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Quality of Life in a Changing World

Spatial, Social and Environmental Perspectives from Maribor and Beyond

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Defining and Measuring Quality of Life: Theoretical and Empirical Frameworks

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This chapter introduces the theoretical and empirical framework used in this monograph to analyse quality of life as understood within the context of the Summer School: Quality of Life in a Changing World. It begins with a brief overview of philosophical perspectives on the good life, followed by a review of the main contemporary approaches and key dimensions. Next, the chapter discusses the measurement of quality of life through indicators and outlines current debates. It then examines long-term European trends over the past three decades across economic, social and environmental indicators, showing how these trajectories reflect a rapidly changing world in which gains in economic growth and human development coexist with stagnation or decline in several social and environmental dimensions, revealing clear development paradoxes. Finally, the chapter presents the empirical research reports produced during the Summer School and links the conceptual foundations and long-term trends to the everyday experiences of quality of life in Maribor and other European contexts.

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OPREDELITEV IN MERJENJE KAKOVOSTI ŽIVLJENJA: TEORETIČNI IN EMPIRIČNI OKVIRI

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Poglavje predstavlja teoretični in empirični okvir, uporabljen v tej monografiji za analizo kakovosti življenja v kontekstu poletne šole z naslovom Kakovost življenja v spreminjajočem se svetu. Začne se s kratkim pregledom filozofskih pogledov na "dobro življenje", nato pa sledi pregled glavnih sodobnih pristopov in ključnih razsežnosti kakovosti življenja. V nadaljevanju poglavje obravnava merjenje kakovosti življenja s pomočjo različnih kazalnikov ter predstavi aktualne razprave. Prispevek se nato posveti dolgoročnim evropskim trendom v zadnjih treh desetletjih na področju ekonomskih, socialnih in okoljskih kazalnikov ter pokaže, kako te razvojne poti odražajo hitro spreminjajoči se svet, v katerem se dosežki gospodarske rasti in človekovega razvoja prepletajo z zastoji ali nazadovanjem na več socialnih in okoljskih področjih, kar razkriva jasne razvojne paradokse. Na koncu poglavje predstavi raziskovalna poročila, nastala v okviru poletne šole, ter poveže konceptualna izhodišča in dolgoročne trende z "vsakodnevnim" kakovostnim življenjem v Mariboru in drugih evropskih okoljih.

1 Understanding quality of life: concepts, dimensions and contemporary debates

Good life, happiness, well-being, welfare, prosperity, quality of the living environment, quality of life … These terms overlap, diverge and shift across disciplines, time and space. Sometimes they are used as broad umbrella concepts capturing everything of value in human life; at other times they denote specific dimensions such as material standards, subjective experiences, moral fulfilment or environmental conditions. Due to this complexity, the concept of the quality of life (QoL) resists simple definition and invites a multidimensional understanding.

1.1 Historical origins

Ideas about QoL are deeply rooted in the history of philosophy, where different traditions proposed distinct explanations of what it means to live well. In Western philosophy, ancient thinkers offered several foundational perspectives. Aristotle described quality of life as *eudaimonia*, a state of flourishing achieved through the practical wisdom, cultivation of virtue or a balanced life that avoids excess and deficiency. External goods, such as health or wealth, are valuable, but they cannot secure a good life without the active exercise of intellectual and character virtues (Kraut, 2022). Stoic philosophers took a different approach, arguing that well-being depends on living in accordance with nature and reason. For them, virtue is the only true good and external conditions such as health, fortune, or possessions are secondary. A good life requires inner discipline, self-mastery and emotional stability, regardless of external conditions (Durand et al., 2023). Classical hedonism proposed a simpler criterion that equates the good life with the maximisation of pleasure and the minimisation of pain. Epicurean thinkers refined this view and associated well-being with tranquillity, modest pleasures, friendship and especially freedom from fear (Konstan, 2025). Christian thought focused on moral and spiritual dimensions centred on compassion, humility and meaningful relationships with community and God (Wood, 2022). Enlightenment humanism introduced yet another shift and linked good life to dignity, autonomy, rational self-determination, education and the development of human capabilities (Bristow, 2023).

Modern philosophical frameworks continued this diversification and shaped how contemporary debates about QoL are framed. Utilitarianism stressed the greatest happiness for the greatest number of people as the standard for a good life (Driver, 2025). Resourcism approaches the interpretation of a good life through access to material and environmental resources or primary goods. These include income, health, housing and environmental quality that enable people to meet their needs and pursue their aims (White, 2021). Liberal and libertarian theories placed a strong emphasis on individual rights, personal freedom and personal autonomy, arguing that well-being depends on the ability to choose and direct one's own life (van der Vossen & Christmas, 2025). Communitarian thinkers highlighted the importance of belonging, shared values, social practices and mutual recognition and understand well-being as something rooted in strong and supportive communities (Bell, 2024). Existentialist philosophers shifted the focus toward authenticity, responsibility, purpose, and meaning, arguing that a good life emerges from taking ownership of one's choices and shaping a life that is genuinely one's own (Aho, 2025).

Philosophical traditions often overlap, influence one another and evolve through dialogue, critique and borrowing; therefore, their insights cannot be treated as discrete units. Through this long intellectual evolution, QoL has come to be understood not as a single condition but as a complex interplay of material, social, psychological and moral dimensions. Contemporary multidimensional QoL research does not simply repeat these traditions but forms part of this ongoing conversation about what it means to live well rather than merely to survive (Michalos & Robinson, 2012; UN, 2023).

With industrialisation and the rise of national states, the question of living conditions became increasingly connected to state responsibility and social policy. Nineteenth- and early twentieth-century social statistics on housing, working conditions, poverty and mortality were early attempts to quantify aspects of welfare. While not labelled as QoL, they laid the empirical foundations for later approaches by treating health, education, housing and employment as measurable dimensions of social progress (Land et al., 2012; UN, 2023).

More explicit QoL and social indicators movements emerged in the 1960s and 1970s, partly as a reaction to the dominance of gross domestic product (GDP) as the main measure of progress. Researchers and international organisations argued

that economic growth did not automatically translate into improved living conditions, social justice or wellbeing. This triggered efforts to develop social indicators that could capture health, education, housing, leisure and other non-economic aspects of life. Over time, this movement broadened into a multidisciplinary field of QoL research, integrating perspectives from sociology, psychology, economics, geography, public health and environmental studies (Cobb & Rixford, 1998; Land et al., 2012).

In parallel, urban and regional planning began to use QoL concepts to assess the *liveability* of cities, looking at transport, housing, public services and environmental quality. This explicitly spatial turn made it clear that QoL is not only a property of individuals, but also deeply shaped by places and territorial development paths. Recent QoL initiatives by city networks and organisations such as UN-Habitat continue this tradition, linking local living conditions to broader agendas of sustainable and inclusive urban development (UN, 2023).

1.2 Competing approaches

Despite centuries of research, there is no single, universally accepted definition of QoL. Instead, several partly overlapping perspectives coexist, each highlighting different aspects. Objective approaches define QoL primarily through observable conditions and resources. Here, QoL is inferred from indicators such as income, employment, housing quality, education, health status, safety or access to services. This view is closely linked to the tradition of social indicators, where non-economic statistics complement GDP in monitoring societal progress. QoL in this sense is out there in the material and institutional environment, like adequate housing, public infrastructure, accessible health care, and equitable schools (Easterlin & Angelescu, 2012).

Subjective approaches emphasise how people themselves evaluate their lives. The concept of subjective well-being (SWB), developed in psychology, captures cognitive judgements such as life satisfaction and experiences of positive and negative emotions. In this perspective, QoL is what people feel and report–how satisfied they are with their life as a whole, how often they experience joy or anxiety, whether they perceive their lives as meaningful and worth living (Diener et al., 2002; Cummins et al., 2012; Veenhoven, 2012).

The capability approach reframes QoL as people's primary moral importance, consisting of people's *capabilities* (potential states, doings, beings, e.g. being well-nourished, getting married, being educated, participating in community life, etc.) and *functionings* (realised capabilities). Rather than focusing on resources (income) or mental states (happiness), the capability approach asks what people are actually able to do and to be, given their personal and social circumstances. This perspective has strongly influenced human development thinking and many contemporary QoL frameworks (Robeyns & Byskov, 2025; Wells, 2025).

Geographers and spatial planners have contributed to the understanding of QoL by emphasising its spatial dimension. Place matters because access to services, exposure to pollution, availability of green spaces, transport options and social infrastructures are unequally distributed across regions, cities and neighbourhoods (Marans & Stimson, 2011; Nared et al., 2021). QoL depends on the inherent characteristics of a person and their surrounding environment (UN, 2023). Conceptual models such as Veenhoven's *four qualities of life* (Table 1) explicitly distinguish between conditions (environment liveability, people's capacity) and results (life utility, life appreciation). Such frameworks make it clear that QoL is simultaneously about how places are organised and how people utilise and experience them (Veenhoven, 2013).

Table 1: Four qualities of life according to Veenhoven

	Outer	Inner
Conditions	Environmental liveability: moderate climate, clean air, spacious housing, freedom, equality, wealth, brotherhood, education, etc.	People's capacity: physical and mental health, energy, resilience, autonomy, varied lifestyle, creativeness, literacy, manners, etc.
Results	Life utility: care for family and friends, being a good citizen, compassion, inventing, etc.	Life appreciation: appraisal, satisfaction, contentment, etc.

Source: Authors, 2025; Data: Veenhoven, 2013.

Taken together, these perspectives suggest that QoL is inherently multidimensional and contested. It can be understood as a configuration of objective conditions, subjective evaluations and capabilities, all of which are embedded in specific spatial and temporal contexts.

1.3 Domains and dimensions

Because of this conceptual diversity, many authors and institutions structure QoL into domains or dimensions rather than attempting a single, narrow definition. Multidimensional frameworks typically distinguish between economic, social, health, environmental and governance-related aspects of life. The economic dimension of QoL refers to material living conditions and economic security: income and wealth, employment, job quality, housing affordability and the ability to meet basic needs and participate in society (Easterlin & Angelescu, 2012; *Eurostat*, 2025a). Economic deprivation can severely constrain other domains, and while rising income generally improves QoL at low and middle income levels, this effect weakens beyond a certain threshold, a pattern known as the *Easterlin curve* (Easterlin & O'Connor, 2022). This insight is now widely recognised in *beyond GDP* debates (*European Commission*, 2025).

The social dimension addresses relationships, social cohesion and inclusion, including family and friendship networks, trust, perceived fairness, discrimination, safety, crime and social participation. The quality and density of social ties, as well as the presence of supportive institutions, shape how secure, connected and respected people feel in their everyday lives (Michalos, 2004; Robinson & Martin, 2012).

The health dimension includes both physical and mental health, access to healthcare and health behaviours. Health-related QoL research, which developed partly in parallel to social indicators work, has focused on how disease, disability and treatment affect people's daily functioning and subjective wellbeing (Diener & Tov, 2012; Frisch, 2012).

The environmental dimension highlights the importance of clean air and water, low noise, green and blue spaces, climate stability and biodiversity. QoL research increasingly recognises that environmental conditions are not just a background, but an active determinant of wellbeing, shaping physical health, mental health and the aesthetics and identity of places. This has been reinforced by frameworks on planetary boundaries, which show that crossing certain ecological thresholds (for climate, biodiversity, biogeochemical cycles) undermines the biophysical foundations of human wellbeing (Bass, 2009; Rockström et al., 2009).

Next, the governance and participation dimension concerns democratic rights, trust in institutions, perceived corruption, access to justice and opportunities for civic engagement. People's QoL is not only shaped by what they have but also by whether they feel heard, represented and able to influence decisions affecting their lives. This aspect is featured in OECD (*OECD*, 2024) and Eurostat (*Eurostat*, 2025b) wellbeing frameworks (Eckermann, 2012).

Finally, many frameworks include cultural and psychological dimensions, such as identity, belonging, meaning, autonomy and personal growth. These are harder to capture with standard indicators, but are central in eudaimonic approaches to wellbeing and in debates on mental health and loneliness (Keyes et al., 2012).

In practice, different frameworks combine these domains in various ways, but most agree that QoL cannot be reduced to a single dimension. What ultimately matters is the interplay between economic security, social relations, health, environment and governance in specific times and places.

1.4 Measuring approaches

Translating this conceptual richness into measurable indicators is both necessary and problematic. Governments, international organisations and researchers need indicators to monitor trends, design policies, and evaluate interventions. At the same time, any measurement strategy inevitably simplifies and partially distorts the complexity of lived experience.

The first distinction is often made between objective and subjective indicators. Objective indicators capture observable states, including income, employment, housing size, educational attainment, pollution levels, life expectancy, etc. Subjective indicators, by contrast, rely on survey questions about life satisfaction, happiness, perceived health, trust or feelings of safety. Both types are now widely used and increasingly combined (*OECD*, 2024; *Eurostat*, 2025b).

The second distinction concerns single indicators versus composite indices. Single indicators provide transparency and interpretability. Composite indices, which aggregate single indicators, combine multiple dimensions into a summary measure. Composite measures are attractive for communication and cross-country

comparison, but they raise methodological questions about weighting, normalisation and the commensurability of diverse dimensions (Hagerty & Land, 2012; Maggino & Zumbo, 2012; Greco et al., 2020).

From a geographical perspective, such measurement also raises questions of scale and spatial granularity. National averages can hide large regional and local inequalities in QoL. This has stimulated work on spatially explicit QoL indicators and multi-scalar analysis, in which neighbourhood, city, regional and national patterns are compared and mapped (Dobrowolska & Kopczewska, 2024; Răducan et al., 2025).

In response, some frameworks, including those developed by OECD (*OECD*, 2025) and Eurostat (*Eurostat*, 2025c), prefer indicator *dashboards* that present multiple domains side by side rather than collapsing them into a single number. This approach maintains multidimensionality but can be harder to summarise and communicate to non-expert audiences (Sirgy et al., 2012).

Critiques of the QoL measurement focus on several issues, including the danger that complex experiences are reduced to a limited set of comparable numbers; the risk of cultural bias in subjective well-being questions; and the tendency to treat indicators as neutral and technical despite their normative underpinnings. Nonetheless, most authors agree that abandoning measurement is not an option. The challenge is to design indicators that are conceptually transparent, empirically robust and sensitive to context (Hagerty & Land, 2012).

1.5 Contemporary debates

In recent years, QoL has been at the centre of several major debates about the future of development. A central theme is the critique of GDP as the dominant indicator of progress. The Commission on the Measurement of Economic Performance and Social Progress has argued that GDP is a poor proxy for well-being and called for broader, multidimensional measures that capture distributional issues, non-market activities and environmental sustainability. This *beyond GDP* agenda has influenced national and international statistical strategies and given new momentum to QoL research (Camfield, 2012; *Eurostat*, 2025a).

Another topic concerns paradoxes of modernity. Many high-income societies have experienced sustained growth in income and human development indices, yet also report stagnating or even declining levels of subjective well-being, rising mental health problems and persistent or growing inequalities in income and wealth. These patterns fuel debates about whether contemporary economic models effectively translate into improved QoL for all or whether they produce forms of precarity, overwork and social fragmentation that offset material gains (Camfield, 2012).

The third closely related debate focuses on planetary boundaries and environmental limits. Researchers have proposed that humanity operates within a finite safe operating space defined by ecological thresholds in climate, biodiversity, land use, biogeochemical cycles and other Earth-system processes. The evidence that several of these boundaries have already been transgressed raises questions about the long-term sustainability of current lifestyles, especially in high-consumption societies, and about intergenerational aspects of QoL (Rockström et al., 2009).

These insights have inspired new frameworks such as *doughnut economics*, which combines a social foundation (basic human needs and rights) with an ecological ceiling (planetary boundaries), defining a safe and just space where human societies can thrive without undermining Earth-system stability (Raworth, 2017). Similar ideas underpin proposals for a well-being economy or post-growth development models, which shift the central goal from maximising GDP to sustaining high and broadly shared QoL within biophysical limits (*OECD*, 2018).

A further contemporary concern is the fragmentation and unequal distribution of QoL within societies. Spatial disparities between regions, urban and rural areas and neighbourhoods, as well as inequalities across lines of income, gender, age and ethnicity, mean that aggregate improvements can coexist with local decline or exclusion. Urban geographies of segregation, housing unaffordability and environmental injustice illustrate how place-based disadvantages accumulate and erode QoL for specific groups, even in countries that perform well on average (Camfield, 2012).

Finally, debates increasingly highlight emerging issues such as digitalisation, loneliness and mental health. While digital technologies can expand capabilities and access to services, they can also contribute to new forms of stress, surveillance and

exclusion. Rising concern about loneliness and mental distress in some high-income societies suggests that social and psychological dimensions of QoL deserve at least as much attention as material ones (Huebner et al., 2012).

Overall, contemporary debates emphasise that QoL exceeds economic growth or technological progress. It is shaped by complex interactions between economic, social, environmental and cultural processes, within and across time and places.

2 Analysing quality of life: European development paradoxes through indicators

In the following chapter, the general conceptual and philosophical grounding will be connected more directly to empirical evidence by examining long-term trends in selected economic, social and environmental indicators across Europe. For each country, long-term change over 30 years was calculated between the earliest and latest available year (Table 2). This will allow the abstract debates reviewed here to be linked to concrete data, illustrating the changing Europe and its development paradoxes.

2.1 Economic paradox: growth with uneven equality

Nominal GDP represents the total economic output of a country expressed in current USD. Data were obtained from the World Bank for the period 1990–2024. Across Europe, nominal GDP increased dramatically in almost all countries, but with substantial variation in scale. Post-transition economies recorded the strongest relative increases as they moved from centrally planned to market economies, attracted foreign investment, expanded export sectors and underwent institutional reforms. Western and Northern European economies, while already large, continued to grow steadily, though their relative increases appear smaller because they started from a much higher baseline. Some countries (e.g., Greece) showed stagnation or contraction following severe economic crises, while smaller economies (e.g., the Baltics) displayed exceptionally rapid growth relative to their initial size. Overall, nominal GDP trends reveal a continent-wide expansion of total economic activity but also highlight persistent structural differences between regions and the unequal ability of countries to withstand economic shocks (Figure 1a).

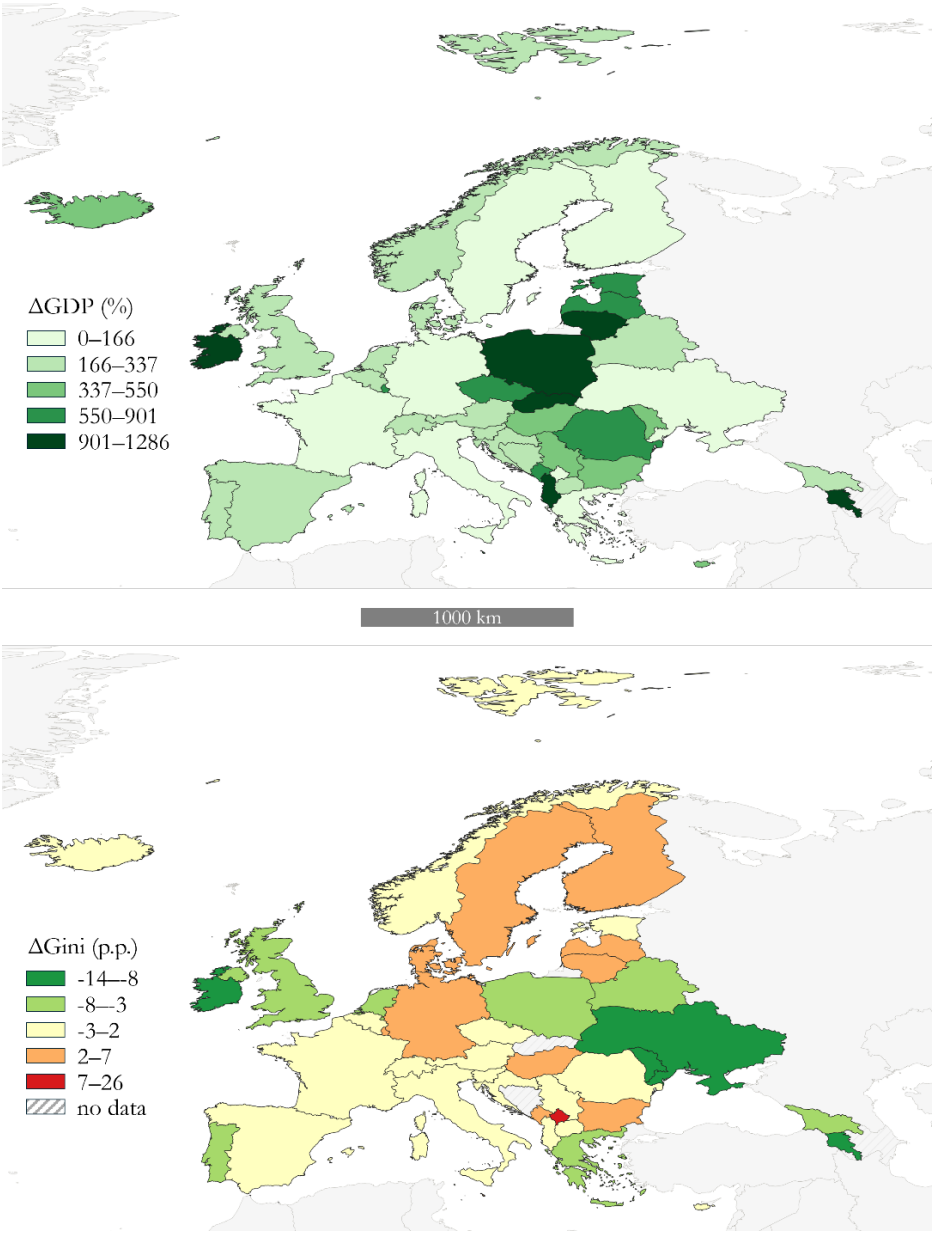

Figure 1 (a, b): Long-term changes in economic growth and inequality in Europe. The upper map (a) shows relative increases in GDP, while the lower map (b) shows changes in the Gini coefficient, highlighting that rapid economic convergence did not necessarily align with parallel improvements in income equality.

Source: Authors, 2025 (Data: GDP, 2025; Gini, 2025).

The Gini coefficient measures the distribution of disposable household income and ranges from 0 (perfect equality) to 1 (maximum inequality). Data were obtained from the World Bank for the period 1990–2023. While already low, income inequality shows far less movement than GDP. Many Central and Eastern European countries saw major increases during the 1990s transition and later partial stabilisation. Western Europe experienced modest shifts, with some countries recording widening inequality due to labour-market polarisation and housing-cost pressures, while others maintained relatively low inequality thanks to robust welfare systems. Overall, Gini trends demonstrate that distributional structures are much more stable than economic output, suggesting that large increases in GDP do not automatically alter the way income is shared. In conflict-affected economies (e.g., Ukraine), decreases in the Gini coefficient may reflect income compression due to war-related economic disruption rather than an improvement in equality (Figure 1b).

Together, nominal GDP and the Gini coefficient reveal an important structural contradiction: Europe experienced an extraordinary expansion of total economic output, yet income inequality barely changed. Rapid GDP growth, especially in post-transition economies, did not automatically produce more equitable societies and, in some cases, coincided with the widening of income gaps. In spatial terms, the European pattern underscores the core economic paradox: growth was widespread and often impressive, but its benefits were unevenly shared (Table 2).

2.2 Social paradox: development with slower well-being gains

HDI integrates life expectancy, education and income into a single composite indicator. Data were obtained from the UNDP for the period 1990–2023. HDI increased substantially in every country, but the dynamics differ. Post-transition countries made the most dramatic gains, reflecting improvements in health systems, education reforms and rising income levels. Western and Northern Europe maintained already high HDI values but still recorded incremental progress, illustrating the difficulty of improving once close to the upper bound. A few countries, especially those affected by conflict or demographic contraction (e.g., Ukraine), recorded stagnation or slight decline. In general, HDI trends confirm broad and durable improvements in the objective dimensions of QoL, indicating that people live longer, are more educated and enjoy higher material standards (Figure 2a).

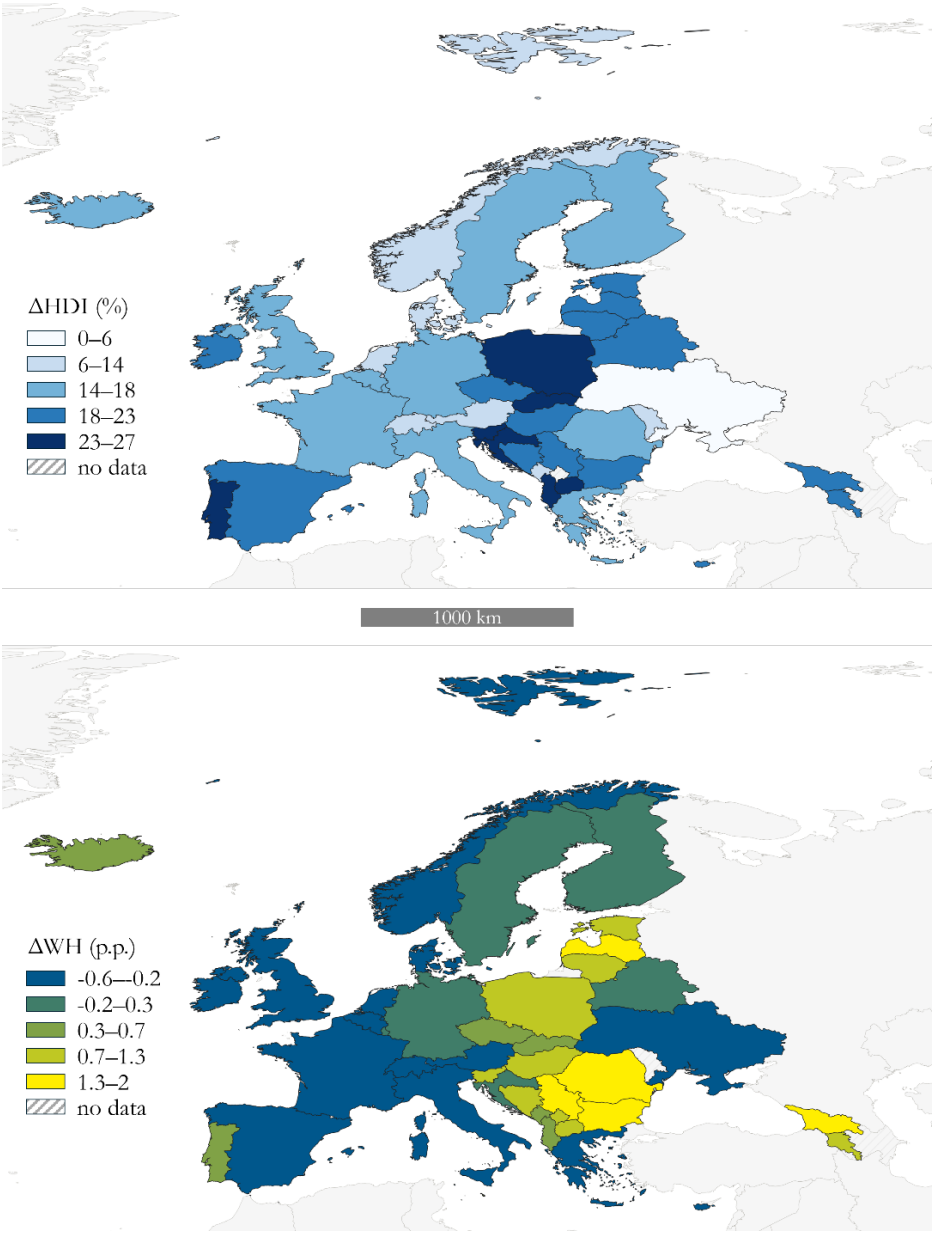

Figure 2 (a, b): Long-term changes in human development and subjective well-being in Europe. The upper map (a) shows relative increases in HDI, while the lower map (b) shows changes in life satisfaction, illustrating that strong human-development gains did not necessarily coincide with similar improvements in subjective well-being.

Source: Authors, 2025 (Data: HDI, 2025; WH, 2025).

The World Happiness Index measures self-reported life satisfaction on a scale of 1 to 10. Data were obtained from the World Happiness Reports for the period 2011–2024. The European pattern is strikingly different from HDI. Many high-HDI, high-income countries show stagnation or deterioration in life satisfaction (e.g., Denmark, Norway, Finland, Ireland, the Netherlands, UK). These declines often align with rising mental-health challenges, increasing living-cost pressures, weakened social trust or political polarisation. Conversely, several Central and Eastern European countries (e.g., Serbia, Lithuania, Poland, Romania) experienced notable improvements, suggesting that rapid socioeconomic progress can translate into improved subjective well-being when it supports rising optimism and stability. However, overall levels remain lower than in Western Europe, demonstrating that well-being gains do not automatically converge with economic gains. This divergence signals that subjective well-being is shaped less by aggregate wealth and more by complex social, psychological and institutional conditions (Figure 2b).

Together, HDI and happiness reveal Europe's emerging social paradox: objective indicators of human development continue to rise, yet subjective life satisfaction stagnates or declines in many of the wealthiest and most developed societies. This suggests that education, longevity and income are necessary but not sufficient. Social cohesion, mental health and everyday pressures increasingly determine how people evaluate their lives (Table 2).

2.3 Environmental paradox: decarbonization with biodiversity decline

Domestic net greenhouse gas emissions measure total national emissions of greenhouse gases from all sectors expressed in tons per capita. Data were obtained from the European Environment Agency for the period 1990–2023. Most European countries achieved major reductions in emissions, in some cases exceeding 50%. These declines stem from improvements in energy efficiency, technological upgrading, coal phase-out, post-industrial restructuring, and EU climate legislation. Eastern Europe's reductions are partly linked to the collapse of heavy industry in the 1990s, while Northern Europe's progress reflects long-term investment in renewables. At the same time, a few countries recorded increases in emissions, most notably Latvia, where post-1990 economic restructuring, rising transport emissions, and growth in residential energy demand outweighed efficiency gains. Overall, Europe demonstrates clear progress in climate mitigation, achieving significant decoupling between economic growth and carbon emissions (Figure 3a).

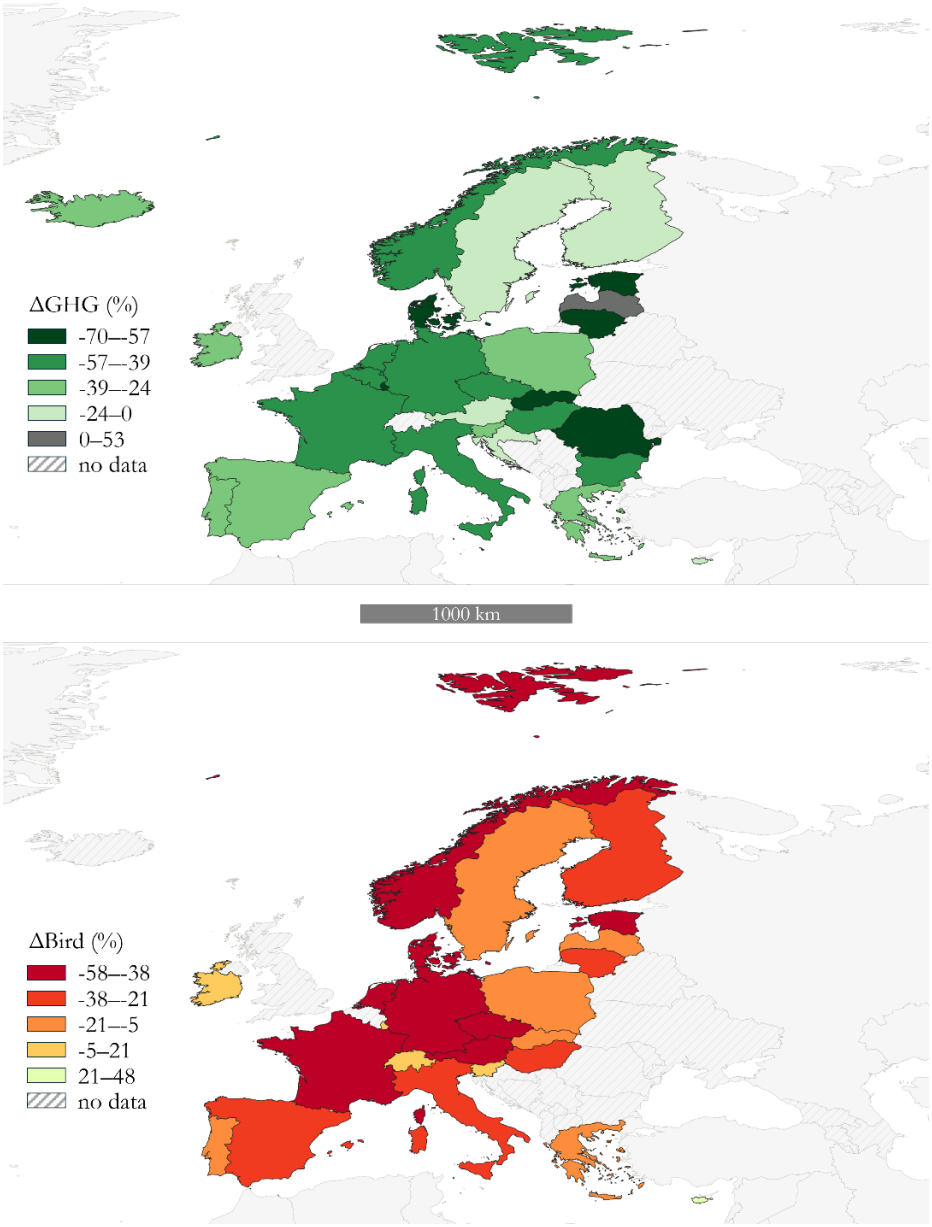

Figure 3 (a, b): Long-term changes in greenhouse-gas emissions and farmland-bird populations in Europe. The upper map (a) shows relative reductions in GHG emissions, while the lower map (b) shows changes in farmland bird population, highlighting that successful decarbonization has occurred alongside widespread declines in biodiversity.
Source: Authors, 2025 (Data: GHG, 2025; Bird, 2025).

The Common Farmland Bird Index tracks population trends of bird species associated with agricultural landscapes, serving as a sensitive proxy for biodiversity health. Data were obtained from the PECBMS and the EEA for the period 1990–2023. Farmland bird populations have declined dramatically across most of Europe, often by 30–50% or more. These decreases reflect intensifying agricultural practices (monocultures, pesticide use, fertiliser dependency, loss of hedgerows and field margins) and the homogenization of rural landscapes. Even countries with strong conservation frameworks (e.g., France, Germany, Czechia) observe persistent declines, indicating structural pressures from modern agriculture. Only a few cases show stabilisation or increases (e.g., Cyprus, Switzerland, Luxembourg), usually linked to targeted agri-environmental measures or extensive farming systems. Overall, biodiversity trends reveal one of Europe's most severe sustainability challenges (Figure 3b).

Environmental indicators expose a dual reality: while Europe has succeeded in reducing greenhouse gas emissions, biodiversity continues to decline at alarming rates. Decarbonization alone does not prevent habitat loss or ecological degradation. This contrast highlights that climate policy progress does not automatically translate into broader ecological recovery, underscoring the urgency of transforming land-use systems to safeguard Europe's natural capital (Table 2).

Table 2: Three European development paradoxes shaping QoL in a changing world: economic (growth with uneven equality), social (development with slower wellbeing gains) and environmental (decarbonization with biodiversity decline).

	Economic paradox		Social paradox		Environmental paradox	
Country	ΔGDP (%)	ΔGini (p.p.)	ΔHDI (%)	ΔWH (p.p.)	ΔGHG (%)	ΔBird (%)
Albania	1239.8	-1.2	23.9	0.3	n.d.	n.d.
Andorra	292.6	n.d.	10.7	n.d.	n.d.	n.d.
Armenia	1042.6	-8.8	22.3	1.0	n.d.	n.d.
Austria	214.6	1.3	11.8	–0.4	–3.5	–38.3
Belarus	336.8	-4.3	19.1	0.0	n.d.	n.d.
Belgium	223.7	-1.6	15.4	–0.2	–42.0	n.d.
Bosnia and Herzeg.	265.6	n.d.	19.3	1.3	n.d.	n.d.
Bulgaria	443.9	6.7	19.7	1.7	–39.4	n.d.
Croatia	260.7	-1.2	24.7	0.2	–1.9	n.d.
Cyprus	549.8	1.5	21.9	–0.5	–8.5	48.1

	Economic paradox		Social paradox		Environmental paradox	
Country	ΔGDP (%)	ΔGini (p.p.)	ΔHDI (%)	ΔWH (p.p.)	ΔGHG (%)	ΔBird (%)
Czechia	741.2	-1.2	21.5	0.4	–49.7	–39.9
Denmark	210.7	6.9	14.0	–0.3	–57.8	–48.4
Estonia	849.7	0.6	22.6	1.1	–57.8	–43.5
Finland	112.0	3.9	15.2	0.2	–4.0	–27.3
France	151.4	-0.3	15.3	–0.2	–44.4	–45.7
Georgia	336.6	-5.7	19.7	1.5	n.d.	n.d.
Germany	162.1	3.6	15.0	0.2	–45.1	–57.6
Greece	166.4	-3.6	17.9	–0.4	–35.0	–4.7
Hungary	546.5	3.2	19.2	1.0	–42.0	–21.5
Iceland	417.3	-2.2	15.6	0.6	–29.5	n.d.
Ireland	1071.0	-8.0	22.3	–0.4	–35.8	8.6
Italy	100.4	-0.9	16.3	–0.2	–39.1	–28.8
Kosovo	108.6	26.2	n.d.	1.2	n.d.	n.d.
Latvia	676.0	3.0	20.8	1.4	52.9	–10.1
Liechtenstein	483.0	n.d.	6.3	n.d.	n.d.	
Lithuania	971.4	4.3	20.1	1.2	–62.4	–22.0
Luxembourg	629.3	5.9	17.2	0.1	–68.3	21.1
Malta	854.8	2.4	25.7	0.4	–44.6	n.d.
Moldova	406.6	-9.6	11.8	n.d.	n.d.	n.d.
Monaco	302.8	n.d.	n.d.	n.d.	n.d.	n.d.
Montenegro	719.8	5.2	11.5	0.7	n.d.	n.d.
Netherlands	285.1	-5.1	11.7	–0.2	–46.1	–46.4
North Macedonia	255.0	1.3	26.6	1.1	n.d.	n.d.
Norway	303.8	0.5	13.3	–0.3	–40.6	–46.2
Poland	1286.4	-6.1	25.5	0.9	–25.9	–13.1
Portugal	292.2	-4.6	25.9	0.7	–23.8	–6.5
Romania	900.8	-1.4	17.5	1.4	–69.7	n.d.
San Marino	81.8	n.d.	3.9	n.d.	n.d.	n.d.
Serbia	397.1	-1.5	21.4	2.0	n.d.	n.d.
Slovakia	997.8	n.d.	26.1	0.6	–57.4	–5.7
Slovenia	265.5	0.1	26.8	0.9	–30.6	0.6
Spain	221.3	1.4	19.8	–0.3	–29.7	–25.0
Sweden	133.3	4.1	17.2	0.0	–14.3	–15.4
Switzerland	252.4	0.3	13.1	–0.6	n.d.	1.6
Ukraine	134.3	-13.6	3.9	–0.4	n.d.	n.d.
United Kingdom	233.3	-3.1	16.5	–0.2	n.d.	n.d.

Source: Authors, 2025 (Data: *GDP*, 2025; *Gini*, 2025; *HDI*, 2025; *WH*, 2025; *GHG*, 2025; *Bird*, 2025).

Negative trend (worsening) Stagnation / modest change Positive trend (improvement)

ΔGDP (%) – Percentage change in Gross Domestic Product (economic expansion); ΔGini (p.p.) – Change in the Gini index in percentage points (income distribution); ΔHDI (%) – Percentage change in the Human Development Index (social development); ΔWH (p.p.) – Change in the World Happiness score in points (subjective wellbeing); ΔGHG (%) – Percentage change in greenhouse gas emissions (climate mitigation); ΔBird (%) – Percentage change in the common farmland bird index (biodiversity loss).

3 Investigating quality of life: Summer School context and research reports

Building on the conceptual foundations introduced in Chapter 1 and the long-term trends outlined in Chapter 2, this chapter presents the empirical work conducted during the Summer School, where international student research teams explored how social, cultural, environmental and spatial factors shape everyday QoL in Maribor and beyond. Through diverse qualitative, quantitative and spatially informed approaches, including field observations, interviews, GIS analysis and comparative case studies, their reports offer insights into how people experience urban spaces, public services, community initiatives and environmental change.

1. Social Inclusion Issues in Contemporary Housing Estates: The Case Study of Poljane, Maribor (mentor: José Ignacio Vila Vázquez)

The case study by Dušek et al. (2026) employs field observations, stakeholder interviews, and literature analysis to examine the dynamics of social exclusion in the Poljane social housing estate in Maribor. It finds that physical deterioration, concentrated Roma residency, weak interaction between groups, and the stigmatised image of the estate reinforce segregation despite some NGO-led inclusion efforts.

2. Quality of Life and Welfare Spaces in Maribor´s Koroška Vrata District: Mapping and Interviews (mentor: Maria Chiara Tosi)

The study by Koyun et al. (2026) combines systematic field observations and twelve semi-structured interviews to analyse how welfare spaces in Maribor's Koroška Vrata district shape everyday well-being. It finds that walkability, abundant green areas, and strong perceptions of safety support high QoL, while minor concerns relate to infrequent public transport, football-related disturbances, and occasional mobility conflicts.

3. Case Study on Urban Atmospheres in Maribor (mentor: Eberhard Rothfuss)

The study by Donnay et al. (2026) compares the atmospheres of Lent and the Europark shopping centre, using go-along interviews, open-ended interviews, and field observations to understand how different user groups perceive sensory and emotional qualities of urban spaces. It finds that Lent evokes calmness but is interpreted differently by tourists, locals, and employees, while Europark produces gendered sensory experiences shaped by design, crowding, and commercial cues, showing that urban atmospheres are co-produced by spatial form and social interpretation.

4. Linking Urban Public Spaces and Cultural Institutions to Quality of Life (mentors: Jarosław Działek, Monika Murzyn-Kupisz)

The study Krasniqui et al. (2026) by employs systematic field observations to evaluate four Maribor squares across seven dimensions of public space quality. It finds distinct but complementary functions among the squares and highlights shared needs for shade, seating, lighting, and basic infrastructure to improve everyday QoL.

5. Everyday Encounters in Public Transport: Mapping Bus Behaviour in Maribor (mentor: Tilen Kolar)

The study by Huszti et al. (2026) uses systematic observations on four Maribor bus lines to document passengers' behaviours, emotions, and interactions across weekday and weekend rides. It finds that buses function as quiet, socially mixed micro-spaces, primarily used by women, students, and older people, where fatigue, disengagement, and phone use predominate but are punctuated by small moments of comfort, routine, and occasional social connection.

6. Cultivating Resilience: Permaculture and Self-Sufficient Communities across European Contexts (mentor: Ana Vovk)

The comparative study by Durán-Rubi et al. (2026) uses literature review and project documentation from seven European countries to analyse how permaculture supports independent living, focusing on food production, water and energy management, governance, and education. It finds that despite diverse scales and

contexts–from urban gardens to large ecovillages–all initiatives strengthen self-sufficiency, ecological restoration, and community resilience.

7. Rural Europe in Comparison: A SWOT Perspective on Quality of Life in the Selected Regions (mentors: Éva Máté, Pavel Ptaček)

The study by Nikolić et al. (2026) uses a qualitative SWOT analysis of selected European rural areas to identify common factors shaping rural QoL. It finds that strong community ties and natural environments are key strengths, while demographic decline, weak services, and marginalisation are major weaknesses, with opportunities emerging through sustainable agriculture, rural tourism, and targeted development policies.

8. Spatial Analytics of Climate Change Impacts: The Case Study of Maribor (mentor: Danijel Ivajnšič)

The study by Blaj et al. (2026) models future climate and heat stress in Maribor using high-resolution climate projections (CHELSA), Landsat-derived LST and NDVI, population data, and a composite fuzzy-logic heat stress index. It finds strong warming (+4 °C), declining precipitation, and severe future heat stress concentrated in dense central and southern urban areas, underscoring the need for targeted adaptation planning.

9. Ecological Network and Ecosystem Services (mentors: Serge Schmitz, Sanda Nicola)

The study by Yakovlieva et al. (2026) combines GIS-based mapping of green areas, ecological corridors, and Natura 2000 sites with 20 on-street interviews to assess Maribor's ecological network and residents' perceptions of ecosystem services. It finds that while the city is surrounded by extensive green spaces and exhibits generally good ecological connectivity, central districts lack continuous green corridors and that residents most value clean air, shade, recreation, and riverfront areas, highlighting opportunities for targeted green infrastructure improvements.

10. Urban Agriculture and Quality of Life: A Comparative Analysis of Different Forms of Urban Agriculture and Its Effects on Welfare (mentor: Silva Grobelnik Mlakar)

The study by Grobelnik Mlakar et al. (2026) combines a comparative literature review with fieldwork and expert interviews in Maribor to examine how different forms of urban and peri-urban agriculture across six European cities contribute to community well-being and sustainable urban development. It finds that despite diverse local contexts, UA consistently supports social cohesion, ecological awareness, and local food systems, with the Maribor case showing strong potential through school gardens, cooperatives, and CSA models, though broader participation still depends on institutional support and public engagement.

11. Urban–Suburban Relations and Quality of Life Along the Maribor–Graz Corridor: A Study of Four Settlements in Northeast Slovenia (mentors: Peter Kumer, Danijel Davidović)

The study by Kumer & Davidović (2026) examines urban–suburban relations along the Maribor–Graz corridor through four case studies, combining field surveys, interviews, municipal consultations and direct observation. It finds that suburbanisation, cross-border labour mobility and post-industrial restructuring are reshaping settlement patterns, creating challenges related to housing pressure, car dependency, demographic change and fragmented spatial governance within an increasingly integrated city region.

Taken together, the eleven research reports provide a broad, practice-based view of how QoL is shaped across different settings, from central public spaces and neighbourhood environments to ecological networks, rural regions and food systems. Although each study focuses on a specific site or theme, they collectively reveal how liveability emerges from the interaction of social relations, environmental conditions, spatial design and community initiatives. The findings underscore that everyday well-being is rooted in material infrastructure and institutional provision but also in subtle emotional atmospheres, patterns of use, access to green spaces and forms of collective organisation. Seen together, these investigations translate the abstract trends and debates from the previous chapters into concrete, situated

examples of how people experience and negotiate QoL in Maribor and European contexts.

4 Conclusion

This chapter has outlined the conceptual and analytical foundations used in this monograph to understand QoL in a changing world. It traced how thinking about the good life has evolved from classical philosophical reflections, through early social statistics and economic indicators, to contemporary multidimensional frameworks that integrate objective conditions, subjective evaluations and human capabilities. QoL is now widely recognised as a complex, contested and spatially embedded concept, encompassing economic, social, health, environmental, political and cultural dimensions.

The examination of long-term European trends over the past three decades illustrated how these conceptual debates unfold in a rapidly changing world. Economic growth and human development have continued to rise, yet several social and environmental dimensions have stagnated or declined. Societies can grow richer while remaining unequal, improve health and education while subjective well-being weakens, and reduce pollution while biodiversity continues to decline. These development paradoxes underscore the importance of approaching QoL in explicitly multidimensional terms, being attentive to both progress and its limits, as well as to the spatial differences that shape everyday experience.

Finally, by introducing the empirical research reports produced during the Summer School: Quality of Life in a Changing World, the chapter linked conceptual foundations and long-term European trends to lived realities in Maribor and other European contexts. QoL emerges here not as a single measure but as a process shaped by material conditions, human capabilities, subjective perceptions, social cohesion and ecological resilience. This multidimensional understanding provides the framework for the chapters that follow, where QoL is examined through concrete neighbourhoods, landscapes and everyday practices.

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Social Inclusion Issues in Contemporary Housing Estates: The Case Study of Poljane, Maribor

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Social exclusion in housing estates remains a pressing challenge in Europe, where concentrated poverty and marginalised groups face persistent barriers to integration. This paper examines the case of the Poljane public housing development in Maribor, Slovenia, asking whether its location within a low-density neighbourhood and the characteristics of its residents contribute to social exclusion and urban segregation. A mixed-method approach was applied, combining field observations, semi-structured interviews with stakeholders, and literature analysis. The findings highlight the deterioration of shared spaces, tensions between Roma and non-Roma residents, and the persistence of negative external perceptions, while also noting efforts at inclusion through NGO-led initiatives. Overall, the results confirm that physical decay, high density, and social fragmentation contribute to reinforcing forms of social exclusion in Poljane.

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VPRAŠANJA SOCIALNE VKLJUČENOSTI V SODOBNIH STANOVANJSKIH SOSESKAH: ŠTUDIJA PRIMERA POLJANE V MARIBORU

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Ključne besede:
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Socialna izključenost v stanovanjskih soseskah ostaja pereč izziv v Evropi, kjer se revni in marginalizirane skupine soočajo s trajnimi ovirami pri vključevanju. Prispevek obravnava primer javnega stanovanjskega kompleksa Poljane v Mariboru, njegovo umestitev v redko pozidano sosesko ter kako značilnosti prebivalcev prispevajo k socialni izključenosti in urbani segregaciji. Uporabljen je bil kombiniran raziskovalni pristop, ki je vključeval terenska opazovanja, polstrukturirane intervjuje z deležniki ter analizo literature. Ugotovitve izpostavljajo propadanje skupnih prostorov, napetosti med romskimi in neromskimi prebivalci ter negativne zunanje zaznave, hkrati pa tudi prizadevanja za vključevanje prek pobud, ki jih vodijo nevladne organizacije. Rezultati potrjujejo, da fizična degradacija, visoka gostota poselitve in socialna razdrobljenost prispevajo k utrjevanju oblik socialne izključenosti v Poljanah.

Univerzitetna založba Univerze v Mariboru

1 Introduction

For several years, an increase in inequality and poverty has been observed in Europe, which can lead to social exclusion, especially when low-income households are concentrated in certain neighbourhoods (Chaskin, 2013; Musterd et al., 2017). Indicators and factors of exclusion can be multiple and are also linked to social identity or how a group is perceived by the majority, usually because this group does not share the same normative ideals and "their everyday practices or ways of life are considered inferior" (Zevnik & Russell, 2021, p. 43).

The inaccessibility to the housing system is a key factor for social exclusion (Musterd et al., 2017). Even when shaped by the same policy, housing estates can be heterogeneous (Vila Vazquez & Petsimeris, 2022), and this can create "varieties of trajectories of change" (Hess et al., 2018, p.10). As a result, we can observe some significantly downgraded estates alongside others that are more successful. This downgrading, which is also a cause of exclusion, can occur for multiple reasons, such as construction methods, the size of the settlement, population demands, or location within the city. These characteristics are important to consider during the conception of the housing development programme, as they will generate an inertia in the area that will shape the future of the housing development (Hess et al., 2018; Wassenberg, 2018). Furthermore, "the problematic start of some housing estates is in several cases /.../ [due to] the recruitment of the first residents" (Bolt, 2018, p. 61).

This paper analyses a case study of a public housing development in Maribor, Slovenia. The objective of the research is to verify whether the analysis of the case study confirms that the potential social exclusion of a neighbourhood is based on social and ethnic composition and has been reflected in certain urban fabric characteristics. Furthermore, it tries to determine whether the location within a low-density neighbourhood plays a major role in this exclusion and residential segregation. The article begins with the housing context and the policies that have shaped Maribor, and presents the chosen settlement more specifically. An analysis of field observations and stakeholder interviews enables a diagnosis of the neighbourhood in terms of social exclusion and management. The final section presents a discussion of the insights provided by the case study.

2 Context of Slovenia and Maribor

Since the end of the Second World War, the political context surrounding housing in Maribor has undergone multiple changes. Until the early 1980s, Slovenian cities were characterised by the development of high-quality residential blocks, following the principles of the international movement in planning, which offered a large stock of public housing units available for any kind of households in new Yugoslavian residential neighbourhoods (Skalicky & Cerpes, 2019). Following Slovenia's independence in 1991, the National Housing Fund of the Republic of Slovenia was established, and the country permitted the privatisation of social housing estates, thereby reducing the state's role. At that time, the number of state-owned housing units drastically declined (Skalicky & Cerpes, 2019). Between 1991 and 2002, the number of households decreased by 3.6% in Maribor and by 12.5% in the city centre (Sitar, 2008). On the other hand, the development of housing estates until 1991 helped to provide general access to housing units to citizens from different social classes, as a prototype of a quite egalitarian society; meanwhile, this kind of neighbourhood in Western Europe had been generating a process of stigmatisation and the source of deeper social issues, comparatively (Hess et al., 2018).

In 2000, the Ministry of Environment and Physical Planning defined a shortage of approximately 12,000 social and nonprofit housing units in Slovenia (Sitar, 2008). The country then adopted a National Housing Programme for the period between 2005 and 2015, but this has largely not been realised, with 70% of existing flats being older than 30 years in 2012 (Skalicky & Sitar, 2012). The stock was then divided into two forms: dense construction of non-profit and social housing on one hand, and single-family housing with low density and a lack of services on the other (Sitar, 2008). In 2025, the Slovenian government has reinforced the capacity of the state to fund and promote new state-based programmes of public rental housing (Sta, 2025), which might contribute to improving access to more affordable housing units.

Considering that the origin country and ethnic composition are significant dimensions of social exclusion, it is necessary to note that Slovenia recognises three minorities: Italian, Hungarian, and Roma (Zevnik & Russell, 2021). The first two are considered "national communities"; meanwhile, Roma are considered a "special community," and one of their larger urban settlements is located in Maribor (Zupančič, 2007). This situation creates an asymmetry in the access to the rights of

political representation and protection as recognised minorities by these three minorities. According to Zevnik and Russell (2021, p. 55), Roma are a marginalised group that "remain outside the political realm, subjected to racial abuse and deprivation".

3 Case study: Poljane housing estate

This study focuses on a specific site located in Poljane, Maribor – a small residential neighbourhood on Preradovičeva ulica street near the shopping mall Planet Tuš (Figure 1), among areas with a lower quality of residential environment in Maribor (Tiran & Koblar, 2017). In the early stages of the project, various collective housing neighbourhoods in Maribor were considered as potential case studies. On August 27th, a field visit was conducted to all the proposed neighbourhoods, allowing for direct observation of their physical, social, and spatial characteristics. Based on this comparative exploration, the neighbourhood on Preradovičeva ulica was selected for reasons that align with the research objectives: the recency of the intervention, explicit focus on social inclusion issues, manageable scale and clear boundaries, and public space configuration.

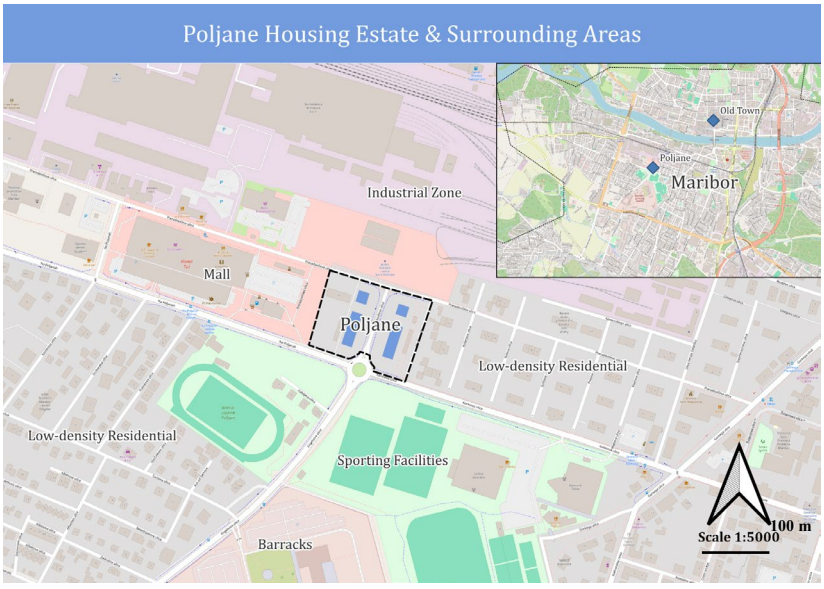

Figure 1: Location map of the case study
Author: Heřman Dušek, 2025; source: Open Street Map, 2025

Poljane is a social housing estate built by the multiple award-winning architect's office Bevk Perović. The project was initiated by the Housing Fund of Maribor and the Housing Fund of Slovenia in 2002, and its development was completed in 2007 (Bevk Perovic Arhitekti, n.d.). This development was undertaken during a period of crisis in social housing production, with 590 units built for 3,876 applicants between 1994 and 2005 in Slovenia (Sitar, 2008).

The housing project comprises four buildings (as shown in Figure 1) and 130 social housing apartments. The urban plan of the area and the two busy roads surrounding the settlement were limiting the possibility of creating exterior public spaces, which led to the construction of common spaces inside the building. The apartments' design is standard and "follows the industrial character of the surroundings," but "their individuality is expressed with colourful balconies," and their position on the façade is supposed to create a dynamic character (Bevk Perovic Arhitekti, n.d.).

4 Methodology

This research is structured as a case study, understood as "the study of the particularity and complexity of a single case, to understand its activity within important circumstances" (Stake, 2005, as cited in Álvarez & San Fabián, 2012, p. 3). The research employs a mixed qualitative methodology in the perspective of Wynn and Money (2009), who argue that qualitative research seeks "the understanding of social phenomena from the experiences and viewpoints of social actors, and the interpretation of the meanings they assign to their actions, beliefs, and values" (Wynn & Money, 2009, as cited in Izcara Palacios, 2014, p. 13).

To develop a comprehensive and situated understanding of the case study, two methods were used: direct observation and semi-structured interviews, combined with a literature analysis. The order in which these methods were employed responded to the logic of the research process, starting with field observation and followed by interviews.

- Direct observation: On August 20 and 31, 2025, two field visits were conducted to document the physical characteristics of the area, the use of public spaces, and the dynamics of social interaction in everyday life. These observations served as a preliminary approach to the case, providing contextual and visual

information about the material and relational dimensions of the neighbourhood. They also informed the design and focus of the subsequent interviews.

- Two semi-structured interviews: Interviews were conducted with representatives of the Javni medobčinski stanovanjski sklad Maribor (JMSS) and the NGO *Kralji ulice*, which provided valuable insights regarding the project's objectives and the current issues it seeks to address. Interviews with residents of the neighbourhood, representing different socio-demographic groups, and individuals living in adjacent areas were attempted without success.

5 Results

The interview and field observation reveal several criteria of exclusion and inclusion that shape life within the housing blocks in Poljane. **Public spaces** are a recurring concern, with greenery, benches, and sports facilities often poorly maintained (Interview 1; observation). Some areas suffer neglect due to their specific location, such as being situated on hills, and there appears to be a general lack of care for shared outdoor environments (Interview 1; observation). Furthermore, **accessibility** aspects are also present: biking lanes, underground car parking, and access for persons with disabilities to the houses exist (observation).

The fabric of the **housing blocks** shows clear signs of ageing, although it was built in 2007. Facades, balconies, and external features are deteriorating. In addition, graffiti tags and other forms of vandalism represent another persistent issue in Poljane (Interview 2, observation). While tenants generally maintain their individual apartments, minor decay, such as broken blinds, is evident, as illustrated in Figure 2 (Interview 1; observation). This creates a contrast between personal care for private flats and the visible neglect of common and external areas. Surrounding the blocks, the neighbourhood includes football fields, sports facilities, family houses, a shopping centre, and a petrol station (observation). When the blocks were first developed, the wider community did not oppose them, but negative perceptions grew once tenants began moving in (Interview 1). Nowadays, children from the blocks play with local children, yet adults rarely mix, contributing to a sense of segregation (Interview 1).

Figure 2: Visible physical deterioration in a block of Poljane
Author: Michelle Puškárová, 2025

Social issues deepen this divide. Access to apartments is regulated by strict national conditions, requiring Slovenian or other EU nationality. According to the interviewees, Roma families, who tend to have more children, make up about 30% of the apartments and represent the largest number of residents due to the point-based system favouring families with children (Interview 1). Furthermore, Poljane offers the largest flats in terms of square meters among social housing options in Maribor, making them ideal for larger families (Interview 2). The NGO *Kralji ulice* provides essential support, including childcare, apartment management, and free workshops (Interview 1), as well as assistance with official documents (Interview 2). The office of migrants rents some apartments, where Afghan families live now (Interview 1). Despite the initial ease of construction, problems have persisted since tenants first moved in in 2007 (Interview 1). Challenges include loud environments, children avoiding school, criminal behaviour, and frequent police involvement (Interview 1). As Interview 1 indicates, conflicts within the blocks are common, particularly between Roma and non-Roma residents, often concerning house rules, noise, and the use of shared common spaces. These tensions contribute to an atmosphere of mistrust (Interview 1). The NGO is trying to connect all the tenants through workshops and events, but usually only Roma people attend: "*We are also inviting them (Slovene tenants) to our activities, it is for everyone. They decide not to come.*"

The **image** of the Poljane blocks reinforces these difficulties. Though located on Preradovičeva ulica, the buildings' closed facades and a lack of facing doors foster feelings of disconnection and isolation (observation). Poorly maintained outdoor areas heighten the impression of neglect, while many residents fail to appreciate their living environment, sometimes even damaging it (Interview 1; observation). Although there is recognition that more such housing is needed, opposition from neighbourhoods prevents its expansion (Interview 1). In addition, the Poljane buildings are often perceived by Maribor residents as a "Roma ghetto." As the social workers from *Kralji Ulice* mention in the interview: "*You ask anyone who is living in Maribor about this neighbourhood, they will tell you: 'Oh, this is like a Roma gypsy ghetto.'*"

A possible solution to the marginalisation of Roma people could be to disperse them across different areas within the mainstream population, rather than concentrating them in a single location, such as Poljane (Interview 2). An interviewee from *Kralji Ulice* supports this idea, stating: "*A good thing would be to relocate those people, they all live in the same place. But at the same time, it is not possible because there are no apartments that are so big. The solutions would be to build a new block or to put these families all around Maribor, not just in one place.*"

High **density**, referring to the number of tenants in the apartments and compared to the neighbourhood, intensifies these challenges. Compared to nearby single-family houses, the six-floor blocks accommodate much larger households, with Roma families often comprising five to six people per apartment (Interview 1; observation). While this density generates vibrant activity, groups gathering outside and children playing, it also amplifies tensions within the community (Interview 1; observation).

6 Discussion and conclusion

The case study revealed the role of design and housing management in shaping social exclusion within the estate. The observations align with the arguments of Musterd et al. (2017) and Zevnik & Russell (2021). The housing management and the general perception of estate inhabitants can reinforce segregation and marginalisation. Roma residents are related to the general perception of the estate and are clearly segregated. This process of segregation is visible in conflicts between Roma and non-Roma tenants and in the convergent characterisation of Poljane with trends of

ghettoisation by different stakeholders. Spatial concentration of marginalised groups, as noted by Hess et al. (2018), is a major factor of exclusion. While the project was made by a prestigious studio that wanted to provide public spaces for inclusion, interactions between different groups of inhabitants are kept to a minimum. The poorly maintained common spaces are generally used by the Roma families and children playing. The contrast between care for private apartments and neglect of public areas also suggests exclusion. The design itself was insufficient in building social inclusion.

The study partly confirms the hypothesis that the location of the estate–four high-density apartments within a low-density neighbourhood–does not help in including marginalised communities into broad society. Despite the otherwise good location, our analysis reflects a general sensation of isolation in this housing estate. Different housing management and perceptions of the marginalised communities would likely make this feeling less pronounced. The limits of this study come from the time constraint and the focus on both the institutional perspective of stakeholders and direct observation. Interviews with residents and their neighbours were not successfully conducted. As their experience could not be directly accessed, it would be necessary to conduct interviews with residents in further research. Future research could broaden the scope by incorporating comparative studies with other Slovenian or European estates developed during a similar period, particularly those where social exclusion is less pronounced.

While the estate provides much-needed social housing, its concentration of marginalised groups, poor maintenance and felt stigma undermine its role in urban integration and inclusion. Reconsideration of local strategies and programmes for social inclusion seems to be required. Overall, the combination of physical neglect, social fragmentation, and contested coexistence defines the exclusionary dynamics in these housing blocks.

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Quality of Life and Welfare Spaces in Maribor's Koroška Vrata District: Mapping and Interviews

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This study examines the role of public or "welfare" spaces in shaping quality of life in the Koroška Vrata neighbourhood of Maribor, Slovenia. Using direct observation and twelve semi-structured interviews, it analyses residents' perceptions of mobility, safety, and social interaction. Findings indicate that compact urban design, abundant green spaces, and accessible services promote well-being and a strong sense of safety. While minor issues were raised regarding public transport, football-related disturbances, and e-bikes, residents overall considered the neighbourhood highly liveable and expressed little need for change.

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KAKOVOST ŽIVLJENJA IN PROSTORI BLAGINJE V MARIBORSKI MESTNI ČETRTI KOROŠKA VRATA: KARTIRANJE IN INTERVJUJI

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Študija preučuje vlogo javnih oziroma prostorov "blaginje" pri oblikovanju kakovosti življenja v soseski Koroška vrata v Mariboru. Z uporabo neposrednega opazovanja in dvanajstih polstrukturiranih intervjujev analizira zaznave prebivalcev glede mobilnosti, varnosti in socialnih interakcij. Ugotovitve kažejo, da kompaktna urbana zasnova, obilje zelenih površin in dostopne storitve spodbujajo dobro počutje ter močan občutek varnosti. Čeprav so bili izpostavljeni manjši izzivi, povezani z javnim potniškim prometom, motnjami ob nogometnih tekmah in električnimi kolesi, so prebivalci sosesko na splošno ocenili kot zelo primerno za bivanje in izrazili nizko potrebo po spremembah.

Ključne besede:
prostori blaginje,
dobro počutje,
kakovost življenja,
javni prostori,
urbano blagostanje,
Koroška vrata,
Maribor,
Slovenija

Univerzitetna založba Univerze v Mariboru

1 Introduction

"Quality of life" is a multidimensional concept that measures individuals' satisfaction with life in physical, psychological, social and environmental dimensions (Van Kamp et al., 2003). In urban planning and design, one of the key elements that impacts individuals' quality of life is public and semi-public spaces, also known as welfare spaces. These spaces include green spaces, parks, squares, and shared social spaces that support both physical and social well-being (Gehl, 2010).

According to Tosi and Munarin, the concept of "welfare space" defines the spaces built for socialisation, collective living activities, services and infrastructure in Europe in the 20th and 21st centuries; these areas not only provide comfort, health and security in the city, but also constitute the spatial manifestation of welfare state policies (Tosi & Munarin, 2010). Research has shown that such spaces of well-being have a positive impact on quality of life. For example, urban green spaces have been found to encourage physical activity, facilitate social interactions, and support psychological well-being (Maas et al., 2006; Sugiyama et al., 2008). It has also been emphasised that these areas strengthen individuals' ties with the city and increase their sense of belonging in terms of social sustainability (Dempsey et al., 2011). Therefore, there is a bidirectional relationship between quality of life and welfare spaces: While the quality of public spaces increases the quality of life, the measured quality of life confirms the importance of welfare spaces in spatial planning.

In the case of Maribor, recent studies illustrate how welfare spaces can actively shape urban well-being. Projects focusing on the rehabilitation of city streets, such as the extension of pedestrian zones, shared-space design, and the introduction of parklets, show that reimagined public spaces can enhance both environmental quality and everyday well-being (Pogačar et al., 2024). Moreover, participatory initiatives to revitalise degraded green areas in Maribor reveal that involving local communities not only increases the usability of these spaces but also strengthens social cohesion, belonging, and collective identity (Pogačar et al., 2019).

Taken together, the Maribor experience confirms the broader theoretical understanding: welfare spaces are not just physical infrastructures but essential environments for social sustainability, health, and quality of life.

1.1 Study in the Context of "Koroška Vrata" district in Maribor, Slovenia

This study explores how welfare spaces shape quality of life in the Koroška Vrata district of Maribor, Slovenia. Known for its sustainability and cultural heritage, Maribor offers a compact, walkable urban environment with parks, schools, and cycling networks that foster mobility, interaction, and place attachment (Visit Maribor, 2025). Using a participatory approach, involving local stakeholders and students collaborating as co-researchers via focus groups and observation workshops, four international students reflected on safety, accessibility, environmental quality, and belonging, providing a multidimensional view of welfare spaces and urban well-being.

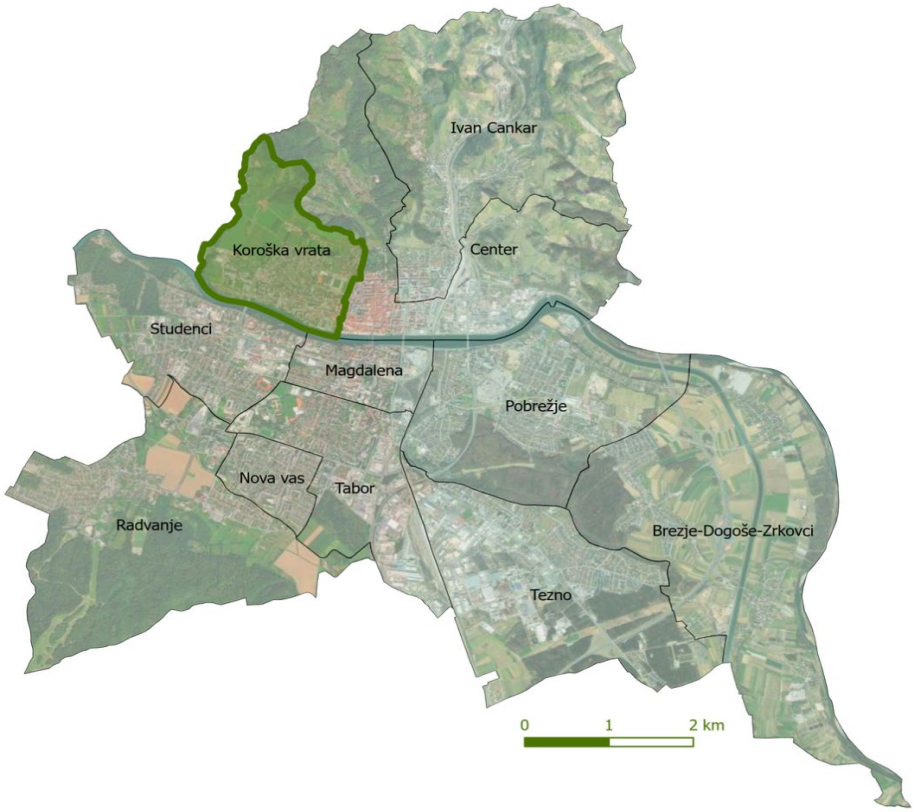

Figure 1: Map of Maribor's districts
Author: Michal Tobola, 2025
(Data source: Esri, World Imagery; GURS, 2025)

2 Methodology

This study was designed as a qualitative field investigation aimed at exploring the relationship between welfare spaces and quality of life in the Koroška Vrata neighbourhood of Maribor. A qualitative approach was chosen because it allows for an in-depth understanding of how individuals experience and interpret their social and physical environments (Creswell & Poth, 2018). The methodology combined direct observation and semi-structured interviews, enabling triangulation between physical, social, and perceptual data. Moreover, we can notice the complementary use of ArcGIS to visualise, represent and analyse data.

2.1 Direct observation

The first method consisted of systematic field observations of public spaces, using structured forms to record physical features, accessibility, user profiles, and activity levels. Conducted at different times of day, between 26 and 29 August, from 11:00 am to 2:00 pm and 6:00 pm to 9:00 pm, these observations captured variations in use and atmosphere, offering insights into the role of welfare spaces in enabling or limiting social interaction.

2.2 Semi-structured interviews

The second method involved conducting short, semi-structured interviews with residents and users of public spaces in Koroška Vrata. These were conducted during the same observation periods, with individuals who happened to be present in the identified welfare spaces, including both local residents and visitors from other countries. This format allowed participants to share personal experiences and views on safety, mobility, connectivity, and quality of life, while leaving room for them to raise issues of particular importance. Interviews were conducted in situ, mainly in welfare spaces such as parks, schools, and sports facilities, encouraging reflections directly tied to the environment. The interview guide included core questions, such as: How do you usually get to essential facilities (shops, schools, services)? Do you think the area is well-connected to other parts of the city? Do you feel safe in this neighbourhood? What do you like most about this area? What do you dislike or what problems do you perceive? What improvements would you suggest?

In total, 12 interviews were carried out during five site visits. Participants represented a wide demographic range, from a 12-year-old boy to a 71-year-old woman, including teenagers, parents, couples, elderly residents, and international students. While the small sample does not allow for statistically representative conclusions, it provides valuable qualitative insights into local dynamics and perceptions, offering an indicative overview of the neighbourhood's main assets and challenges.

3 Findings

3.1 Spatial dynamics of accessibility, connectivity, and public life

By distinguishing residential, commercial, public, green, and vacant areas, the map highlights urban organisation and functional diversity (Figure 2). Contrasts between dense residential zones and public or green spaces reveal patterns of accessibility and potential inequalities, which are central to understanding spatial justice and the concept of "welfare space."

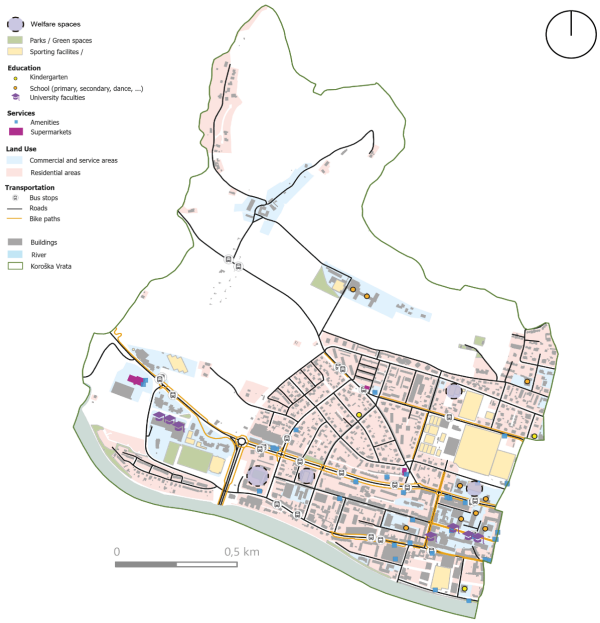

Figure 2: Urban organisation and functional diversity of Koroška Vrata
Author: Michal Tobola, 2025
(Data source: © OpenStreetMap contributors; GURS, 2025)

The map also illustrates connectivity, showing how roads, pathways, and links between areas affect residents' mobility and access to essential services. Limited or uneven connections may hinder social inclusion and equitable access. Finally, the distribution of public spaces emphasises their role in social interaction and community life. Well-placed parks and recreational areas foster cohesion and well-being, while uneven distribution can restrict opportunities for collective activities, underlining the importance of accessible welfare spaces.

3.2 Welfare Spaces

The first welfare space serves as a vibrant meeting point for people of different ages, genders, and nationalities, offering green areas for leisure, sports, and social interaction. Surrounded by housing and close to essential facilities, it is highly accessible, allowing residents to walk both within the neighbourhood and to other parts of Maribor. Interviews highlight a strong sense of safety and familiarity, with many describing the city as secure and the park as central to community life. The second welfare space, located in a primary school yard, mainly attracts families with children. Its central position and green amenities make it popular, though access is limited outside school hours. Residents value its convenience and child-friendly environment, but note that events like football matches sometimes create noise and reduce safety (Figure 3).

Welfare spaces 3 and 4 exhibit comparable spatial characteristics, as they are embedded within residential areas and green surroundings. Nevertheless, welfare space 3 incorporates a playground, which introduces a differentiated user profile and slightly diversifies patterns of use. Both spaces are located within walking distance of several essential facilities and are primarily frequented by residents of the adjacent neighbourhoods. Insights derived from interviews with local inhabitants highlighted the notions of security, familiarity, proximity, and tranquillity as key attributes shaping the perception and use of these areas (Figure 4). In contrast, welfare space 5 demonstrates a distinctive character, functioning as a landmark within the urban fabric. It operates not only as a central meeting point for local residents but also as a significant attraction for tourists, while simultaneously maintaining a strong integration of natural elements within everyday urban life. Alongside pedestrian pathways, cycling constitutes a widely adopted mode of mobility. Nonetheless, its intensity declines considerably during the midday hours in the summer season, and

uncontrolled bicycle movements occasionally pose safety risks to pedestrians. Despite these challenges, the site accommodates a highly heterogeneous user profile, encompassing individuals from diverse demographic and social backgrounds (Figure 4).

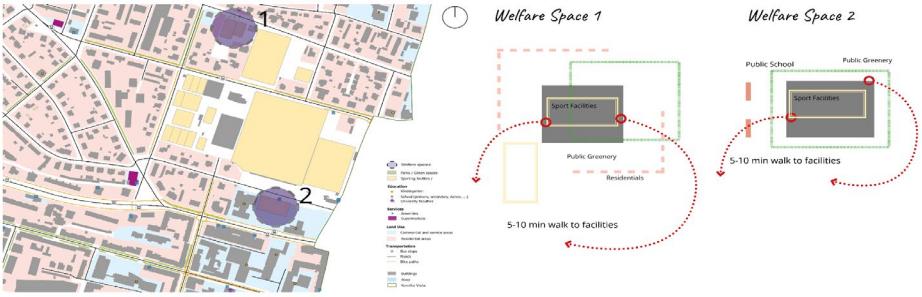

Figure 3: Welfare spaces 1 and 2 in Koroška Vrata
Authors: Michal Tobola & Ezgi Koyun, 2025
(Data source: © OpenStreetMap contributors; GURS 2025)

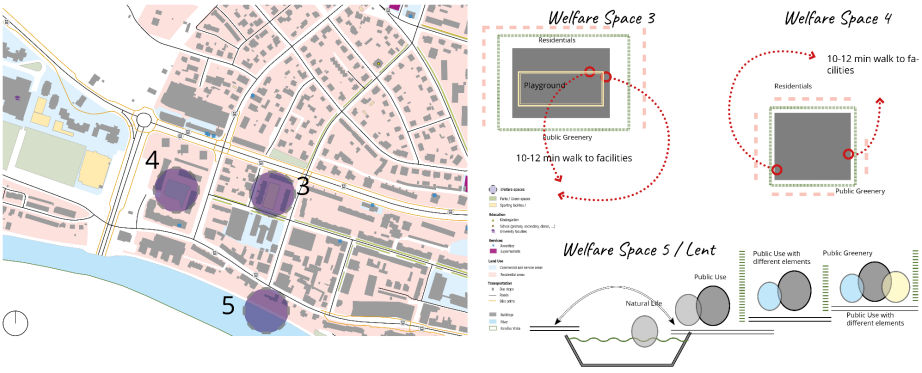

Figure 4: Welfare spaces 3, 4 and 5 in Koroška Vrata
Authors: Michal Tobola & Ezgi Koyun, 2025
(Data source: © OpenStreetMap contributors; GURS, 2025)

3.3 Interviews

Interviews revealed clear patterns in how the residents view Koroška Vrata (Tables 1 & 2). Walking and cycling were common among younger and older residents, while families relied on cars. Public transport was seen as the weakest link due to

infrequent buses. Safety was mostly positive, with disturbances during football matches and at night from poor lighting or noisy e-bikes. Residents valued accessibility, green spaces, and the child-friendly atmosphere. Negative comments focused on noise, parking shortages during matches, and traffic risks. Suggested improvements included better roads, more bike paths, traffic-calming measures, and increased police presence. Overall, satisfaction was high, with most residents highlighting the positives and only a few suggesting areas for improvement. The findings show that welfare spaces support not only mobility and safety but also a sense of belonging and quality of life.

Table 1: Interview results – Residents' perceptions of mobility, connectivity, and safety

Interview number	Age	Gender	Usual mobilities	Connected to city?	Safety?
1	~20	F	Cycling	Infrequent & slow buses	Yes
2	~40	F	Car	Yes	Yes – less during football match days
3	71	F	Walking	Yes	Yes
4	~40	F	City bike and car	Yes	Yes
5	47	F	Car and walking	Yes	Yes – less at night
6	63 & 65	F & M	Car and walking	Yes, but infrequent buses	Yes – less at night
7	12	M	Walking and cycling	Yes	Yes
8	25	M	Walking	Yes	Yes
9	19	F	/	/	Yes
10	~40	M	Walking and cycling	Yes	Yes
11	~20	M	Walking	Yes	/
12	~40 & ~60	F & M	Car	Yes	Yes

Source: data from interviews

Table 2: Interview results – Residents' perceptions of their favourite aspects, weaknesses and suggested improvement points

Interview number	Age	Gender	Favourite points	Weak points	Improvement points
1	~20	F	Accessibility, safety, children	/	More crossroads
2	~40	F	Green spaces, activities	/	/
3	71	F	Accessibility	/	/
4	~40	F	Walk, children	E-bikes – dangerous and noisy	Install road bumps
5	47	F	Green spaces, children	/	/

Interview number	Age	Gender	Favourite points	Weak points	Improvement points
6	63 & 65	F & M	Nature, walk, children	E-bikes	More police patrols
7	12	M	Park	/	/
8	25	M	/	Occasionally overcrowded	/
9	19	F	Safety	/	/
10	~40	M	Accessibility – cycling and walking	/	Quality of the roads
11	~20	M	/	Noise & parking issues on football match days	Quality of the roads
12	~40 & ~60	F & M	Quiet and positive	Parking issues on football match days	More bicycle roads

Source: data from interviews

4 Discussion and conclusion

This study highlights the crucial role of welfare spaces in shaping the quality of life in mid-sized European cities such as Maribor. Accessibility, safety, and opportunities for social interaction emerged as central dimensions through which residents evaluate their environment (Creswell & Poth, 2018; Braun & Clarke, 2007). In Koroška Vrata, compact urban design, abundant green areas, and proximity to services contribute to consistently high satisfaction. Safety was described as strong and reliable, reinforcing the literature that links inclusive public spaces to cohesion and trust (Gehl, 2010; Low et al., 2005). Disturbances such as football match noise, traffic, or drug activity in the city centre were seen as minor exceptions rather than systemic threats, suggesting resilient social and physical infrastructures. Mobility also played a key role: residents favoured walking and cycling, while public transport was considered less efficient. Concerns about e-bikes and scooters highlight the need for stricter regulation to ensure safety.

Perhaps most striking is the exceptionally high satisfaction with the neighbourhood, with many describing Maribor as "almost perfect." This contrasts with urban studies that emphasise constant demands for improvement (Innes & Booher, 2010), suggesting instead that satisfaction here is tied to the city's human scale, proximity to nature, and welfare spaces enabling daily leisure and interaction (Lewicka, 2011). Yet, practical issues–such as traffic, parking shortages, and limited bus services–remain and reflect common challenges in medium-sized cities (Pojani & Stead, 2015). Targeted improvements, such as safer crossings and better lighting, could further enhance the already high well-being levels. Overall, welfare spaces emerge not only as physical infrastructures but also as social anchors that shape belonging,

safety, and connectivity. The case of Koroška Vrata shows how walkable, green, and accessible environments can sustain strong place attachment and subjective well-being. This study examined how welfare spaces influence quality of life in Maribor's Koroška Vrata neighbourhood through observations and interviews. Results show that its walkable design supports sustainable mobility, social interaction, and a strong sense of safety and belonging. However, limited public transportation and parking shortages highlight the need for improved infrastructure. The case highlights how well-planned welfare spaces can foster physical activity, social cohesion, and place attachment, offering valuable insights for mid-sized European cities.

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Case Study on Urban Atmospheres in Maribor

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Our research explores how people living in, working in, or visiting Maribor experience different urban areas and the emotions these spaces evoke. We aim to move beyond the physical and functional aspects of cities to understand how the built and social environments shape daily urban experiences. The study focuses on "urban atmospheres" of two contrasting case studies: the Lent waterfront, designed to evoke calm, natural and positive feelings, and the Europark shopping centre, which creates a lively, consumer-driven atmosphere. By comparing these spaces, we aim to identify what makes them feel distinct and how diverse groups of people perceive them. Ultimately, our goal is to highlight the role of urban atmospheres in shaping lived experiences and to contribute insights to the field of urban studies. We emphasise the importance of designing cities that are not only functionally modern but also emotionally and sensory engaging and supportive of human well-being.

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ŠTUDIJA PRIMERA URBANIH AMBIENTOV V MARIBORU

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Ključne besede:
čustvene izkušnje,
razlike med spoloma,
socialne zaznave,
senzorna okolja,
urbano načrtovanje

Študija ugotavlja, kako prebivalci, zaposleni in obiskovalci Maribora doživljajo različna urbana območja ter kakšna čustva ti prostori vzbujajo. Namen je preseči zgolj fizične in funkcionalne vidike mest ter razumeti, kako grajeno in socialno okolje oblikujeta vsakodnevne urbane izkušnje. Študija se osredotoča na »urbane ambiente« dveh kontrastnih primerov: obrežje Lenta, ki je zasnovano tako, da vzbuja mirne, naravne in pozitivne občutke, ter nakupovalno središče Europark, .ki ustvarja živahen in potrošniško usmerjen ambient.. S primerjavo teh prostorov želimo ugotoviti, kaj jih naredi drugačne in kako jih zaznavajo različne skupine ljudi. Končni cilj raziskave je poudariti vlogo urbanih atmosfer pri oblikovanju doživetih izkušenj ter prispevati spoznanja k področju urbanih ambientov. Poudarjamo pomen načrtovanja mest, ki niso le funkcionalno sodobna, temveč tudi čustveno in senzorno vključujoča ter podpirajo dobrobit ljudi.

Univerzitetna založba Univerze v Mariboru

1 Literature background

Atmosphere describes the character or "feel" of spaces, whether interior or exterior. Gernot Böhme (2021) describes atmospheres as "felt spaces." Every city has its own "aura" and "aliveness" expressed in the performative flow of human activity (Hasse, 2019). In urban contexts, it refers to the sensory and affective qualities of streets, squares, or parks (Andrzejewski & Salwa, 2020). Kazig (2008) emphasises that atmospheres arise from the constant sensory connection between people and their environment. Thibaud (2003) describes them as the medium shaping these relations, while Gandy (2007) highlights their ambiguities, noting how atmosphere links space and subjectivity.

Shopping centres illustrate this interplay. Beyond consumption, they act as semi-public, social, sensory, and symbolic places. Kazig and Laroche (2024) demonstrate how malls utilise lighting, soundscapes, scents, and architecture to influence movement and engagement. Pettersen et al. (2024) conceptualise them as "third places," particularly valued by women for social and leisure purposes, while men often approach them functionally. Such differences highlight that atmospheres are not uniform but rather mediated by factors such as gender, age, and social roles.

On the other hand, central open spaces or green areas (such as Lent and Glavni Trg in Maribor) function as "third places," but their perception differs across user groups. While both residents and tourists often value these spaces for beauty, relaxation, and sociability, they attach distinct meanings: visitors emphasise scenery and novelty, whereas locals relate them to everyday identity and lifestyle (Ryan & Aicken, 2010). Thus, squares and parks are inclusive gathering places, yet their atmospheres remain plural, shaped by users' backgrounds and modes of engagement.

2 Methodology

Two case studies were conducted in Maribor: the Lent waterfront and the Europark shopping centre. For the Lent location, we employed the "go-along" method (Kusenbach, 2003; Carpiano, 2009), which involves walking with participants while observing their interactions with the environment. This approach, as described by Kusenbach (2003), combines participant observation and in situ interviewing, allowing researchers to access the meanings, practices, and spatial experiences that

emerge directly from moving through places together. It emphasises the way individuals perceive, use, and emotionally relate to their surroundings in real time. This was complemented with open-ended interviews involving tourists, international students, local residents, and bar employees.

For the Europark location, we conducted short, open-ended interviews with ten young adults (five women and five men), supported by field notes and observations. Questions invited reflection on atmosphere, sensory impressions, and differences when alone or with others. The interviews were audio-recorded with participants' consent and subsequently transcribed verbatim.

This combination of observation and interviews provided a comparative understanding of how atmospheres are experienced socially and individually. The empirical work was based on Kazig's (2008) different applied types of urban place atmospheres, to better describe current socio-spatial ambience: (1) Atmospheres of "expansion" versus "narrowness," (2) Atmospheres of fear or unsecurity, (3) Atmospheres of transition, (4) Collective atmospheres ("quality to rest/stay"), and (5) Atmospheres of aesthetic stimulation.

3 Case studies

3.1 Lent

The Lent waterfront, stretching along the Drava River, is one of Maribor's most recognisable public spaces. The Lent waterfront underwent significant renovations as part of a project aimed at regenerating the area by 2023. The urban redevelopment project included a new landscape design featuring trees, stages for cultural events, and public playgrounds, along with new street furniture and lighting, to create a more vibrant urban space. To understand how people experience it, we interviewed approximately 10 individuals, comprising tourists, local residents, and employees working in nearby cafés and bars. Each group engaged with Lent in different ways, some temporarily, others routinely, and some professionally.

Tourists overwhelmingly described Lent as a calm, welcoming, and picturesque destination. A retired Irish couple told us, *"It feels very relaxed and lovely by the river; people are friendly."* Similarly, a group of Czech musicians praised the benches, swans, and

cleanliness, calling it *"peaceful and inviting."* For international visitors, Lent offered openness, water views, and a sense of leisure.

Local residents, however, gave more complex accounts. One Maribor resident explained, *"It depends on which side of the river you're on. The right side is greener and calmer, but the left side feels livelier."* Others pointed to practical issues that shaped their everyday use, such as limited parking, disruptive construction, or the presence of swans, which tourists found charming but locals sometimes found aggressive.

Employees, such as bar workers, highlighted how their perception and spatial experience were tied to the rhythms of their work. While they appreciated the lively summer season, some described the atmosphere as *"empty in winter"* and noted that seasonal variation strongly influenced how Lent felt.

Taken together, these findings reveal that while Lent projects a generally positive and relaxed atmosphere, interpretations differ depending on whether one visits the location temporarily, lives nearby, or works there. Tourists tended to romanticise the riverside, while locals focused on functionality and liveability, and employees emphasised seasonality.

Mapped area of the atmosphere in Lent

Based on the collected responses and our personal observations, we mapped the area, as presented in Figure 1.

The main finding is the significant amount of transfer and transit occurring along the main paths of Lent. According to Kazig's (2008) classification, this creates a *transit atmosphere* (highlighted in red, Figure 1), characterised by movement, with people walking, running, or cycling between different points of interest. The second type of atmosphere present in Lent is a *relaxing atmosphere* (indicated in green), found mainly along the left bank of the Drava River. This area is frequented by people resting, sitting, or chatting. The third atmosphere observed in Lent is a *mixed atmosphere of relaxation and consumption* (indicated in yellow). This is linked to the concentration of cafés, where music and ambience encourage people to linger and consume. Finally, two areas can be classified as *atmospheres of insecurity* (also marked in red). These are located in narrower spaces, such as under the bridge crossing the Drava and in certain confined streets.

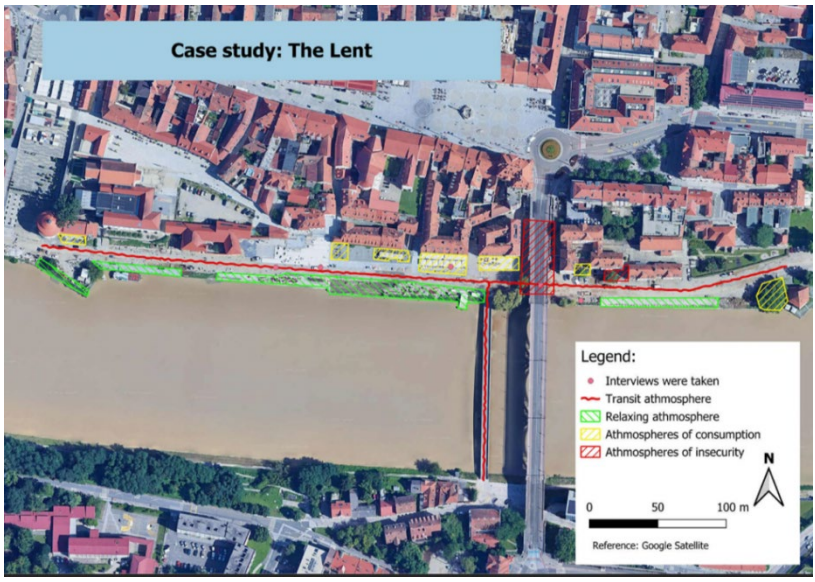


Figure 1: Map of urban atmosphere in Lent
Data: Field work (27-28/08/2025)
Authors: Donnay, F., Prokešová, Z., Svozilová, A., Tänzer, D., and Vešligaj G.

3.2 Europark

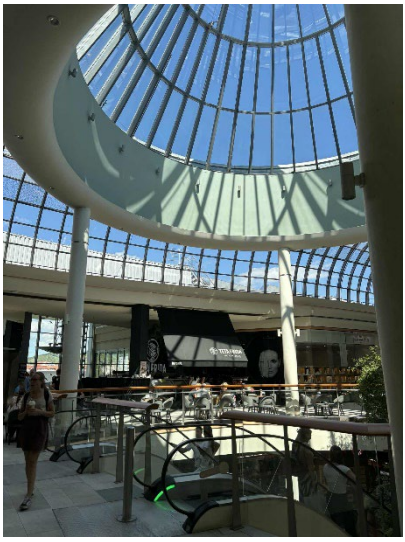
Europark, Maribor's largest shopping centre, is not only a retail hub but also a sensory and social environment. Its design actively shapes how people move, pause, and interact. Observations showed that entrances channel visitors into commercial areas, sometimes in strategic ways; for instance, a playground placed next to McDonald's appeared to "trap" families. The layout inside was disorienting at times, possibly encouraging visitors to pass by more shops.

The atmosphere varied by location and time. On the ground floor, narrow corridors and crowd density generated stress, particularly at lunchtime when music and conversations blended into an overstimulating mix (See Figure 2a). By contrast, the first floor felt brighter and calmer thanks to roof windows, wider corridors, and art displays that engaged older visitors (See Figure 2b). Shops themselves generated micro-atmospheres: darker boutiques with music encouraged immersion, while brighter stores invited quick browsing.

Interview responses highlighted subtle gender contrasts. Women frequently commented on sensory aspects. A participant from Vienna described the space as "Open, bright, I feel very fine," while another called it "Energetic, happy, but a little bit chaotic." Several participants noted that being alone heightened their noise sensitivity, with one commenting that she wears earphones when visiting alone. Seasonal changes were also important: ordinary days felt "basic," while the holiday season was "vibrant and fun."

Men more often emphasised functionality and service. One praised the "positive energy everywhere" and helpful staff, while another stressed that "shops don't force you to come in," appreciating a sense of relaxed navigation. Food smells, particularly from restaurants, were described as a defining sensory feature.

a)



b)

Figure 2a and Figure 2b:
a) Picture of the high traffic area (ground floor), b) Picture of the open and light-filled area (first floor)
Data: Field work (27-28/08/2025), authors: Prokešová, Z., Svozilová, A.

Although women tended to focus on aesthetic and emotional impressions, and men on practical aspects, practices often overlapped. Women were more often seen around beauty shops, while men were more frequently found around restaurants; however, both used the mall as a meeting and leisure space. Europark functions as

a "third place" (Pettersen et al., 2024), combining shopping with social interaction; its atmosphere is influenced by both its design and the people who bring it to life.

4 Comparison and conclusion

The two case studies demonstrate that urban atmospheres are not neutral backdrops, but rather lived experiences of place and space, shaped by both architectural design and social interaction. In Lent, the "felt space" showed the clearest contrast between tourists and locals. Tourists emphasised openness, beauty, and friendliness, framing Lent as a calming leisure space. Locals and employees, however, saw it through the lens of everyday life: parking shortages, seasonal emptiness, construction noise, or even the behaviour of swans. This illustrates how visitors may romanticise spaces that residents assess more pragmatically with different needs and visions.

In the case of Europark, differences appeared along gender lines. Women paid closer attention to light, sound, and mood, while men highlighted service, navigation, and food. The mall's design encouraged both stress (in crowded corridors) and relaxation (in open, bright areas), showing how atmospheres are strategically orchestrated. Importantly, Europark challenged mall stereotypes as primarily women's spaces, as men also actively used it as a meeting place.

Together, these cases demonstrate that atmosphere is co-produced by spatial design and human interpretation of the experience of place. Tourists, locals, men, and women bring distinct expectations and roles, shaping how they perceive the same environment. For planners and designers, this means that creating successful urban spaces requires more than efficiency or aesthetics. It involves recognising the emotional and social dimensions that make spaces inclusive, welcoming, and meaningful for diverse users.

In sum, Maribor's Lent and Europark highlight the layered nature of urban atmospheres: riverside calm, commercial orchestration, and gendered perceptions, as well as leisure and routine. Atmosphere is not a fixed property but a living, negotiated experience, an insight essential for urban design that seeks to resonate with both temporary visitors and long-term inhabitants.

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Linking Urban Public Spaces and Cultural Institutions to Quality of Life

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This study examines four public squares in Maribor–Grajski trg, Trg Generala Maistra, Trg Leona Štuklja, and Židovski trg–across seven dimensions: physical structure, aesthetics, functionality, comfort and safety, utilisation, atmosphere, and accessibility. Results suggest that Grajski trg and Židovski trg carry historical value and symbolic meanings, yet their infrastructure and safety features could be improved. Trg Generala Maistra is a transitional area of social and symbolic significance, but it lacks vibrancy, while Trg Leona Štuklja is the most socially inclusive and dynamic square. The findings highlight that public space quality is not merely a physical design function but also a function of social use and subjective perception. Combining cultural institutions with city squares helps activate the spaces and make them more responsive to citizens. This approach to addressing the quality of urban spaces contributes to long-term urban sustainability, social inclusivity, and overall quality of life.

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POVEZOVANJE JAVNIH URBANIH PROSTOROV IN KULTURNIH INSTITUCIJ S KAKOVOSTJO ŽIVLJENJA

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Ključne besede:
javni prostor,
kulturne institucije,
kakovost življenja,
Maribor,
dostopnost,
urbana identiteta,
vključenost

Študija preučuje štiri javne trge v Mariboru – Grajski trg, Trg generala Maistra, Trg Leona Štuklja in Židovski trg – skozi sedem razsežnosti: fizično strukturo, estetiko, funkcionalnost, udobje in varnost, rabo, atmosfero ter dostopnost. Rezultati kažejo, da imata Grajski in Židovski trg zgodovinsko vrednost in simbolni pomen, vendar bi bilo njuno infrastrukturo in varnostne vidike treba izboljšati. Trg generala Maistra je prehodno območje s socialnim in simbolnim pomenom, vendar mu primanjkuje živahnosti, medtem ko je Trg Leona Štuklja najbolj socialno vključujoč in dinamičen trg. Ugotovitve poudarjajo, da kakovost javnega prostora ni zgolj funkcija fizičnega oblikovanja, temveč tudi družbene rabe in subjektivnega zaznavanja. Povezovanje kulturnih institucij z mestnimi trgi pomaga aktivirati prostore in jih narediti bolj odzivne na potrebe prebivalcev. Takšen pristop k obravnavi kakovosti urbanih prostorov prispeva k dolgoročni urbani trajnosti, socialni vključenosti in splošni kakovosti življenja.

Univerzitetna založba Univerze v Mariboru

1 Introduction: Dimensions of the quality and functioning of public spaces

This report builds on the analytical framework developed collectively during the Summer School research activity, which guided the evaluation of selected urban public spaces in Maribor.

The framework provided a structured lens for observing spatial configuration, public usage, and perceived qualities of the squares, allowing for consistent comparison across locations. It encompassed the following dimensions: 1) Physical and Structural Aspects, 2) Aesthetic Quality and Design, 3) Functionality and Activities, 4) Comfort and Safety, 5) Utilisation by People, 6) Atmosphere and Subjective Experience, and 7) Accessibility and Inclusiveness. Rather than relying on predefined literature models, the analysis emphasises site-based interpretation rooted in observed patterns of interaction, accessibility, and urban character. It was, however, guided by existing knowledge on the role of high-quality public spaces in stimulating the social, cultural, and economic life of cities (Gehl, 2010; UN-Habitat, 2015, 2020; Carmona, 2019).

Physical and structural aspects include the size and shape of the space, its connections to main streets and entrances, accessibility for various modes of transportation, the functions of surrounding buildings, and the presence of historic landmarks. Aesthetic qualities and design relate to greenery, seating, interactive features, surface materials, lighting, signage, the scale of the built environment, and the harmony of design with local heritage and identity.

Functionality and activities are reflected in everyday uses such as walking, playing, eating, resting, or working, supported by nearby services, designated spaces for children, sports, and cultural events, as well as digital infrastructure like Wi-Fi. Comfort and safety depend on shade and weather protection, cleanliness, traffic safety, lighting, security, accessible surfaces, toilets, and drinking fountains. Use by people can be observed in the number and types of users, the duration of stays, and patterns of movement and flow.

Atmosphere and subjective experience involve sensory impressions such as noise, smell, and visual appeal, alongside perceptions of safety, hospitality, repair, crowdedness, and commercialisation; public art also enriches this dimension.

Finally, accessibility and inclusiveness concern the ease of access for people with disabilities, bicycle and public transport connections, and the openness of the square to all social and cultural groups.

In this context, cultural institutions and heritage sites situated near public spaces can play significant roles, not only by providing an attractive backdrop for everyday activities, but also by actively engaging with these spaces. Their involvement may include offering street furniture and design elements related to their profile, providing educational boards that communicate history and local heritage, and organising events that enliven and stimulate the use of public space. In doing so, they extend the functions they already perform within their buildings–strengthening social capital, fostering local identity, and enhancing place attachment (Murzyn-Kupisz & Działek, 2013).

2 Research methods

2.1 Research area

Four urban squares in the historic centre of Maribor–Grajski trg, Trg Generala Maistra, Trg Leona Štuklja, and Židovski trg–were selected for assessment of public space quality according to the framework (Fig. 1). They were chosen from among the relatively large number of squares in the city centre, representing smaller yet diverse spaces that could be studied within a limited time period. Consequently, the largest and best-known public spaces of Maribor, such as Lent, Glavni trg, and Slomškov trg, were not included. Nonetheless, Grajski trg is among the city's most recognisable tourist places, while the other three are located farther from the most common tourist routes (Horvat & Stubičar, 2021).

Grajski trg is a small historic square beside Maribor Castle, paved with cobblestones and almost devoid of vegetation. It primarily serves as a passageway for locals and visitors, featuring a large restaurant and café terraces, but it offers limited publicly available seating. Trg Generala Maistra lies on the opposite side of the castle, surrounded mostly by public institutions and historic buildings. Most of its area is arranged as a park, with a smaller western section paved, and it serves a symbolic role through monuments dedicated to important Slovenian personalities.

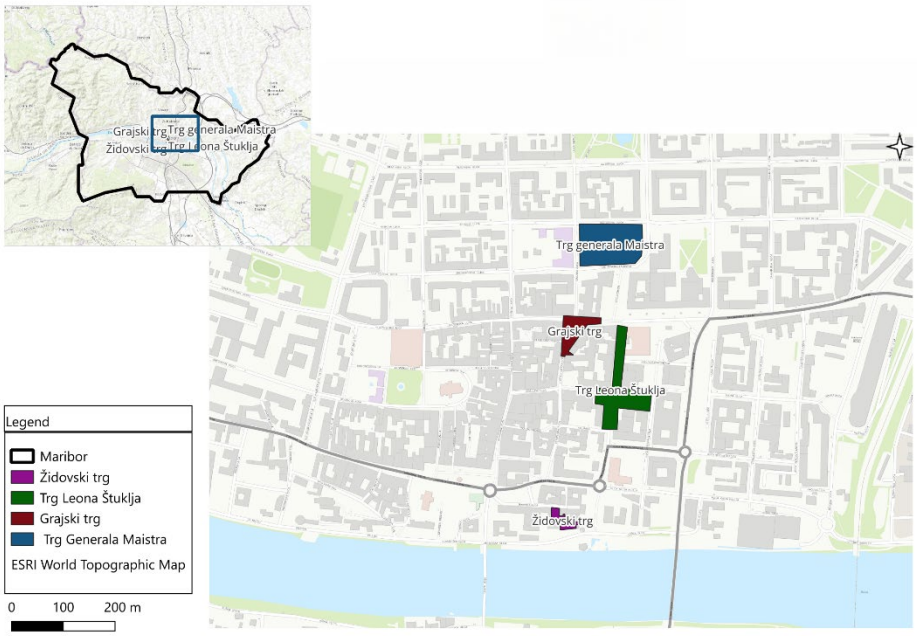

Figure 1: The four analysed public spaces in Maribor
Author: Elmedina Jashari, 2025. Map source: ESRI World Topographic Map (digitalized and processed in QGIS)

Trg Leona Štuklja is a much larger space, framed by modern buildings, which frequently hosts urban and cultural events. It is flanked by cafés and shops and offers a relatively high number of trees, benches, and other interesting design elements. Finally, Židovski trg is a much smaller, quieter, and more peripheral square with historical significance, located in the old Jewish quarter. Today, it has undergone a transformation and features a creative quarter, housing several cultural institutions.

2.2 Research design

Field research examined the features and use of four central squares in Maribor through direct observation at different times of day and week (morning, afternoon, and evening; weekdays and weekends) (UN-Habitat, 2020). The assessment was guided by a framework encompassing seven dimensions of public spaces. During the observations, notes were taken, photos and videos were captured, and sketches

and maps of existing features and uses were produced. This approach provided an overview of the squares' accessibility, inclusiveness, ambience, and the ways in which history, aesthetics, and contemporary needs are accommodated.

3 Results

The study of four selected public squares in Maribor–Grajski trg, Trg Generala Maistra, Trg Leona Štuklja, and Židovski trg–revealed their distinct yet complementary functions within the urban fabric (Table 1).

Grajski trg primarily serves a commercial purpose, with restaurants and shops dominating the space. It also functions as a passage area, connecting people to other parts of the city. Trg Generala Maistra is characterised as a meeting and relaxation spot, where social interaction and greenery play a crucial role. Trg Leona Štuklja is designed as an event space, hosting festivals and larger gatherings, while Židovski trg remains a smaller and more symbolic square with a tranquil atmosphere.

The user profiles differ between squares. Grajski trg is visited by a diverse range of people, including many tourists, and remains lively throughout the day and into the evening. Trg Generala Maistra attracts mainly young people, especially in the afternoons and evenings, while mornings remain less frequented. Trg Leona Štuklja experiences fluctuating use – relatively calm most of the time, but heavily populated during events. In contrast, Židovski trg offers a quieter experience and is particularly appealing to younger visitors seeking calm spaces.

Each square offers unique elements that enhance its character: Grajski trg features historical panels (though their placement could be improved), Trg Generala Maistra boasts greenery that supports relaxation, Trg Leona Štuklja offers a safe, car-restricted open space, and Židovski trg is enriched by street art and modern art galleries.

Individually, the squares fulfil only selected functions, yet their proximity ensures complementarity. Together, they create a diverse network of commercial, cultural, social, and contemplative spaces in the city centre.

Table 1: Comparative assessment of four public spaces in Maribor across seven dimensions of public space quality

Dimensions	Trg Generala Maistra	Grajski trg	Trg Leona Štuklja	Židovski trg
Physical & Structural Aspects	- Rectangular spaces - Park and greenery - Surrounded by car roads and historic buildings - Very open	- Historic square in front of Maribor Castle - Small, narrow, triangular square - Tourist-oriented and surrounded by shops and services - Close to the train station and main road	- Second to third largest square in Maribor (~9,000 m²) - Rectangular public space - Surrounded by modern buildings	- Small, intimate square near the Drava River - Framed by old town alleys - Historic charm and small buildings
Aesthetic Quality & Design	- Paved, limited greenery, a lot of trees - Leisure function - Seating opportunities	- Paved - Renaissance, and Baroque facades - Some seating - Strong presence of the castle - Some cafés	- Modern design (2000s) - Large, paved surface - Minimal greenery - Monumental feel - Narrowing view due to high buildings	- Cobblestones - Historic buildings - Only one tree and no greenery - Very atmospheric and "old town" characteristics
Functionality & Activities	- Meeting point at the start of the old town - Transition between the city centre and the Mestni park	- Transitional space and can be seen as the second "Glavni trg" (main square), i.e., as the second central place in Maribor - Gastronomy, tourism (Castle Museum) - Small events and markets	- Main venue for large-scale events (concerts, festivals, political gatherings, sports screenings) - Cafés and restaurants surrounding it	- Intimate meeting place - Only popular for sitting in quiet surroundings - Small cultural activities (historic and art tours) - Niche and alternative uses - Alternative, artisan, and artsy
Comfort & Safety	- Near traffic, therefore noisy at the edge of the park - Enough shaded areas - Partly illuminated at night; mostly safe but functional - Missing public toilets	- Pleasant, sheltered from wind due to enclosed form - Little shade and hot in the summer; shade only in cafés - Seating is available, but not sufficient - Safe and tourist-friendly - Missing public toilets	- Very open and little shade, hot in summer - Light at night, but the lights are installed very high - Provides a feeling of safety, but can also feel "empty" during the day as well as at night - Missing public toilets	- Pleasant, quiet - Shade from one huge tree, but other parts of the space do not have shade - Limited infrastructure (e.g. toilets missing)
Utilisation by People	- Mixed users - Many inhabitants for meetings - Passers-by, commuters - Tourists and short stays	- Mostly tourists - Museum visitors - Café guests - Families in summer	- Used by all age groups - Very crowded during events - Otherwise often empty - Young people and tourists	- Mostly locals - Alternative groups - Small events - Alternative groups - Longer, more relaxed stays.
Atmosphere & Subjective Experience	- Busy (as a meeting point) - Meeting/sitting, but also a transitional character - Stay quality	- Historical - Atmospheric - Culturally interesting - Lively in summer	- Monumental, spacious, but sometimes unwelcoming - Strongly "urban"	- Intimate, charming - Historical - Mixed quality of stay
Accessibility & Inclusiveness	- Good public transport connection (close to the train station) - Barrier-free - Bicycle access	- Central, walkable, barrier-free - Tourist-oriented signage	- Very well connected - Barrier-free - Suitable for large events - Digital services are possible	- Slightly hidden - Less signage - Mostly barrier-free, but cobblestones limit wheelchair access

Notes: Colours denote the quality of public spaces: darkest blue – high quality; dark blue – above-average quality; light blue – below-average quality; and the lightest blue – low quality.
Source: own elaboration.

4 Recommendations and conclusions

To strengthen the usability and inclusivity of the squares, several improvements are suggested. Grajski trg would benefit from additional shading elements, while the unused corners of Trg Generala Maistra could be activated through interactive features for young people, such as outdoor games. Trg Leona Štuklja could be enhanced with facilities that make it more attractive outside of major events, and Židovski trg could reinforce its cultural identity by further developing street art in its passageway. The wider presence of cultural institutions in urban public spaces appears to be an untapped potential. More generally, all squares would profit from better lighting to improve safety, the installation of drinking fountains (including for pets), accessible Wi-Fi, benches with charging points, mist cooling systems for hot days, additional greenery and as well as the provision of accessible and free public toilets, which are currently absent but essential for comfort.

The main limitation of this study was time, which restricted the methods employed to direct observation only. Incorporating additional approaches such as surveys, interviews, or questionnaires could provide deeper insights into user perceptions, preferences, and needs (UN-Habitat, 2020).

The four squares of Maribor demonstrate the richness and diversity of urban public spaces, which, while functioning differently, collectively form an interconnected network. Their complementary character underscores the importance of variety in urban design, ensuring that public spaces cater to multiple social groups and serve various purposes within the city.

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Everyday Encounters in Public Transport: Mapping Bus Behaviour in Maribor

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This paper examines the emotional and social expressions of the local transportation passengers in the city of Maribor. While transport research typically emphasises technical efficiency, this study examines the lived and emotional aspects of mobility. Through systematic observation of four bus routes, we documented behaviours, interactions, and spatial contexts across weekday and weekend journeys. The findings show that public transport in Maribor is primarily used by students, the elderly, and those without cars, reflecting the country's high motorisation rate and the social stigma associated with bus travel. Passenger moods were frequently marked by fatigue and disengagement, often expressed through phone use or passive waiting. Yet moments of social connection, such as casual conversations or small acts of kindness, revealed that buses can also provide comfort and a sense of community. These insights highlight how public transport functions not only as a technical system but also as an emotionally and socially meaningful space.

Keywords:
social behaviour,
public space,
bus,
Maribor,
observation

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VSAKDANJA SREČANJA V JAVNEM POTNIŠKEM PROMETU: KARTIRANJE VEDÊNJA NA AVTOBUSIH V MARIBORU

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Ključne besede:
socialno vedênje, javni prostor, avtobusni promet v Mariboru, opazovanje

Prispevek preučuje čustvene in socialne izraze potnikov v lokalnem javnem prometu v mestu Maribor. Medtem ko raziskave prometa običajno poudarjajo tehnično učinkovitost, se ta študija osredotoča na doživete in čustvene vidike mobilnosti. S sistematičnim opazovanjem štirih avtobusnih linij smo dokumentirali vedênja, interakcije in prostorske kontekste med vožnjami ob delavnikih in vikendih. Ugotovitve kažejo, da javni promet v Mariboru večinoma uporabljajo študenti, starejši in osebe brez avtomobila, kar odraža visoko stopnjo motorizacije v državi ter socialno stigmo, povezano z uporabo avtobusov. Razpoloženja potnikov so bila pogosto zaznamovana z utrujenostjo in nezainteresiranostjo, kar se je izražalo z uporabo mobilnih telefonov ali "pasivnim čakanjem". Kljub temu so trenutki socialne povezanosti, kot so priložnostni pogovori ali drobna dejanja prijaznosti, pokazali, da avtobusi lahko nudijo tudi udobje in občutek skupnosti. Ta spoznanja poudarjajo, da javni potniški promet ne deluje le kot tehnični sistem, temveč tudi kot čustveno in socialno pomemben prostor.

Univerzitetna založba Univerze v Mariboru

1 Introduction

Transport geography research has historically approached mobility quantitatively as a function of transporting an individual from one place to another. This has been demonstrated through the overwhelming majority of studies focusing on transport planning solutions that, for example, prioritise the reduction of travel time, the quality of infrastructure, the cost-benefit analysis of transport provisioning, and other similar considerations grounded in positivist geographical thinking (Shaw & Hesse, 2010).

Such a positivist approach often overlooks the relational spaces that take place in the act of moving itself. New mobilities scholarship, first introduced by Sheller & Urry (2006), tries to address this gap by holistically considering mobile bodies as both producing and being affected by spaces of mobilities that afford emotions, embodied and sensorial experiences. In other words, mobility is not considered solely as a function to bridge the distance between two or more places, but as a spatiotemporal affordance of someone's identity- and world-making practices experienced through, among other things, daily encounters.

Wilson (2011) discusses how different passengers experience everyday encounters on the bus differently, based on their identities and previous interactions–the feelings emerging from non-verbal (and sometimes verbal) cues when sharing space with others intersect with identity markers. More specifically, for example, in the case of the LGBTQ+ population, Weintrob et al. (2021) consider how such encounters in public transport represent the emotional cost of mobility because of fear of potential assaults or negative experiences. Such research emphasises the importance of considering subjective spatiotemporal experiences of passengers, foregrounding the embodied elements of transit space and not solely perceiving transit as a non-space, as a function in-between places, but as a social arena facilitating "throwntogetherness" (Koefoed et al., 2016).

Slovenia ranks high in motorisation rates, being 9th in the EU in terms of vehicles per 1,000 inhabitants (see Acea, 2024). There are more reasons for this, perhaps the most prominent being a quasi "American dream" aspiration to own a large house and live a suburban, motorised lifestyle, whereas using public transport is considered culturally regressive (e.g., Bole & Gabrovec, 2014). Overwhelmingly, the Slovenian

people prefer driving a car to using the public transportation system. Trains and buses in Slovenia are mostly used by students, who have discounts provided by the government, or by people who do not own cars and rely on public transportation. The use of public transport is hence stigmatised and often perceived as "a personal failure" of not being able to afford a car and practice in the dominant "mobility citizenship" (e.g. Bole & Gabrovec, 2014). In the present day, as the European Union encourages citizens to use public transportation, it is even more important to focus on the quality of travel and to "erase" the stigma associated with using public transportation. In Slovenia, the share of public transport in total passenger traffic has been continuously decreasing since 2000. While it was 17.1% in 2000, it dropped to 13.2% by 2010 (Odyssee-Mure, 2024).

Although the study by Bole & Gabrovec (2014) culturally addresses transportation in Slovenia, it focuses on the macro-scale, which may overlook the relational aspects of microspaces created during transportation. Drozg (2017) zooms in on the urban scale by examining the social structure of bus passengers in Maribor, finding that predominantly women and the elderly use them, further supporting the argument about the stigmatisation of public transport use. We advance Drozg's (2017) observational approach by "zooming in" even further, also observing the relational and affective dimensions of buses in Maribor. Thus, our study tries to contribute to the absence of the empirical focus on such relational transit spaces by focusing on the behaviour and everyday encounters taking place inside Maribor buses. We explore how public transportation is socially experienced and emotionally perceived by the passengers. Attention is given to differences between age and gender in order to understand how these factors influence observed behaviours and interactions on buses. At the same time, we consider how the characteristics of bus infrastructure and the spatial context of stops and routes affect passengers' feelings of comfort, safety, and engagement.

2 Methods

The primary method employed in this study was observation, a technique commonly used in mobility studies to capture everyday practices and interactions within transport environments (Merriman, 2014). Observations were conducted on four preselected bus routes serving different parts of the city to cover a larger portion of its territory. For this reason, the research team was divided into pairs, which also

made it possible to better capture the atmosphere inside the buses as well as in their surroundings. In addition, photographic documentation of the environment inside the buses and around the bus stops was conducted, providing further insight into the material context of the observed situations. The observations took place on two separate days: Wednesday after 5 p.m. and Sunday morning.

The method of observation offered valuable insight into the everyday functioning of public transport, but it also has its limitations. The research was time-consuming, and due to the language barrier (the researchers not speaking Slovene), we decided not to conduct interviews with passengers. As a result, the dimension of emotions and affective experiences could only be captured indirectly, through outward expressions. As Roy, Bailey, and van Noorloos (2025) point out, combining observation with interviews is crucial for gaining a deeper understanding of emotions associated with mobility. Nevertheless, the chosen method made it possible to systematically observe actual practices and to provide our subjective interpretation of how people use the transport environment in their everyday lives.

Interestingly, the positioning of our researchers' bodies on buses influenced the type of data we gathered. There was a difference in the position we occupied during our observations. For example, in the first observation, we sat next to each other at the back of the bus, whilst in subsequent observations, we sat at the front and rear of the bus, facing each other with a full view of the bus. At the back of the bus, we were unable to observe people's facial expressions in enough detail to reflect on their reactions and emotions but were primarily able to analyse their spatial positioning.

3 Results

In this section, we compile various observational notes regarding the use of specific bus lines.

3.1 Bus line G01

Line G01 departs from Maribor's main bus station and ends in the southeast, in a suburban area with garden houses, in the Tezenska Dobrava district. This line does not pass through the historic city centre, but instead crosses the Drava River at the first opportunity. Consequently, only one of its stops is located relatively close to the

city centre, which also turned out to be the most crowded boarding point during our research.

The starting point of our journey, the bus station, features a passenger information system (displays) that makes it easy for locals to find their way. However, as a foreigner, it was not clear which platform belonged to the G01 service, as the display only showed platform numbers for long-distance buses, while local services were indicated by signs on the glass doors. During our observation, as described in the methodology, we focused on a Wednesday afternoon and a Sunday morning service, during which we travelled on three different buses.

We noted a fundamental difference between our weekday and weekend trips: while on Wednesday, women made up the majority of passengers, on Sunday, we observed a greater number of men. We concluded that older people and women tend to choose seats at the front and in the middle of the bus, which are closer to the driver and therefore potentially safer, as the bus did not have CCTV cameras. The seats at the back of the bus were often occupied by young people, or sometimes left unoccupied. In addition, during our weekday commute and weekend bus trip, when we arrived at the final stop, we were the only ones left on the bus, which shows that not many people use this service to travel from the suburbs to the city centre.

However, the most important aspect of our observation was how people interacted with their fellow passengers and the leisure activities they engaged in during their journey. This observation is significant because in other countries, such as Hungary, listening to loud music can cause discomfort among fellow passengers. In contrast, in Maribor, we encountered the following cases: during our Sunday trip, the bus driver, sensing that we were the only ones left on the bus, listened to loud Slovenian music to relax when the bus was empty at the terminal, but as soon as the bus started moving, he turned down the music so as not to disturb the passengers. In addition, one passenger, unaware that he was, in our opinion, listening to music too loudly, used headphones at a volume that could be disturbing to those around him.

The bus also proved to be a suitable space for discourse when two elderly ladies engaged in conversation during our weekend trip, from which we can conclude that they felt comfortable.

One of these conversations is of particular interest to us because the woman at the bus station behaved in a way that suggested she was distracted and nervous, but after her neighbour arrived, she appeared to feel more comfortable and calmer. Based on our observations, it appears that public transport on this route is less used by passengers, which could reflect a tendency towards car reliance in the area. At the same time, it was noticeable that young people already view this differently, as buses can be an ideal means of transportation for them in Maribor.

3.2 Bus line G03

The G3 bus line is a circular route. We start and end our observation at the main railway station in Maribor. The route connects the city centre with residential neighbourhoods, suburban areas, and semi-rural zones with open fields and forest patches. We carried out our observations during two separate journeys: one on Wednesday afternoon and another on Sunday morning.

The vehicle was adequately equipped, with electronic panels clearly showing the stops and transfers. On one ride, retro background music created a surprisingly pleasant atmosphere, compared with the otherwise monotonous silence. During both rides, the bus was never crowded. Typically, between 6 and 15 passengers were on board at the same time, with the number increasing in the outer residential districts. We noticed clear differences between the two observations. On Wednesday, the line was used primarily by women, often middle-aged or elderly. On Sunday, however, there was a noticeably higher share of men, some of whom carried sports equipment (such as a bicycle wheel).

The general atmosphere was calm and quiet. Many passengers looked neutral or tired, especially on the weekday journey in the late afternoon. Their activities were repetitive: staring out of the window, scrolling on their phones, or chatting quietly with friends. Elderly passengers often prepared to get off much earlier than necessary, standing at the doors well before the bus had reached the stop. Some passengers expressed visible fatigue; for example, a middle-aged woman reading and filling out paperwork during the Wednesday ride, who was constantly frowning. By contrast, Sunday morning passengers seemed more relaxed, with couples and pairs of friends laughing quietly or engaging in casual conversations.

A few unusual or noteworthy situations stood out. Two teenage boys boarded at the very first stop of our Wednesday journey and remained on the bus for the entire circle, still staying on board after we had left the railway station. They occupied the entire back row, spreading across several seats and repeatedly dropping their bottles, disturbing the otherwise peaceful ride.

Another interesting feature was the final circular stop at Tabor, where, on Wednesday, passengers were required to leave the bus for a short break, while on Sunday, the pause was shorter, and we were allowed to stay on board. However, most of the passengers from Wednesday returned immediately to their original seats, resuming their passive waiting. On Wednesday, there was also an older woman who kept smiling throughout the entire ride, even smiling at other passengers.

3.3 Bus line G04

The G4 bus line runs daily between the Main Bus Station and Studenci/Lesarska šola. The route runs through the historic centre and the southwest part of Maribor, which consists of suburbs with detached houses and modern housing estates. We began our observation on Wednesday, 27 August at 6:00 p.m. at the bus station. We travelled the route in both directions and finished our observation at 6:50 p.m. There were only a few passengers on the bus, around 6 people. At peak times, there were 8 passengers travelling on the G4 line simultaneously.

We noticed that there were only a few passengers travelling on the line that day. The vast majority of passengers on the G4 line were teenagers and elderly people. In addition, the bus was mostly used by women, while men accounted for a very small proportion, which chimes with Drozg's (2017) findings discussed above. Most people consider travelling by bus to be stigmatising (e.g., Bole & Gabrovec, 2014), especially men who view a car as a personal space where they can assert their independence (cf. Balkmar, 2018), leading to buses being predominantly used by teenagers, students, women, and the elderly.

Nevertheless, we observed that passengers felt relaxed and comfortable throughout the entire bus ride. They had neutral expressions on their faces. So, the biggest trigger for some kind of reaction for them would be the warm weather, since the G4 bus

had no air conditioning. The passengers tried to open the window or wave their hands in front of their faces to cool themselves down.

We observed that teenage passengers tend to gravitate towards using their phones on the bus as a way to stay connected or engaged, perhaps even as a form of escape from feeling alone. For older people, this was not the case. Elderly people often watch the road or the scenery outside the window during the bus ride, while passengers travelling together, such as couples, usually converse with each other.

3.4 Bus line G06

The G6 bus line also runs daily, but on a slightly different route. It goes from the Main Bus Station through the historic city centre to Vzpenjača, which is located in the southern part of Maribor. The bus terminates just outside the Pohorje mountain range, which is a popular destination for active leisure on days off. We began our observation on Sunday, August 31, at 10:10 a.m. at the bus station and concluded it at 10:35 a.m. at the final stop.

There were not many passengers on the bus. At its peak, the vehicle had 11 people on board. We observed that the line is used not only by local residents but also by tourists due to the recreational nature of its destination. The bus was mainly used by elderly people over 60 years of age. Most of them were senior couples. Contrary to the age dominance, we did not observe a dominance of a specific gender.

During our observations, we noticed that passengers felt comfortable on the bus. People had gentle, neutral expressions on their faces, and couples talking to each other sometimes exchanged smiles. In addition to talking, passengers looked out the window and used their phones. Interestingly, many people travelled with Nordic walking poles. These passengers got off at the last stop, indicating that they used the G6 line to reach Pohorje and spend their free time there.

Importantly, we observed an unusual situation during the journey. At the "Streliška - Ulica Pohorskega odreda" stop, a man in his 50s boarded the bus. He played music on his phone throughout the bus ride, so that it could be heard by everyone. None of the other passengers, nor the driver, paid any attention to him. In general, people did not seem surprised or even interested in the situation. It evoked an emotional

reaction in us, as such an occurrence in public transport would be considered absurd or disruptive in our home countries. The experience of such a situation is quite subjective, since the local citizens did not display any sort of reaction. This could be due to cultural differences. In Poland and Bulgaria, it would be met with at least indignation and hostile looks from most passengers, and most often also with a warning and a request to turn off the music. It was an interesting experience for us, and we were able to view this situation from a different perspective.

4 Conclusion

Our observations indicate that public transport in Maribor is primarily used by women, students, the elderly, and those without access to cars, reflecting the motorisation level of Slovenian society and existing empirical research. Gender and generational patterns were clearly visible: more feminine-presenting passengers used buses more frequently on weekdays, while men used them more often on weekends. Additionally, younger passengers had a more pragmatic approach to bus travel than older generations. Passengers' emotions were often subtle and expressed indirectly, although there were situations where emotional expressions were more direct, such as reactions to music or the weather. The limitation of the used method is the interpretational power of researchers. This vignette should hence be used as an inspiration, the first step, for follow-up interviewing, inspired by some of our preliminary observations, to deeply understand the emotions of the users of the bus infrastructure in the city. Overall, buses are not only a means of transportation but also a social and emotional space where anonymity and community coexist.

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Author Contributions

T.K. supervised and guided the students throughout the process. Students M.H., B.E., K.B., Z.N., F.N., and M.M.M. conducted the observations and fieldwork. The writing was carried out by the students, with T.K. providing supervision and support during the writing process.

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Cultivating Resilience: Permaculture and Self-Sufficient Communities across European Contexts

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Independent living, defined as the ability to meet basic needs with autonomy and resilience, has gained popularity amid climate change, food insecurity, and energy dependence. Permaculture, a holistic design framework rooted in ecological ethics, offers practical strategies to enhance self-sufficiency while fostering community resilience. This research explores how permaculture has been developing across seven European countries (Italy, Germany, Croatia, Slovenia, Kosovo, the Czech Republic and Spain) through a comparative case study approach. Using qualitative data from literature reviews and project documentation, the research identifies key practices in food production, water and energy management, community governance, funding, theoretical framework and ecological education.

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RAZVIJANJE ODPORNOSTI: PERMAKULTURA IN SAMOOSKRBNE SKUPNOSTI V EVROPSKIH KONTEKSTIH

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Ključne besede:
neodvisno življenje, odpornost skupnosti, samooskrba, Evropa, trajnostni prehodi, prehranska varnost, energetska varnost

Neodvisno življenje, opredeljeno kot zmožnost zadovoljevanja osnovnih potreb z avtonomijo in odpornostjo, pridobiva na priljubljenosti v času podnebnih sprememb, prehranske negotovosti in energetske odvisnosti. Permakultura kot celostni pristop, utemeljen na ekološki etiki, ponuja praktične pristope za krepitev samooskrbe in hkratno spodbujanje odpornosti skupnosti. Raziskava preučuje razvoj permakulture v sedmih evropskih državah (Italija, Nemčija, Hrvaška, Slovenija, Kosovo, Češka in Španija) s primerjalnim pristopom študij primerov. Na podlagi kvalitativnih podatkov iz pregleda literature in projektne dokumentacije raziskava opredeli ključne prakse na področjih pridelave hrane, upravljanja z vodo in energijo, skupnostnega upravljanja, financiranja, teoretičnih izhodišč ter ekološkega izobraževanja.

Univerzitetna založba Univerze v Mariboru

1 Introduction

Independent living is the capacity of individuals, households, or communities to manage their lives, meet basic needs, and make choices without overreliance on external systems, combining self-sufficiency, the ability to provide essentials such as food, water, shelter, and energy, and autonomy, the freedom to make decisions and assume responsibility for one's well-being (DeJong, 1979). It implies not isolation but dignity, agency, and participation in social life while reducing dependence on unstable systems (World Health Organization, 2015).

Its global relevance has grown in recent decades due to interconnected crises such as climate change, food insecurity, and energy dependence. Decentralised living systems reduce ecological footprints and enhance resilience to environmental change (IPCC, 2022). Increasing volatility in global food systems, driven by climate change, biodiversity loss, and market disruptions, has made local food production critical (FAO, 2021). Household and community gardening, agroecology, and permaculture improve food availability and accessibility, reducing vulnerability to external supply chain disruptions (Altieri & Nicholls, 2020). Simultaneously, decentralised renewable energy decreases reliance on non-renewable resources and supports a just energy transition (IEA, 2021).

Permaculture constitutes a key dimension of independent living, as it enhances self-sufficiency, food and energy security, waste reduction, and community resilience while reducing dependence on unstable external systems and fostering long-term sustainability.

2 Theoretical framework

Permaculture, developed in the 1970s by Bill Mollison and David Holmgren, represents a holistic design philosophy that integrates ecological principles with ethical imperatives–Earth Care, People Care, and Fair Share (Holmgren, 2002). Its applications span agriculture, water management, renewable energy, community governance, and education (Ferguson & Lovell, 2014). Permaculture constitutes a key dimension of independent living, as it enhances self-sufficiency, food and energy security, waste reduction, and community resilience while reducing dependence on unstable external systems and fostering long-term sustainability.

It is defined as a holistic design system that draws on ecological patterns and processes in nature. Permaculture is applied to develop sustainable food systems, housing, and community structures (Mollison, 1988). Its principles enable individuals and communities to enhance their self-sufficiency, thereby reducing dependence on external supply systems.

3 Methodology

The study applied a comparative case study design (Eisenhardt & Graebner, 2007) to explore how permaculture is practised in diverse European contexts. The research was conducted during a week-long workshop at the University of Maribor (August 2025), where participants from six countries collaborated with a permaculture mentor in Slovenia to document and analyse these initiatives. Each participant contributed one or more case studies from their home country.

Table 1: Permaculture framework key factors summary

Resource and Infrastructure Management	Soil Management
	Water Management
	Energy Resource
	Food System
	Waste Management
	Ecobuilding
Community and Engagement	Educational projects
	Regional/Local actors involvement
	Collective workshops
	Traditional local practices
	Volunteering
Socioeconomic Context	Economic activities
	Financial funding
	Land ownership
	Governance structure
Theoretical Sustainability Integration	Permaculture claim
	Sustainable framework/ perspective
	Ethical view/ principles
	Cultural factors influence
Scale	Inhabitants (number & characterisation)
	Area (ha)
	Animals involved

Source: own elaboration based on permaculture framework (Holmgren, 2002; Ferguson & Lovell, 2014).

Data obtained by literature review and different project documentation were analysed through thematic coding. The initial key factors (Table 1) analysis was based on the permaculture theoretical framework. Comparative synthesis identified similarities and differences. This iterative process was enriched by group discussions, enabling collective negotiation of meaning and validation of interpretations.

4 Case analysis

4.1 Slovenia

The permaculture movement in Slovenia has been actively developing since the 1990s, with a strong focus on practical implementation and community building. This local adaptation of permaculture principles is rooted in a rich tradition of self-sufficiency and a deep connection to nature. The Permaculture Society of Slovenia (Društvo za permakulturo Slovenije), established in 1996, has played a pivotal role in promoting permaculture through educational programs, workshops, and community events (Društvo za permakulturo Slovenije, 2024).

The Slovenian approach often emphasises regenerative agriculture, especially through the creation of forest gardens (*gozdni vrtovi*) and the use of natural building techniques. One example of a successful project is the PermaMama estate in Rimske Toplice, which serves as a model for self-sufficiency and educational workshops, showcasing how permaculture principles can be applied to create a sustainable and productive living environment (PermaMama, 2024). Furthermore, organisations like the Permaculture Institute Maribor are leading projects focused on regenerating the local environment and promoting a higher quality of food (Permakulturni Inštitut Maribor, 2024). Another example of a key initiative is the International Centre for Self-Sufficiency Dole, which includes the Education Polygon Dole. This site serves as a learning hub for all generations, demonstrating how to apply permaculture principles to rebuild degraded soil, manage water, and promote a holistic approach to sustainable living (IPVO, 2024; Vovk Korže, 2024). These initiatives demonstrate how permaculture is being adapted to Slovenia's specific environmental and social context, reinforcing the core ethics through tangible, local actions.

4.2 Spain

The permaculture movement in Spain has been developing since the early 1990s, primarily focusing on the Mediterranean region and prevailing traditional practices in the area. Water retention and hydrological design have been identified as central components of these adaptations, particularly through small-scale reservoirs and swales that enhance soil moisture, prevent erosion, and support biodiversity, as demonstrated in Southern Spain (Fiebrig & Van De Wiel, 2021). Food sovereignty and localised production are equally emphasised, aligning ecological restoration with social resilience and self-sufficiency (Naylor, 2019).

Three different cases illustrate this focus on water management, the food system, and community. Huerta del Boticario (0.13 ha, founded 2011) combines synergistic beds, mulching, companion planting, and a food forest, updating traditional gardening in a rebuilt, typical housing of humble village farmers (Huerta del Boticario, s.f.). Granja de Masphaël (5 ha, founded in 2013) utilises food as a pedagogical tool, enabling children to harvest produce, prepare meals, and learn about ecological diets, while also interacting with animals such as hens, donkeys, and bees for experiential learning (Granja de Masphaël, s.f.). Mas Les Vinyes (25 ha, founded in 2013), a cooperative, offers training, consultancy, certified courses, internships, and volunteer placements, reflecting permaculture's ethic of a fair share while linking professional development with community engagement (Mas Les Vinyes, n.d..).

4.3 Italy

Permaculture in Italy has been developing steadily since the early 1990s, beginning with pioneering courses and grassroots initiatives, such as Torri Superiore in Liguria, where a cultural association restored a 13th-century village, starting in 1989, renovating over 150 rooms with ecological materials and hosting Italy's first permaculture design courses (Torri-Superiore.org, n.d.). Formal networks emerged in the 2000s, including the Accademia Italiana di Permacultura (with support from Langford & Wade), the Istituto Italiano di Permacultura (Zucchetti), and the World Permaculture Association (Tallarico), linking educators, professionals, and enthusiasts nationwide. Hundreds of local groups implement projects in gardens,

farms, and communities, while networks such as Fruttorti and Coltivare Condividendo promote urban orchards, seed-saving, and biodiversity.

Case studies illustrate diverse applications. La Scoscesa integrates terraced gardens, swales, and micro-reservoirs, growing 148 plant varieties and supplying local families and restaurants (Dissapore, 2021; ReSoil Foundation, n.d.). Torri Superiore (Imperia, Liguria) combines eco-restored housing, communal gardens, and training programs, supporting cooperative living and ecotourism (Ecovillaggi.it, n.d.; Torri-Superiore.org, n.d.). Fattoria dell'Autosufficienza integrates pastures, orchards, renewable energy, and ecotourism while serving as a living classroom (Autosufficienza.it, n.d.; Romagna Toscana Turismo, n.d.). Casa di Paglia Felcerossa is a small off-grid homestead with straw-bale construction, polyculture gardens, and educational stays (ItaliaCheCambia.org, 2020; Casadipagliafelcerossa.it, n.d.).

4.4 Kosovo

In Kosovo, permaculture emerged in the 2010s, building on traditional self-sufficiency and ecological knowledge (Caka, 2020; Kjeldsen, 2021). The 314 Garden (2015) in Prishtina serves as a community farm and Edible Outdoor Classroom, featuring raised beds, a greenhouse, drip irrigation, and ninety trees, partially supplying SOS Children's Village while offering experiential learning for youth. Volunteers collaboratively maintain the site, promoting urban sustainability and environmental literacy (GAIA Kosovo & 3PEAS, 2021).

The Bozevce Permaculture Centre in Ranilug, founded by GAIA Kosovo, functions as a rural hub for ecological living and intercultural education (GAIA Kosovo & 3PEAS, 2021; GAIA Kosovo, 2024). It features gardens, orchards, greenhouses, beehives, rainwater harvesting, compost toilets, and passive solar buildings. Residents and volunteers engage in shared labour, participatory decision-making, and educational programs, fostering both social and ecological resilience. Bozevce exemplifies small-scale regenerative permaculture, integrating food sovereignty, renewable technologies, and community cohesion.

4.5 Germany

Permaculture in Germany originated in the 1980s and gained momentum with rising environmental awareness around the turn of the century. The German Institut für Permakultur e.V. was founded in 2003, followed by other grassroots initiatives, with the Permakultur Akademie now forming a national community of practice (Ulbrich & Pahl-Wostl, 2019, pp. 1–2). Permaculture is applied in diverse contexts, from urban gardens, such as those in Berlin, to large rural plots and sustainable green villages, linking human activity to an improved quality of life (Ulbrich & Pahl-Wostl, 2019, p. 9).

The Ecovillage Sieben Linden, home to around 120 adult residents, exemplifies community-scale permaculture, producing 75% of its food on-site. They utilise renewable energy, well-insulated housing made of wood, straw and clay, and water-saving techniques like compost toilets. Through this, they reduce their CO2 footprint to 2.4 t per person, while the average German contributes 8.9 t (Ökodorf Siebenlinden 2023, 5:49min). Workshops share sustainable living practices with visitors. Smaller initiatives, such as Waldgeister e.V. and the Boljahn family garden, demonstrate adaptive strategies that include sun traps, winter water capture, bokashi composting, raised beds, and integration of chickens and bees.

4.6 Croatia

In Croatia, organised permaculture began in 1995 with the founding of Hrvatska permakultura, promoting professional development, networking, and permaculture education across Croatia, Southeastern Europe, and the EU (Kiš & Kiš, 2014). The association emphasises "care for the Earth, care for people, and wise control over population and consumption" (Kiš & Kiš, 2014, p. 13) and has functioned since 2013 as an adult education platform for urban and rural community development. Permakultura Dalmacija similarly promotes sustainable living and regenerative design through education, collaboration, and awareness-raising (Permakultura Dalmacija, n.d.).

Two illustrative properties highlight Croatian permaculture in practice. Recycled Property Vukomerić, near Zagreb, was transformed by Matko Šišak in 2001 into an ecological education centre using recycled and natural materials, including straw,

wood, clay, and repurposed car tyres. Solar collectors, windmills, green roofs, and Finnish stoves provide energy and heating. The site hosts permaculture gardens, seed conservation, workshops, and operates as a living community with consensus-based governance (ZMAG, n.d.; Agroklub.hr; Drumtidam.info; Peroforum.hr).

Gea Viva, an eco-island retreat on Brač established by Sabine Engelhardt in 2010, combines off-grid living with fruit and olive cultivation, solar energy, rainwater collection, and composting toilets. It functions as an educational and meditative site, offering glamping, workshops, and volunteer engagement, emphasizing a holistic connection to nature (Agroklub.com., n.d.).

4.7 Czech Republic

Permaculture in the Czech Republic blends traditional self-sufficiency with ecological design, rooted in widespread gardening tradition and post-1989 environmental activism (Kolářová, 2020). In the Czech context, permaculture has developed significantly from this strong gardening tradition, evolving into a recognised and growing movement for sustainability and resilience. The national association Permakultura CS, founded in the early 1990s, supports networks of gardens, farms, and Regional Permaculture Centres (REPECs), publishes the *Key to Self-Sufficiency,* and maintains international connections (Permakultura CS, 2024a, 2024b). Mendel University in Brno provides research, teaching, and practical training (ICV MENDELU, 2024).

Initiatives include demonstration projects, selective applications in schools, households, and REPECs, with sites like Hostětín Ecocentre showcasing renewable energy, orchards, food forests, and ecological construction as part of a model village. Beyond rural contexts, urban gardens in Prague and Brno integrate food production with social inclusion, while schools experiment with food forests and composting, embedding permaculture practices in everyday learning (Permakultura CS, 2024a). Governance is participatory, often led by families or associations, with international volunteers supporting Fair Share principles (Holmgren, 2002).

Despite challenges, limited policy support, funding, scalability, and generational continuity, Czech permaculture demonstrates how ordinary traditions can evolve into a broader sustainability movement. It promotes independent living, community

resilience, and sustainability transitions in Central Europe, while also becoming increasingly visible and popular among diverse social groups.

5 Comparative analysis of European permaculture movements

European permaculture movements share a core ethos of sustainability, ecological stewardship, food sovereignty, and community resilience, yet they differ in scale, institutionalisation, and local adaptation. In all the cases, education is central and community engagement and participatory governance are common, as exemplified by cooperatives in Spain (Mas Les Vinyes) and Germany (Sieben Linden), as well as volunteer networks in Kosovo and Croatia (Table 2).

Differences emerge in ecological focus and technological adaptation. Mediterranean countries, such as Spain, Italy, and parts of Croatia, prioritise water retention, swales, and drought-tolerant polycultures, whereas Slovenia emphasises forest gardens and soil regeneration. Germany demonstrates energy-conscious design and renewable integration at the household and ecovillage scale, while Kosovo and the Croatian mainland rely on small-scale, off-grid innovations. Scale also varies: Italy and Germany host large ecovillages and multifunctional farms, while Slovenia, Kosovo, and the Czech Republic often operate demonstration gardens or educational hubs.

Institutionalisation differs regionally as well, with formal networks prevalent in Italy, Germany, and the Czech Republic, whereas Kosovo and Croatia rely on nascent associations and grassroots initiatives. Cultural traditions further shape practice: the Czech Republic and Slovenia integrate historical self-sufficiency and gardening heritage, while Mediterranean sites incorporate regional agricultural customs.

Despite these differences, all movements link permaculture principles to ecological restoration, community learning, and resilience-building. Their comparative analysis illustrates the flexibility of permaculture, which is adaptable to environmental constraints, societal norms, and scales, yet consistently oriented toward sustainable living, resource stewardship, and knowledge sharing.

Table 2: Comparative table of permaculture practices in European countries

Country	Main Focus	Key Initiatives	Scale	Distinctive Features
Slovenia	Forest gardens, regenerative agriculture, natural building	PermaMama, Permaculture Institute Maribor, Education Polygon Dole	Educational hubs and estates (small to medium scale)	Long tradition of self-sufficiency, focus on education
Spain	Water retention, food sovereignty, community engagement	Huerta del Boticario, Granja de Masphaël, Mas Les Vinyes	Small farms), cooperative models	Integration of traditional Mediterranean practices
Italy	Restoration of villages, eco-building, multifunctional farms	Torri Superiore, La Scoscesa, Fattoria dell'Autosufficienza, Casa di Paglia Felcerossa	Large ecovillages, multifunctional farms	Historic restoration with permaculture, strong national networks
Kosovo	Community gardens, eco-education centres, off-grid living	314 Garden Prishtina, Bozevce Permaculture Centre	Small-scale community projects	Youth education, intercultural learning
Germany	Ecovillages, renewable energy, urban/rural gardens	Ecovillage Sieben Linden, Waldgeister e.V., Boljahn family garden	Large ecovillage (120 residents), small family gardens	Low CO2 footprint, national academy and networks
Croatia	Ecological education centres, off-grid eco-retreats, community projects	Recycled Property Vukomerić, Gea Viva, Permakultura Dalmacija	Education centres, eco-retreats, grassroots initiatives	Grassroots activism, adult education platforms
Czech Republic	Gardening traditions, ecological villages, renewable energy	Permakultura CS, Hostětín Ecocentre, urban gardens in Prague & Brno	Community-based projects, family/association-led initiatives	Strong gardening heritage, participatory governance

6 Conclusion

Permaculture movements across Europe, while operating in diverse national and cultural contexts, demonstrate the versatility and vitality of the permaculture ethic. Despite these differences, all movements link permaculture principles to ecological restoration, community learning, and resilience-building. Their comparative analysis

illustrates the flexibility of permaculture, which is adaptable to environmental constraints, societal norms, and scales, yet consistently oriented toward sustainable living, resource stewardship, and knowledge sharing.

Every example, from micro-homesteads to large ecovillages, confirms that permaculture is not just a theoretical concept but a set of rigorous agronomic practices and social innovations. By combining knowledge and practice, permaculture projects position themselves as living laboratories, developing resilient and self-sufficient models that can offer independent living as an alternative to conventional living.

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Rural Europe in Comparison: A SWOT Perspective on Quality of Life in the Selected Regions

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Rural areas are diverse and different across the world, and they face numerous challenges, such as depopulation or economic and agricultural decline. The various faces of rural development describe a colourful composition of rural areas all over Europe, but according to experiences from separate research, some challenges are based on the same processes. However, the question remains whether European spatial planning policy on rural development can adopt a comparative approach in rural development, targeting the proper goals. In this paper, our aim was to evaluate the main characteristics of rural settlements in Wallonia (Belgium), Jihovýchod (the Czech Republic), Vojvodina (Serbia) and Galicia (Spain). Our goal was to find common opportunities for development by applying an assertive qualitative method, which can be used to prepare development goals. After a qualitative SWOT analysis of the common characteristics, the paper emphasises the importance of strengths and opportunities for rural development. The threats, such as climate change, increased demographic and economic decline and urban-rural polarisation, may be managed through adequate regional and rural planning.

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PRIMERJAVA PODEŽELIJ V EVROPI: SWOT-POGLED NA KAKOVOST ŽIVLJENJA V IZBRANIH REGIJAH

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Ključne besede:
podeželska območja,
deruralizacija,
zaton podeželja,
Evropa,
SWOT-analiza

Podeželska območja so po svetu zelo raznolika in se soočajo s številnimi izzivi, kot so depopulacija ter padec gospodarskih in kmetijskih aktivnosti. Različni obrazi razvoja podeželja prikazujejo pestro podobo podeželskih območij po vsej Evropi, vendar iz izkušenj posameznih raziskav izhaja, da nekateri izzivi temeljijo na istih procesih. Kljub temu ostaja vprašanje, ali lahko evropska prostorska politika razvoja podeželja sprejme primerjalni pristop. Namen prispevka je bil ovrednotiti glavne značilnosti podeželskih naselij v Valoniji (Belgija), Jihovýchodu (Češka), Vojvodini (Srbija) in Galiciji (Španija). Cilj je bil s kvalitativnim pristopom prepoznati skupne razvojne priložnosti, ki jih je mogoče uporabiti pri oblikovanju razvojnih ciljev. Na podlagi kvalitativne SWOT analize skupnih značilnosti prispevek poudarja pomen prednosti in priložnosti za razvoj podeželja. Grožnje, kot so podnebne spremembe, demografski in gospodarski upad ter polarizacija med mestom in podeželjem, je mogoče obvladovati z ustreznim regionalnim in ruralnim načrtovanjem.

Univerzitetna založba Univerze v Mariboru

1 Introduction

There is no universally accepted definition distinguishing the term "rural" from the term "urban" (Li, Westlund & Liu, 2019). Regardless of the definition, rural decline is observable worldwide (Bubalo-Živković et al., 2024; Li, Westlund, & Liu, 2019). Rural areas have traditionally been the centres of agricultural production, where most of the population was employed in this activity. With the industrial revolution, urbanisation and technological development, rural areas no longer depended on agriculture (Kusio et al., 2022). In a society that constantly requires economic growth and progress, higher education, as well as social and spatial mobility, have become imperative. Since urban areas offer more in these terms, rural areas must adapt to the challenges of the modern world (Kusio et al., 2022; Máté, Pirisi & Trócsányi, 2024).

According to the World Bank data (World Bank, n.d.), which gathers information on rural settlements based on each country's administrative classification, the share of the worldwide rural population has been in decline since the middle of the last century, and in the year 2024, it reached 42%. In the European Union, around 80% of the territory is comprised of rural areas, while only around 30% of the population lives in those areas (European Commission: Directorate-General for Agriculture and Rural Development, 2023). The share of the rural population in Eastern Europe and post-socialist countries is generally higher than in Western Europe (Perpiña Castillo et al., 2018).

In this research, the authors will focus on the countries of Belgium, the Czech Republic, Serbia, and Spain, as well as their specific rural areas. The regions that were selected as rural areas at the national level exhibit significant diversity, highlighting the need for the identification of a single region based on the similarity of settlement characteristics. In Table 1, the main demographic features of the rural population are given for each country and the chosen region. The aim of this study is to compare the regions, provide a combined SWOT analysis of the main characteristics of rural settlements, and offer possible solutions to the challenges, based on successful practices in other countries. This cross-regional analysis can provide useful data for future regional rural development.

Table 1: Main characteristics of rural settlements in the selected countries and regions

	Area (km²)	Population	Rural pop. (%)	Data year	Source
Belgium	30,688	11,584,008	1.86	2022	World Bank
Wallonia, Belgium	16,901	3,662,495	No data	2022	STATBEL
The Czech Republic	78,871	10,827,529	25	2022	World Bank
Jihovýchod, The Czech Republic	13,983	1,731,977	No data	2025	Czech Statistical Office
Serbia	88,499* 77,589**	6,647,003**	38**	2022	Statistical Office of the Republic of Serbia (SORS)
Vojvodina, Serbia	21,507	1,740,230	38	2022	SORS
Spain	505,978	47,786,102	18	2022	World Bank
Galicia, Spain	29,574	2,701,819	38	2020	Xunta de Galicia (2020)

Note: * - Serbia with AP Kosovo and Metohija; ** - Serbia without AP Kosovo and Metohija

There are noticeable differences between these areas, particularly in their rural settlement structures. While in Vojvodina and in Wallonia the typical village sizes are relatively big, in Jihovýchod and in Galicia settlements are small, sometimes even tiny in population (SORS, 2023; Van Hecke et al., 2000). Their economic profile differs too; the Western-European examples rather have a relatively high importance of agriculture with traditional yet efficient farming, while in Middle and Eastern Europe, the economy struggles more and loses its traditional agricultural profile (Perlín et al., 2010; Paül i Carril, V., 2018). Besides this, slight differences exist, such as the economic capital of residents, their level of mobility and other features that have an impact on their quality of life (Woods, 2010).

Despite all differences, the general characteristics of rural settlements among the countries and regions are quite similar. The main problems of the rural settlements in the Czech Republic, Serbia and Spain are demographic decline, brain drain, emigration of young and educated population, ageing population, agricultural abandonment and economic decline (Bubalo-Živković et al., 2024; Vaishar et al., 2021; Xunta de Galicia, 2020). In contrast, Belgium has less than 2% of the rural population that is densely populated and well-connected to the urban centres (Statbel, 2025). Although the countryside does not suffer from decreasing

population, the ageing of local communities creates a specific spatial type with rural features, especially in Flanders (Gruijthuijsen & Vanneste, 2020).

2 Methodology

The SWOT analysis was conducted based on the literature review of the rural settlements conducted in the aforementioned regions of Belgium (Giulia, Dupeux, 2023; Van Hecke, Meert & Christians, 2000), the Czech Republic (Pělucha, 2019; Petrovič & Maturkanič, 2022), Serbia (Bubalo-Živković et al., 2024; Đerčan et al., 2017), and Spain (González-Leonardo, López-Gay & Recaño, 2019; Paül I Carril, 2018). Although these regions may have cardinal differences, we decided to conduct our research in these rural areas, as they are typical in their country. With this selection, we could ensure to find examples and practices in different types of European rural settlements that share similar trends and problems.

Another common feature is that all countries use population density to distinguish rural areas from urban landscapes, although the thresholds vary according to national characteristics. In Belgium, a municipality is considered rural if the population density is strictly less than 150 people per km² or if the population density is greater than 150 people per km² but its rural areas cover more than 80% of the total area of the statistical sector (Service public de Wallonie (SPW) - DGO3., 2013). The criterion is similar in Spain; rural municipalities are defined by a population density of less than 100 people per km² (Spain, 2007). In the Czech Republic, the municipalities with more than 3000 inhabitants may obtain the status of a town (The Czech Republic, 2000). On the other hand, the criterion in Serbia is of an administrative–legal background, with all settlements being divided into urban and other settlements (Bubalo-Živković et al., 2024). Since 1981, censuses have simply used these two categories without any statistical basis, but certain researchers have tried to establish a methodology to create complex statistical evaluation methods to define rural dimensions in Serbia (Bogdanov et al., 2008).

In our research, we chose SWOT analysis as our primary method (Knierim & Nowicki, 2010). As we highlighted earlier, the research field includes rural areas with various features. A SWOT analysis can effectively address these differences by also focusing on similar problems. During our research phase, we conducted a literature review to identify all strengths and weaknesses, as well as opportunities and threats.

In the evaluation and selection of secondary data, we set a list of aspects to fulfil a comparative study: population dynamics; infrastructure with a special focus on institutional coverage; economic potential, especially agricultural features; marginalisation processes and their specific effects on rural societies. The qualitative evaluation of the literature based on the selected rural landscapes enabled a comparative approach to our research.

3 Results and conclusions

Based on Table 1, the compared regions consisted of relatively large areas; the smallest one evaluated was Jihovýchod in the Czech Republic, with an area of almost 14,000 km², while the largest was Galicia in Spain, with an area of almost 30,000 km². Essentially, these areas encompass cities, towns, larger and smaller villages, as well as agricultural disperses and farms. On the other hand, the population ratios of these regions compared to the country's total are usually lower than the proportions of the areas in their respective countries. This reinforces their rural value, as the average population density is below 150 people per km², except for Wallonia, where this value is around 200 people per km². In the case of Vojvodina in Serbia and Galicia in Spain, the population density is below 100, while in the Jihovýchod region it is around 120 residents per unit. In the case of Wallonia, the generally densely populated countries of BeNeLux have a higher average density than the European average –for the three states, the average value is 385 people per km² (World Population Review, n.d.). In such an urban environment, 200 people per km² is considered rather rural.

The main findings of the analysis are summarised through a SWOT framework. The results are presented in Table 2, which outlines the key strengths, weaknesses, opportunities, and threats identified in rural areas across all studied regions.

Although rural areas and settlements offer numerous characteristics that improve the quality of life, such as a healthy environment, safety and lower costs of living, their demographic and economic parameters are consistently in decline. Unemployment and inequalities related to accessible transportation, education, the internet, and, mainly, almost every basic urban function are more prominent in rural areas. The threats regarding rural settlements are mostly related to the increasing

rates of demographic decline, polarisation, urbanisation, environmental problems and climate change, which all influence the quality of life.

Table 2: Summarising SWOT analysis of the four research areas.

STRENGHTS	WEAKNESSES
– Sense of community and strong local society; – Pristine nature, no pollution and original natural environments; – Availability of agricultural land; – Lower cost of living; – Inclusive and safe social environment with high levels of trust and social capital.	– Demographical decline; – Insufficient public services, lack of access to basic services. – Remoteness and reduced access to public infrastructure, including telecommunication services; – Gender inequality in access to education, employment, and healthcare; – Higher unemployment rates, often due to the decreasing opportunities for education and the closure of rural schools; – Persistent poverty and a deprived population living in marginalised social and physical spaces.
OPPORTUNITIES	**THREATS**
– Sustainable development of agriculture, biotechnologies, organic production; – Development of rural tourism, including attractions based on rural cultural heritage sights; – Keeping local traditional crafts and heritage by empowering workshops; – Enhancing the infrastructure and attracting digital nomads; – Enhancing immigration by offering houses and plots to educated young couples, also providing them with local jobs; – Renewable energy development; – Mobility such as 'MaaS (Mobility as a Service)' in Belgium.	– Increasing demographic shrinking processes jeopardise local communities by ageing and selective demographic erosion. – Expanding rural tourism can threaten the rural features and traditional heritage of local communities. – Uneven regional development and overwhelming promotion of urban areas. – Urbanisation, urban sprawl and industrialisation. – Climate change poses risks for rural environments, wildfires, heatwaves, floods and other escalating climate events, which decrease the recreational values of rural areas. – Environmental issues, such as soil erosion, water pollution, and deforestation. – Political marginalisation and weak rural voice in policy making.

Regarding population and society, according to our findings, there is a general perspective that strong local communities have great potential and strength in all rural areas, especially when focusing on the weaknesses and also the threats like depopulation and the consequences of demographic decline. Thus, we can conclude that the major strength of rural areas in Europe is the local society and its integrity;

however, as a result, the biggest threat is the loss of people. Three regions out of four have already been suffering from the effects of shrinking; the exception is Wallonia, where the only demographic challenge seems to be ageing.

As people are the most important resource for future development in rural Europe, one of the main tasks is to reduce rural poverty and decrease marginalisation processes with regional development. Marginalised communities have no access to jobs, they lack good income opportunities, and they struggle to reach amenities and services. These circumstances not only decrease the quality of life of rural residents, but also make rural settlement unattractive to potential new residents, like young educated people. Marginalisation became a common threat across the European countryside, which demands a more sensitive policy and best practices to reduce the negative effects of this social and spatial inequality.

In the case of the local economy, the literature clearly emphasises two main resources: agriculture, representing the traditional means of production, and tourism, especially based on rural heritage. Although the conditions for agroeconomic expansion are not present in many cases (see, for instance, selective demographic erosion and the loss of human resources), traditional agriculture, ecological production, and bio-food are creating opportunities for these rural communities. In terms of tourism, there is a high potential for increasing the number of visitors and offering sights and attractions based on local resources. According to our perspective, tourism can usually reach a successful economic output only at higher scales. If the aim is to protect traditional local heritage, rural tourism should be kept on a small-scale basis, as mass tourism expands the number of guests, services, infrastructure, and other elements, which can simply transform rural areas into merchandised global places or products. Thus, tourism in rural areas is considered to be either an opportunity or a threat.

The natural environment of rural areas in Europe is considered one of the most important terroirs for recreation, green and sustainable lifestyles and environmentally friendly futures. The challenges of climate change are also affecting rural environments, creating a considerable threat to these areas. Protecting the rural environment, on the one hand, is a common task for all European rural regions. As such, it has become essential to establish and develop circumstances that can

mitigate the negative effects of climate events, creating a significant demand for effective regional development policies, including resources.

Despite numerous negative factors, there are many opportunities for the development of rural settlements. By applying positive principles from different countries, such as good public transportation systems in Belgium and the Czech Republic, or the modernisation of agricultural production, rural settlements may become a new ideal living environment. Furthermore, urban pressure and urban sprawl are significant issues in countries like Belgium, where the majority of the population resides in rural areas. Promoting the strengths and opportunities of rural areas, as well as implementing the right measures, is crucial for achieving even regional development.

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Spatial Analytics of Climate Change Impacts: The Case Study of Maribor

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Climate change represents one of the most pressing challenges of the twenty-first century, marked by rising global temperatures, more frequent heatwaves, and increasing risks of floods and droughts. Urban areas are particularly vulnerable because dense construction, limited vegetation, and impervious surfaces intensify heat exposure and reduce resilience. This urban heat island effect has significant consequences for human health, infrastructure, and the environment, making cities critical focal points for adaptation strategies. This study explores long-term climate change in Slovenia with a focus on Maribor, the country's second-largest city. Maribor's geographical location in the Drava valley, combined with its ageing population, increases its vulnerability to extreme heat events. Evidence indicates a seasonal shift in urban heat intensity from colder to warmer months, with projections of substantial increases in future decades, particularly in industrial zones. By combining high-resolution climate data, satellite imagery, and socio-demographic indicators, this research identifies spatial patterns of heat stress and highlights vulnerable areas. The findings provide a scientific basis for sustainable urban planning and effective adaptation to climate change.

Keywords:
GIS,
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PROSTORSKA ANALITIKA VPLIVOV PODNEBNIH SPREMEMB: ŠTUDIJA PRIMERA MARIBOR

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Ključne besede:
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toplotni stress,
zdravstvena tveganja

Podnebne spremembe predstavljajo enega najresnejših izzivov enaindvajsetega stoletja, za katere so značilni naraščanje globalnih temperatur, pogostejši vročinski valovi ter povečana tveganja za poplave in suše. Urbana območja so še posebej ranljiva, saj gosta pozidava, omejena vegetacija in neprepustne površine stopnjujejo toplotno obremenitev ter zmanjšujejo odpornost. Ta pojav mestnega toplotnega otoka ima pomembne posledice za zdravje ljudi, infrastrukturo in okolje, zaradi česar so mesta ključne točke prilagoditvenih strategij. Raziskava obravnava dolgoročne podnebne spremembe v Sloveniji s poudarkom na Mariboru, drugem največjem mestu v državi. Geografska lega Maribora v Dravski dolini v kombinaciji s starajočim se prebivalstvom povečuje njegovo ranljivost za ekstremne vročinske dogodke. Ugotovitve kažejo na sezonski premik intenzivnosti mestnega toplotnega otoka iz hladnejših v toplejše mesece ter na znatno povečanje v prihodnjih desetletjih, zlasti na industrijskih območjih. Z združevanjem visokoločljivostnih podnebnih podatkov, satelitskih posnetkov in socio-demografskih kazalnikov raziskava prepoznava prostorske vzorce toplotnega stresa in izpostavlja najbolj ranljiva območja. Rezultati predstavljajo znanstveno podlago za trajnostno urbano načrtovanje in učinkovito prilagajanje na podnebne spremembe.

Univerzitetna založba Univerze v Mariboru

1 Introduction

Climate change is one of the defining global challenges of the 21st century. Global surface temperatures have already risen by approximately 1.1°C relative to pre-industrial levels, and each additional 0.5°C of warming is expected to further increase the frequency and intensity of hot extremes, heavy precipitation, and droughts. Under high-emission scenarios, global mean temperature could rise by 3.3–5.7°C by the end of the century, leading to severe impacts on ecosystems, health, and economies (Intergovernmental Panel on Climate Change, 2021).

Europe is particularly vulnerable. The European Environment Agency (2025) highlights that climate-related risks such as heatwaves, floods, and droughts will intensify even under optimistic scenarios. These changes will disproportionately affect cities, where dense built forms, impervious surfaces, and limited vegetation amplify thermal stress through the urban heat island (UHI) effect (Oke, Mills, Christen, & Voogt, 2017). The UHI not only exacerbates heat exposure but also increases the incidence of heat-related illnesses and mortality (Grimmond, 2007). The Local Climate Zones (LCZ) classification provides a useful framework to systematically analyse these patterns in urban areas (Stewart & Oke, 2012).

Maribor, Slovenia's second-largest city, offers a critical case study. Its geomorphological setting in the Drava valley, combined with an ageing population, makes it particularly sensitive to heat stress (Horvat, 2015). Recent studies show a seasonal shift of UHI intensity from winter toward spring and summer, with projections suggesting more than a 60% increase in intensity in southern industrial zones by the end of the century (Žiberna, 2021; Žiberna & Ivajnšič, 2022).

This study therefore examines long-term climate change in Slovenia and evaluates heat stress distribution in Maribor by integrating climate datasets, satellite imagery, and socio-demographic indicators. The findings provide evidence for sustainable urban planning and climate adaptation strategies.

2 Research area

The research area encompasses the Municipality of Maribor (Fig. 1), with a particular focus on the urban settlement as its central unit. Maribor is located in the northeastern part of Slovenia, within the Podravska statistical region, along the

middle course of the Drava River. As the country's second-largest city, it functions as a regional administrative, economic, and cultural centre.

The city's relief is defined by its position in the Drava valley, situated between the Slovenske gorice hills to the north and the Pohorje Massif to the south. The urban centre lies at an elevation of approximately 270 m, on a river terrace shaped by the Drava River. Land use reflects a high degree of urbanisation. Central zones are predominantly residential and commercial, while industrial complexes, transport corridors, and agricultural land are situated on the periphery. Urban development is characterised by a mixture of a historical centre, modern residential blocks, and suburban areas. Green areas (urban forests and parks) and the forests of Pohorje play an important heat stress mitigation role within the urban system (Pipenbaher et al., 2022).

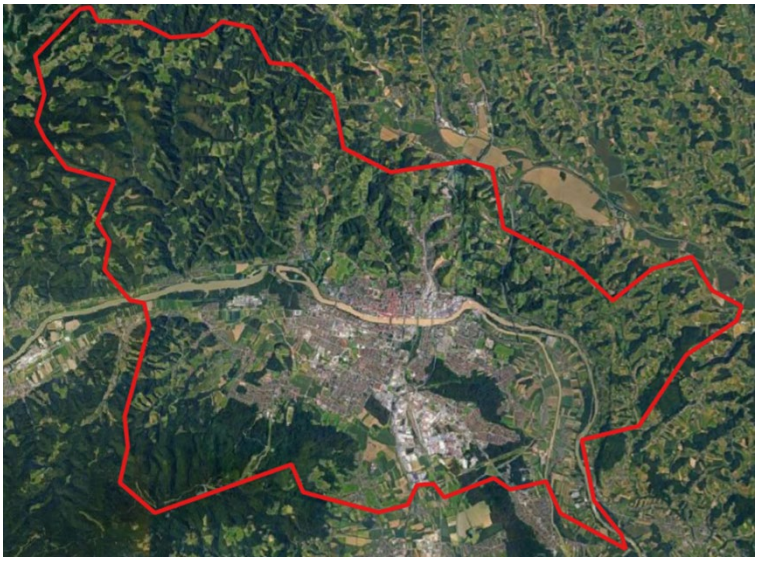

Figure 1: True colour composite satellite image and the municipality of Maribor
Source: Google. (n.d.), retrieved September 23, 2025, from URL: https://www.google.com/maps/; Eurostat Geodata, from https://ec.europa.eu/eurostat/web/gisco/geodata, 2025.

According to census data (SURS, 2025), Maribor has a population of 114,301 inhabitants. Population growth stagnated in the 1980s and was followed by depopulation in the 1990s and after 2000. Natural growth has been constantly negative from 1985 onwards, and net migration was negative between 1992 and

2007. Maribor is also showing the most unfavourable age structure of the population, with the highest proportion of the elderly population and the highest ageing index (Horvat, 2015).

Maribor's temperate continental climate (Vršič et al., 2014) is characterised by considerable seasonal temperature variability, cold winters, and moderately hot summers. According to data provided by the Slovenian Environmental Agency (ARSO) for the period 1971–2000, average July temperatures reach about 20.1°C, while January averages fall below 0°C. Precipitation is relatively evenly distributed throughout the year.

3 Methodology

3.1 Data sources and acquisition

a) Climate data

High-resolution climatological data were obtained from the CHELSA database version 2.1, specifically CHELSA_bio1 (mean annual air temperature in °C) and CHELSA_bio12 (mean annual precipitation in mm) at ~1 km spatial resolution for historical (1981–2010) and future (2071–2100) periods (Karger et al., 2023). Future climate projections were derived from the MPI-ESM1-2-HR Earth System Model under the SSP585 scenario, representing a high greenhouse gas emission pathway with radiative forcing reaching 8.5 W/m² by 2100.

b) Satellite imagery

Landsat 9 Collection 2 Level-2 surface reflectance and surface temperature data were acquired from the USGS Earth Explorer platform. The selected satellite image captured on July 26, 2024, provided cloud-free coverage during peak summer conditions.

c) Administrative units

In order to spatially limit our climate and satellite data sets, two administrative units databases were used: (a) the European land area units, available on the Eurostat GISCO platform, and (b) the municipal vector layer available on the STAGE data

platform owned by the Slovenian Statistical Office. Additionally, population data were downloaded from the STAGE platform on a 100 m vector grid. Population data were later considered as one of the predictor variables for heat stress evaluation.

3.2 Data preprocessing

All spatial datasets underwent standardisation to ensure geometric consistency. Vector boundaries were reprojected to WGS84 (EPSG:4326) for broad-scale analysis, while municipal analysis utilised the UTM Zone 33N projection (EPSG:32633). Raster datasets were clipped to study area boundaries using mask-based extraction procedures.

3.3 Climate change impact assessment

Long-term climate trends were quantified through temporal differencing of bioclimatic variables using raster algebra:

Temperature Change (ΔT) = $T_{2071–2100}$ - $T_{1981–2010}$
Precipitation Change (ΔP) = $P_{2071–2100}$ - $P_{1981–2010}$

Municipal-level statistics for both climate variables were derived through zonal statistics, computing mean values and standard deviations for each administrative unit.

3.4 Urban heat stress modelling

Heat stress assessment for Maribor integrated multiple variables through a composite modelling approach:

a) Land Surface Temperature (LST) was calculated from Landsat 9 thermal infrared band using the USGS Collection 2 algorithm: LST (°C) = ($Band_{10}$ × 0.00341802 + 149.0) - 273.15
b) Vegetation density was assessed using the Normalized Difference Vegetation Index: NDVI = (NIR - Red) / (NIR + Red)

c) Population density was spatially interpolated using Inverse Distance Weighting (IDW) with 500-metre cell resolution. Point centroids were generated for each population grid cell, creating spatially explicit population density estimates.
d) Composite Heat Stress Index: The Fuzzy Raster (large membership) function integrated multiple risk factors. Each input layer (LST, population density, temperature change projections) underwent fuzzy membership transformation, normalising values to a scale from 0 to 1. The composite index was calculated as:

Heat Stress Index = Fuzzy (LST) + Fuzzy (Population) + Fuzzy(ΔT) + NDVI

3.5 Technical implementation

All analyses were conducted using QGIS 3.44.0 (QGIS Development Team, 2024) with processing algorithms including Raster Calculator, Clip Raster by Mask Layer, Zonal Statistics, IDW Interpolation tools and Fuzzy Raster.

4 Results

An analysis of climate projections, Fig. 2 and Fig. 3, for municipalities in Slovenia indicates significant changes in average temperatures and precipitation between 1981–2010 and the projected period 2071–2100. In addition, a case study of the city of Maribor illustrates the spatial distribution of anticipated heat stress.

Fig. 2 shows the change in average temperature, with an increase ranging from +4.07 to +4.65°C. The lowest warming is expected in the Alpine regions of western Slovenia (approx. +4.1°C), where altitude and more frequent cloud cover mitigate temperature rise. The highest warming, up to +4.65°C, is projected for eastern and southeastern lowlands, creating a clear climatic gradient from the coast towards the continental interior. These results demonstrate that warming in Slovenia will not be uniform but will reflect natural climatic heterogeneity.

Alongside the temperature rise, Slovenia is expected to experience a significant decline in average precipitation (Fig. 3), with changes ranging from approximately -143 mm to -66 mm by the end of the century. The largest declines are expected in the Julian Alps and their foothills, which are key sources of water for the national river system. A more moderate but still noticeable decrease is expected in central

and southern Slovenia. These changes indicate a higher risk of summer drought and water shortages, and reduced snowfall in mountain regions, with possible consequences for agriculture, water management, and winter tourism. Unlike temperature, changes in precipitation are more spatially fragmented, reflecting the greater sensitivity of precipitation to local topography and atmospheric circulation patterns.

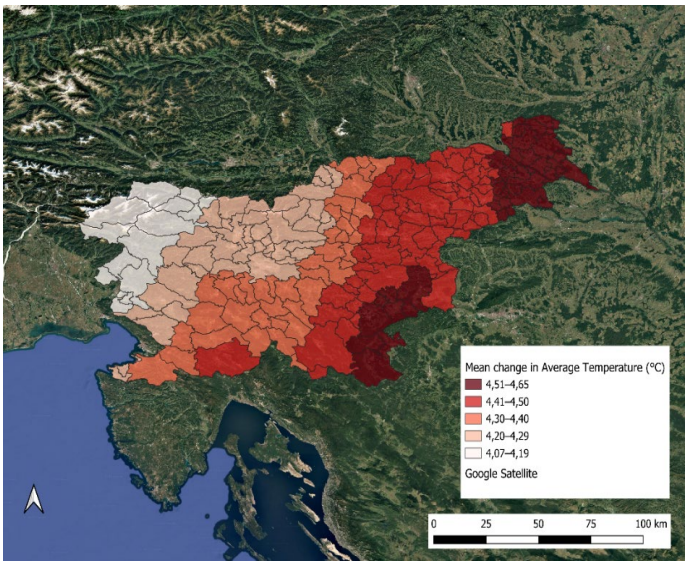

Figure 2: Potential mean change in average air temperature in Slovenian municipalities (2071–2100, 1981–2010)

Source: Authors.

In general, the spatial distribution of heat stress in Maribor, as presented in Fig. 4, shows that the most critical hot spots are located in the city centre and in the southern residential areas, which are strongly affected by the UHI. Meanwhile, the suburban areas and green spaces generally show lower levels of heat stress. In the historic city centre, the cooling potential of the Drava River appears to be limited due to concrete surfaces and dense surrounding development. The analysis, conducted with a spatial resolution of 500 × 500 m, may smoothen local variability, as small features such as parks or stadiums can lower the classification of entire cells despite dense, poorly ventilated, and vegetation-poor surroundings. This highlights the need for more detailed data in future research to better capture the heterogeneity of the urban environment. Overall, the results demonstrate that Maribor will face

significant heat stress by the end of the century, with the highest risks clustered in the high-density urban centre, which highlights the urgent need for urban adaptation measures.

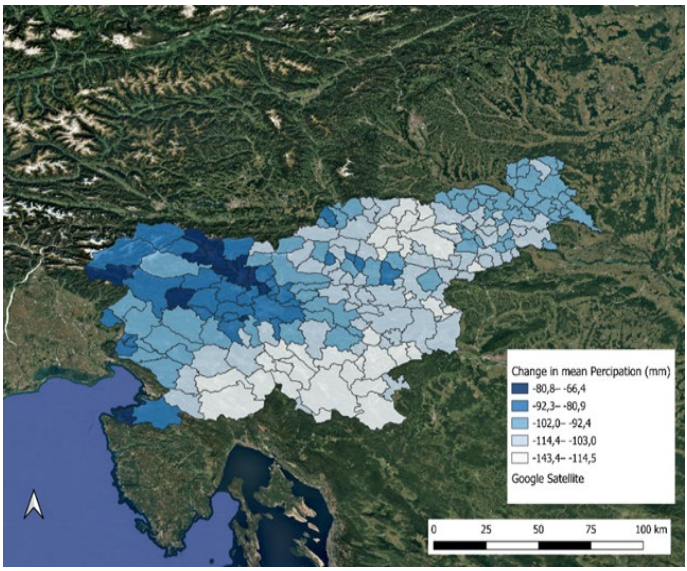

Figure 3: Potential change in mean precipitation in Slovenian municipalities (2071–2100, 1981–2010).

Source: Authors.

Figure 4: Predicted heat stress in Maribor under the MPI-ESM1-2-HR SSP585 scenario, representing a high greenhouse gas emission pathway with radiative forcing reaching 8.5 W/m² by 2100

Source: Authors.

5 Discussion

Our research was heavily dependent on open data sources provided on different scales (global, regional, local). While other articles may focus on either urban morphology or climatic factors (or both), this research relies purely on modelling, predictions based on climatic, land cover and population data. Since UHI research has a rich history, many principles have been defined throughout the years. Indeed, Arnfield (2003) summarised past advances in UHI research based on Oke's generalisations (1982), and concluded that many climatic and non-climatic factors play an important role; therefore, urban heat stress (HS) modelling remains a complex task in modern science.

Heat stress in itself is heavily dependent on population density, as it primarily reflects conditions affecting residential areas rather than the physical spaces that are, or may be, more directly impacted by the urban heat island (UHI) effect (for example, industrial areas). We could also explain HS as a modified metric of UHI, essentially for the quality of human life. Urban morphology, population density, and patterns of residential spaces cannot be predicted, as they rely on planning policies which could change drastically in the future. Measures like NDVI (which are essential in UHI modelling) are also difficult to predict for similar reasons; however, creating predictions like in this research is inevitable to have a ground idea of what the urban climate might look like if no serious changes take place. This study aims to prompt discussion between planners and public policy makers to address these threats against liveable residential areas and to also enhance further investigations in urban climates in Slovenia.

Our research could be improved through collecting more precise local data, validating the demographic situations in the city, implementing more predictor variables, like NDBI (Normalized Difference Built-Up Index) values or comparing the LST values found on urban spaces with the ones measured in rural areas. Researching morphological patterns as a separate topic would make more precise predictions in HS. UHI could also be described as a result of other urban climatic anomalies, such as air flow (Borrego et al., 2006) or precipitation (McLeod et al., 2024). As we examine the interrelated climatic mechanisms, it becomes clear that the city's structure, in a way, shapes its own climatic deviations from the local climate.

Another way to inspect HS is from a health perspective. Studies found a correlation between heat-related health problems and UHI. Long-term HS enhances the effect of heat waves on humans (Tan et al., 2008). These ideas propose not only problems related to living comfort, but also to serious health concern, which further strengthens the sincerity of urban climate research.

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ECOLOGICAL NETWORK AND ECOSYSTEM SERVICES

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To address the growing challenges faced by near-future cities–such as floods, water shortages, and heat islands–urbanism and ways of dwelling must adapt. Currently, two main approaches are favoured: technological solutions and nature-based solutions. To adopt the second option, a good understanding of green infrastructure is essential. This research aims to analyse the ecological network of Maribor, with particular emphasis on ecological corridors. For this analysis, we investigated both the actual ecological network and people's perception of ecosystem services through spatial analysis using GIS tools and a survey. Most respondents expressed satisfaction with the availability and accessibility of green spaces. However, the maps indicate that, although Maribor is surrounded by many green areas, including several Natura 2000 sites, some central districts need improvement. It is recommended to establish green corridors in these areas to create both an ecological network and to enhance ecosystem services.

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EKOLOŠKO OMREŽJE IN EKOSISTEMSKE STORITVE

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Ključne besede:
ekosistemske storitve,
ekološko omrežje,
zeleni koridor,
dobrobit,
zaznavanje,
Maribor

Za soočanje z naraščajočimi izzivi mest v bližnji prihodnosti – kot so poplave, pomanjkanje vode in toplotni otoki – se morata urbanizem in način bivanja prilagoditi. Trenutno prevladujeta dva glavna pristopa: tehnološke rešitve in na naravi temelječe rešitve. Za uveljavitev slednjih je ključno dobro razumevanje zelene infrastrukture. Namen raziskave je analizirati ekološko omrežje Maribora, s posebnim poudarkom na ekoloških koridorjih. V analizi smo preučevali dejansko ekološko omrežje ter zaznavanje ekosistemskih storitev med prebivalci. Izvedli smo prostorske analize z GIS-orodji in anketiranje. Večina anketirancev je izrazila zadovoljstvo z razpoložljivostjo in dostopnostjo zelenih površin. Kljub temu kartografski prikazi kažejo, da je Maribor sicer obdan s številnimi zelenimi območji, vključno z več območji Natura 2000, vendar nekateri osrednji mestni predeli potrebujejo izboljšave. Priporočena je vzpostavitev zelenih koridorjev na teh območjih, saj bi ti prispevali tako k oblikovanju ekološkega omrežja kot tudi k izboljšanju ekosistemskih storitev.

Univerzitetna založba Univerze v Mariboru

1 Introduction

Maribor is the economic, transportation, cultural and tourist centre of northeastern Slovenia and the second-largest city in Slovenia. Its geographically favourable and picturesque location on both banks of the Drava River has significantly contributed to its importance, where, at the transition from the pre-Alpine to the sub-Pannonian world, the narrow Drava valley widens into the Drava plain, in the north it passes through the border of the Podravska region hills with the Kozjak Mountains into the wine-growing region of Slovenske gorice, and in the south it ends at the forest ridge of the Pohorje Mountains (Kert, 1978; EU, 2023).

Research on ecological networks presents numerous opportunities, as it plays a crucial role in preserving biodiversity, adapting to climate change, and enhancing the quality of life in cities (Ignatieva et al., 2011; Pandey & Ghosh, 2023; Sturiale & Scuderi, 2019; Wang et al., 2024). When it comes to Maribor, there is a need to better understand how ecological networks contribute to sustainable city development and strengthen the resilience of urban areas.

At the European level, Natura 2000 is a European ecological network designed to preserve biodiversity, as biodiversity in Europe is declining. Floodplain forests and wetlands are disappearing, and the cultural landscape is undergoing significant changes. To stop and reverse the trend of plant and animal species extinction, the European Union established the Natura 2000 network of sites (Debeljak, 2025). In 1992, the Habitats Directive was adopted, which sets out criteria for the protection of rare, endangered or endemic species of wild animals and plants as well as their habitats. Previously, in 1979, the Bird Directive aimed to protect wild birds present in the EU and their habitats. Together, the two directives form the framework for nature conservation in the EU, the Natura 2000 network. Slovenia has implemented both directives with the Regulation on Special Areas of Conservation (ZRSVN, n.d.).[3] Nonetheless, few reflections exist at the city level in former socialist states on developing and connecting green areas of biological interest. This creates a research gap in understanding how ecological infrastructure functions in medium-sized Central European cities, such as Maribor.

Two main research questions will lead our study:

What is the Ecology Network in Maribor like?

How do people perceive the Ecological Network in Maribor?

2 Ecological network and ecosystem services

The United Nations Environment Program defines ecosystem services as the benefits derived from ecosystems. They are classified into four different categories: provisioning (water, food), regulating (climate and flood/drought regulation, water purification), cultural (aesthetic, educational, recreational), and supporting (soil formation, nutrient supply, water cycles) (UNEP, 2005).

In social-ecological networks (SENs), the ecosystem services can be modelled in different ways, chosen to fit the study's aim and context. It provides a promising approach to representing the complex ecological, social, and social–ecological relationships that influence the service supply of ecosystems. In this context, ecosystem services may be represented as links, nodes, node attributes, or emergent properties of the network (Felipe-Lucia et al., 2022).

Figure 1: Ecosystem services provided by a tree, illustrating provisioning, regulating, supporting and cultural benefits.
Source: Vokřál, 2025

Previous studies have demonstrated that ecological and socio-ecological networks are crucial for comprehending biodiversity conservation and sustainable land use. Research indicates that stakeholder participation, governance structures, and institutional power significantly influence how networks like Natura 2000 operate in practice (Laktic et al., 2020). Research indicates that stakeholder participation,

governance structures, and institutional power significantly influence how networks like Natura 2000 operate in practice.

Beyond Slovenia, landscape fragmentation remains one of the greatest threats to habitats, biodiversity, and ecosystem services (Laktić et al., 2020). To address this challenge, greater attention needs to be paid to the dynamic processes of socio-ecological systems (Xiu et al., 2017).[7]

3 The ecology network in Maribor

To answer the question of what the ecological network is like in Maribor, we drew several maps representing both the land cover, especially green areas, and the protected areas.

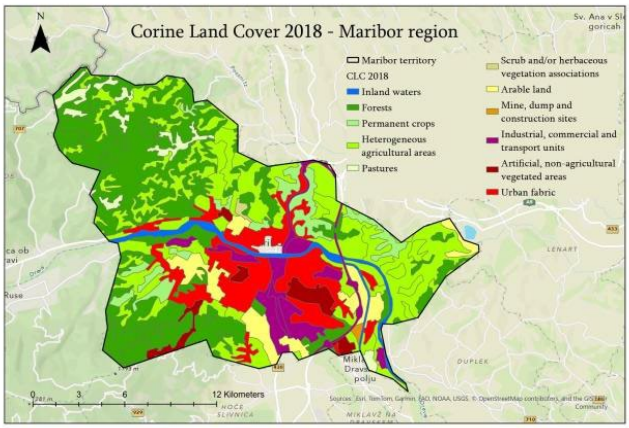

Figure 2: Map of Corine land cover 2018 in the Maribor region.
Source: S. Yakovlieva, 2025

Figure 2 illustrates land-cover patches within the municipality of Maribor. The municipal boundary at the NUTS 3 level was obtained from the Eurostat official dataset, while land cover data was derived from the Copernicus Land Monitoring Service (Corine Land Cover). The map highlights the spatial distribution of urbanised and non-urbanised areas.

Figure 3 illustrates Natura 2000 protected areas within the municipality, which are localised along the Drava River and part of the Pohorje Mountains.

Figure 4 shows several ecological areas, mainly concentrated near the city of Maribor, some of which overlap with the Natura 2000 protected areas.

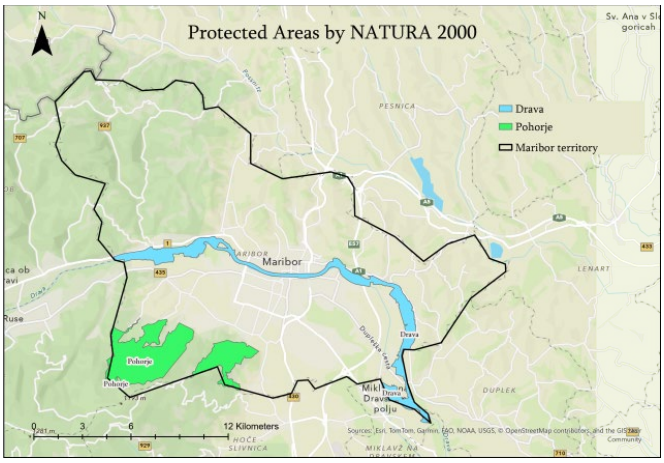

Figure 3: Map of the protected areas by Natura 2000.
Source: S. Yakovlieva, 2025

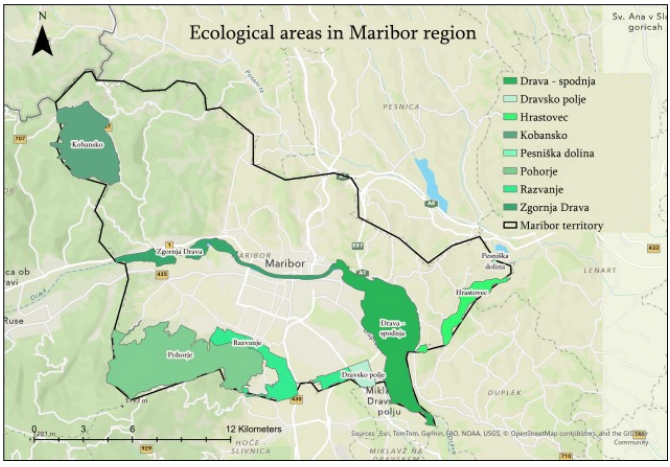

Figure 4: Map of ecological areas in the Maribor region.
Source: S. Yakovlieva, 2025

Figure 5 gives an overview of all green areas within the municipality. To better illustrate green areas within the city border, a more detailed scale is applied in the following map (Figure 6).

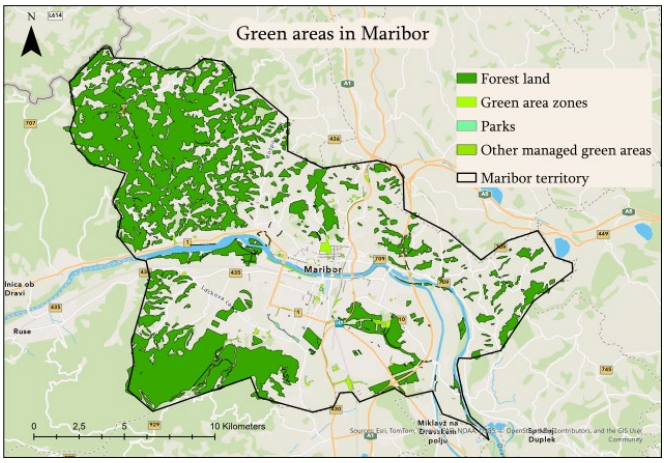

Figure 5: Map of green areas in Maribor.
Source: S. Yakovlieva, 2025

Figure 6: Map of green corridors in the central urban zone of Maribor.
Source: S. Yakovlieva, 2025

Figure 6 presents the green corridors, demonstrating the level of connectivity between patches of green areas in the central urban zone. The results indicate that ecological networks in Maribor are relatively well-connected.

Figure 7: Map of green corridors along the Drava river in Maribor.
Source: S. Yakovlieva, 2025

The map in Figure 7 focuses on the Drava River, which connects the northern and southern parts of the city. It highlights adjacent green spaces and pedestrian zones along the river, which provide important ecosystem services related to recreation and contribute to mental and physical health.

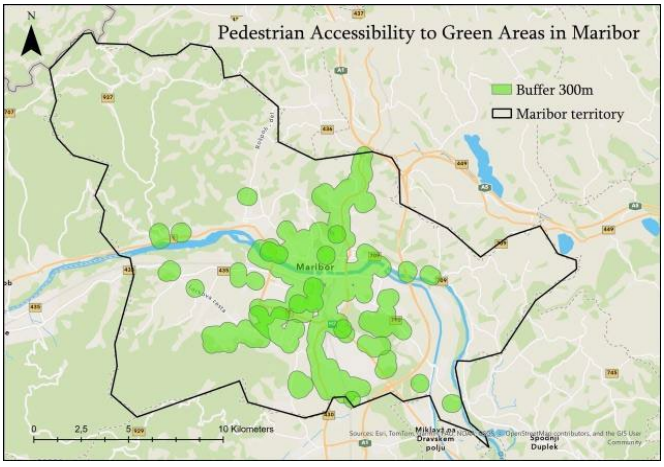

Figure 8: Map of the pedestrian accessibility to green areas in Maribor.
Source: S. Yakovlieva, 2025

Figure 8 analyses pedestrian accessibility to green areas using a 300-metre buffer. This threshold is based on the "3-30-300" rule, which states that for high-quality urban life, every resident should have access to a green area within 300 metres of

their home (Lopez et al., 2025). The pedestrian accessibility map illustrates the accessibility of urban green spaces. The analysis excludes forests and green areas that are not designed or equipped for public use, i.e., spaces without urban infrastructure such as parks, paths, or recreational facilities. The buffer zone was created to show how city residents can access and utilise green spaces within the urban environment.

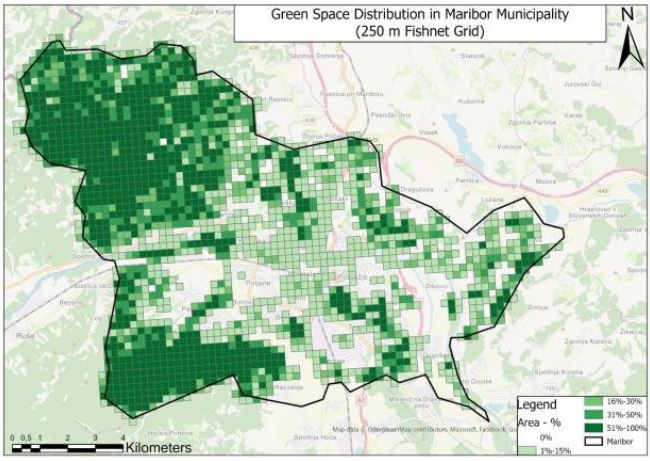

Figure 9: Map of green space distribution in Maribor.
Source: E. Cherkez, 2025

The map in Figure 9 utilises a fishnet grid approach to present the distribution of green spaces in the municipality of Maribor. The study area was delineated using a uniform grid of 250 x 250 m cells (6.25 ha), which was then clipped to the municipal boundary. For each cell, the proportion of green space was calculated by intersecting the grid with green space polygons and expressing the result as a percentage of the cell area.

The map utilises a graduated colour scheme, where lighter shades represent cells with minimal or no green space, while darker shades indicate higher levels of green coverage. The results reveal a clear spatial pattern: peripheral areas of Maribor are characterised by high percentages of green space, mainly due to forests and agricultural land, whereas the urban core shows limited coverage, reflecting dense built-up areas.[2]

The previous cartographies aimed to assess the ecological structure of the city of Maribor and evaluate the overall quality of its urban environment using spatial data. The analysis focused on the distribution and accessibility of green spaces, ecological zones, and protected areas designated under the Natura 2000 network. Collectively, these datasets provide a comprehensive understanding of how green areas are integrated into the broader ecological framework of the city and the extent to which they are institutionally protected at both national and European Union levels. The integration of accessibility maps into the study enabled a detailed examination of how urban residents can physically access and utilise green spaces. This component highlights the interconnection between green infrastructure and quality of life in Maribor, emphasising the role of ecological areas in enhancing the physical and psychological well-being of the population.

4 The perception of the ecological network in Maribor

In addition to the previous mapping of the ecological networks, we conducted interviews with people present in the streets of Maribor to collect their perceptions of green areas. During the week of the summer school, we interviewed a total of 20 individuals–11 women and 9 men–resulting in a relatively balanced sample. Most participants are either residents (8 people) or commuters, including students (9 people), while only 3 respondents are visitors. Walking (7 people) and driving (6 people) are the most common transport modes, followed by public transport (4 people) and cycling (3 people), indicating that active mobility is important, but car use still plays a significant role.

Most respondents use green spaces in Maribor very frequently (several times a week or daily), showing that nature and parks are an essential part of everyday life in the city. The Drava riverbanks (9 mentions), parks (7), Pohorje (6), and Piramida (6) emerged as the most popular natural destinations, highlighting their importance for the city's ecological network and for connecting residents with nature. At the same time, the main reasons stopping people from visiting these areas more often are lack of time (5 people), work or studies (5), and weather conditions (3), suggesting that external and personal factors are more significant barriers than accessibility or safety. When asked about the most important benefits of green areas, respondents emphasised clean air (9 mentions), shade (6), recreation (6), and relaxation (6), underlining that people value both the environmental and well-being functions of urban green spaces.

For some questions, respondents provided multiple answers, which is why the total number of mentions exceeds the number of participants.

5 Discussion

The first part of the research, spatial analysis, demonstrates the current state of the ecological network of Maribor. The outcome illustrates a positive picture of how these systems are functioning. The second part complements the previous one, providing information on how people living or temporarily staying in Maribor use services and how they evaluate their quality. Overall, we observe a positive situation in both aspects: what the system provides and how communities use it and feel. The lack of time is often mentioned as a constraint to frequenting green areas, suggesting that incorporating green spaces into everyday spaces could enhance the benefits of green corridors.

Unfortunately, time constraints restricted the scope of our study. A potential future part of the research could delve into specific areas of Maribor and examine them in greater detail. Biological aspects, such as the distribution of biodiversity and species, as well as the health of residents, could also be included. Nevertheless, the resources and data we gathered offer an overall view of the city.

6 Conclusion

This research was initiated by emphasising the significance of ecological networks and ecosystem services in shaping sustainable urban development in Maribor. By combining spatial analysis with the perceptions of residents, commuters, and visitors, it becomes evident that green corridors, protected areas, and accessible urban green spaces play a key role not only in maintaining ecological connectivity but also in supporting the well-being of local communities. The positive alignment between the current state of the ecological network and the way people use and value these services underlines the city's potential to strengthen resilience against environmental and social challenges, especially since the literature study demonstrates that ecological infrastructure is not only a matter of biodiversity conservation but also a foundation for healthier, more inclusive, and climate-adapted urban living.

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Urban Agriculture and Quality of Life: A Comparative Analysis of Different Forms of Urban Agriculture and Its Effects on Welfare

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This paper explores the diverse forms and functions of urban and peri-urban agriculture (UA/PUA) across six European cities–Bayreuth, Prishtina, Budapest, Venice, Brno, and Maribor–highlighting their contributions to social well-being, environmental sustainability, and community development. Drawing on literature review and field research, including interviews conducted in Maribor, the study analyses how UA strengthens local food systems, promotes ecological awareness, and enhances emotional and social resilience in urban communities. Comparative insights reveal that while UA initiatives share common goals of sustainability and inclusion, their success depends on tradition, local governance, institutional support, and civic participation. The Maribor case exemplifies how educational gardens, cooperatives, and community-supported agriculture (CSA) models can integrate learning, production, and social interaction. Overall, the findings suggest that UA serves not merely as a source of food but as a transformative social practice fostering connection, sustainability, and a sense of place in contemporary urban environments.

Keywords:
community-supported agriculture, social well-being, environmental sustainability, urban resilience, food production

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URBANO KMETIJSTVO IN KAKOVOST ŽIVLJENJA: PRIMERJALNA ANALIZA RAZLIČNIH OBLIK URBANEGA KMETIJSTVA IN NJIHOVIH VPLIVOV NA BLAGINJO

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Ključne besede:
skupnostno podprto kmetijstvo, socialna blaginja, okoljska trajnost, urbana odpornost, proizvodnja hrane

Prispevek obravnava raznolike oblike in funkcije urbanega in periurbanega kmetijstva (UA/PUA) v šestih evropskih mestih – Bayreuth, Priština, Budimpešta, Benetke, Brno in Maribor – ter izpostavlja njihov prispevek k socialni blaginji, okoljski trajnosti in razvoju skupnosti. Na podlagi pregleda literature in terenskega raziskovanja, vključno z intervjuji v Mariboru, raziskava analizira, kako UA krepi lokalne prehranske sisteme, spodbuja ekološko ozaveščenost ter povečuje čustveno in socialno odpornost urbanih skupnosti. Primerjalni vpogledi kažejo, da imajo pobude UA skupne cilje trajnosti in vključevanja, vendar je njihov uspeh odvisen od tradicije, lokalnega upravljanja, institucionalne podpore in participacije prebivalcev. Primer Maribora ponazarja, kako lahko izobraževalni vrtovi, zadruge in modeli skupnostno podprtega kmetijstva (CSA) povezujejo učenje, pridelavo in socialno interakcijo. Rezultati kažejo, da UA ni zgolj vir hrane, temveč transformativna družbena praksa, ki spodbuja povezanost, trajnost in občutek pripadnosti v sodobnih urbanih okoljih.

Univerzitetna založba Univerze v Mariboru

1 Introduction

Urban and peri-urban agriculture (UA/PUA) is a rapidly expanding practice worldwide that integrates food production with community, environmental, and educational functions. It encompasses activities such as vegetable cultivation, small animal husbandry, food processing, and food distribution within and around urban areas. Due to its proximity to urban life, this form of agriculture provides important solutions to global challenges, including climate change, food security, and environmental sustainability. Recent studies estimate that up to 30% of the urban demand for vegetables could be met through urban and peri-urban agriculture (Pradhan et al., 2023).

In addition to providing food, UA offers numerous social, cultural, and environmental benefits. Engaging in such activities promotes social inclusion, strengthens community ties, and improves the mental well-being of both producers and consumers. Recent empirical evidence from the United States of America confirms that urban gardening activities–especially vegetable gardening in low-income urban households–are significantly associated with higher levels of emotional well-being and happiness (Ambrose et al., 2020). These positive effects, such as enhanced social relationships and reduced stress, are particularly important in today's cities, where social isolation is widespread (Pradhan et al., 2023; Hawkes & Acott, 2013).

UA takes diverse forms depending on local traditions, economic conditions, and policy frameworks, yet it consistently pursues the common goal of sustainable urban development. Beyond its social and economic dimensions, UA contributes to environmental resilience by mitigating urban heat islands, enhancing rainwater retention, conserving soil quality, and supporting urban biodiversity (Pradhan et al., 2023). Recent research further indicates that UA can enhance environmental sustainability by reducing greenhouse gas emissions, moderating urban temperatures, managing flood risks, and strengthening biodiversity; however, these benefits depend heavily on appropriate policy support and integration into urban land-use planning (Ebissa et al., 2024). Moreover, studies highlight that UA and green infrastructure together deliver multiple ecosystem services–including provisioning, regulating, cultural, and supporting functions–thus reinforcing their joint potential for sustainable urban planning (Wentworth, 2017). A policy brief by

Margaras & Michelogiannaki (2025) similarly emphasises that UA not only involves food-production activities but also delivers social, educational, and recreational benefits, while its contribution to food security, climate resilience, and social inclusion is increasingly recognised at the EU level.

UA can take many forms depending on local conditions, cultural traditions, and available space. The most common types include household and allotment gardens, community gardens, rooftop and vertical farms, educational and therapeutic gardens, and community-supported agriculture (CSA) systems that directly connect consumers and producers. While household and community gardens focus on self-provisioning and social interaction, CSA initiatives emphasise shared economic responsibility and solidarity between farmers and citizens (FAO & Urgenci, 2016). Other models–such as urban cooperatives, school gardens, and municipal greening programmes–further expand the social and educational dimensions of UA. Together, these diverse approaches form an integrated network that supports local food systems, promotes circular economies, and enhances urban resilience (Pengal & Simoneti, 2015; Lucertini & Di Giustino, 2021; Koopmans et al., 2017).

From a socio-economic perspective, UA generates employment and income opportunities, particularly in disadvantaged urban areas, thereby contributing to reduced food insecurity and improved living conditions. However, the long-term sustainability of these initiatives relies on adequate access to land, infrastructure, technical assistance, and supportive public policies (Pradhan et al., 2023). Furthermore, recent analyses confirm that UA contributes to nearly all of the United Nations' Sustainable Development Goals (SDGs), though its effectiveness depends strongly on local implementation and governance frameworks (Pradhan et al., 2024).

Within this context, the present study aims to explore different forms of UA across selected European cities and to analyse their contribution to individual and community well-being. As part of this comparative approach, the authors first examined the state and forms of UA in their own regions and cities and subsequently conducted fieldwork in Maribor, Slovenia. The central research question guiding the study is therefore: *What forms of urban agriculture exist across different European contexts, and how do they contribute to individual and community well-being?*

2 Methodology

To address the research questions, we adopted a qualitative approach that combined an extensive literature review with fieldwork in the form of a site visit and two expert interviews conducted in Maribor, Slovenia. The fieldwork aimed to provide a deeper understanding of the local context of UA and its social dimensions. During a guided site walk-through, the research team visited key locations in Maribor, including the city's first officially recognised community garden and the Dobrina Cooperative shop in the city centre.

Two semi-structured interviews were conducted to complement the field observations. The first interview was carried out with Simona T. Z., a representative of the Dobrina Cooperative and, at the same time, one of the pioneers behind the establishment of the Community Urban Eco Garden in Maribor during the European Capital of Culture project in 2012. The second interview was conducted with Polonca F., a consumer participating in a CSA scheme, who regularly sources food from the biodynamic farm Zlate Misli while living and working in the urban area.

3 Examples around Europe

We explore different forms and scales of UA in six European cities–Bayreuth (Germany), Prishtina (Kosovo), Budapest (Hungary), Venezia (Italy), Brno (Czech Republic), and Maribor (Slovenia)–to provide a holistic and interdisciplinary perspective on the topic. The comparative analysis highlights how urban agriculture operates in diverse social, cultural, and institutional contexts, revealing both shared opportunities and local specificities that shape its development.

3.1 Urban agriculture in Bayreuth

Although Germany has a highly industrialised agricultural sector (Bauerkämper, 2004), various forms of UA have expanded considerably in recent decades. Waiting lists for *Schrebergärten* (allotment gardens) are consistently long, as residents increasingly seek opportunities for small-scale cultivation and closer contact with nature–often preferring productive gardening over purely ornamental use (Kühn, 2025).

Across Germany, UA initiatives range from allotment and community gardens to self-harvest farms and semi-commercial urban farming models. Studies in the Bonn/Rhein-Sieg region, for example, reveal that motivations for engagement include environmental education, community building, and local food production. However, while UA demonstrates clear potential for more sustainable urban food systems, it still remains a niche practice requiring stronger policy and institutional support (Hirsch et al., 2016).

A particularly prominent form of UA in Germany is *Solidarische Landwirtschaft* (solidarity-based or community-supported agriculture, CSA), which promotes regional and organic farming through direct cooperation between producers and consumers. Members share production costs and harvests, fostering transparency, joint decision-making, and social responsibility. According to the FAO & Urgenci (2016) overview, Germany hosts one of the most dynamic CSA networks in Europe, with such initiatives enhancing trust in local food systems and strengthening community resilience.

In Bayreuth, the SoLaWi Bayreuth initiative exemplifies this model of urban–rural cooperation. It connects local farmers with approximately 70 to 80 urban households, who contribute monthly fees in exchange for fresh, seasonal produce such as vegetables, fruits, and herbs delivered directly from nearby farms (One for the Planet, n.d.). Beyond providing food, SoLaWi Bayreuth plays an active role in environmental education and biodiversity conservation. One of its flagship programmes, Streuobst-Wissen ("Knowledge about Traditional Orchard Meadows"), combines organic farming with nature conservation and experiential learning. The project preserves traditional orchard meadows (*Streuobstwiesen*) around Bayreuth through educational workshops, pruning demonstrations, and school-based activities. It promotes awareness of the ecological value of these peri-urban landscapes while fostering intergenerational learning and community engagement (SoLaWi Bayreuth, n.d.). Together, these examples demonstrate how Bayreuth's approach to urban agriculture bridges the gap between citizens and their surrounding environment, merging food production with education, biodiversity protection, and social inclusion. Such initiatives show that, when supported by municipalities and civic organisations, UA can contribute meaningfully to resilient urban food systems in Germany.

Figure 1: a) Community flea market and b) Fruit trees pruning workshop organised by SoLaWi Bayreuth
Source: SoLaWi Bayreuth (n.d.)

3.2 Urban agriculture in Prishtina

While Kosovo has supported agricultural development primarily in rural areas, urban regions continue to experience a significant loss of fertile land due to rapid urbanisation and construction, thereby limiting opportunities for local food production. Ramadani and Bytyqi (2018) emphasise that rapid urban expansion, unplanned construction, and surface mining have led to substantial losses of fertile agricultural land in Kosovo, underscoring the need for strategic urban planning and the preservation of green spaces.

Small-scale practices such as household and kitchen gardens, however, have shown potential to provide fresh food–especially during periods of economic hardship. For instance, during years of higher unemployment and poverty (2014 and 2017), the area devoted to home gardening increased notably, suggesting that citizens relied on such practices as a strategy for both survival and well-being. Moreover, initiatives such as the Urban Garden at Termokiss in Prishtina have served as positive examples of creating community spaces that strengthen social ties and provide free food for vulnerable groups during the COVID-19 pandemic (Caka, 2022). One notable initiative, the project Bread for All (Figure 1a), was carried out by volunteers of Termokiss to prepare and distribute food to the homeless and socially vulnerable,

demonstrating the role of urban gardens as instruments of solidarity and community resilience (Olegovich Rakhmanin, 2022). Termokiss itself–a former heating-plant building transformed into a community-run centre and urban garden–exemplifies how old industrial infrastructure can be reused for civic and ecological purposes (Figure 1b). It symbolises the broader movement of citizens reclaiming urban space for community use, creativity, and sustainability, thereby "challenging old policies with new practices" (Rexha, 2022).

A particularly notable example of public engagement with urban greening was the temporary Urban Garden at the Heart of Prishtina, installed at Skënderbeu Square on Earth Day (April 19, 2021). The project, organised by UNDP (United Nations Development Programme), UN-Habitat, the Innovation Centre Kosovo (ICK), and UNDCO, remained open for three weeks and aimed to raise public awareness of environmental sustainability, the green economy, and sustainable urban development (Figure 3). This centrally located, short-term intervention demonstrated how public green installations can enhance citizens' connection to nature, increase environmental consciousness, and offer accessible green spaces within a densely built city core (UN Kosovo, 2021).

Figure 2: a) Bread for All project at Termokiss.
Source: Olegovich Rakhmanin, 2022

Nevertheless, Kosovo continues to face major structural challenges, and institutional support for urban agriculture remains limited. Existing legislation on agriculture, spatial planning, and food systems still does not adequately integrate UA or promote community-gardening initiatives (Caka, 2022). Despite these constraints, urban agriculture in Kosovo presents a valuable opportunity to address food-security concerns, strengthen social cohesion, and enhance the overall quality of urban life. Integrating urban agriculture into frameworks for urban planning and sustainable development–through coherent national strategies, legal reforms, targeted subsidies,

and institutional support–could facilitate the creation of healthier, more inclusive, and more resilient urban environments.

3.3 Community gardens in Budapest

UA in Hungary has evolved rapidly over the past decade, especially in the form of community gardens (*közösségi kertek*). According to FAO & Urgenci (2016), Hungary has developed a growing number of local food and community-based initiatives since the early 2010s, often led by civic organisations and informal neighbourhood groups. While agricultural activism is less established than in some neighbouring countries, these initiatives represent a grassroots response to urbanisation, limited access to green spaces, and a renewed interest in sustainable lifestyles.

In Budapest, both small and large community gardens have been established in recent years, many of them located beneath or near large panel-block housing complexes. These gardens have been developed with the support of municipalities and NGOs and are often coordinated by the Hungarian Contemporary Architecture Centre (Kortárs Építészeti Központ) through its Közösségi Kertek – KEK (Community Gardens) programme. Since around 2010, KÉK has been instrumental in promoting urban gardening by developing methodologies, legal frameworks, and pilot projects in collaboration with local authorities, private firms, and civic groups. According to the programme, more than 80 community gardens have been created in Budapest under its coordination (Közösségi Kertek, n.d.).

One of the largest examples is the Kerthatár Community Garden in District IX, which covers approximately 2,600 m² and offers 90 individual plots (Figure 3a). Annual membership fees range from 2,000 to 12,000 HUF (approximately 5–30 EUR), with discounts available for retirees, families with young children, and other vulnerable groups. Due to high demand, waiting lists are common, reflecting the popularity and social value of these shared green spaces (Közösségi Kertek, n.d.). Some other examples described by Mseddi and Simon (2022) further illustrate the diversity of Budapest's community gardens in terms of size, social role, and spatial context. The Kisdiófa Garden (Figure 3b) was established on a small vacant lot in the city centre and functions as a micro-oasis for residents seeking greenery and social contact in a densely built neighbourhood. The Auróra Garden (Figure 3c) forms part of a broader civic and cultural centre, combining organic cultivation with

artistic and social activities that foster inclusion and participatory democracy. The Rózsa Garden is one of the oldest and most structured community gardens in the city, offering individual plots and shared spaces for families and intergenerational learning. Meanwhile, the Tolnai Garden (Figure 3d) demonstrates how temporary use of underutilised land can bring life and cooperation to socially disadvantaged areas, even under uncertain tenure conditions. Together, these examples reveal how community gardens in Budapest contribute to social cohesion, environmental awareness, and the creative reuse of urban space despite challenges of temporality and limited institutional support.

Figure 3: Examples of community gardens in Budapest: a) Kerthatár Community Garden and b) Kisdiófa Garden (source: Közösségi Kertek, n.d.)**; c) Auróra Garden and d) Tolnai Garden** (source: Mseddi & Simon, 2022)

Community gardens in Budapest serve not only as spaces for cultivation but also as hubs for social interaction, recreation, and environmental education. They host workshops, children's programmes, and neighbourhood events, encouraging community cooperation and environmental stewardship. Mseddi and Simon (2022) emphasise that these gardens contribute to "a new urban ecology", fostering environmental awareness while helping residents reclaim agency over urban space.

Their study also reveals that community gardens often act as informal laboratories for participatory urban design, where citizens, NGOs, and local authorities experiment with new models of cooperation and collective governance.

Nevertheless, community gardens in Budapest face several challenges. A recent study by Mseddi and Simon (2022) found that most gardens operate on temporarily leased land, making long-term sustainability uncertain. The authors also highlight the lack of formal legal frameworks, unequal access to resources among districts, and the dependence on a few active NGOs, such as KÉK, for project continuity and advocacy. Despite these limitations, the study concludes that community gardens represent a promising tool for participatory urban design and social innovation when local governments and civil organisations collaborate effectively.

3.4 Urban agriculture in Venezia

UA and PUA in Italy are highly diverse and deeply rooted in regional traditions, yet they have gained renewed importance in recent years through community-based and socially inclusive projects. According to FAO & Urgenci (2016), Italy has one of the most active CSA networks in Southern Europe, with over one hundred local initiatives and cooperatives promoting sustainable food systems, solidarity, and urban–rural linkages. These projects often combine environmental education, short food-supply chains, and social goals, particularly in metropolitan areas such as Milan, Bologna, Turin, and Venice.

Recent research in the Venetian region highlights the growing potential of PUA as a strategic response to climate change and food insecurity. Using the case of Mestre (Venice), Lucertini and Di Giustino (2021) show that transforming under-utilised urban land–such as rooftops, abandoned lots, and peri-urban fields–into productive agricultural areas can both reduce CO_2 emissions and increase local food production. Their findings confirm that UA and PUA can serve as effective tools for climate change mitigation and adaptation while supporting sustainable urban development in Northern Italy.

The fast-paced lifestyle of Italian city dwellers often distances them from agricultural practices, yet this separation has inspired a renewed awareness of food origin, health, and community well-being. UA initiatives thus provide opportunities to reconnect

with nature and promote more sustainable lifestyles. One inspiring example are the Orti della Pace ("Gardens of Peace") in Bologna, a community project that welcomes people with disabilities, trauma survivors, and the elderly, enabling them to participate in gardening and social interaction. The initiative embodies the principle of "taking care of the garden so that it can take care of us," highlighting gardening as both a therapeutic and community-building activity (PilastroBologna, 2025). In Milan, Allegricola represents a cooperative model focused on reclaiming abandoned urban spaces and transforming them into gardens that blend education, recreation, and food production. Located in the Trenno district, it serves as a community hub where families and individuals cultivate vegetables, participate in workshops, and engage in local food networks (Allegricola, n.d.). Similarly, ORME – Orti Metropolitani in Turin functions as a digital platform connecting citizens with urban gardening initiatives and strengthening the visibility of grassroots projects (ORME, 2025).

In the Venetian metropolitan area, UA and PUA have become increasingly visible through initiatives that combine sustainability with social inclusion. The Municipality of Venice has promoted the creation of *orti urbani*–urban gardens designed to foster active ageing and intergenerational exchange. These gardens provide opportunities for residents, especially older citizens, to engage in physical activity, grow their own food, and connect with neighbours, thereby improving social cohesion and well-being (Comune di Venezia, n.d.; La Piazza Web, 2023). Urban gardens are recognised as spaces of high social value (*valenza sociale*), promoting sustainability, inclusion, and a better quality of life. The city currently manages more than 120 municipal gardens distributed across districts such as Zelarino, Favaro, and Marghera, providing land, infrastructure, and technical support to local associations (Comune di Venezia, n.d.).

Beyond these local examples, a broader transformation is emerging among young Venetians who are redefining the relationship between agriculture, innovation, and urban life. As FreedomLab (2023) notes, a new generation of farmers is embracing sustainable practices, short supply chains, and collaborative models that integrate traditional know-how with digital tools. This movement reflects the wider trend of agri-food urbanism–a form of sustainable development that reimagines food production as an integral part of urban design and community resilience.

3.5 Urban agriculture in Brno

In the Czech Republic, CSA has experienced rapid development over the past decade. The first CSA partnership appeared in 2009, and by 2020 there were approximately 80 initiatives serving around 2,000 families. These are coordinated through networks such as the Association of Local Food Initiatives (AMPI) and Komunitou Podporované Zemědělství or KPZ (KPZ, n.d.). This model provides an alternative to industrial food systems and strengthens local communities by fostering trust-based relationships between farmers and citizens.

In Czechia, the CSA movement operates through the national platform KPZ, which serves as the central hub for such type of UA. The network provides education, coordination, and communication between farmers and consumers, supporting the development of local food systems based on solidarity and transparency. Through its interactive map, the platform connects dozens of active CSA groups and farms across the country, helping citizens find nearby producers and join local partnerships. In addition to coordinating national activities, KPZ offers training courses, educational videos, and practical guidelines for members (farmers and consumers), promoting fair prices, shared responsibility, and local (organic) production methods. This decentralised, participatory model demonstrates how CSA in Czechia functions not only as an alternative food network but also as a community-based approach to sustainable agriculture and civic engagement (KPZ, n.d.).

UA in Czechia also takes the form of community gardens and allotments, which have become increasingly popular in cities such as Prague and Brno. Sovová (2015) examines the everyday practices of Brno's allotment gardeners, revealing how they engage in "quiet sustainability"–small-scale, self-provisioning activities that promote environmental awareness, food self-sufficiency, and community connection. Her findings show that allotment gardens function not only as productive spaces but also as important sites for social interaction and informal environmental education. Building on this local perspective, Pixová and Plank (2024) analyse urban food governance in Czech post-socialist cities and identify a persistent gap between municipal strategies and grassroots initiatives such as community gardens and local food networks. While sustainability and food issues are gradually entering policy agendas, urban agriculture remains marginalised, with limited institutional support

and weak cooperation between public authorities and civic actors. Together, these studies highlight that urban agriculture in Brno is sustained primarily by bottom-up engagement rather than policy frameworks, functioning as both a social and ecological practice that strengthens local resilience and urban well-being.

The Kraví hora allotments in Brno are a prominent example, covering 14 hectares in the city centre and encompassing more than 500 individual plots (Koopmans et al., 2017). Established in the 1930s, the site has evolved into a multifunctional space where food production, recreation, and social life intersect. The area also features a public park, swimming pool, and astronomical observatory, illustrating the integration of productive and recreational urban green spaces. Authors highlight that Kraví hora plays a crucial "place-making" role within Brno: gardeners perceive their plots as personal and family heritage, often passed down through generations. This sense of belonging transforms the allotments into a form of "home" within the city, reinforcing social ties and continuity across generations (Figure 5b). Despite the site's cultural and historical value, however, the allotments remain under pressure from urban redevelopment plans that propose converting parts of the area into public parks or sports facilities. This tension between the private and public use of urban green space exemplifies broader planning challenges for urban agriculture across Europe.

Beyond the long-established Kraví hora site, Brno hosts several other allotment and community gardens that play important ecological and social roles. A study by researchers from Masaryk University, reported by Solaříková (2021), revealed that urban gardens across the city function as vital microhabitats supporting pollinators, birds, and soil biodiversity. These green enclaves also help regulate urban microclimates and provide residents with recreational and psychological benefits. However, many of these sites face increasing pressure from urban development, as zoning plans often reclassify garden areas for potential construction. The findings underline that urban gardens in Brno represent not only spaces of self-provisioning and community life but also important ecological assets that contribute to the city's environmental resilience.

3.6 Urban agriculture, happiness and the community – a case study from Maribor

UA in Maribor represents a vibrant mosaic of practices that connect education, community development, ecological awareness, and sustainable food systems. Various forms of UA and PUA coexist in the city–from educational gardens in schools, kindergartens, and the university to community gardens, cooperatives, and CSA models. These initiatives illustrate how food production, learning, and social interaction are interwoven into the urban fabric, contributing to a greener and more connected city. This diversity is deeply rooted in Slovenia's long-standing tradition of small-scale food production and home gardening (MKGP, 2020). Such cultural orientation toward gardening as both a practical and emotional activity provides fertile ground for the development of diverse UA initiatives–many of which have found a home in Maribor.

One of the most widespread programmes in Slovenia is the Organic School Gardens Programme (*Šolski ekovrtovi*), launched in 2011, which now supports more than 400 schools and kindergartens in establishing organic gardens integrated into the curriculum (Inštitut za trajnostni razvoj, n.d.). These gardens act as living classrooms for science, mathematics, art, and language learning while promoting ecological awareness and cooperation. In 2025, the national Urban Garden Stories competition involved approximately 1,700 mentors and 17,500 students across Slovenia, illustrating the educational and social reach of school-based urban agriculture (Interreg Central Europe, 2025).

Building on this educational approach, a similar initiative has been developed at the University of Maribor, where student dormitories in the Koroška vrata district have created an educational garden featuring organically managed grapevines, vegetables, and herbs (Figure 4). Installed in 2021, the raised-bed gardens allow students to grow their own produce and promote sustainable habits within campus life. The project–coordinated by the Student Council of the University Dormitories–encourages peer collaboration and environmental stewardship, demonstrating how urban agriculture can foster community spirit and sustainability among young adults (personal communication with a former student involved in the project).

As explained by Simona T. Z., our interviewee–who was involved from the very beginning and is now employed at the Dobrina Cooperative–the first officially recognised Community Urban Garden in Maribor was established in 2012 during the European Capital of Culture programme Urban Furrows. Supported by the Seed Guardians Association, the gardeners founded the Urban Eco Garden Association, which leased the land from the municipality at a symbolic price and committed to organic cultivation, making it the first community-based, organically certified urban garden in Slovenia (group certification only became feasible after amendment of the EU organic regulation Reg. (EU) 2018/848, effective in 2022). The garden covers approximately one hectare and includes around 50 plots, eight tool sheds, and a community house for meetings and workshops, all accessible to people with disabilities. Participants receive training in organic farming techniques and regularly attend workshops focused on sustainability and knowledge transfer to younger generations. Pengal and Simoneti (2015) recognise this initiative from Maribor as a milestone in the development of community gardening in Slovenia, demonstrating how local collaboration between citizens, NGOs, and municipal authorities can transform neglected urban spaces into productive and socially inclusive environments.

Figure 4: Student community garden.
Source: own

Today, the Urban Eco Garden Association remains active in promoting sustainable resource management and community engagement. It is part of the national platform Dovolj za vse – Sustainable Community Resource Management, which

connects local initiatives in food sovereignty, social inclusion, and environmental education. The association also participates in national and international projects and has produced the *Manual for Establishing a Community Garden* in 2017, offering practical guidelines for municipalities and community groups (Dovolj za vse, n.d.).

Figure 5: a) Entrance and b) Community garden in Maribor
Source: own

Beyond municipally supported initiatives, other local actors also play an important role in connecting producers and consumers. One of the most active actors in Maribor is the Cooperative Dobrina, founded in 2011 by small farmers from the Slovenske gorice region with the aim of supporting sustainable family farming, ensuring fair payment for producers, and improving access to high-quality local food. In 2015, the cooperative obtained the official status of a social enterprise (Zadruga Dobrina, n.d.).

As indicated on its website and explained by Simona T. Z., an employee interviewed for this study, the cooperative currently has around 130 members, of which slightly more than 60 small farms are actively offering their products at the time of writing this contribution. Maribor residents can access local produce through Dobrina's shop in the city centre, its online store, or by subscribing to weekly or biweekly boxes of seasonal fruit and vegetables–small (3 kg for 10 €), medium (5 kg for 15 €), or large (8 kg for 20 €). The boxes are delivered free of charge to households in Maribor

and its surroundings. In its stores, the cooperative offers over 600 products across diverse categories, including fruit, vegetables, grains, oils, vinegars, beverages, meat and dairy products, pastries, honey, and artisanal goods. The available food items are produced either organically, under conversion to organic farming, through integrated production (a national standard), or by small-scale conventional farms. Dobrina also supplies over 70 public institutions, such as schools and kindergartens in the Maribor and Slovenske gorice regions, and provides catering services featuring ingredients produced by its members. These include traditional finger foods, soups, desserts, and local beverages such as wine, spirits, and juices. As a legal entity, the cooperative actively participates in projects co-financed through various measures of the Common Agricultural Policy and collaborates within consortia of local action groups, contributing to regional development and sustainable food systems (Simona T. Z., interview, Maribor, August 2025; Zadruga Dobrina, n.d.).

A different but complementary model of urban–rural cooperation in Maribor is represented by a CSA system operated by the biodynamic farm Zlate Misli (Golden Thoughts), which holds an international Demeter certification. Polonca F., our second interviewee, who lives and works in Maribor and has been a long-term customer of the farm, shared further details about how this system operates. As she explained, her family sources most of its vegetables from Zlate Misli through a prepayment scheme. According to her, the process is quite user-friendly: customers top up an online virtual wallet, depositing either smaller sums or a larger contribution that effectively represents a share in the farm's annual production–similar to crowdfunding. Depending on the balance in their account, they can fill a virtual box each week (or every other week) with the vegetables currently available on the farm. On average, a box weighs around 6.5 kg and includes seven or more types of seasonal vegetables, although customers can adjust the content according to their preferences. Additional products such as grains, fruit, preserves, or other farm produce can also be ordered. Orders are picked up weekly at a designated, cost-free parking area in Maribor, accessible by all means of transport. According to Polonca F., this system ensures access to high-quality organic food while fostering a sense of community, trust, and shared responsibility between producers and consumers. However, she also noted that CSA participation still mostly attracts individuals with strong ecological awareness and a greater willingness to pay for sustainable food, highlighting the need for broader consumer education and outreach (Polonca F., interview, Maribor, August 2025).

Founded in 2012 in Jarenina (NE Slovenia), the 16-hectare farm Zlate Misli is run by Maja and Matjaž, a young couple with three children who combine farm family life with scientific expertise. Both hold PhDs in agricultural sciences, with Matjaž being the first Slovenian to earn a doctorate in biodynamics. The farm produces a diverse range of vegetables, fruits, and field crops throughout all four seasons, applying organic and biodynamic methods combined with regenerative practices such as green manuring, mulching, and minimal soil cultivation. More than 40 vegetable species and 12 apple varieties are grown, along with blueberries, hazelnuts, ancient grains (einkorn, emmer, spelt), sunflowers, and gluten-free crops such as buckwheat and millet. Unheated greenhouse cultivation enables year-round vegetable production. The farm also integrates education and practical training, offering internships and seasonal learning experiences to students and aspiring farmers from Slovenia and abroad. Over the past decade, more than 250 participants have taken part in these programmes, gaining hands-on experience in sustainable and biodynamic production (Zlate Misli, n.d.). Through this multifaceted approach–combining food production, education, and community engagement–Zlate Misli demonstrates how small-scale farms can successfully implement the principles of the circular bioeconomy and CSA within the context of UA and PUA

4 Conclusion

This study explored how urban and peri-urban agriculture (UA/PUA) across six European cities–Bayreuth, Prishtina, Budapest, Venezia, Brno, and Maribor–contributes to individual well-being, community cohesion, and sustainable urban development. In all cases, UA emerges as far more than food production: it is a social, cultural, and ecological practice that reconnects people with land, nature, and one another.

The cases demonstrate the wide diversity of UA forms–from solidarity-based agriculture and traditional orchards in Bayreuth, to community and temporary gardens in Budapest and Prishtina, municipal *orti urbani* in Venice, and long-established allotments in Brno. Despite different contexts, shared patterns are evident: UA strengthens community ties, enhances biodiversity, and improves urban resilience, yet faces recurring challenges such as insecure land tenure, fragmented institutional support, and limited accessibility beyond environmentally aware citizens.

The Maribor case provides a detailed example of how multiple initiatives can interact within one city, ranging from school gardens and student community plots to the Dobrina Cooperative and biodynamic CSA models such as Zlate Misli. Together, they illustrate how food production, learning, and social engagement can intertwine to support emotional well-being, sustainability, and local food security. At the same time, interviews revealed that advanced forms like CSA still mainly attract citizens already committed to sustainable lifestyles.

Overall, UA represents a promising but underutilised element of sustainable urban development. Its long-term success depends on: (i) secure access to land and integration into urban planning; (ii) inclusive and affordable participation supported by education and infrastructure; and (iii) stronger roles for cooperatives, schools, and civic networks linking producers, consumers, and municipalities. When understood as a multifaceted strategy rather than a marginal activity, UA can substantially contribute to healthier, more resilient, and socially connected European cities.

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URBAN–SUBURBAN RELATIONS AND QUALITY OF LIFE ALONG THE MARIBOR–GRAZ CORRIDOR: A STUDY OF FOUR SETTLEMENTS IN NORTHEAST SLOVENIA

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This paper examines spatial, demographic, and functional transformations in the Maribor city region through case studies of four cities–Šentilj, Miklavž, Maribor Studenci, and Kidričevo–located along the southern part of the Maribor–Graz corridor. Based on field surveys, interviews, municipal consultations, and direct observation conducted between 2024 and 2025, the study identifies suburbanisation, cross-border mobility, and post-industrial restructuring as the key processes shaping contemporary settlement development. Although each settlement exhibits distinct historical and economic trajectories, they share common challenges related to housing pressures, mobility patterns, demographic change, and administrative fragmentation. The findings show that the region is becoming increasingly integrated into an urban agglomeration influenced by labour migration to Austria and the central role of Maribor as the main employment centre. The paper concludes that coordinated spatial planning, sustainable mobility improvements, and strengthened cross-municipal cooperation are essential for managing future development within this evolving urban–suburban landscape.

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ODNOSI MED MESTOM IN PREDMESTJEM TER KAKOVOST ŽIVLJENJA OB KORIDORJU MARIBOR–GRADEC: ŠTUDIJA ŠTIRIH NASELIJ V SEVEROVZHODNI SLOVENIJI

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Ključne besede:
mestna regija,
suburbanizacija,
čezmejna mobilnost,
razvoj naselij,
demografske spremembe,
Kidričevo,
Šentilj,
Miklavž,
Studenci,
postindustrijska preobrazba,
prostorsko načrtovanje.

Prispevek preučuje prostorske, demografske in funkcijske preobrazbe v mestni regiji Maribor na podlagi študij primerov štirih naselij – Šentilj, Miklavž, Maribor Studenci in Kidričevo – ki ležijo ob južnem delu koridorja Maribor–Gradec. Na podlagi terenskih anket, intervjujev, posvetov s predstavnikom občin in neposrednega opazovanja, izvedenih med letoma 2024 in 2025, raziskava prepoznava suburbanizacijo, čezmejno mobilnost in postindustrijsko prestrukturiranje kot ključne procese, ki oblikujejo sodobni razvoj naselij. Čeprav ima vsako naselje svojevrstne razvojne poti, se soočajo s skupnimi izzivi, povezanimi s pritiski na stanovanjski trg, mobilnostnimi vzorci, demografskimi spremembami in upravno razdrobljenostjo. Ugotovitve kažejo, da se regija preobraža v urbano aglomeracijo, na katero vplivajo delovne migracije v Avstrijo ter osrednja vloga Maribora kot glavnega zaposlitvenega središča. Prispevek zaključuje, da so za usmerjanje prihodnjega razvoja v tem spreminjajočem se urbanem-suburbanem prostoru ključni usklajeno prostorsko načrtovanje, izboljšave trajnostne mobilnosti in okrepljeno medobčinsko sodelovanje.

Univerzitetna založba Univerze v Mariboru

1 Introduction

Researching the connection between urban areas and their surroundings has long been a topic of interest to urban geographers. In recent decades, cities and their surrounding settlements in Europe have begun to form an integrated spatial unit. In many cases, nearby villages with a distinctly rural character have also been absorbed into urban areas. Demographic growth, the territorial expansion of cities, and the transformation of relations between a city and its surroundings have altered the physiognomic appearance not only of cities but also of their wider surroundings. Because of this, many urban geographers describe the city and its immediate and broader surroundings as a single organism, often referred to as an urban region (Ravbar, 1990).

In the 1960s, the growth of the urban population slowed down across much of Western and Central Europe. Centripetal processes gradually shifted into centrifugal ones. The movement of residents and production activities toward the urban fringes not only led to the spatial expansion of cities but also strengthened functional links between urban and rural areas. The increase in population and related activities on the edges of cities and urban agglomerations is described with terms such as urban sprawl, slurbs, rural–urban fringe, suburbs, and the rural–urban continuum (Kokole, 1976).

In Maribor, the phenomenon of suburbanization is understood as the spatial expression of broader social changes in society. The visible manifestations of these changes are not only reflected in the growth of areas with single-family, detached houses on the urban fringe, in the transformation of the agrarian landscape, and in the so-called "urban flight". As illustrated in Figure 1, between 1991 and 2002, the population in the surroundings of Maribor increased, while the population within the city itself declined (Uršič, 2010). The population growth concentrated on the urban fringes and along major transport routes, such as toward Šentilj at the border with Austria, while the city core continued to lose residents.

This process has so far been impossible to prevent or mitigate, despite planning efforts at various levels, in Slovenia through national, regional, and municipal spatial plans, which have been carried out intensively since at least the mid-1970s, and in Europe, where such planning traditions are even longer (Ravbar, 1990).

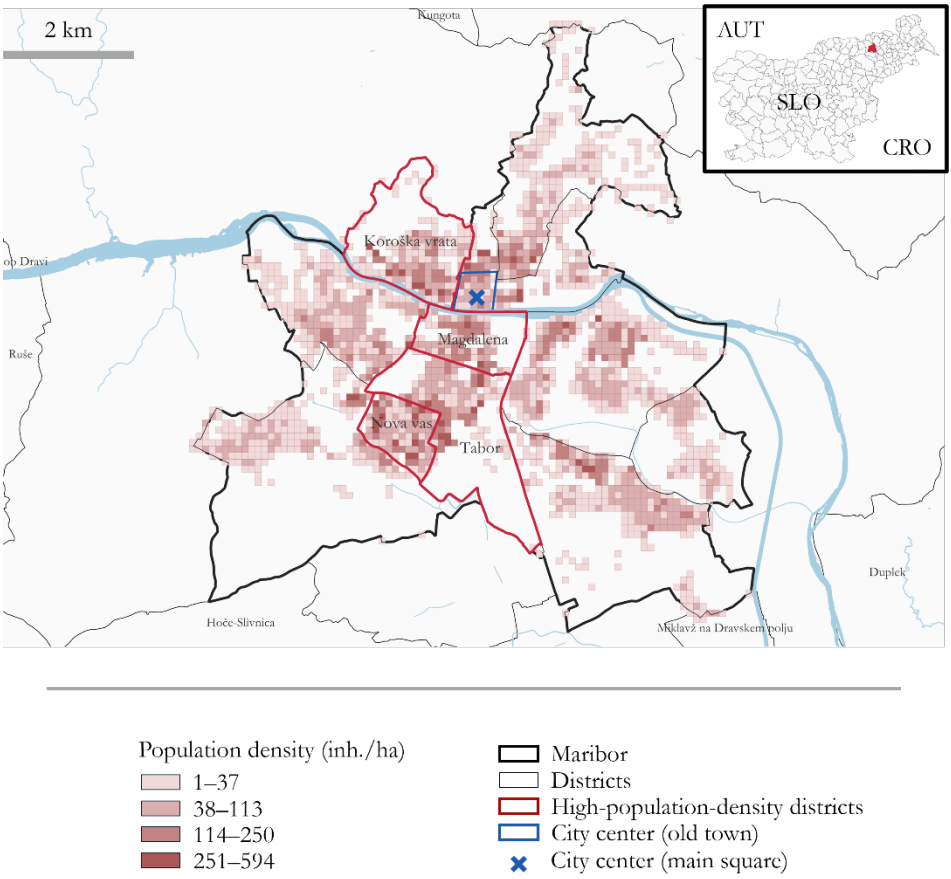


Figure 1: Within the administrative area of Maribor, the highest population density is not found in the historical city centre but in the outer residential zones (shown with darker red colours), showing suburbanization trends.

(Source: Authors, 2025; Data: SURS, 2024; GURS, 2025; ARSO, 2025).

The urban region of Maribor (the area from which daily migration predominantly flows toward the city of Maribor) covers a large part of northeastern Slovenia (Drozg, 2006), including the municipalities of the Drava Valley, the western part of Slovenske gorice, and the Drava Plain (Figure 2). Daily migrants within the Municipality of Maribor represent only one-fifth of all migrants (Krojs, 2010).

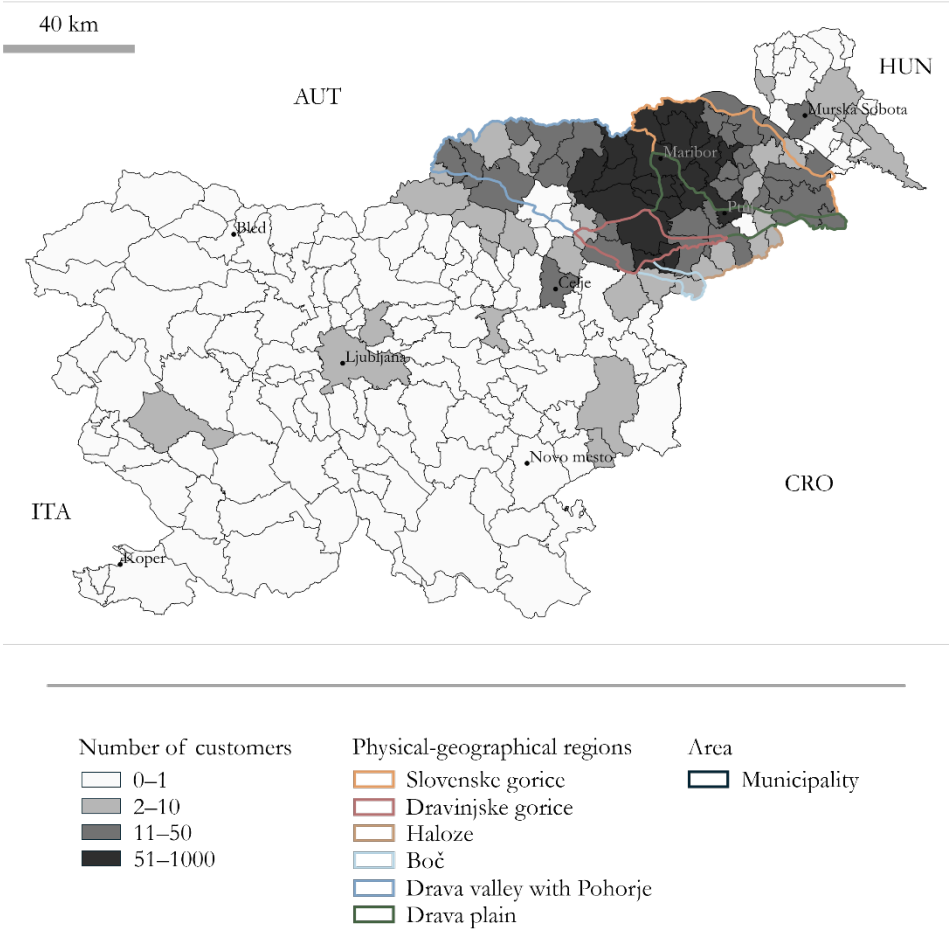


Figure 2: City region defined by the origin of customers visiting shopping centres in Maribor. (Source: Authors, 2025; Data: Drozg, 2006).

Administrative, economic, and social ties have formed between Maribor and the surrounding settlements (Figure 3). The rapid development of transportation and the improvement of transport infrastructure have also had a significant influence on this process, as they reduced the time needed to travel from the city to suburban settlements and back (Krojs, 2010).

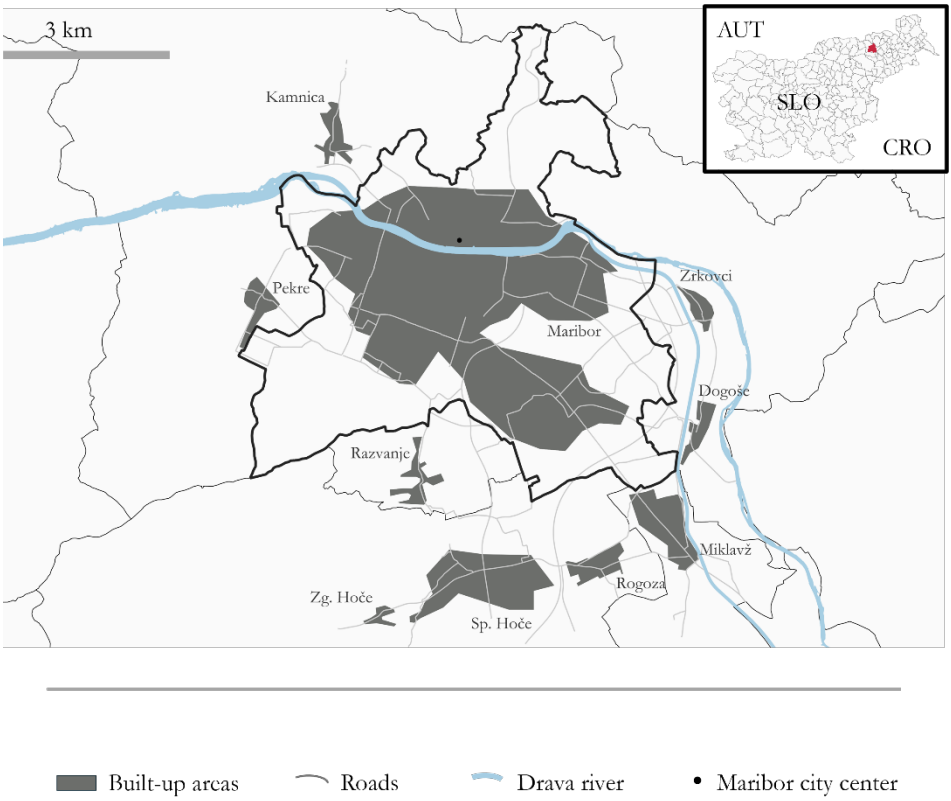


Figure 3: Urban region of Maribor, including the city and its surrounding satellite settlements.
(Source: Authors, 2025; Data: GURS, 2025).

Suburban settlements such as Kamnica, Pekre, Razvanje, Spodnje Hoče and Zgornje Hoče, Bohova, Rogoza, Miklavž, Zrkovci, and Dogoše have, because of these processes in the past, rapidly lost part of their independent functions (Lobnik, 1999). Suburbanization was followed by a fragmentation of the administrative territory. New municipalities were established (Figure 11), which granted them autonomy, yet they remained functionally dependent on the Municipality of Maribor (Čokert, 2005).

While this chapter focuses on the Maribor urban region, it forms part of a broader spatial development axis connecting three agglomerations: Graz (Gradec), Leibnitz (Lipnica) and Maribor. The two regional centres (the city of Graz in the Southern

Styria region, Austria and the city of Maribor in the Podravje region, Slovenia) are situated only 60 km apart. Strengthened global connectivity transformed settlement patterns, with large retail centres, logistics hubs, technology parks, and recreational complexes emerging between Graz and Maribor (Pogačar & Sitar, 2009).

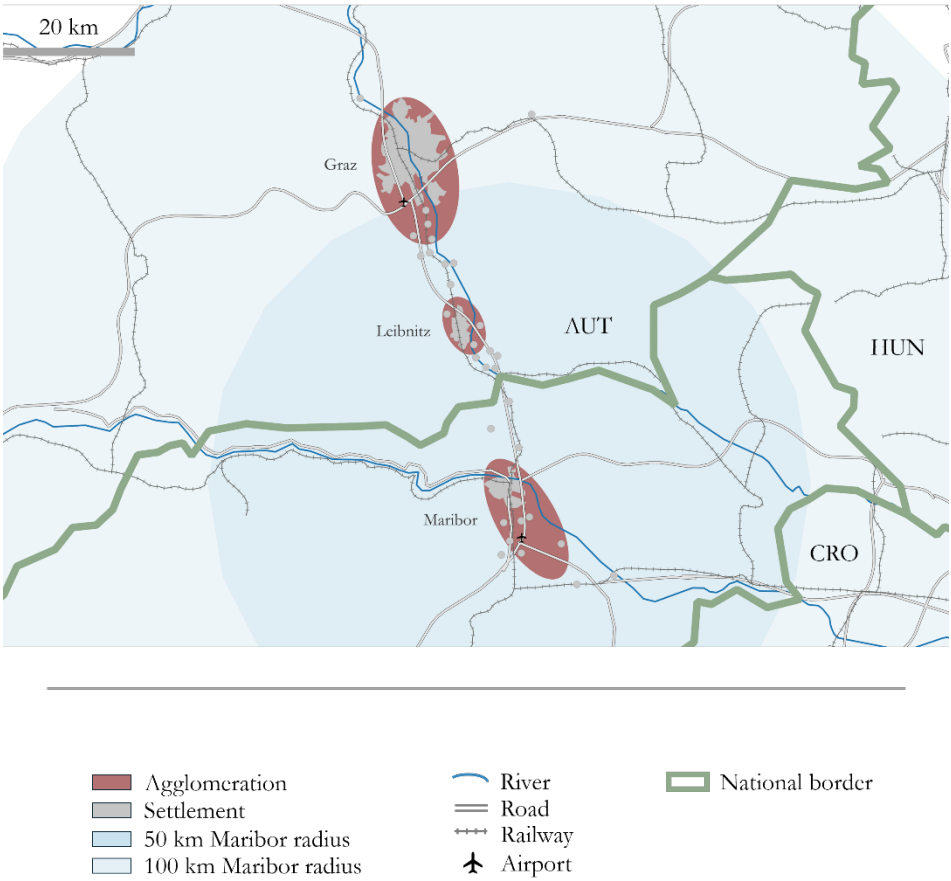


Figure 4: Agglomerations along the spatial development axis between Graz and Maribor, including settlements that are functionally part of these agglomerations.
(Source: Authors, 2025; Data: Pogačar and Sitar, 2009; Natural Earth, 2025).

A specific feature of this region is that its spatial development continues to be influenced by the national border, even though both Austria and Slovenia joined the Schengen Area in 2007, abolished internal border controls, and now share a common visa policy. The contrast across the border persists due to significant wage

differences and Austria's continued extension of its border controls with Slovenia, reintroduced in 2015 during the migrant crisis.

Border municipalities in northeastern Slovenia, situated along the Austrian border, continually face demographic decline and significant population loss, primarily driven by rural–urban migration. Increased mobility has also transformed local lifestyles, as daily activity spaces for work, education, and services increasingly extend beyond small settlements. While Maribor remains the main employment centre, media reports suggest that around 40,000 labour migrants commute daily from northeastern Slovenia to Austria (see for example: Bedek, 2025).

Urban development along the southern end of the Graz–Maribor transport corridor will be analysed through the concepts of compact settlements and the urban–rural dichotomy, both of which are clearly visible in the region.

2 History of the spatial development of the border region between Graz and Maribor

After World War II, southeastern Austria–especially Southern Styria and Burgenland–was in a disadvantaged geostrategic position along the Iron Curtain, becoming some of the country's poorest and most underdeveloped regions. Conditions began improving in the mid-1970s as relations with Yugoslavia softened. Subsequent decades saw strong social and economic progress, supported by regional development policies, subsidies for agriculture, tourism, and viticulture, as well as the rise of cross-border "shopping tourism". Border towns such as Leibnitz, Strass, and Spielfeld experienced rapid urban growth through new retail and service facilities, while Graz strengthened its role in cross-border economic flows. Southern Styria continues to show positive demographic and economic indicators.

Within the Austro-Hungarian Empire, the Graz–Maribor area belonged to the Duchy of Styria and remained strongly connected through transport links, including the Vienna–Trieste railway. However, after 1918 and throughout the mid-20th century, the new national border and different political–economic systems led to separate development paths. Border areas on both sides became peripheral and depopulated, while Graz and Maribor developed as regional industrial centres–Maribor, in particular, as a major Yugoslav textile and metal industry hub.

From the 1970s onward, warming international relations increased cross-border flows. The construction of the Graz–Maribor motorway further enhanced mobility, turning the corridor into a major European transport route. Yet, economic disparities between Austria and Slovenia continued to grow. Graz continued its prosperous expansion, while Maribor entered a long period of industrial stagnation and rising unemployment.

After Slovenia's independence (1991) and entry into the EU (2004), cross-border cooperation intensified. Urbanisation spread beyond city borders, forming new urban nodes along the transport axis. At the same time, the opening of the border paradoxically reduced daily cross-border commuting, while public transport remained weak. The formerly important Šentilj–Spielfeld crossing lost much of its function (Pogačar & Sitar, 2009).

Maribor faced severe unemployment throughout the 1990s and early 2000s, peaking at almost 17% in 2004, while suburban areas expanded rapidly. Small and medium-sized enterprises became the main drivers of new employment. Maribor's recovery from the economic downturn strengthened particularly after the COVID-19 pandemic, which is now also reflected in renewed construction activity within the city (not just in the outskirts).

3 Methods

The results of this chapter are based on three phases of field-based activities conducted with students at the University of Maribor (partly in cooperation with the University of Graz) in four case studies (Šentilj, Maribor Studenci, Miklavž and Kidričevo). The methodological approach combines a short resident survey, field observation, and walking interviews (Table 1).

In Phase 1 (December 2024), students of the Geography of Settlements course (academic year 2024/2025) conducted an on-site questionnaire survey with passers-by in Kidričevo (N = 61). The average age of respondents was 41 years. The questionnaire covered four main themes: residents' perceptions of the settlement's urban design, the quality of the living environment, mobility and access to services, and social connectedness within the community.

Table 1: Research phases in the selected case studies

Phase	Field-based activity	Timeframe	Approach
1	Survey in Kidričevo	December 2024	Short street survey with residents
2	Interviews in Miklavž	October 2025	Semi-structured walking interviews
3	Fieldwork and consultations	November 2025	Field observation and structured consultations

In Phase 2 (October 2025), students conducted semi-structured interviews with residents of Miklavž na Dravskem polju. The interviews explored suburbanisation processes, daily mobility, and perceptions of living in a rapidly urbanising settlement.

Figure 5: Locations of four case studies for field-based activities.
(Source: Authors, 2025; Data: GURS, 2025; Open Street Map, 2025).

In Phase 3 (November 2025), students of the Urban Geography and Geography of Settlements courses (academic year 2025/2026) carried out field observations in four settlements (Šentilj, Maribor Studenci, Miklavž and Kidričevo), together with students from the University of Graz. In Šentilj, Miklavž and Kidričevo, the group

held structured discussions with the mayor, the head of municipal administration and representatives of the spatial planning department, focusing on spatial development, heritage protection, and demographic change. In Maribor Studenci, the informant was the representative of the leading real estate investment company in Maribor.

Survey results, field observations, and interview findings were combined to provide an integrated understanding of spatial trends and urban–suburban dynamics along the Šentilj–Kidričevo section of the Graz–Maribor corridor.

4 Spatial trends in four towns in north-east Slovenia

4.1 Case study I: Šentilj, a cross-border transit town

The first case study town is Šentilj v Slovenskih goricah, which is also the largest settlement and the administrative seat of the Municipality of Šentilj (roughly 8,500 inhabitants). It is located in the northwestern part of the Slovenske gorice hills (the hilly area between the Drava and Mura rivers). The town lies along the Maribor–Graz railway line and the motorway at the border with Austria, which gives it a strong transit character.

The town expanded along the Maribor–Graz railway line (the Austro-Hungarian Southern Railway reached the town as early as 1843), while today's residential development is found mainly on the slopes of the surrounding hills (Ivanič, 2011; Figure 6).

Due to its favourable position near the border (many residents work in Austria), the population increased by 30% between 1961 and 1991. The municipality currently has a positive migration rate, as more people move in than move out. However, there are spatial differences: rural areas are experiencing depopulation, whereas urban settlements are attracting new residents.

In 2023, there were 2,770 employed residents, of whom 28.16% worked within the municipality, while the rest commuted elsewhere. Most worked in Maribor (37.17%), Ljubljana (7.62%), and Lenart (5.85%), which shows a high level of daily commuting. The labour migration index of 62.6 indicates that the municipality is classified as a

moderately habitable residential municipality (as opposed to an employment-based municipality). It demonstrates a strong dependence on external job opportunities, including those in Austria. Because of better working conditions and higher salaries, many residents commute daily across the border.

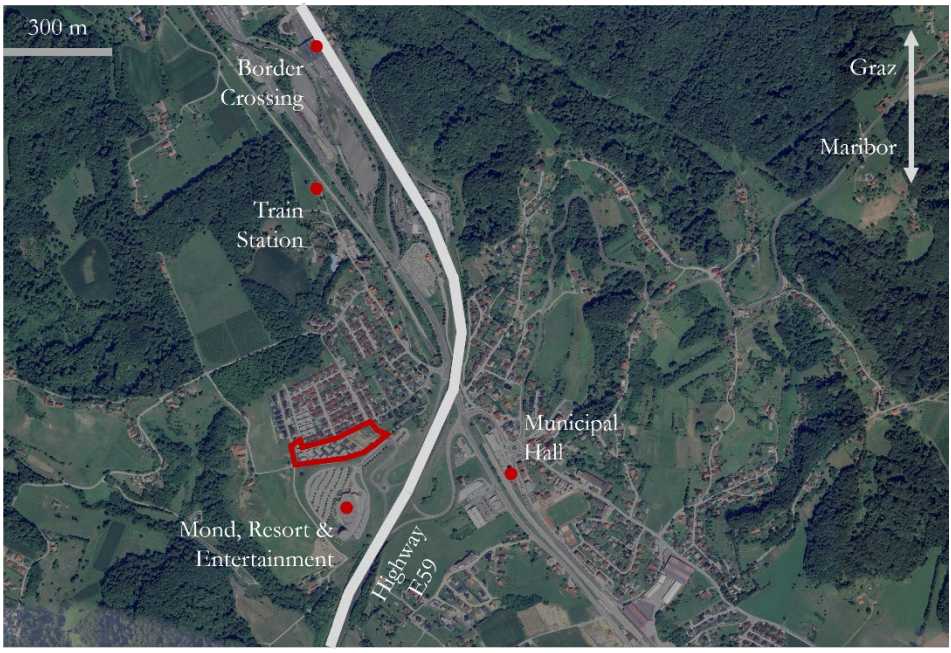


Figure 6: The town of between the border crossing and Mond, showing the construction site near the highway.
(Source: Authors, 2025; Data: Google Satellite, 2025).

The increasing share of people older than 60 (which requires additional investment in age-friendly infrastructure) and the stabilised, non-growing number of young residents pose a challenge. This is due to the fact that many working-age inhabitants are not officially registered in this municipality. Therefore, Šentilj is considered a "dormitory town", similar to some tourist municipalities, and many residents do not pay taxes locally.

The mayor emphasises that they want to attract young families, which is supported through concrete policy measures: numerous new housing units are being built, and young families are eligible for reduced municipal utility fees. The municipality also

aims to attract young professionals who could contribute to the development of the town and the wider municipality.

The local economy is based on small businesses and crafts, while good transport connections and proximity to the border give the municipality strategic importance as a transit area. Šentilj also hosts a metal industry plant, and part of the active population commutes to Maribor or to Sladki Vrh, home of the prominent Paloma factory. Paloma represents a major source of income for the wider area and employs many workers from Šentilj and neighbouring municipalities. As a result, Šentilj functions as a smaller gravitational centre attracting daily commuters from the broader region.

Municipal income also comes from taxes paid by the casino company Mond (Figure 7 owned by the Nova Gorica-based company HIT), where 80% of customers are Austrians, including a considerable number of Chinese visitors. Because of the casino, Šentilj ranks among the fastest-growing tourist municipalities in Slovenia. The municipality recognises this but stresses that it does not want to pursue mass tourism.

Economic potential also lies in micro-tourism, focusing on hiking and cycling. Important features include the cycling route along the Mura River towards Graz (the Mura ferry transports around 20,000 cyclists per year), as well as the sports hall that hosts international volleyball matches.

From the second half of the 19th century onwards, tensions between the German-speaking and Slovene-speaking populations increased, and separate associations were established (Kmetijsko bralno društvo, Südmark, Schulverein, Slovenska domovina, Posojilnica). In the struggle for the northern border after World War I, the residents of Šentilj supported General Rudolf Maister, who had his headquarters in the town for several days. During the Slovenian War of Independence, on 2 July 1991, members of the Territorial Defence recaptured the border station in Šentilj. Today, however, strong cultural ties exist between the communities on both sides of the border.

Casino Mond serves as a significant link between Šentilj and neighbouring Austria. Cooperation extends far beyond tourism–the municipality and Austrian neighbouring communities collaborate in many areas: mutual firefighting assistance,

a shared cycling trail and ferry on the Mura River, joint festivals, village celebrations, and sports events. Some Austrian sports clubs, for instance, regularly play matches in the Šentilj sports hall.

Figure 7: Promotional image of Casino Mond in Šentilj, foregrounded by cyclists to showcase recreational cycling as a main local attraction.
Source: Pogačar & Sitar, 2009.

4.2 Case study II: Market-driven housing development and inner-urban densification in Maribor, Studenci

The Studenci district is located on the south bank of the Drava River (opposite the oldest part of the town, called Lent). The oldest part of Studenci, located along the river and around the Church of Saint Joseph, developed due to the establishment of workshops for the purposes of the Austro-Hungarian Southern Railway. The name Studenci (German: Brunndorf) derives from the murmuring springs of water in the area.

Studenci is a significant residential and transportation area of the city of Maribor, where numerous procedures are underway concerning changes in land use, urban planning conditions, public infrastructure, and the coordination of interests between residents and the municipality.

The southern part of Studenci (Figure 7) is currently the most sought-after area in Maribor for new construction, with several active building sites. Since the mid-20th century, the city's expansion has focused on this area (Mestna občina Maribor, 2025), partly due to the compact city planning concept, which aims to concentrate urban development in designated growth areas and prevent sprawl in rural surroundings. This expansion slowed in the 1990s due to deindustrialisation and Maribor's economic downturn and has only recently re-emerged with the city's economic recovery.

The newest residential neighbourhood is emerging near the Supernova (Qlandia) shopping centre (Figure 7). Our informant, a representative of the company Novogradnje–currently one of the largest private investors in residential buildings in the region–purchased this land from a city-owned company that had gone bankrupt. At this site, construction is underway to cater to upper-middle-class clientele. Five residential buildings have already been completed, and 3–5 additional buildings are either under construction or in the planning phase. The land is suitable for the construction of 1,000 apartments over the next 10 years. The apartments cost on average 3,500 € per square meter, meaning that the price for an average apartment is around 300,000 €.

Apartments are selling extremely quickly. In May 2025, during the sale of apartments planned for one of the buildings, as many as 75 units were sold in a single day, which demonstrates a strong demand and the success of the project. About 75% of buyers are from Slovenia, while 25% are investment buyers who later rent out the apartments. On average, one to two apartments per building remain vacant due to "property speculation", while most are rented out. Since the COVID-19 crisis, prices have increased by 90% (making it a secure investment), even though many expected housing prices to fall at that time.

Figure 8: The area of Maribor between the Supernova shopping centre and Tabor sport hall, showing the construction site near the Engels Street.
(Source: Authors, 2025; Data: Google Satellite, 2025).

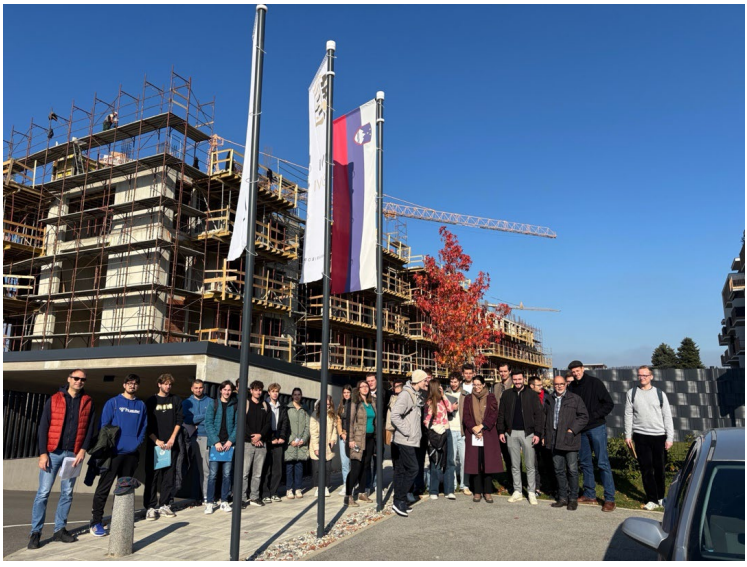


Figure 9: Group of students and professors from the University of Maribor and the University of Graz visiting the largest construction site of residential buildings in Maribor (November 2025)
Source: Authors

In the vicinity of the new buildings, amenities include a shopping centre, a bike-sharing station, and a car-sharing service. One of the present limitations in Studenci is the lack of schools and kindergartens nearby. The construction of a new school near the shopping centre is planned; however, it will not be financed by the company but rather by public funds. Besides schools, urban planning conditions for Studenci include the arrangement of squares, green areas, as well as requirements for greening and compliance with water protection regulations. A more frequent circular public bus line, Studenci–Tabor–Pobrežje–Melje–Center–Studenci, has already been established.

The average number of parking spaces per apartment is 1.5, whereas trends in sustainable plans of cities (for example in Graz) aim for one parking space per apartment.

4.3 Case study III: Suburbanization of the rural settlement of Miklavž in the gravitational area of Maribor

The old, medieval city centre of Miklavž na Dravskem polju (first mentioned in 1202) developed on the edge of the Drava terrace south of Maribor. The newer part of the settlement expanded in the 1960s and 1970s along the feeder canal of the Zlatoličje hydropower plant and into the Tezno forest area.
Today, it is an urbanised settlement (Figure 9) and the administrative centre of the municipality bearing the same name, located in the influence area of Maribor, with approximately 3,808 inhabitants. With ongoing urbanisation, the built-up area has been expanding rapidly, forests and fields are being converted, and the number of commercial and recreational surfaces is increasing. In recent years, numerous new buildings have emerged, and Miklavž is characterised by large single-family houses. The settlement is increasingly merging with Maribor, which has led to well-developed transportation connections between the two. The municipality is becoming increasingly built-up, population density is rising, and real estate prices are increasing in parallel with infrastructure development. The area mainly attracts young families seeking a quieter environment.

This is a suburban area of Maribor. For about fifty years, residents of Maribor have been relocating to Miklavž; however, in recent years this trend has intensified, marking a phase of pronounced suburbanisation, as Miklavž expands rapidly due to

in-migration. Suburbanisation is also visible in the work locations of residents. Most of the active population is employed in service activities (crafts, trade, hospitality, transport, and communications) (Ivanič, 2011). One of the weaknesses of the municipality is the lack of an industrial zone. Numerous small companies have emerged, but once they expanded, they had to relocate either to the Tezno Industrial Zone in Maribor or to the Hoče zone.

Figure 10: Transformation (urbanization) of the central part of Miklavž, originally rural in character. Renovations by the younger generation often do not adequately consider the settlement's traditional building heritage.

Most residents only live in Miklavž but commute to Maribor for work. The settlement is connected to Maribor by a well-maintained cycling path and a bus line that runs every 15 minutes during working days. Despite this, around 80% of residents use private cars for their daily commute, while 20% use public transport. The municipality is also considering joining the MBajk bike-sharing system, given its suburban position in relation to Maribor.

The Municipality of Miklavž na Dravskem polju was established in 1998, having previously been part of the larger Municipality of Maribor (Figure11). Several new municipalities formed around Maribor, each with around 8,000 inhabitants. Miklavž covers only 12.5 km² and has 5,915 inhabitants (2011). Therefore, it collaborates with Maribor and shares certain public services, such as waste management, sewage systems, and spatial planning. As the mayor noted, becoming an independent municipality created a significant development "boom", as, in his view, Miklavž

would not have developed to the same extent had it remained part of Maribor. One contributing factor is financial: the municipality now operates with an annual budget of €10 million, a level of funding it would not receive if it remained part of Maribor (the budget of which is €150 million). The mayor also drew a comparison between Miklavž and Radvanje, a neighbourhood of Maribor: although both have similar population sizes, Radvanje lacks a family doctor and a school, unlike Miklavž.

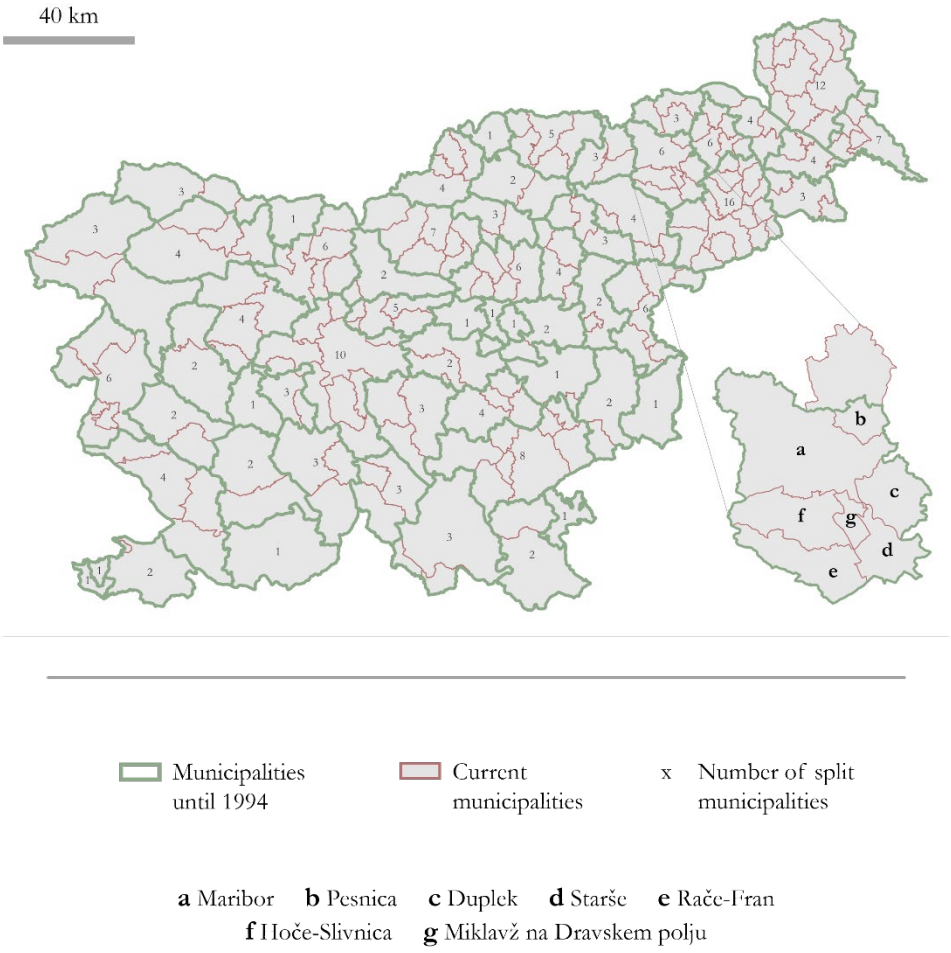


Figure 11: Comparison between former larger municipalities (green lines), which remained almost unchanged until 1994, and present-day municipalities (red lines). The figure illustrates the process of fragmentation of the local self-governing system and the challenges of managing very small municipalities.
(Source: Authors, 2025; Data: GURS, 2025).

The settlement is surrounded by agricultural land, with cattle breeding and crop production (mainly cereals) being the key agricultural activities. Given the municipality's small size, land must be managed carefully, with particular emphasis on protecting the remaining agricultural areas. Farming must adhere to environmentally sustainable practices, as the area encompasses a water protection zone and the main groundwater pumping station for the wider Maribor region.

During the peak of Maribor's industrial era, many residents worked in TAM (truck manufacturer) or Metalna in Tezno, which is within cycling distance. This is also the part of Maribor that blends most strongly with Miklavž.

The main road through Miklavž has always been a significant route. Historically, it formed part of the major route between Munich and Istanbul. After the motorway was built, traffic on this road declined significantly, yet it remains the main connection between Miklavž and Maribor. Mobility in Miklavž is strongly car-oriented, as most residents commute daily to Maribor. This contributes to high traffic volumes and occasional congestion during peak hours. Commercial and service facilities are developing along the main road, while areas further away from the main routes primarily function as residential zones.

Residents express strong appreciation for Miklavž's good location, peaceful environment, and well-developed local infrastructure, which together offer the benefits of near-urban living without the drawbacks of the city centre. At the same time, they voice concerns about rapid urbanisation, including loss of green areas, increasing traffic congestion, and pressure on local businesses from expanding residential development (Table 2).

The municipality hosts 55 associations, offering numerous opportunities for residents to participate in community life. Yet, key challenges include the loss of traditional settlement character and the weakening of social cohesion due to urbanisation. The expansion of the settlement also creates environmental pressures– high car traffic, the clearing of forest areas, and the loss of agricultural land. Opportunities lie in the continued in-migration of young families, who contribute to the vitality of the area.

Table 2: Residents' positive and negative perceptions of living in Miklavž

Type of perception	Interview excerpt (translated)
Positive	"If you're lucky, you can reach Tržaška Road [the main arterial road to Maribor] in ten minutes, so the location is excellent. I think that's why the settlement is expanding–people don't want to live right in the city centre because of parking problems and parking garages. Many apartment blocks don't have parking, and it's hard to get a plot there. So Miklavž is now the second-best option."
Positive	"Limbuš is part of the Municipality of Maribor, but it takes them longer to get to the city centre than it does from here."
Positive	"Here you have peace, good infrastructure, a school, a kindergarten–everything is close. You are outside the city but at the same time almost in the city."
Negative	"In 10 or 20 years, I imagine that it will no longer be possible to get a plot for new construction unless they start cutting down the forest again. Where our house stands today, there used to be a forest, and they cleared everything to create space for new development."
Negative	"The rush hour starts around half past five or a quarter to six in the morning for all those coming from the motorway, and then again for 15–20 minutes before seven and before eight. In the afternoon, traffic jams occur between three and four, and on Fridays even earlier, around half past one to three. This means longer travel times."
Negative	"They have started building apartment blocks, and it's uncertain how long local craftsmen–like the car painter or the metalworker–will still be able to stay. There are blocks around them already, and people will want this area to become fully residential."

Source: Walking interviews with residents (October 2025)

4.4 Case study IV: Kidričevo – a socialist planned town facing post-industrial pressures for residential expansion

The settlement developed on the site of Sternthal (Šterntal), where, during the First World War, a camp made of wooden barracks was first established for prisoners of war of the Austro-Hungarian Army, later serving as a military hospital.

The development of present-day Kidričevo is closely linked to the establishment of an industrial complex, which began when the German occupier built an alumina factory in 1942 in Strnišče to supply the German military industry in the nearby city of Maribor. For the construction of the factory, a large labour camp was built nearby. After the Second World War and the victory of the communist revolution in Slovenian and Yugoslav territory, the new revolutionary authorities took over the labour camp and turned it into an OZNA (secret police of communist Yugoslavia) concentration camp.

Figure 12: Present-day Kidričevo, where the defining features are large apartment blocks situated within extensive inter-block green spaces (right part of the picture). The large agricultural area on the left is now considered a potential site for future settlement expansion.
(Source: Reiter & Reiter, 2022).

The Yugoslav authorities took over the alumina factory and decided to introduce aluminium production in Strnišče, continuing the construction. With the development of the factory, the former camp around the Strnišče/Sternthal manor (today the seat of the Municipality of Kidričevo) was modernised. The wooden barracks were demolished and replaced with masonry buildings that gradually took on the characteristics of a settlement. The camp inmates were replaced by workers and their families employed in the newly established alumina and aluminium factory (named TGA).

The camp could no longer accommodate the rapid expansion of the factory, which provided work and housing for factory workers and their families. A decision was made to build a new settlement, and a development plan was adopted for the area north of the railway line, prepared by architect Danilo Fürst, a graduate of the renowned Slovenian architect Jože Plečnik.

The first industrial town in Slovenia was planned in the middle of a pine forest, covering an area of two square kilometres. The multi-apartment blocks were built according to the principles of functionalism. Set in a green environment, they are surrounded by trees and large park areas.

Figure 13: Residential blocks in Kidričevo surrounded by spacious green areas–a characteristic of the settlement's functionalist form.
(Author: Kumer, 2024).

Most residential blocks were built between 1947 and 1954. Fürst later invited architect Edvard Ravnikar–known for designing Slovenia's other major socialist planned town, Nova Gorica–to contribute; however, his plans were never carried out. Due to limited financial resources, as construction relied heavily on self-contribution schemes (which was common in post-war Yugoslavia), public facilities were added only gradually over a longer period, including a primary school, a multipurpose hall with a restaurant, and a post office (Koselj, 2000).

Fürst is also the author of the administrative building of the Talum factory (the successor of TGA), located near the residential blocks. The settlement has always been closely tied to the industrial complex, which was historically a heavy and highly polluting industry–long-term residents still recall winters when the snow would turn black from soot.

Reflecting on a documentary showing the demolition of the old factory's chimney in 1996, one resident commented:

"/…/ how many years did that chimney stand, how many years did it poison us. We had black snow in winter, and in summer you couldn't step from the balcony into the living room because the carpet would immediately turn dirty from all the soot." (Facebook post, 2016)

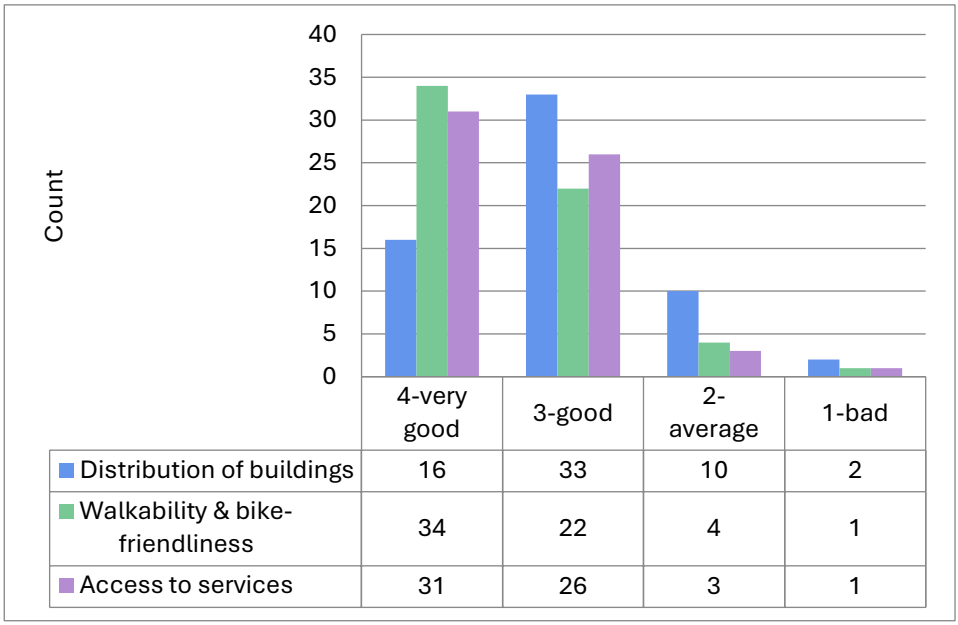
Today, the apartments provide a high standard of living: they are relatively spacious by current building norms (with an average size of around 100 m^2), feature high ceilings, include several shared spaces, and offer views of the surrounding greenery. The residential buildings for factory employees are located near the industrial complex, set in a green environment surrounded by trees and lawns (Figure 13. This combination–housing close to workplaces and a green living setting–recalls the garden city paradigm that emerged in Western Europe at the beginning of industrialisation and later became a widely adopted model of urban development. Central functions are located along the main road, while residential blocks are arranged on side streets in an orthogonal layout, with buildings positioned in rows and slightly offset from one another (Figure 12). Pedestrian pathways run along the roads, and garages–an element of urban culture–are positioned slightly away from the residential buildings. There is also ample parking, which is essential given the limited public transport and the population's strong reliance on cars.

Our 2024 study shows that residents are generally satisfied with the settlement's urban design, suggesting a high-quality living environment (Figure 13).

The statements from the 2024 survey summarise the general views expressed by most residents regarding their satisfaction with the settlement's urban design:

A: Well planned and easy to navigate. Functional, but in need of some improvements.
B: Good, compact, with plenty of shops and green areas.

C: Everything is great as it is; everything is accessible.
D: It's fine, although the quality of the apartments could be better. The façades of the blocks could be renovated, but this is currently impossible due to cultural heritage protection.



	4-very good	3-good	2-average	1-bad
Distribution of buildings	16	33	10	2
Walkability & bike-friendliness	34	22	4	1
Access to services	31	26	3	1

Figure 14: Residents' satisfaction with urban design (N=61)

Today, the town is inhabited primarily by the second generation of the original residents, resulting in a relatively high average age. Although the settlement is attractive to young families, moving in is difficult because apartments typically become available only after the owners pass away. Many units require renovation, including energy-efficiency upgrades, yet such improvements are often constrained by cultural heritage protection regulations. Because current planning regulations do not allow spatial expansion, Kidričevo has not experienced suburbanization, unlike other towns in the region. However, due to its large industrial zone, the town functions as a gravitational centre for the regional workforce, attracting many daily commuters.

The development of the settlement is strongly influenced by the economic performance of the municipality. According to the municipal development coefficient, Kidričevo ranks among the top 10% of the most developed

municipalities in Slovenia. The state-owned company Talum shut down its last primary aluminium smelting furnaces in April 2023–after 70 years of operation–during the period of Europe's energy crisis. Primary aluminium production moved to Asian countries due to high energy prices and falling aluminium prices. However, the company successfully shifted towards aluminium processing, focusing on the production of slugs and other aluminium products.

Another textile company in the industrial zone, Boxmark Leather, a producer of leather covers for the automotive and aviation industries, continues to operate; however, it relocated its serial production to Croatia and Bosnia and Herzegovina, where labour costs are lower. This resulted in the dismissal of a few hundred employees in the years following the COVID-19 pandemic, although most later found new employment elsewhere in the region.

In the past, Talum was an extremely energy-intensive industry–back in 2018, it consumed 8.4% of all electricity in Slovenia (Zwitter, 2020). Today, more than half of its production comes from recycled aluminium purchased within Europe. The company has committed to achieving carbon neutrality by the end of the decade and is therefore steadily increasing the share of recycled aluminium, since recycling requires only about five percent of the energy needed for former primary production (Artiček, 2025).

Due to the town's controversial history linked to environmental challenges and ecological impacts–for example, from the beginning of aluminium production in Kidričevo until the discontinuation of alumina production from bauxite–the factory generated large quantities of red mud. This waste was deposited near the village of Strnišče, and during peak production years, as much as 160,000 tons were produced annually. Over time, this created a 48-hectare elevated disposal site rising several metres above the surrounding Dravsko polje landscape. Because of these environmental burdens, along with past deforestation, the town is now steering toward a green transition. Plans include constructing a large solar power plant on top of the covered red-mud landfill. In 2020, Talum also opened the largest electricity storage facility in the wider region.

The settlement has significant potential for further spatial development, and local planners stress that future concepts must build on the existing conditions.

Opportunities for expanding residential and service functions should therefore be sought outside the protected cultural-heritage zone. Given the existing built structures and infrastructure, it would be sensible to direct residential expansion toward the north and west (however, it would destroy the pine forest and agricultural land). New development would follow Fürst's original geometric concept–the layout of buildings that creates a pattern reminiscent of a forest.

The local economy remains strongly tied to the operations of the Talum factory, which benefits from high-quality infrastructure (railway, gas pipeline, electricity network). Consequently, the town's future development depends heavily on the economic prosperity and strategic direction of the company.

5 Discussion and conclusion

The analysis of four settlements along the southern part of the Maribor–Graz corridor demonstrates how spatial, demographic, economic, and functional changes are reshaping the urban–suburban landscape of northeastern Slovenia. Although all four settlements lie within the gravitational influence of Maribor, their development trajectories differ significantly due to their geographic position, historical legacies, planning frameworks, and economic structures.

Across all cases, suburbanisation emerges as the dominant spatial process, but its intensity and expression vary. Šentilj illustrates a transit-oriented settlement strongly shaped by cross-border labour migration and economic ties with Austria. Miklavž represents a typical suburban municipality experiencing rapid in-migration, rising population density, and increasing pressure on agricultural land. The Studenci district in Maribor exemplifies inner-urban densification and market-driven residential expansion aligned with compact-city planning. Kidričevo, by contrast, stands out as a post-industrial planned town whose growth is constrained by heritage protection, while its future remains closely tied to the restructuring of the Talum industrial complex.

Despite these differences, several common themes emerge. First, mobility represents the strongest integrative force shaping daily life in all four settlements. While motorway and partially rail infrastructure link the region into a functional urban corridor, car dependency remains very high, particularly in suburban municipalities.

Public transport integration between Maribor and the surrounding settlements continues to lag behind mobility needs.

Second, while population ageing and out-migration of younger residents are typical for the rural hinterland of the examined municipalities, the tendency for in-migration of young families is high in all four settlements. Cross-border commuting to Austria plays an increasingly important role in shaping household income levels and preferences on where to live (particularly in Šentilj).

Third, the fragmentation of municipalities around Maribor, following administrative restructuring in the 1990s, complicates coordinated spatial planning. Although local autonomy enabled dynamic development in some municipalities, it also created challenges in areas requiring shared infrastructure, environmental management, and housing policy.

Fourth, the case of Kidričevo highlights the long-term consequences of industrial path-dependence. The settlement's urban design continues to provide high living standards, but environmental burdens and strict cultural-heritage rules limit spatial expansion. At the same time, the town's strong economic position suggests potential for green transformation, particularly through renewable energy and circular-economy initiatives.

Overall, the findings confirm that the Maribor–Graz corridor is evolving into a polycentric border-region urban system in which development is shaped by cross-border economic relations, mobility patterns, industrial restructuring, and suburbanisation processes. Strengthening cooperation between municipalities, improving sustainable mobility, protecting agricultural land, and addressing housing pressures will be essential for managing future development along this increasingly interconnected urban axis.

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Quality of Life in a Changing World: Spatial, Social and Environmental Perspectives from Maribor and Beyond

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Contemporary societies are shaped by increasingly rapid and interconnected global changes, including technological acceleration, environmental pressures, and social transformations, which continuously reshape everyday life and spatial realities. As a consequence of these dynamics, quality of life has gained increasing relevance in contemporary research. The scientific monograph addresses quality of life in a holistic manner, through an interplay of spatial, social, and environmental perspectives, based on an empirical framework that draws on diverse case studies from Maribor and the wider European context. A particular strength of the monograph lies in its international and collaborative character, as it brings together contributions from students and researchers from different disciplines and countries, reflecting contemporary research approaches and enriching the understanding of quality of life as a multidimensional theme. The chapters reflect methodological diversity, the use of a combination of qualitative and quantitative approaches, fieldwork, spatial analyses, and cartographic representations. As a whole, the monograph represents an important contribution to the study of mediumsized cities, regional geography, and quality of life, while also offering significant pedagogical and applied value for further research and policy-making.

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KAKOVOST ŽIVLJENJA V SPREMINJAJOČEM SE SVETU: PROSTORSKI, DRUŽBENI IN OKOLJSKI VIDIKI IZ MARIBORA IN ŠIRŠE OKOLICE

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Ključne besede:
kakovost življenja,
blaginja,
prostorski razvoj,
prostorske neenakosti,
trajnostni urbani razvoj,
javni prostor

Sodobno družbo zaznamujejo vse hitrejše in medsebojno prepletene globalne spremembe, vključno s tehnološkim razvojem, okoljskimi pritiski in družbenimi procesi, ki nenehno preoblikujejo vsakdanje življenje in prostor. Posledično postaja kakovost življenja v znanstvenih razpravah vse pomembnejši raziskovalni koncept. Znanstvena monografija kakovost življenja obravnava celostno, skozi preplet prostorskih, družbenih in okoljskih vidikov, z empirično zasnovo, ki temelji na raznolikih študijah primerov iz Maribora in širšega evropskega prostora. Posebna vrednost monografije je v mednarodnem in sodelovalnem značaju, saj združuje prispevke študentov in raziskovalcev iz različnih disciplin in držav, kar odraža sodobne raziskovalne pristope in bogati razumevanje kakovosti življenja kot večrazsežnostne tematike. Prispevki v monografiji odražajo metodološko raznolikost, uporabo kombinacije kvalitativnih in kvantitativnih pristopov, delo na terenu, prostorske analize in kartografske prikaze. Monografija kot celota ponuja pomemben prispevek k preučevanju srednje velikih mest, regionalne geografije in kakovosti življenja, hkrati pa ima tudi izrazito pedagoško in aplikativno vrednost za nadaljnje raziskave ter oblikovanje politik.

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