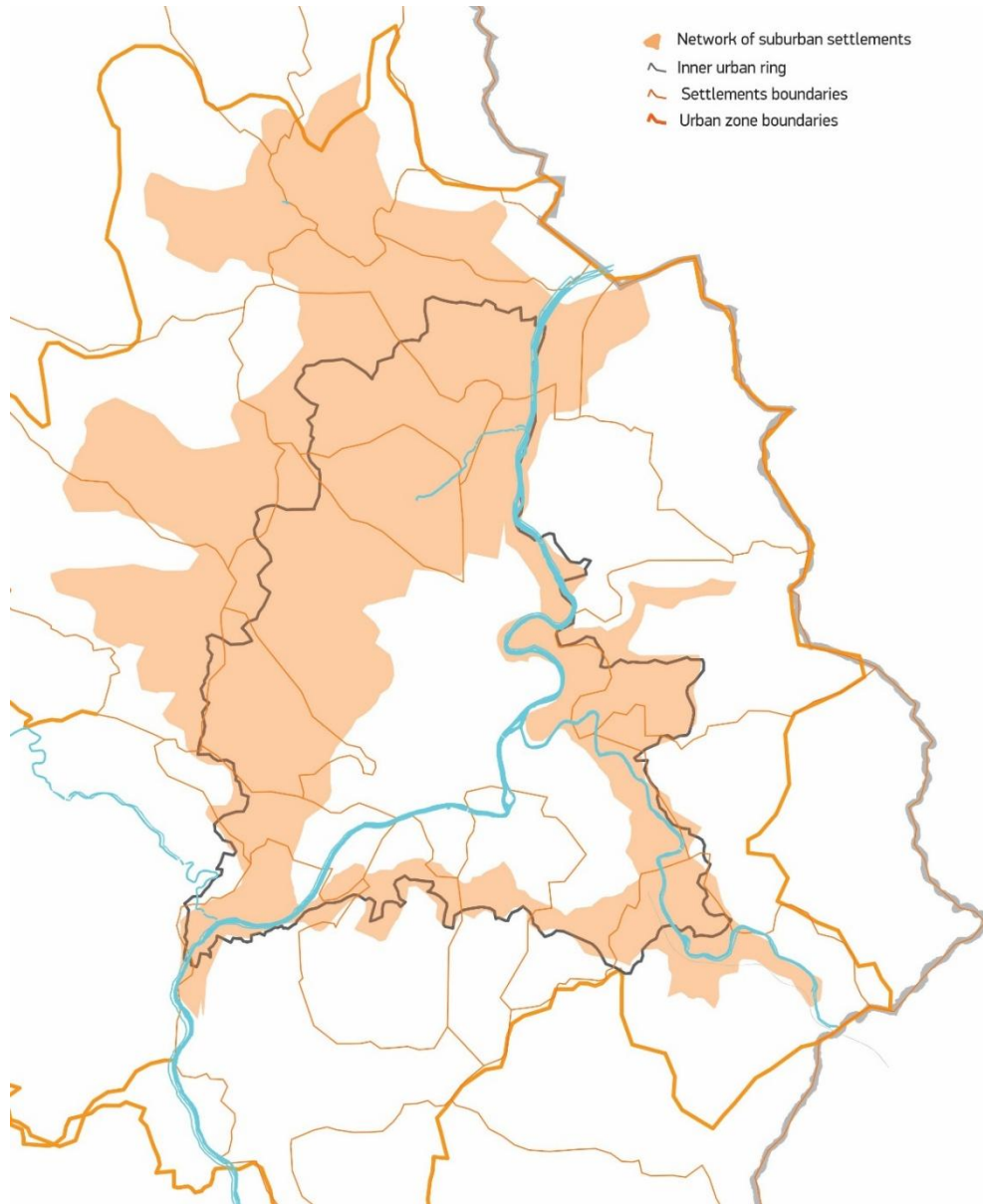


Figure 7. Suburban layer, source: author, based on the Spatial Plan of the City of Banja Luka

One of the increasingly visible problems is the disruption of the cityscape and urban landscape, which undermines the intended gradual transition from urban to rural areas. This is reflected in two spatial phenomena:

- a) discontinuity in construction, with numerous empty plots within the urban zone that lack any economic function, ‘waiting’ to be developed as sites for future multi-family housing or popular residential blocks;
- b) incoherence in building density and volumetric regulations, resulting in cases where larger, taller buildings are illogically interspersed with smaller structures within the same block.

Observing these phenomena through the lens of the city’s image reveals a series of inconsistencies and mixed patterns, occurring primarily within the suburban layer under study. For this reason, the research focuses on examining the consequences of these processes—shaped by specific historical

moments and the ongoing transitional profiling of the city—with the aim of proposing strategies for the regeneration of suburban settlements and the improvement of the overall urban image.

6. CONCLUSION

This research set out to identify, classify, and interpret the morphogenetic patterns of suburban development in the periphery of Banja Luka, with the aim of contributing to a more integrated and context-sensitive understanding of suburban space. The analysis of the morphogenesis of suburban settlements in the periphery of Banja Luka demonstrates that their evolution has not followed a uniform or linear trajectory, but has progressed through a series of distinct phases influenced by broader social, economic, and spatial conditions. Each phase has produced observable impacts on settlement structure, parcelisation patterns, building typologies, and infrastructure provision, resulting in a notably heterogeneous suburban landscape.

Initial phases of suburban development were primarily marked by extensive territorial expansion at low residential densities, driven by housing shortages, large-scale migration, and crisis-related settlement initiatives. Later phases indicate a gradual shift towards densification, infill of previously undeveloped interstitial spaces, and the emergence of multi-floor residential buildings, often implemented without coherent regulatory oversight. These processes generated spatial tensions, infrastructure deficiencies, and inconsistencies between parcel dimensions and building typologies. Recent transformations highlight increasing socio-spatial differentiation within suburban areas, particularly in locations with favorable environmental conditions, where former crisis-driven housing zones are being reshaped through selective investment and higher-income residential development. Such dynamics intensify morphological fragmentation and exert additional pressures on environmental resources, including river corridors and protected natural areas.

The scientific contribution of this research lies in the initial hypothesis that suburban settlements of Banja Luka constitute a continuous spatial and functional layer in the morphological context that cannot be adequately interpreted or managed through a rigid urban–rural dichotomy. Identified development patterns demonstrate that suburban areas accommodate both urban and semi-rural functions, while remaining structurally and functionally integrated with the urban core via shared infrastructure, mobility, and everyday socio-economic interactions. By classifying distinct suburban development types, the study achieves its objective of elucidating the internal logic of suburban morphogenesis and its relation to broader urban transformations. The typological framework proposed here therefore extends beyond descriptive categorisation and offers an analytical tool applicable to other medium-sized cities experiencing comparable post-socialist transformations. The results underscore the discrepancy between formal planning frameworks and actual development dynamics, revealing the limitations of existing regulatory approaches in addressing hybrid and evolving spatial conditions. This gap between strategic planning discourse and everyday spatial production indicates the need for more adaptive governance models capable of engaging with incremental, layered, and partially unplanned urbanisation processes.

These findings resonate with Viganò's interpretation of the "horizontal metropolis," in which peripheral territories function not as marginal appendices but as structurally constitutive elements of contemporary urbanisation. The suburban belt of Banja Luka similarly operates as an extended urban field, where layered and incremental transformations challenge compact-city paradigms and rigid territorial classifications. Furthermore, the coexistence of formal planning instruments and informally produced spatial patterns confirms broader theoretical observations on the negotiated and hybrid character of post-socialist urbanisation processes. In this regard, the case study contributes empirical evidence to debates on extended urbanisation, reinforcing the argument that suburbia represents a dynamic continuum within the urban system rather than a transitional zone between city and countryside. In summary, the research demonstrates that suburban development in Banja Luka is characterized by (1) phase-dependent morphogenetic transformations, (2) increasing internal differentiation driven by market-oriented processes, and (3) a persistent misalignment between planning frameworks and actual spatial dynamics. These findings confirm the initial hypothesis and highlight the necessity of rethinking suburbia as a continuous, relational, and context-dependent spatial system.

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