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THE FUTURE OF SPATIAL PLANNING IN UKRAINE

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For All Correspondence
transactionsaesop@gmail.com

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EDITORIAL: FIXING FOUNDATIONS, BUILDING RESILIENCE, DEVELOPING CAPACITY – UKRAINIAN RECOVERY PLANNING AS A PART OF THE COMMON EUROPEAN PROJECT

Oleksandr Anisimov[1], Dominic Stead[2]

Ukraine faces some of the most extreme conditions to have been experienced in Europe since the Second World War, including the loss of human life, depopulation, forced migration, the destruction of settlements, natural and agricultural areas, and the lack of access to basic services (e.g. water, electricity). These extreme conditions require huge, concerted efforts to promote the country's recovery, as was also the case in Europe in the second half of the 1940s, when countries were rebuilt after being ravaged by war. At that time, new planning practices were developed in many countries in parallel with the establishment of new arrangements of the welfare state, including public housing, education and healthcare provision, on a scale unimaginable just one or two decades earlier.

While Ukraine's recovery and reconstruction have been discussed at length, little attention has so far been devoted to the implications for the role of spatial planning in the rebuilding process (with some minor exceptions: Maruniak et al., 2022; UN-Habitat Urban Recovery Framework Thematic Papers, forthcoming). The spatial dimension has largely been absent in political and expert debates, as though geography and the built environment hardly matter, which is certainly not the case.

Less than five years ago, pre-war territorial and administrative reforms reshaped the governance and land ownership landscape in Ukraine (Anisimov et al., 2024; Umland and Romanova, 2024). While these shifts have created new opportunities for locally led economic growth, they have also presented new problems and challenges for regional development, nature conservation, and land degradation (Anisimov et al., 2025). These reforms have also increased the dynamism of governance and land management. Understanding the spatial governance context is highly important for the EU and its member states, as Ukraine's accession to the EU is likely to pose new challenges in the implementation of directives and regulations with direct impact on land.

At the same time, it also signals new opportunities for spatially bound policies, such as nature preservation, agriculture, housing, energy policy, and the Green Deal overall, to work on a continental scale. Influenced by EU political and funding priorities, Ukraine's recovery and reconstruction debates have already begun to consider how they can be aligned with EU goals such as sustainable transition, stronger and more secure borders, social cohesion, climate adaptation, food security, societal resilience and strengthening democracy. To address the housing reconstruction topic, a symposium 'Rebuilding a Place to Call Home' was organised and hosted in 2023 by PBL Netherlands Environmental Assessment Agency (Anisimov et al., 2023). Since then, the symposium has become an annual event organised by Kharkiv School of Architecture and other partners, providing an important opportunity for researchers and policy-makers to meet and exchange knowledge.

1 Aalto University, oleksandr.anisimov@aalto.fi, https://orcid.org/0000-0001-7229-2290

2 Aalto University, dominic.stead@aalto.fi , https://orcid.org/0000-0002-8198-785X

The third iteration of the symposium in 2024 was convened in Lviv around three main themes on the future of spatial planning: (i) governance for recovery; (ii) planning tools and learning; and (iii) knowledge in and for planning. Within the first theme, attention was focused on the mechanisms and specifics of the current spatial and regional management, and configurations of power that can enable or prevent effective recovery efforts in future. Under the second theme, researchers were invited to share first-hand experiences in designing and elaborating plans and digital tools. Within the third theme, attention was focused on formal education arrangements, extra-curricular studies and citizen-science approaches informing understanding and analysis of spatial planning and shaping proposals for future reforms. While some contributions addressed one of the specific themes mentioned above, others spanned several themes, providing intersectoral and cross-disciplinary insights.

Over 120 participants took part in the 2024 symposium (60 in Lviv, 60+ online), including four roundtable speakers, 12 panel members, and three invited external presenters. This special issue provides an edited collection of written contributions presented by the invited panel presenters to offer international readers a well-rounded overview of spatial planning in Ukraine, with a view to linking the findings to the broader European research context. Adding to understanding about planning and territorial development in the largest country in Europe is timely, particularly in relation to the future of EU cohesion and urban policies. In addition, the collection provides an opportunity for mutual reflection between Ukrainian scholars and their international counterparts, raising new issues and insights that may be overlooked in national debates.

On the theme of **governance for recovery**, Malchukova's contribution focuses on the needs of re-scaling and fine-grained recovery measures after occupation in Kherson Oblast (region). Delving into findings of a case study, she considers the local capacity and sharing of governance responsibilities, including options for combining multi-level governance and more direct governmental involvement in order to address deficiencies and setbacks in municipalities. The article by Ohorodnyk et al. examines Chernihiv Oblast with the aim of assessing the relevance of the existing planning framework for the local conditions, pointing to a need to review the 'napoleonic' symmetrical structure of the planning system, with every municipality adhering to the same scope and form of planning documents. Building on the analysis of governmental priorities and economic planning documents, Shevchenko and Kuzmunchuk develop a capacity assessment framework of Ukrainian cities under current conditions for integrative strategy development.

On the theme of **planning tools**, Kercuku et al. provide a critical look at the prospects of Mykolaiv municipality, focusing on the issues of governing the shrinking city. Their view is particularly directed towards a sober assessment of the underlying trends, backed by new data. Golubtsov offers an in-depth overview of the landscape planning instrument in Ukraine. Building on the wealth of practical experience, the paper highlights trail-blazing projects across the country, and major implications on the functional land-use plans, as well as the concrete examples of successful soil and nature conservation. Some of the most advanced spatial thinking and computing methods related to the resilience of urban systems are presented by Dale et al. on the cases of Kryvyi Rih and Nikopol, urban communes heavily impacted by the Russian invasion. They bring to the fore a condition in which an uptake of digital instruments is not only an obligation, but a powerful constructive force when combined with sufficient capacity and skills.

On the theme of **knowledge and learning**, the contribution by Lozynskyy et al. concentrates on analysing the variety of existing curricula in the broadly considered 'spatial planning'-related disciplines. Integrating findings from neighbouring countries' university systems, the paper showcases comparative findings to inform local debate. Schwartze et al. present a rich description of the activities of the bridging project between German and Ukrainian Universities, aiming to change and challenge the pre-existing notions and educational approaches. Their contribution reflects on the new ideas and concepts from the German planning system, the principles of the new and old Leipzig Charter and Integrated Urban Development.Kopacz-Gruzlewska focuses her attention on opportunities for digital participation and citizen-based data-driven approaches for producing planning documents. This contribution reviews EU-level digital infrastructure requirements with the view of evaluating current development in Ukrainian legislation and offering pathways for future development.

Taken together, the nine contributions to this special issue help to inform the reader about contemporary spatial planning in Ukraine, and identify a number of key messages and conclusions for both academics and practitioners. Ten key messages and conclusions are presented below.

First, integrated planning represents a promising approach for addressing short-term recovery and long-term resilience. Recovery efforts should balance urgent needs (e.g. housing, infrastructure) with broader resilience and sustainability goals (see contributions from Dale et al, Kercuku et al., Schwartze et al., Malchykova, Ohorodnyk et al., Golubtsov).

Second, environmental integration and landscape planning appear to be gaining importance. For example, Golubtsov shows that landscape planning, influenced by German methodology, is now formally required in comprehensive plans. There is some variability in implementation, but when landscape and spatial planners collaborate early, environmental goals are more likely to be meaningfully integrated.

Third, digitalisation and geospatial data use are crucial but have been unevenly developed and used to date. The role of GIS, spatial data infrastructures, and digital tools is widely acknowledged and requires deeper integration in planning practice (see contributions from Dale et al, Kopacz-Gruzlewska, Shevchenko & Kuzmynchuk, Ohorodnyk et al., Golubtsov). GIS is a promising means to enhance landscape analysis and decision-making under time and resource constraints.

Fourth, local institutional capacity is often a limiting factor in policy implementation. There is often a mismatch between policy intent and implementation capacity, especially in hard-hit or de-occupied areas (see Malchykova, Ohorodnyk et al., Golubtsov, Lozynskyy et al.). The lack of awareness, training, and methodological clarity can hinder the effective rollout of newer planning instruments (e.g. landscape plans). Moreover, the dearth of pre-existing research in the sphere of planning in Ukraine heavily hampers the quality of current planning, limits the imagination and depth of solutions to urban development and/or shrinkage.

Fifth, effective planning requires coordination across actors and scales. Various contributions in this special issue highlight the need for inter-level and inter-sectoral coordination (e.g. Lozynskyy et al., Malchykova, Ohorodnyk et al., Golubtsov). Golubtsov suggests that early-stage coordination between planning teams can lead to more substantial integration of landscape objectives than late-stage stakeholder consultation.

Sixth, there are increasing calls for participation, transparency, and public engagement to be deepened. Within spatial planning, limited public involvement is a recurring concern among many contributors (see for example Dale et al, Schwartze et al., Kopacz-Gruzlewska, Malchykova, Ohorodnyk et al., Golubtsov). Low awareness and symbolic consultation can both undermine the impact of planning. In this regard, projects and tools have been piloted, requiring local political support and changes to the current practices from practitioners.

Seventh, efforts are needed to improve standardisation, monitoring, and methodological support in spatial planning. Contributions from Shevchenko & Kuzmynchuk, Ohorodnyk et al., and Golubtsov stress the need for standardised indicators, monitoring tools, and clear methodologies for urban resilience, spatial planning, and environmental objectives. Monitoring implementation against nature protection and landscape preservation goals is currently missing and should be a future research and policy priority.

Eighth, legal reform is crucial, but must be matched with training and resources. Legal progress has recently been made, but this was undermined by weak technical and human capacities and lack of institutional training (see, for example, Lozynskyy et al. Malchykova, Ohorodnyk et al. and Golubtsov). There is a need for project subsidies, training, standardisation of planning schemes and graphics, and platforms for sharing success stories to make spatial planning instruments credible and effective. Various authors have highlighted that the impact of reforms over the last four years has yet to unfold, so it is still too early to clearly see the new spatial planning system and its implications.

Ninth, bottom-up initiatives generally need supportive top-down frameworks. Various contributions conclude that hybrid governance models, mixing decentralised innovation and centralised support, are best suited to some of the current challenges (e.g. Lozynskyy et al., Schwartze et al., Malchykova, Ohorodnyk et al.). Golubtsov recommends national support mechanisms (e.g. clearer laws, methodology) in combination with local ownership of environmental goals. There is plenty of space for both innovation and supportive knowledge creation in designing a new generation of planning approaches and plans, pushing the boundaries of what authorities and professionals currently do.

Finally, the Ukrainian experience offers transferable lessons for post-conflict spatial policy. Ukraine's context, shaped by decentralisation, war-related disruption, and ongoing planning reform, generates valuable insights into post-conflict planning (see contributions by Malchykova, Shevchenko & Kuzmynchuk, Ohorodnyk et al., Golubtsov). Developing cost-effective resilience measures and inserting sustainability-oriented components in existing planning processes can guide other countries navigating similar reconstruction challenges. While many important decisions on the reconstruction of destroyed cities and districts are yet to be made, the necessity to build planning capacity towards recovery efforts before they begin in practice is present in most contributions. This supports an overarching crucial point for recovery efforts across the globe, often guided by unfounded market expectations – that policy goals without public governance capacity will hardly ever materialise.

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References

Anisimov, O., Fedoriv, P., Tkachenko, O., Lawson, J., & Buitelaar, E. (2023). Rebuilding a place to call home. Sharing knowledge for the recovery of Ukraine. The Hague: PBL Netherlands Environmental Assessment Agency.

Anisimov, O., Smirnova, M., & Dulko, I. (2024). Establishment of a New Planning System in Ukraine: Institutional Change Between Europeanization and Post-Socialist Path Dependence. Planning Theory and Practice, 25(4).

https://doi.org/https://doi.org/10.1080/14649357.2024.2414973

Anisimov, O., Vlasenko, Y., Stead, D., & Smirnova, M. (2025). Caught Up Between War, Localism and EU Land Policy Regulations. Unravelling Local Land Use Decision-Making in Ukraine. European Journal of Spatial Development, 22(3), 1–37. https://doi.org/10.5281/zenodo.16635072

Maruniak, E. O., Palekha, Y. M., & Kryshtop, T. V. (2022). Planning of spatial development in times of war and reconstruction: a vision for Ukraine. Ukrainian geographical journal, 4, 13-22.

Umland, A., & Romanova, V. (Eds.). (2024). Ukraine's Decentralization: Challenges and Implications of the Local Governance Reform after the Euromaidan Revolution. ibidem.

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PLANNING REGIONAL RECONSTRUCTION AMIDST CONFLICT: BALANCING TERRITORIAL GOVERNANCE IN (POST-)WAR UKRAINE

Daria Malchykova[1]

Abstract

This article analyses the challenges of regional reconstruction in scenarios of ongoing conflict and deepens existent understanding of the multivariate patterns of (post-)war spatial policy making. Using a case study approach, the article points to situations where the existing institutional structure of decision-making at the territorial community (hromadas) level cannot overcome all consequences of the war in Ukraine. The paper argues that matching (post-)war reconstruction measures with the new functionalities of hromadas, their institutional capacity, level of destruction, resilience, and subjectivity will maximise support for bottom-up initiatives, while adaptively and flexibly supplementing them, where necessary, with a top-down approach.

Keywords:

War, reconstruction, territorial communities (hromadas), spatial policy, decentralisation.

1 Professor at the Department of Geography and Ecology,
Kherson State University, 27 Universytets'ka St.,Kherson, Ukraine 73003 darina1378@gmail.com
https://orcid.org/0000-0002-7197-8722

1. Introduction

Wars and forced conflicts are significant forms of human and spatial disasters as a consequence of their impacts on issues such as: large-scale human suffering, refugee and internal displacement, the destruction of infrastructure, and the economic and environmental transformations that follow within war-torn countries. The large-scale, long-term Russian-Ukrainian war in the heart of Europe crucially changes the dimensions of European spatial development (Mearsheimer, 2022) as well as European global supply chains, energy security and agricultural markets (Hensel, 2024). In this context, the (post-)war reconstruction process in Ukraine has become a key effort at national and European scales, as well as an important research lens through which to understand the planning of regional reconstruction in areas erxperiencing ongoing conflict.

Planning regional reconstruction in areas experiencing ongoing conflict is a comprehensive research paradigm that focuses on (post-)war social, economic, spatial reconstruction (Hasic, 2004; Castillo, 2008; Jabareen, 2013; Earnest, 2015); crisis management (Rose and Adler, 2024); social cohesion (Fiedler, 2023; Krawchenko, 2023); institutional adaptation (Wang et al, 2005; Assem et al, 2020), post-traumatic urbanism (Wahba et al, 2021), and so on. Research in recent years has demonstrated successful solutions to strategies, policies and programmes for sustainable post-war recovery and ongoing conflict reconstruction (Langer, 2016; Rezk et al., 2025). Nevertheless, many existent studies discuss not only strategies and projects for post-conflict reconstruction, but also the design of decision-making: Commenting further, Earnest (2015) argues for a more participatory approach to territorial community engagement in the identification, planning, and implementation of post-conflict reconstruction projects. The smart governance approach to reconstruction (Assem et al., 2020) proposes the development of intelligent management systems for use by municipal managers and government agencies in post-conflict zones through bottom-up decision-making by engaging citizen participants, especially diaspora populations. The local context of post-conflict reconstruction (D'Alessandro-Scarpari, 2011) defines the complex powers of local territories in their development and reconstruction projects. However, there is research (Saleh et al., 2023) that identifies "strong government leadership" and a top-down approach as the most influential success factors that have successfully helped reconstruction practices as well as resources for recovery.

In this context, post-war spatial policy, as well as planning regional reconstruction and development amidst conflict in Ukraine should be rethought in terms of a rational balance of top-down and bottom-up approaches, as well as centralised and decentralised solutions. It follows, that there is a gap at the regional level which this paper is seeking to address. The article summarises and systematises the challenges of wartime, changes in the governance conditions of territories ,and their potential in the context of spatial policy makings amidst conflict and in post-war recovery. In so doing, the following key research questions were formulated:

How does decentralisation help (or not help) hromadas to keep their national and regional subjectivity?

What are the challenges posed by the war to the capacity of hromadas for post-war reconstruction efforts and the preservation of the hromada map?

How does one find a balance between centralised solutions and a 'bottom-up' initiative with new hromadas functionality?

The first part of the article outlines the general discourse on (post-)war reconstruction, focusing on Ukraine's present circumstances and the international paradigms influencing spatial planning in times of war. The second part presents the study's research methodology. The third part outlines the results of the Kherson region case study, which illustrates the social and spatial transformations of wartime at the regional level. The final section contains reflections on the potential for integrating centralised and decentralised approaches to create new spatial policies.

2. Contextual Background: What is the Theoretical and Regional Context We Are Working with?

2.1. Planning Regional Reconstruction Amidst Conflict

Planning regional reconstruction and development amidst scenarios of war conflict is one of the most serious challenges facing national development (del Castillo, 2008). Nowadays, the main issue on the global development agenda is the development of policies for countries that have come to the end of periods of serious conflicts (Stewart, 2009). This is partly because of the large number of countries where such policies are relevant, and partly because their situations are usually among the most desperate. Actual discourse on post-conflict reconstruction in the Middle East, South Asia, and Africa provides valuable lessons on post-war development. In some cases (Payab, 2014; Isayinka, 2023) it has been shown that even after more than a decade of effort, and billions of dollars and donations from the international community, the governments' post-war reconstruction efforts have not progressed and have not achieved their goals. Successful examples include post-conflict reconstruction based on multidisciplinary and systemic approaches and the SCOPE model (Hasic, 2004); reconstruction in the context of ongoing conflict (Jabareen, 2013); and post-conflict reconstruction interventions based on integrating rebuilding soft and hard infrastructure (Sakalasuriya et al., 2018).

The post-conflict reconstruction case of Ukraine is significantly different, as coupled with the catastrophic wartime losses (World Bank, European Union..., 2025), Ukraine is experiencing fundamental transformations of its civic society (Krawchenko, 2023) and spatial planning (Anisimov et al, 2024). Moreover, Ukraine's experience is contributing to the reconfiguration of the global order (Cox, 2023) and reshaping the strategic landscape of Europe (Götz & Ekman, 2024)

The following factors are the most crucial. The Russian-Ukrainian war is ongoing, with large-scale hostilities having taken place for more than 3 years. The geostrategic significance of Ukraine in the geopolitically diverse Eurasian space, and its European integration progress makes it a key transatlantic partner against Russian aggression in Europe as well as a key element of European security architecture (Rouet and Pascariu, 2025). The accumulated losses and damages since the beginning of the full-scale invasion amount to more than $750 billion (and the value is growing daily), whilst recovery will require, according to the RDNA4 report, more than $486 billion for the period 2025-2034 alone (World Bank, European Union, 2025). Despite large-scale losses, Ukraine has a highly skilled labour force, a functioning economy and social resilience (European Commission Directorate, 2024), which should increase the effectiveness of ongoing and post-conflict reconstruction.

The experience of European spatial policy is already being used in the practice of developing the Ukraine Recovery Plan (Ukraine Recovery Plan, 2022). The European Commission's 2024 report (European Commission Directorate.., 2024) assesses Ukraine's progress in implementing reforms in the context of its European integration course and post-war recovery. The report highlights that Ukraine has taken steps to integrate multi-level governance and regional development principles in line with the EU's Territorial Agenda 2030, and also recognises Ukraine's progress in the anti-corruption, decentralisation, and digitalisation sectors. The synthetic model developed and used to analyse the transformational changes in the Ukrainian planning system (Anisimov et al, 2024) also demonstrated that the Ukrainian spatial system has undergone multilayered transformation in the direction of prevailing European planning trends.

In April 2022, Ukraine established the National Council for the Recovery of Ukraine from the War (About the National Council, 2022), which has already proposed its first drafts of documents. Analytical academic research (Sakun and Shkola, 2023) provides a vision of post-war territorial hromada development in the context of the European Green Deal and other key priorities. Such documents give us an answer to the question as to which areas and what key results we are striving for. However, there has been insufficient analysis of how we should organise the decision-making process, enable cooperation between different spatial and administrative agents, and what models of local policy should be created amidst existing humanitarian and spatial challenges. Some analytical reviews (Nadin and Stead, 2008) point out that national social model systems may have a certain degree of path-dependency; such as the persistence of institutions and cultures.

Bottom-up and top-down approaches are characterised by different dynamics, and lead to different forms of cooperation between citizens and government. The key pitfalls of citizen participation, co-decision-making, and civic initiatives (Meerkerk, 2019) are determined by the motivations, capacities, and representativeness of the participants' efforts. Scholars embrace multilevel governance as an analytical framework for solving complex problems and identifying the elements necessary for its operational implementation (Homsy et al., 2019). While most scholarship on reconstruction amid conflict centers on the national scale, this approach overlooks the needs of subnational actors. In Ukraine, for example, the Recovery Plan offers only a broad framework, leaving local and regional authorities without concrete guidance. The Recovery Plan was developed as a broad and rather general strategic programme document, but its effectiveness will largely depend on the specific measures that will be implemented under its "umbrella". The main problems might be low institutional capacity and a lack of necessary skills/awareness of project management at the hromada level (European Committee, 2022).

2.2. Ukraine's Modern Context and Global Framework for Spatial Policy during Wartime

Ukraine, one of the largest countries in Europe, is a typically East European nation whose history is marked by a high degree of discontinuity (Rudnytsky, 1963). The country's favorable geographical location between Western Europe and Asia, its rich natural resource potential, and its powerful human resources made Ukraine a priority object of colonial interest for the Russian and Soviet empires. During its 30 years of independence, new institutions have been established, including private property, market economy, free enterprise, multiparty system, pluralistic civil society, freedom of speech and censorship-free media, and so on (Yakymenko et al, 2021). The modern stage of Ukraine's Euro-Atlantic path, despite the large-scale war, envisages the implementation of key European goals, including a Just Europe that offers future perspectives for all places and people, and a Green Europe that protects common livelihoods and shapes societal transition. This is supported by spatial development instruments which were formed following the European Commission's priorities (2019-2024) and within the framework of the EU cohesion policy (since 2007). Such regional policies are based on human-centredness, rational spatial planning, sustainable mobility, inclusiveness, energy efficiency, energy saving, and environmental friendliness. At the local level, they are implemented through a bottom-up approach by engaging citizens and ensuring their participation in the formation of planning policies.

In this framework, Ukraine's modern context forms a challenging basis for spatial policy for several reasons. The colonial experience of Ukraine during the imperial and Soviet periods determined the dominance of the top-down approach in all spheres of life (Motyl, 1993). This trend and the economic imperatives associated with the same persisted, to a large extent, in the first decades of the country's independence. However, since 2015, spatial policy and planning have increasingly emphasized the importance of leveraging local potential as a foundation for territorial development. This was ensured by introducing the concept of functional regions, and was reinforced by implementing decentralisation reforms (2015-2020). The reforms enabled local authorities (hromadas) to gain real powers in their activities, and especially so in the management of territorial resources of hromadas, as well as the activation of civil society in regional initiatives (Ostapenko et al, 2023). A culture of participatory engagement at the level of local hromadas (Malchykova, 2021) emerged in the pre-war years and this also strengthened the bottom-up approach to spatial policy and regional development. The great challenging influence of the large-scale Russian-Ukrainian war over the last three years, has led to numerous global changes, as well as local and large-scale regional destruction (Palekha et al, 2023). Ukraine and the world are also experiencing socio-environmental consequences at various scales after the explosion of the Kakhovka HPP (Pylypenko and Malchykova, 2023).

For all European countries, including Ukraine, the war has accelerated the need for energy transition, as well as the global megatrends of demographic change, biodiversity degradation, whilst the weakening of democratic guarantees has also intensified (Nadin and Fernández-Maldonado, 2023). Given Ukraine's European integration progress, (post-)war regional reconstruction of Ukrainian hromadas should be carried out according to European innovative spatial planning policies as set out in key documents such as the EU territorial development and cohesion policy - Territorial Agenda 2030: A future for all places (2015). This document calls for a strengthening of the territorial dimension of sectoral policies and promoting an inclusive and sustainable future for all places and regions.

3. Methodological approaches

This study was conducted using thematic analysis and adopted a case study methodology which also incorporated online information collection tools, as well as the author's reflections on the experience of being under active hostilities, occupation, and displacement. The thematic analysis of spatial policy making amidst conflict and post-war reconstruction was carried out in three interrelated analytical contexts: (1) institutional capacity - the analysis covered the Ukrainian context of post-conflict reconstruction and transformational changes in the system of administrative and territorial structure; (2) National and regional subjectivity was explored through the ways in which civic actors at the national and regional levels are involved in the formation of spatial policy, in particular through activism, crisis response and adaptation to demographic, social and environmental changes; (3) the new functionality of hromadas – undertaken in order to identify how the war transformed the traditional roles of hromadas with regards to governance, as well as the spatial dimensions of the war's impacts. This made it possible to identify key patterns, new challenges, and trends in the territorial governance system during the war, as well as assessment of the potential to shape post-conflict reconstruction policies that combine top-down and bottom-up approaches. The case study was chosen as the most accepted qualitative research method, and allowed for an in-depth assessment of the situation in the context of real life. The use of a case study enabled an in-depth analysis of the Kherson region, which has experienced occupation, daily shelling, and the devastating consequences of the Kakhovka reservoir disaster. The study systematised the challenges faced by war-torn hromadas, examined the specific features of governance during wartime and post-war recovery, and assessed ongoing trends in balancing centralised and decentralised policy solutions. Statistical observations of demographic changes occurred between 24 February 2022 to 14 September 2023 within 17 territorial hromadas of Kherson region; these were de-occupied in autumn 2022 after a long occupation. The statistics were collected in cooperation with the Kherson Regional Military State Administration. The research uses open data from the Digital Reconstruction Ecosystem for Accountable Management (DREAM, n.d.) and the Clarity Hromada analytical platform (Clarity Hromada, n.d.), as well as the results of surveys conducted by the Kherson Community Foundation 'Zakhyst' (Charitable organisation, n.d.). An integral analysis of the multi-temporal and multi-topical surveys presented on this platform enabled the researcher to establish Kherson residents' assessment of hromadas resilience in various aspects as well as their perceptions of the ongoing recovery process. The study continues the conceptualisation of the assessment of the consequences of Russian military aggression and post-war reconstruction policy at regional and local levels. It also presents conclusions on a new perspective on spatial policy-making in time of war and post-war resurgence.

4. Results and Findings: The case of Ukraine's Regions in the Russo-Ukrainian War and Development Amidst Conflict

4.1. Decentralisation Reform in Ukraine in Wartimes: the Basis for Increased Participation, Civic Activism and Regional Resilience

From the Soviet period, Ukraine inherited a highly bureaucratic and complex administrative-territorial organisation, in which local administrations at the district level had no real tools of local governance and were not capable of addressing economic, social, and cultural development issues (Yakymenko et al, 2021). The rayon as a territorial unit was used more for statistical accounting of regional indicators than for the decentralisation of governance.

The decentralisation reforms that occurred in Ukraine between 2015-2020 were implemented on the principles of decentralisation and subsidiarity, and determined the new administrative and territorial structure of Ukraine at the grassroots and rayon levels (Decentralisation and formation , 2020).

However, the war has led to a new challenge in the system of territorial governance. The Law of Ukraine 'On the Legal Regime of Martial Law' (2015) provides for the possibility of establishing temporary state bodies - military administrations - to ensure the operation of the Constitution and laws of Ukraine so asto ensure, together with the military command, the launch and implementation of martial law measures, defence, civil protection, public safety and order, the protection of critical infrastructure, and the protection of the rights, freedoms and legitimate interests of citizens (Table 1)

Table 1. Administrative and territorial division before, after reform and due the war times.

Administrative territorial division	Before reform	After reform	Military state administrations (after 24 February, 2022)
Intermediate level	24 regions Autonomous Republic of Crimea 2 cities with the status of Regions (Kyiv and Sevastopol)	24 regions Autonomous Republic of Crimea 2 cities with the status of Regions (Kyiv and Sevastopol)	*24 regional military state administrations,* *Kyiv city military administration*
Districts	490 districts and 176 cities with district status	136 districts	*136 districts military administration*
Local units	-	**1469 territorial communities (hromadas)**	***192 military administrations of city and rural settlements in 12 regions***
Settlements	279 cities of district subordination, 884 urban municipalities, and 28573 rural settlements	29710 settlements (cities, rural settlements)	

* Developed by the author

European analysts have noted that decentralisation has been one of the most successful reforms in Ukraine since the Revolution of Dignity (Dudley, 2019). In general, among the positive achievements of the reform are the consolidation of rayons, fiscal decentralisation, the revival of economic activity, and the formation of new opportunities for inter-municipal cooperation and capacity building (Kaliuzhnyj et al, 2022). Current research confirms that the capacity of local governance has an overall impact on regional economic resilience (Martin and Sunley, 2020; de Vries and Nemec, 2025). In addition, a territorial hromada's lower dependence on subventions and grants from the state budget has a positive impact on its preparedness for complex, multidimensional shocks (Kurnyshova, 2023).

The decentralisation reforms provided for the strengthening of powers and the expansion of the resource bases of local rather than regional and district self-government bodies while also making inter-budgetary relations more transparent. One year after the full-scale Russian invasion, empirical findings from Ukraine demonstrate that the decentralised system of governance contributed to resilience in the face of a prolonged and extraordinary wartime crisis (Keudel and Hus, 2023). Romanova and Umland (2023) identify three types of contributions of local governments at the territorial hromada level to state capacity building during the Russian full-scale invasion: contribution to the territorial defence of Ukraine, support for IDPs, and assistance in state reconstruction.

The reforms contributed to the modernisation of key instruments for territorial development, particularly the system of spatial planning at the local level. This can be seen as a positive outcome and a continuation of the broader decentralisation reform (Melnychuk et al., 2021). Decentralised solutions and hromada capacities in wartime have been strengthened by the implementation of cross-cutting digitalisation of recovery project activities and accountability (DREAM, n.d.), the dissemination of analytics (Clarity Hromada, n.d.), and the maintenance of a constant dialogue with hromadas (Charitable organisation n.d.). It follows, that a high level of digitalisation of local governance and accountability in post-conflict reconstruction enhances the inclusiveness of regional reconstruction planning processes and also supports civic activism.

4.2. The War-Torn Region: the Challenges of Wartime, and Changes in the Governance Conditions of Territories

This part focuses on context at different scales, as this allows for a better understanding of the multi-dimensionality of the issues and their significance at different spatial levels

4.2.1. Political Challenges

Russia's full-scale military invasion caused the temporary occupation of a large part of Ukraine's territory, led to millions of internally displaced persons, and gave rise to a record decline in Ukraine's economy (World Bank, European Union 2025). The war has led to significant losses of key resources that were crucial for local and regional development including demographic, natural, and infrastructure resources. Since the beginning of the full-scale aggression, almost 4,000 settlements in 231 hromadas in 11 of Ukraine's 24 regions have been temporarily occupied (Barynova, 2024). The most significant political challenges for territorial hromadae's recovery are: (1) destruction and/or complication through the creation of military administrations within the still relatively young governance system at the local level; (2) 'dismantling' of the Ukrainian governance system in the de-occupied hromadas; (3) unevenness with regard to the creation of military administrations at the local level and their existence not for all occupied territories. For example, at the local level only in the Kherson region each hromada has a military administration. The experience of the Kherson region with regard to the activities of the military administrations shows that they can function not only in de-occupied territories and territories near the demarcation line, but also in temporarily occupied territories. This approach has only been implemented in the Kherson region, and makes it possible to manage territories more efficiently.

In these circumstances spatial policy can be cumbersome and difficult to adapt or update to the realities of either decentralisation or post-war development contexts. To achieve a common vision in decision-making and in order to find the optimal combination of top-down and bottom-up approaches, it is necessary to take into account the basic capacity of the individual hromada, its existing demographic potential, the level of physical destruction caused by the hostilities, and the geospatial scope of its coverage. In order to garner territorial hromadas' perspectives on the problems or goals of post-war recovery, it was important to organise a dialogue on the following questions:

Who is affected/what is affected?

What are the consequences of the problem and how do they affect the well-being of the hromadas?

How many people are affected by a particular problem (within 1 hromadas, group of hromadas, region)?

Which ethnic, cultural, gender communities are particularly affected by the problem?

Can the problem be addressed at the hromadas level?

Which people, institutions (or other change agents) can create (or block) solutions to the problem?

In the context of the analysis "What Kind … and for Whom?" (Pike et al, 2007), such a dialogue enables a better analytical assessment of the objects, subjects and dimensions of social well-being, as well as an understanding of who benefits and loses from specific forms of local and regional development and where. Answers to these questions allow for a more informed balance to be achieved between top-down and bottom-up approaches, as well as the development of a common conceptual framework for regional and local policies.

One of the key challenges in the recovery process of de-occupied hromadas and war-torn territories is ensuring transparency and clarity of regional and local development for all actors involved (Balagna et al, 2024). Openness and accessibility of information contribute to trust, public engagement, and efficient resource allocation, whilst the most affected hromadas lose their ability to compete for resources and attention, putting them in an extremely vulnerable position. This raises a dilemma: how to ensure a level playing field when the starting point is so unequal? In such contexts there is a need for radical institutional solutions and large-scale financial support to compensate for losses and create conditions for the recovery of the subjectivity of such hromadas. Transparency should be combined with targeted support to avoid deepening spatial inequalities in post-war periods.

4.2.2. Spatial Challenges

The active hostilities have caused significant changes in the functionality and suitability of the territories with regards to economic use. The research, conducted within 17 de-occupied hromadas in Kherson region between 24 February 2022 and 14 September, 2023, showed damage to 14953 objects, including 12626 (84.5%) private residential buildings, 950 (6%) apartment buildings and 1377 (9.5%) communal, social, transport and industrial infrastructure. Thousands of hectares of land have now become militarised badlands which are uninhabitable due to dangers including, amongst others, hazardous substances, radiation leakage, and mined areas. Even when the spatial resource is not lost or the territories are de-occupied, their functionality and content have changed radically. In total, 69 percent of the damage was caused by ammunition, 4.5 percent by rocket fire, and 26.5 percent by other actions undertaken by Russian troops.

The Kakhovka Reservoir disaster on 06 June 2023, - a case of complex socio-environmental military aggression by the occupiers - has led to numerous local, regional, and national consequences as well as global challenges. The direct and horrific impacts of the disaster included flooding, deaths, the destruction of homes and infrastructure, water shortages, pollution, the extinction of rare species of flora and fauna, and the dewatering of the reservoir basin amongst others. The long-term consequences of this disaster related to the unique role of the Kakhovka reservoir for the Ukrainian economy and society (Pylypenko and Malchykova, 2023). The global challenges include environmental and food security as well as direct threats to nuclear safety.

The Kherson region is also a prime example of a territory in which the occupiers destroyed key transport and logistics elements, drastically changing the communication connectivity of the area and the transport accessibility of its hromadas. Kakhovka hydroelectric power plant dam, the railway bridge and Antonivskiy bridge within the Kherson Urban Territorial Hromada had, hitherto, increased the region's communication connectivity, effectively created a "new" transport and geographical location for hromadas and ensured increased regional resilience. However, the destruction of all bridge crossings by the occupiers within the region has created significant problems for warfare strategy and tactics. It has also made it virtually impossible for sustainable social communications to exist between the hromadas on the left and right banks of the Dnipro.

4.2.3. Geodemographic Challenges

The large-scale military invasion of 2022 created entirely new dimensions for spatial functionality in Ukraine and Europe as a whole. The scale of war refugees from Ukraine is incredible: there are more than 6.3 million refugees from Ukraine, including 5.9 million in Europe, and internal displacement within Ukraine is estimated to be more than 3.7 million. In reality, one in four Ukrainians has been displaced and has moved either abroad or to another region of Ukraine (Malchykova and Pylypenko, 2023). The demographic changes observed in Ukraine, whether in the whole country, in de-occupied hromadas, or in areas where ongoing hostilities are taking place, pose significant challenges for post-war reconstruction efforts. Analysis of the demographic situation within the de-occupied hromadas of the Kherson region reveals the following key findings.

Table 2. Demographic indicators in the de-occupied hromadas
(case study of Kherson region, as at 01.01.2022 and 01.09.2023) *

Hromada	Type **	**Share of available population compared to the pre-war period,%**	Population density, persons/km²,		Average population of settlements,	
			01.01.2022	**01.09.2023**	01.01.2022	**01.09.2023**
Tyaginskaya	RH	**25.9**	23.4	**6.0**	902	**233**
Beryslavskaya	UH	**26.9**	39.9	**10.7**	1827	**491**
Khersonska	UH	**29.0**	720.1	**209.1**	20378	**5917**
Mylivska	RH	**31.6**	12.5	**4.0**	690	**218**
Novooleksandrivska	RH	**32.8**	14.9	**4.9**	673	**221**
Novorayskaya	RH	**40.6**	16.8	**6.8**	656	**266**
Kalynivska	RH	**41.2**	17.6	**7.2**	289	**119**
Novovorontsovskaya	RH	**45.5**	27.0	**12.3**	1255	**571**
Stanislavskaya	RH	**46.1**	24.3	**11.2**	2501	**1153**
Chernobaevskaya	RH	**49.5**	62.2	**30.8**	1504	**745**
Vysokopilska	RH	**50.6**	22.6	**11.4**	507	**257**
Darievskaya	RH	**50.9**	31.7	**16.1**	934	**476**
Belozerskaya	RH	**51.7**	54.3	**28.0**	886	**458**
Borozenskaya	RH	**62.7**	11.5	**7.2**	373	**234**
Kochubeevskaya	RH	**65.1**	14.3	**9.3**	211	**137**
Velykoaleksandrovska	RH	**67.4**	19.0	**12.8**	484	**326**
Muzykivska	RH	**84.3**	29.3	**24.7**	743	**627**
De-occupied hromadas together		**34.9**	**71.5**	**25.0**	**2161**	**755**

* Developed by the author based on data from Kherson Regional Military State Administration
** Type of hromada: RH – Rural Hromada; UH – Urban Hromada

On average, the population of the de-occupied hromadas has declined by about 65 percent compared to the pre-war period, with fluctuations ranging from 15 percent to 74 percent within individual hromadas. The population density within the de-occupied hromadas has decreased by almost three times, from 71.5 persons/km² to 25 persons/km². In some rural hromadas, the population density as of 01 September, 2023 had dropped to 10 persons/km² or less; in eight out of the 17 de-occupied hromadas. The average population of settlements in the de-occupied hromadas has decreased three times, and within rural hromadas it has halved (from 720 to 355).

The war has had a significant impact on the demographics of the region and has highlighted issues with hromadas' capacities. It may, as a result, be necessary to reconsider the network of hromadas. The conflict has also caused damage to important transport infrastructure, such as bridges, railways, and roads; altering the socio-geographical landscape of the area. With regard to the Kherson region we can discuss that the existing scale of demographic losses, the multi-vector and multi-scale consequences of infrastructure destruction, and the Kakhovka reservoir disaster may be the basis for rethinking the capability of hromadas, revise the network of the territorial structure of hromadas, increased centralization in the post-war reconstruction.

4.3. The New (Post-)War Reality and Functionality of Hromadas: Finding a Balance in Territorial Governance

In the field of planning theory, two major strategies exist: the top-down and the bottom-up approach. These approaches have been widely used in reforming the administrative and territorial structure in many European countries (Centre of Expertise, 2017). The top-down approach is initiated by the highest level of territorial government, while the bottom-up approach depends on initiatives from regional or local governments. The choice between top-down and bottom-up approaches to planning and implementing policies is a subject of active discussion. As Sabatier (1986), Pissourios (2014) show, each approach has i advantages depending on the scale, context, and number of actors involved. The centralised (top-down) approach is effective in cases where there is a clear government programme or legislative framework and the number of actors involved is limited, whereas a bottom-up approach works better in a multi-stakeholder environment, where it is important to take into account local differences, social dynamics, and community needs.

Within the modern digitalisation framework, these approaches not only coexist, but also enter into new forms of interaction - sometimes conflicting, sometimes complementary. While digital tools increase the transparency and accountability of centralised solutions, they also open up space for local initiative, civil society mobilisation, and the formation of a smart bottom-up approach (Zhou et al., 2023). This context that embraces a combination of approaches is well demonstrated in Ukraine, and has mobilised hromadas and civic engagement as part of an inclusive process of shaping the post-war reconstruction agenda (Rzegocki et al, 2024).

War-affected hromadas face challenges of post-war development and reconstruction that do not fit into the concept of the dominance of any one approach. A striking example is the formation of spatial policy at the local and regional levels after the Kakhovka hydroelectric dam was blown up. In keeping with current legislation, the use of the Kakhovka reservoir bottom was prohibited until the war is resolved, and a pilot project being developed to restore the hydroelectric power plant and water supply system in the southern and eastern regions of Ukraine after de-occupation. There is no alternative to this spatial development strategy due to it being implemented by a top-down approach. At the same time, hromadas in the areas adjacent to the reservoir are already demonstrating flexible and adaptive solutions using bottom-up methods. Community participation and consideration of their interests is a priority, and it is important to engage in dialogue with hromadas whilst also ensuring that civil society is widely involved in discussions of all general strategy and centralised solutions.

A Ukrainian example, the Digital Reconstruction Ecosystem for Accountable Management (DREAM, n.d.), illustrates how digital solutions can bridge these two alternate governance logics. It not only ensures transparency in resource allocation, but also increases community participation in shaping the recovery agenda. In this way, digitalisation creates the conditions for a flexible combination of centralised coordination and local subjectivity, especially important in the (post-)war reconstruction period.

An effective balance between centralised solutions and bottom-up initiatives should be built through synergies and integration, adaptation to the consequences of war in particular hromadas, and also embrace a tailored approach to governance. Centralisation ensures strategic coordination, resource mobilisation and legislative security; all critical in crisis situations. At the same time, bottom-up initiatives, which have intensified in times of war, are the basis for strengthening national identity and subjectivity based on horizontal social organisation (Krawchenko, 2023). In cases where centralised decisions become necessary, they should not displace local participation. Rather, even if centralised approaches are temporarily reinforced, it is important to ensure that hromadas (including temporarily displaced residents) remain active participants in processes of reconstruction, the preservation of regional identities, and the restoration of institutional capacity.

5. Conclusions

Planning for regional reconstruction amidst ongoing conflicts is always a challenge. All war-torn countries experience similarities in overcoming the large-scale physical destruction of infrastructure, the mergence of new demographic patterns, and increasing inequality and polarisation of socio-spatial systems at all levels; but outcomes and successes of post-war reconstruction efforts vary considerably. Ukraine's experience is often overlooked in international discussions, but it provides a valuable contribution to understanding how the changing conditions of territorial governance affect social resilience and cohesion, as well as deepening understanding of the multivariate patterns of spatial policy-making in times of war and post-war reconstruction.

Drawing on a comprehensive analysis of Ukraine's contemporary context, the heritage of administrative centralism, and the success of the decentralisation reform at the national level, this article has shown that administrative and financial decentralisations transform the logic and patterns of territorial governance, and become indicators of societies' ability to adapt to crises while also striving to achieve democratic governance standards. A high level of digitalisation of local governance and accountability in post-conflict reconstruction enhances the inclusiveness of regional reconstruction planning processes and supports civic activism.

Focusing on the regional level of the case study, the article has consistently shown that the multi-vector and multi-scale impacts of the war can serve as a basis for rethinking the capacity of hromadas and revising their territorial structures. Using this case study, it has been argued that the development of a new spatial policy for the post-war reconstruction of war-torn hromadas and regions (especially for the de-occupied territories) should be guided by assessment of such components as: institutional capacity, national and regional subjectivity, and new hromadas' functionality.

Against the backdrop of the ongoing war, national identity and subjectivity are being strengthened through bottom-up social organisation (Krawchenko, 2023). However, for local and regional development, the war has led to significant spatial inequalities, direct and indirect losses of key resources, and dependence on centralised coordination for recovery efforts. Therefore, it is important to ensure that war-torn hromadas (including internally and externally displaced residents) remain inclusive participants in the process of post-conflict reconstruction, the preservation of regional identity, and the restoration of capacity and that they work alongside the temporary strengthening of top-down approaches.

An additional challenge of territorial governance amidst ongoing conflict is the establishment of temporary military administrations. On the one hand, the further complicating of the decision-making system at different administrative levels correlates with the emergence of a new functionality of hromadas and regions in terms of new institutional and social roles - in service delivery, resilience, post-war reconstruction, and national security. However, in de-occupied hromadas there has been varying degrees of 'dismantling' of the Ukrainian governance system depending on the length of the occupation and the depth of destruction of the public service delivery system. In the process of overcoming dysfunctionality, such hromadas demonstrate trends of increasing centralisation.

Reconstruction can catalyse processes of decentralisation and strengthen national and regional subjectivity through an integrated, participatory approach to reconstruction and a recovery that invests in people and place rather than simply rebuilding the physical elements of pre-conflict conditions (Wahba et al, 2021). At the same time, Ukraine's heavily war-affected municipalities indicate that the critical loss of human, spatial and infrastructural resources has facilitated increased centralisation in post-war reconstruction, as the capacity of local institutions to effectively manage, deliver services and respond to wartime challenges has decreased.

Matching (post-)war reconstruction measures with the results of the assessment of institutional capacity, levels of destruction, national and regional subjectivity, and the new functionality of hromadas will maximise support for bottom-up initiatives; this should be supplemented, where needed, by adaptively and flexibly supplementing them with a top-down approach. The findings of the study have also led to further rethinking of decentralisation processes and the effectiveness of centralised solutions in the context of regional and sectoral differences with regards to the impacts of the war's consequences.

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References

About the National Council for the Recovery of Ukraine from the War (2022). Presidential Decree № 266/2022 as of April, 21, 2022. [Online] Available from: https://www.president.gov.ua/documents/2662022-42225 [13/10/2024]

Anisimov, Oleksandr, Maria Smirnova, and Ievgeniia Dulko (2024). Establishment of a New Planning System in Ukraine: Institutional Change Between Europeanization and Post-Socialist Path Dependence. *Planning Theory & Practice,* 25(4), pp. 482–501. https://doi.org/10.1080/14649357.2024.2414973

Assem, Ayman, Sherif Abdelmohsen, and Mohamed Ezzeldin (2020). Smart Management of the Reconstruction Process of Post-Conflict Cities. *ArchNet-IJAR* 14 (2), pp. 325–43. https://doi.org/10.1108/ARCH-04-2019-0099.

Balagna, Jay, Khrystyna Holynska, and Krystyna Marcinek (2024). Trade-Offs of Reconstruction in a Post-Conflict Environment. In: *Enhancing Stabilization and Strategic Partnership in a Post-Conflict Environment: A Comprehensive Approach to Human Security,* P. II, Chapter IV, pp. 89-109.

Barynova, Diana (2024) Recovery and development of de-occupied territorial communities: reality and prospects. National News Agency of Ukraine - Ukrinform, 01 March 2024. [Online] Available from: https://www.ukrinform.ua/rubric-polytics/3834546-vidnovlenna-ta-rozvitok-deokupovanih-teritorialnih-gromad-realnist-ta-perspektivi.html# [10/10/2024]

Castillo, Graciana del (2008) *Rebuilding War-Torn States: The Challenge of Post Conflict Economic Reconstruction.* Oxford, 2008; online ed,), https://doi.org/10.1093/acprof:oso/9780199237739.001.0001

Charitable organisation 'Kherson Community Foundation "Zakhyst" (n.d.) https://pochuty.ks.ua/vasha-dumka/ [02/05/2025]

Clarity Hromada (n.d.) https://clarity-project.info/hromada [02/05/2025]

Cox, Michael (2023) *Ukraine: Russia's War and the Future of the Global Order.* OAPEN (Open Access Publishing in European Networks). London: LSE Press.

D'Alessandro-Scarpari, Cristina (2011) Local territories, their power and their actions: Development as a weapon for peace, World Journal of Science, Technology and Sustainable Development, 8(2/3), pp. 263-275. https://doi.org/10.1108/20425945201100014

Decentralisation and formation of regional development policy in Ukraine: scientific reports (2020) Shevchenko O. V., Romanova V. V., Zhalilo Y. A. et al. 153 p. [Online] Available from: https://niss.gov.ua/sites/default/files/2020-09/decentralizatsiya-i-formuvannya-polityky-regionalnogo-rozvytku-v-ukraini_0.pdf [10/10/2024]

DREAM, Digital Restoration Ecosystem for Accountable Management (n.d.) https://dream.gov.ua/ [02/05/2025]

Dudley, William (2019) *Ukraine's Decentralization Reform.* Berlin: SWP, Research Division Eastern Europe and Eurasia. [Online] Available from: https://www.swp-berlin.org/publications/products/arbeitspapiere/Ukraine_Decentralization_Dudley.pdf [05/10/2024]

Earnest, James (2015) Post-conflict reconstruction – a case study in Kosovo: The complexity of planning and implementing infrastructure projects, *International Journal of Emergency Services,* 4 (1), pp. 103-128. https://doi.org/10.1108/IJES-02-2015-0009

European Commission Directorate-General for Neighbourhood and Enlargement Negotiations (2024) *Ukraine 2024 Report: Commission Staff Working Document.* Brussels: European Commission. https://neighbourhood-enlargement.ec.europa.eu/ukraine-report-2024_en.

European Committee of the Regions, Commission for Citizenship, Governance, Institutional and External Affairs, Anakina, T., Salek-Lipcean, P., Kovalchuk, H. (2022*) Challenges and opportunities of LRAs' involvement in the reconstruction of Ukraine.* European Committee of the Regions. https://data.europa.eu/doi/10.2863/08584

Fiedler, Charlotte (2023) What Do We Know about How Armed Conflict Affects Social Cohesion? A Review of the Empirical Literature. *International Studies Review* 25 (3). https://doi.org/10.1093/isr/viad030.

Götz, Elias, and Per Ekman. (2024). Russia's War against Ukraine: Context, Causes, and Consequences. *Problems of Post-Communism* 71 (3), pp. 193–205. https://doi.org/10.1080/10758216.2024.2343640.

Hasic, Tigran (2004) *Reconstruction Planning in Post-conflict Zones: Bosnia and Herzegovinia and the International Community,* Royal Institute of Technology, 63 p. https://www.diva-portal.org/smash/get/diva2:14256/FULLTEXT02.pdf

Hensel, Nayantara (2024) The Russia-Ukraine Crisis: How Regional Conflicts Impact the Global Economy. PRISM 10, 4, pp. 102–22. https://www.jstor.org/stable/48785858.

Homsy, G. C., Liu, Z., and Warner, M. E. (2019). Multilevel Governance: Framing the Integration of Top-Down and Bottom-Up Policymaking. International Journal of Public Administration, 42(7), 572–582. https://doi.org/10.1080/01900692.2018.1491597

Isayinka, Stephen (2023) The Complexities of Post-War development: A Critical Analysis. *The Complexities of Post-War Development: A Critical Analysis*. [Online] Available from: https://www.academia.edu/114210548/The_Complexities_of_Post_War_development_A_Critical_Analysis [05/10/2024]

Jabareen, Yosef (2013) Conceptualizing "Post-Conflict Reconstruction" and "Ongoing Conflict Reconstruction" of Failed States. *International Journal of Politics, Culture, and Society,* 26(2), pp. 107–125. https://doi.org/10.1007/s10767-012-9118-3

Keudel, Oleksandra, and Oksana Hus (2023). Polycentric governance in practice: the case of Ukraine's decentralised crisis response during the Russo-Ukrainian war. *Journal of Public Finance and Public Choice,* 39(1), pp. 10–35. https://doi.org/10.1332/25156918Y2023D000000002

Krawchenko, Tamara (2023) Ukraine's Decentralisation Reforms and the Path to Reconstruction, Recovery and European Integration. *LSE Public Policy Review* 3 (1). https://doi.org/10.31389/lseppr.87.

Kurnyshova, Yulia (2023) Ukraine at War: Resilience and Normative Agency. *Central European Journal of International and Security Studies,* 17(2), pp. 80–110. https://doi.org/10.51870/UXXZ5757

Langer, Arnim, and Graham K. Brown, eds. (2016). *Building Sustainable Peace: Timing and Sequencing of Post-Conflict Reconstruction and Peacebuilding.* New York, NY: Oxford University Press.

Malchykova, Daria (2021) Participatory budgeting practices and civic activism for urban space renovation: the case of Kherson. *Ekonomichna ta Sotsialna Geografiya,* 85, pp. 38–48, https://doi.org/10.17721/2413-7154/2021.85.38-48

Malchykova, Daria and Ihor Pylypenko (2023) War-Torn Territories and Society: Migration Processes, Cases, Contexts of Ukraine. *Europa XXI*, 45, pp. 21-36. https://doi.org/10.7163/Eu21.2023.45.6

Martin, Ron, and Peter Sunley (2020) Regional economic resilience: evolution and evaluation, in: Gillian Bristow and Adrian Healy (eds), *Handbook on Regional Economic Resilience,* chapter 2, pp. 10-35, United Kingdom: Edward Elgar Publishing. https://ideas.repec.org/h/elg/eechap/16700_2.html

Mearsheimer, John J. (2022). The Causes and Consequences of the Ukraine War. *Horizons: Journal of International Relations and Sustainable Development,* 21, pp. 12–27. https://www.jstor.org/stable/48686693.

Meerkerk, Ingmar van (2019) Top-down versus bottom-up pathways to collaboration between governments and citizens: reflecting on different participation traps. In Anka Kekez, Michael Howlett, and Mishra Ramesh (eds) *Collaboration in Public Service Delivery,* pp. 149–67. United Kingdom: Edward Elgar Publishing. https://doi.org/10.4337/9781788978583.00019.

Melnychuk, Anatolii, Olena Denysenko, and Pavlo Ostapenko (2021) *New tools for new urban spaces? Analyses of planning and participation tools and their performance in (post)transitional perspective.* Ekonomichna ta Sotsialna Geografiya, 85, pp. 11-22. https://doi.org/10.17721/2413-7154/2021.85.11-22

Motyl, Alexander J. (1993) *Dilemmas of independence. Ukraine After Totalitarianism.* New York: Council on Foreign Relations Press, 217 p.

Nadin, Vincent, and Ana Maria Fernández-Maldonado (2023) Spatial planning systems in Europe: multiple trajectories, *Planning Practice and Research,* 38 (5), pp. 625-638, https://doi.org/10.1080/02697459.2023.2258568

Nadin, Vincent, and Dominic Stead (2008) European Spatial Planning Systems, Social Models and Learning. *DISP,* 44(172), pp. 35–47. https://doi.org/10.1080/02513625.2008.10557001

Ostapenko, Pavlo, Daria Malchykova, Ihor Pylypenko, Anatolii Melnychuk, and Stas Ostapenko (2023) Project 'Kherson region geoinformation portal': Initiatives of civil society to support regional development. *Ukrainian Geographical Journal,* 2023(1), pp. 54-66. https://doi.org/10.15407/ugz2023.01.054

Palekha, Yurii, Daria Malchykova, Nadiia Antonenko, and Ihor Pylypenko (2023). Approaches to the Territorial Communities' Typification of Ukraine as a Result of the Russian Military Aggression. *Ukrainian Geographical Journal.* 2023(4), pp. 36–43. https://doi.org/10.15407/ugz2023.04.036

Payab, Mohammad Ilyas (2014) *Post-conflict reconstruction: Impediments and challenges in the process of sustainable reconstruction and development in post-2014 Afghanistan.* Open Access Theses. 665. [Online] Available from: https://docs.lib.purdue.edu/open_access_theses/665 [10/10/2024]

Pike, Andy, Andrés Rodríguez-Pose, and John Tomaney (2007) What Kind of Local and Regional Development and for Whom? *Regional Studies,* 41(9), pp. 1253-1269, https://doi.org/10.1080/00343400701543355

Pissourios, Ioannis (2014) Top-down and Bottom-up Urban and Regional Planning: Towards a Framework for the Use of Planning Standards. *European Spatial Research and Policy,* 21(1), pp. 83–99. https://doi.org/10.2478/esrp-2014-0007

Pylypenko, Ihor, and Daria Malchykova (2023) Der Kachovka-Stausee Wirtschaftsmotor und Kriegsschauplatz. *Osteuropa,* 73(1-2), pp. 53–60 https://doi.org/10.35998/oe-2023-006

Rezk, Josephin, Oriol Pons-Valladares, and Carlos Muñoz-Blanc. (2025) Evaluating Sustainability in Post-Conflict Reconstruction: A Case Study of Blast-Damaged Buildings without Structural Collapse Risk in Syria. *Buildings,* 15 (3), pp. 369. https://doi.org/10.3390/buildings15030369.

Romanova, Valentyna, and Andreas Umland (2023) Centre-periphery relations: means for advancing state resilience. *Political Studies,* 2(6), pp. 103-122, https://doi.org/10.53317/2786-4774-2023-2-5

Rose, Jo, and Claudia Milena Adler. (2024). A Framework for Effective Collaboration with Crisis-Affected Communities. *Challenges,* 15(1), pp. 13. https://doi.org/10.3390/challe15010013

Rouet, Gilles, and Gabriela Carmen Pascariu, (eds) (2025) *Resilience and the EU's Eastern Neighbourhood Countries: Crisis, Transformations and Policies*. Second edition 2025. Cham: Palgrave Macmillan. https://doi.org/10.1007/978-3-031-73379-6.

Rudnytsky, Ivan L. (1963) The Role of the Ukraine in Modern History. *Slavic Review,* 22(2), pp. 199–216. https://doi.org/doi:10.2307/3000671

Rzegocki, SaraJane, and Kyiv School of Economics (2024) *Resilience, Reconstruction, Recovery: The Path Ahead for Ukraine*. Edited by Sam Greene and Elina Ribakova. Washington, DC: Center for European Policy Analysis. https://cepa.org/wp-content/uploads/2024/04/Ukraine-Resilience-Reconstruction-Recovery.pdf.

Sabatier, Paul A. (1986) Top-Down and Bottom-Up Approaches to Implementation Research: a Critical Analysis and Suggested Synthesis. *Journal of Public Policy,* 6(1), pp. 21–48. https://doi.org/10.1017/S0143814X00003846

Sakalasuriya, Maheshika M, Richard P Haigh, and Dilanthi Amaratunga (2018) A Conceptual framework to analyse consequences of post conflict reconstruction interventions. *Procedia Engineering,* 212, pp. 894-901. https://doi.org/10.1016/j.proeng.2018.01.115

Sakun, Oleksandra, and Viktoriia Shkola (2023) The peculiarities of the reconstruction of Ukrainian territorial communities in the context of the European Green Deal. *Socio-Economic Relations in the Digital Society,* 4(50), pp. 51-60. https://doi.org/10.55643/ser.4.50.2023.535

Saleh, Nour, Adnan Enshassi, and Matthias Sundermeier (2023) Factors influencing resource availability for post-disaster housing reconstruction: the case of Gaza Strip-Palestine. International Journal of Construction Management, 24 (12), pp. 1364–1374. https://doi.org/10.1080/15623599.2023.2174654

Stewart, Frances (2009) Policies towards Horizontal Inequalities in Post-Conflict Reconstruction. In Making Peace Work (pp. 136–174). Palgrave Macmillan UK. https://doi.org/10.1057/9780230595194_7

Territorial reforms in Europe: Does size matter? Territorial Amalgamation Toolkit. (2017) Centre of Expertise for Local Government Reform, Council of Europe. [Online] Available from: https://rm.coe.int/territorial-reforms-in-europe-does-size-matter-territorial-amalgamatio/168076cf16 [05/10/2024]

The bottom-up approach, in: LEADER teaching kit - Booklets, chapter IV (2020). [Online] Available from: https://ec.europa.eu/enrd/sites/default/files/leaderii_teaching-kit_booklet-chap4.pdf [08/10/2024]

Vries, Michiel S. de, and Juraj Nemec (2025) *35 Years of Public Sector Reform in Central Europe*. Cham: Palgrave Macmillan. https://doi.org/10.1007/978-3-031-80668-1.

Wahba, Sameh, Maitreyi Bordia Das, and Yuna Chun (2021) Building Back Stronger Urban Resilience through Post-Conflict Reconstruction. *Journal of International Affairs,* 74 (1), pp. 227–42.

Wang, Vibeke, Astri Suhrke and Elling N. Tjønneland (2005) *Governance Interventions in Post-war Situations: Lessons Learned*. Bergen: Chr. Michelsen Institute (CMI Report R 2005: 1).

World Bank, European Union, Government of Ukraine, and United Nations. (2025) *Ukraine Fourth Rapid Damage and Needs Assessment (RDNA4), February 2022 – December 2024*. https://hdl.handle.net/10986/42908.

Yakymenko, Yuriy, et al. (2021) Ukraine: 30 Years on the European Path. The Ukrainian Centre for Economic and Political Studies named after Olexander Razumkov, Kyiv, «Zapovit» Publishing House, 392 p. [Online] Available from: https://razumkov.org.ua/uploads/2021-independence-30.pdf [28/09/2024]

Zhou, Shuwen, Haokun Fu, Shanshan Tao, Yanan Han, and Mingrui Mao. (2023). Bridging the Top-down and Bottom-up Approaches to Smart Urbanization? A Reflection on Beijing's Shuangjing International Sustainable Development Community Pilot. *International Journal of Urban Sciences,* 27 (S1), pp. 101–23. https://doi.org/10.1080/12265934.2021.2014939.

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STRATEGIC SPATIAL PLANNING UNDER PRESSURE IN UKRAINE: BETWEEN LEGAL FRAMEWORKS AND LOCAL IMPLEMENTATION

Vira Ohorodnyk[1], Mariia Markina[2*], Inna Illiashenko[3]

Abstract

This article examines the transformation of Ukraine's spatial planning system in the context of decentralisation, regulatory reform, and the growing role of local communities in decision-making. It emphasises the significance of comprehensive spatial development plans as instruments of integrated local governance. Using the Chernihiv region as a case study, the paper analyses institutional, financial, and organisational challenges in implementing planning decisions and highlights gaps between legislation and practice. The study stresses the need to align spatial planning with modern community development strategies, focusing on digitalisation, local capacity building, and stakeholder engagement. Recommendations are proposed to enhance strategic planning tools and promote balanced territorial development.

Keywords:

Spatial planning, strategic management, public governance, local communities, sustainable development, urban planning documentation

1 Professor at Institute of Higher Education
Kyiv National Economic University named after Vadym Hetman 54/1 Beresteysky ave, 03057, Kyiv, Ukraine
Associated Member of Agricultural Economics and Policy Group, Department of Management, Technology, and Economics ETH Zurich
vohorodnyk@ethz.ch, tel: +380 98 761 80 82
ORCID: 0000-0003-2031-1896

2* Expert in the field of urban planning documentation expertise,
Docent at the Department of Regional Studies and Tourism, Kyiv National Economic University named after Vadym Hetman
54/1 Beresteysky ave, 03057, Kyiv, Ukraine
markina.maria@kneu.edu.ua, tel: +380 50 870 77 33
ORCID: 0000-0003-3350-0039

3 Docent at the Department of Regional Studies and Tourism
Kyiv National Economic University named after Vadym Hetman,54/1 Beresteysky ave, 03057, Kyiv, Ukraine
inna.illyashenko@gmail.com, tel: +380 67 965 43 44
ORCID: 0000-0001-7849-9890

1. Introduction

Ukraine and its spatial planning system are facing challenges that are unique in scope and scale. These challenges are the result of the armed aggression of Russia, the resultant large-scale destruction of infrastructure, demographic changes, and the transformation of the institutional foundations of Ukrainian local development. Territorial communities have a significant role to play in shaping sustainable models of recovery and development. They are in a unique position to influence decision-making processes related to spatial planning, resource allocation, and the organisation of people's lives. It is considered beneficial to have comprehensive spatial development plans for communities that combine the functions of master plans, zoning plans, and land use documentation (Anisimov, Smirnova, and Dulko, 2024; Chervonoslobidska Hromada, 2023). These plans can be key instruments for long-term management and strategic recovery.

Concurrently, extant research (Maruniak et al., 2024; Dolan-Evans, 2023; Lytvynchuk et al., 2022) has demonstrated that the degree of preparedness among Ukrainian communities to adopt comprehensive spatial planning strategy remains limited. This phenomenon can be attributed to a confluence of legal, organisational, and financial factors, as well as a paucity of adequate methodological support. The experience of a number of European countries (Nowak et al. 2021; OECD 2022) demonstrates that integrated planning can serve as a foundation for both regional economic recovery and territorial cohesion. However, this approach necessitates a substantial degree of institutional capacity on the part of local authorities.

In Ukraine, legal regulation of comprehensive plan development was initiated by Law No. 711-IX, adopted on 17 June 2020, which changed the procedure for preparing urban planning documentation, and emphasised its integrative nature as well as the need for compliance with European standards (Verkhovna Rada of Ukraine, 2020). However, as empirical data shows, as of the end of 2023 (Ministry for Communities and Territories Development of Ukraine, 2023), less than a quarter of territorial communities had started work on comprehensive plans, and the vast majority were at the stage of deciding on their development or collecting initial data. This poses a significant risk to the synchronisation of spatial development measures with comprehensive territorial recovery programmes implemented with the support of international partners (USAID, EU, UNDP).

To date, there has been insufficient coverage in scientific literature pertaining to how spatial planning reforms are combined with territorial recovery and development processes, particularly in terms of organisational practices, financial support, and public participation in decision-making (Anisimov et al., 2024). The issue of implementing comprehensive plans for regions that have undergone large-scale changes and challenges, such as the Chernihiv region, is particularly relevant. Recent research and practical recommendations emphasise that the successful implementation of comprehensive spatial development plans largely depends on the active participation of local residents, entrepreneurs, civil society organisations, and other stakeholders (Chervonoslobidska Hromada, 2023; The Public Participation Handbook, 2023; Cedos, 2024; Ro3kvit, 2025). Public involvement ensures transparency, accountability, and the consideration of local needs in the planning process, while also contributing to the effective implementation of decisions (UN Habitat, 2023; ESPON, 2019).

Despite the implementation of updated legislation on spatial planning, Ukrainian local communities encounter substantial challenges when it comes to implementing comprehensive plans under crisis conditions. A discrepancy exists between the legislative provisions and the prevailing practices on the ground. These are attributable to three factors: limited institutional capacity, inadequate coordination between governmental levels, and the repercussions of the war. The absence of empirical research that has systematically examined these challenges at the level of specific communities impedes the efficacy of spatial policy adaptation to recovery conditions.

The objective of this study is to examine the specific features of strategic spatial planning in Ukrainian communities, using the Chernihiv region as a case study. The present study focuses on analysing the relationship between regulatory frameworks, institutional practices, and local implementation in the context of war and post-crisis recovery. The study also analyses the factors that influence the implementation of comprehensive spatial development plans, including the factors that facilitate and hinder that process. A key scientific challenge addressed by this study is identifying the reasons for the discrepancy that exists between regulatory requirements and the current state of planning in communities. The issue of ensuring the consistency of integrated planning with current territorial development programs is addressed separately.

The article's structure is as follows: the second section delineates the theoretical foundations of spatial planning and public administration; the third section describes the methodology; the fourth section is devoted to the results of the analysis of the state of planning and recovery programs; the fifth section discusses the conclusions and recommendations. The final section summarises the main results and outlines directions for further research.

2. Literature review

The study of public administration mechanisms in spatial planning is grounded in a comprehensive array of international and Ukrainian scientific works. The theoretical and methodological foundations of research in the field of public administration and spatial planning are highlighted in the works of Booth et al. (2003), Cropley (2019), Snyder (2019), Dawson (2007), Hill and Lynn (2015), Lynn (2006), and Farazmand (2023). These scholars underscore the significance of adopting an interdisciplinary approach as well as rigorous research methodologies in the domain of public administration (Bekkers et al., 2007; Peters, 2018; Wilson, 2000).

The conceptual development and terminological evolution of spatial planning are discussed in the works of Danielzyk and Munter (2018), Taylor (2010), Lakhotska (2018), Maruniak (2014), and Makieiev (2021). These studies place significant emphasis on the transformation of approaches to spatial planning in European and Ukrainian contexts, as well as on the adaptation of international practices (Komelina and Kondratyeva, 2023; Khvesyk et al., 2018; ESPON, 2019; European Commission DG, 2000; Maier et al., 2021; Zaspel-Heisters and Henger, 2015). As posited by Ukrainian scholars Zhidkova and Shchepetylnyk (2021), there is a clear necessity to harmonise the country's national spatial planning system with European standards.

The contemporary management and decentralisation processes associated with Ukraine's territorial reform, and the creation of amalgamated communities are pivotal to the transformation of spatial planning in the country. Dolan-Evans (2023) analyses decentralisation as an administrative reform and management tool in times of crisis. Tyminskyi (2022) elucidates the hybrid nature of urban policy, and in so doing emphasises the dynamic interplay among international donors, state institutions, local authorities, and civil society. The Organisation for Economic Co-operation and Development (OECD, 2022) and the Council of Europe (2023) have underscored the significance of multi-level governance, institutional capacity, and decentralisation for effective spatial development. A comprehensive overview of the innovative governance and public sector reform literature can be found in the works of Dale et al. (2020), Osborne (1993), Rainey (2020), Pollitt and Dan (2011), Catlaw (2008), and Chen et al. (2020).

A distinct research domain encompasses the modernisation of spatial planning through digitalisation and innovation. Anisimov, Smirnova, and Dulko (2024) underscore the significance of leveraging GIS and digital platforms to ensure transparency and efficiency in planning. In addition, Sokolova and Semenchenko (2023), and Kumar et al. (2022) explore the potential of digital solutions and technological innovations to enhance the adaptability and sustainability of spatial management.

The evolution of local planning tools in Ukraine is explored in the works of Lytvynchuk, Denysenko, and Melnychuk (2022), which outline the problems of fragmented documentation and weak integration with budgeting. Empirical studies of urban reconstruction, sustainability, and strategic planning are presented in the works of Bachynska (2022), Dudar and Brychanskyi (2023), and Danyliuk (2023). A comparative analysis of local spatial development policies in Ukraine, Poland, and neighbouring countries has been conducted by Nowak, Lozynskyy, and Pantyley (2021) and Nowak et al. (2023). This analysis emphasises the importance of public participation and inter-level coordination.

The regulatory framework for spatial planning in Ukraine has undergone significant changes, especially after the adoption of Law No. 711-IX (Verkhovna Rada of Ukraine, 2020), which introduced comprehensive spatial development plans and emphasized the importance of integration with European standards. Further legislative acts have been issued by the Verkhovna Rada of Ukraine (2022), the Cabinet of Ministers of Ukraine (2021, 2024), and the On Regulation of Urban Development (2024), which serve to further shape the institutional and procedural framework of the current spatial planning system. The Ministry of Development of Communities and Territories of Ukraine (2021) and relevant government resolutions also play important roles in regulatory support.

A comprehensive review of international and comparative studies reveals the evolution of planning paradigms, as well as the increasing role of public-private partnerships in urban development. In particular, Alexander (2020) examines public-private partnerships as a novel paradigm for urban development, asserting that they substantially influence contemporary approaches to spatial planning. This finding aligns with the conclusions of Maier et al. (2021), ESPON (2019), and the European Commission (2023), which examined the impact of European policy, cohesion frameworks, and best practices on national spatial planning systems. These findings offer valuable guidelines for Ukraine.

In recent years, research on public participation, inclusiveness, and local urban practices has become particularly important. Practical recommendations for engaging the public in the spatial planning process are presented in The Public Participation Handbook (UN-Habitat, 2023), as well as in contemporary Ukrainian examples Chervonoslobidska Hromada (2023), Cedos (2024), and Ro3kvit (2025). The effective implementation of comprehensive spatial development plans is contingent, to a considerable extent, on the active participation of local residents, entrepreneurs, civil society organisations, and other relevant stakeholders. The involvement of the public ensures transparency, accountability, and consideration of local needs in planning processes. It also contributes to the effective implementation of decisions (UN-Habitat, 2023; ESPON, 2019).

The subject of socio-economic and financial mechanisms for sustainable regional development is addressed in the works of Pastukh (2017), Pylypiv and Tychkovska (2013), and Prasolova and Danylyshyn (2022). These works emphasize the importance of integrating spatial planning with socio-economic policies and smart specialisation strategies.

In summary, it can be argued that extant literature provides a robust theoretical and empirical foundation for research on spatial planning in Ukraine, which considers international experience, innovations in governance, digitalisation, inclusiveness, public participation, and regulatory reforms. However, the practical aspect of implementing new legislative changes, as well as consideration of the factors influencing the implementation of comprehensive plans at the community level, remain understudied (Shcheglyuk, 2019; Anisimov et al., 2024; Chervonoslobidska Hromada, 2023; Cedos, 2024; Ro3kvit, 2025; UN-Habitat, 2023).

3. Materials and Methods

The present study employs a qualitative interdisciplinary approach which combines tools of legal analysis, public administration research, and spatial planning. The methodology was structured in five analytical stages.

The initial stage entailed a thorough examination of the legislative and regulatory framework. The examination encompassed Law of Ukraine No. 711-IX (2020), its accompanying regulations, state strategies, subordinate documents, and its methodological recommendations. The analysis yielded insights into the reform's underlying logic, its planning principles, and its specific procedural mechanisms.

The subsequent stage in the sequence of events pertained to the process of mapping the institutional environment. The analysis examined the manner in which key actors interact, including local self-government bodies, technical implementers, state agencies, and international partners. The distribution of powers, digital tools, decision-making mechanisms, and the administrative capacity of communities are the focal points of this study.

The third stage of the process entailed the selection and justification of a case study. The territorial communities of the Chernihiv region, which suffered significant destruction as a result of military operations in 2022, were selected for analysis. This territory is indicative in the context of implementing comprehensive planning under conditions of crisis, recovery, and limited resources.

The fourth stage encompassed the collection and analysis of empirical data. A documentary analysis was conducted, encompassing strategies, reports, public registers, and local planning documents. To ensure a comprehensive analysis, expert interviews and analytical reviews were also utilised. The information was then systematised by topic and correlated with legislation.

The fifth stage of the research process was dedicated to interpreting the results. The relationship between legal provisions, institutional practice, and actual implementation was examined. The identification of gaps, barriers, and points of adaptation was a key objective of the study. The results were analysed within a multi-level governance approach.

This five-stage approach enabled the integration of policy analysis, legal assessment, and an examination of implementation practices. The system under discussion is characterised by the provision of a particular set of mechanisms.

4. Results and Discussion

4.1. Theoretical Context of Spatial Planning in Ukraine

In recent years, Ukraine has witnessed a gradual yet pronounced surge in the significance of spatial planning as an instrument that can help ensure that the concerns of all stakeholders are duly considered in territorial planning (Anisimov et al., 2024). This process is occurring, in particular, as part of the reform of current urban planning and land legislation (Law of Ukraine on Amendments to Certain Laws of Ukraine Regarding Priority Measures for Reforming the Sphere of Urban Development). The implementation of public administration in the field of spatial planning at the local level is being carried out using strategic planning and forecasting tools.

A critical aspect of Ukraine's spatial planning reform that warrants attention pertains to the examination of European models of spatial planning systems. This is of paramount importance in the context of Ukraine's ongoing processes of integration with the European Union. The process of Ukraine's potential accession and gradual integration into a unified system with the EU is protracted and necessitates policy alterations; particularly in the domain of spatial planning.

A review of international best practices reveals numerous instances of the effective implementation of spatial planning systems and management processes associated with these definitions. A review of theoretical approaches to spatial planning has revealed significant discrepancies in the methodologies adopted by different countries. These variations pose challenges to identifying a coherent set of principles suitable for shaping an effective spatial planning policy for Ukraine. The role of social and economic inequalities (Maier et al., 2021), national characteristics and traditions (Nowak et al., 2023), and membership of different supranational groups at different periods of historical development (ESPON, 2019) is significant in this regard. It is also important to acknowledge the efforts to establish a set of criteria that would enable the classification of spatial planning systems, and how this would facilitate the determination of their relative rankings in terms of importance and prevalence. The set of criteria encompasses economic, political, social, cultural, and other factors. These criteria are evaluated within the policy framework for their consistency with requirements concerning environmental conditions, social and energy issues, the real estate market, development trajectories, and demographic dynamics. A thorough examination of the circumstances necessitates adherence to legal imperatives, encompassing both domestic legislation and international best practices, as well as the integration processes inherent to the context (Khvesyk et al., 2018; Komelina and Kondratyeva, 2023).

With regard to the sectoral approach, spatial planning at the local level must consider the nature, specialisation, and functioning of the territory. This approach aligns with EU practice, as outlined in a specific document (European Commission, 2000). While the document does not have direct legal force within the EU, it contains criteria by which EU member states should determine the success of their individual management policies, including the regulatory framework for spatial planning, the scale of the system, the degree to which national and regional planning is developed, and the roles of the public and private sectors. Given this, it was possible to assess the transnational differences in governance systems and how they were historicaly established, identify areas of convergence (e.g., compliance with hierarchy, emphasis on local characteristics, and special status for certain territories), and compile a list of recommendations for future members of the European community. The countries analyzed were divided into four categories (Fig. 1).

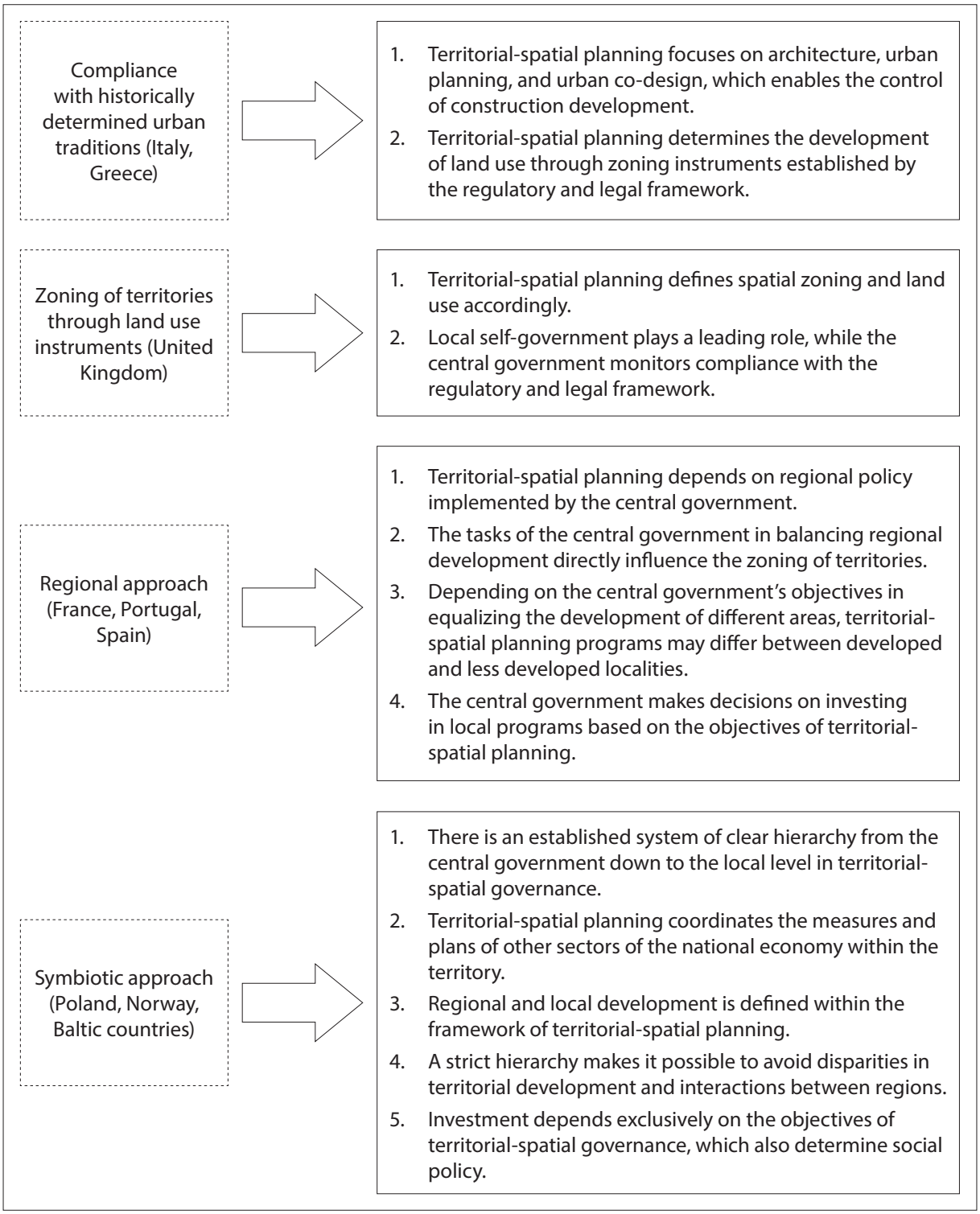

Figure 1. A comparative analysis of spatial planning models and development management systems in European countries is warranted, with particular attention to historical traditions, institutional approaches, and political and administrative structures. Source: compiled by the author based on (Zaspel-Heisters and Henger, 2015), Maier et al. (2021); ESPON (2019); European Commission DG (2000); Komelina and Kondratyeva (2023); Khvesyk et al. (2018).

The left-hand column of this figure presents the types or models of approaches to territorial-spatial planning that are characteristic of different countries, while the right column provides their main substantive characteristics, which describe the principles of planning organisation, the role of the state and local self-government, as well as their influence on territorial development.

It is evident that most European countries have implemented well-defined management systems that have demonstrated their efficacy in promoting equal socio-economic development at the regional level within individual countries and throughout the European Union. This phenomenon has been further enabled by the European Union's cohesion policy, a pivotal policy instrument that is aimed at mitigating regional disparities. The system's flexibility, its openness to external influences, its resilience to stress, and its foundation on a unified regulatory framework across all participating nations have also contributed to the successful implementation of spatial planning mechanisms that support balanced regional development.

A critical evaluation of such systems does, however, reveal several limitations. Primarily, there is a notable deficiency in responsiveness to local initiatives, as each proposal must receive approval from the highest hierarchical level. Additionally, an excessive emphasis on local development can exert detrimental effects at the national level (OECD, 2022; ESPON, 2019; Maier et al., 2021; Zaspel-Heisters and Henger, 2015).

Notwithstanding the considerable advancement of the practical elements of spatial planning, the conceptual definition of "spatial planning" remains absent from Ukrainian legislation. In previous studies, we have concluded that spatial planning is a strategic planning activity in the public sector, and that its aim is to improve society's quality of life at state, region, and territorial community levels. This is achieved through the development and implementation of strategic documents and documentation relating to spatial planning, and the participation of industry stakeholders in the delivery of the same.

In accordance with extant legislation (the Laws of Ukraine "On the Fundamentals of Urban Development", "On Regulation of Urban Development" and "On Amendments to Certain Legislative Acts of Ukraine on Land Use Planning"), urban planning documentation is defined as an approved textual or graphic material that pertains to the regulation of planning, development, and other uses of territories. Urban planning documentation serves as the primary instrument for long-term strategic planning, and facilitates the effective development of the (given) territory. It delineates the principal directions and measures that seek to enhance the investment climate and establish conditions conducive to maintaining a healthy living environment.

The urban planning documentation in Ukraine exhibits a distinct hierarchical structure, with clear vertical progression from the highest to the lowest territorial levels (Fig. 2). In addition to the vertical links, the structure also comprises horizontal links within each existing territorial level. All urban planning documentation must be developed in accordance with the provisions set forth in the approved higher-level documentation.

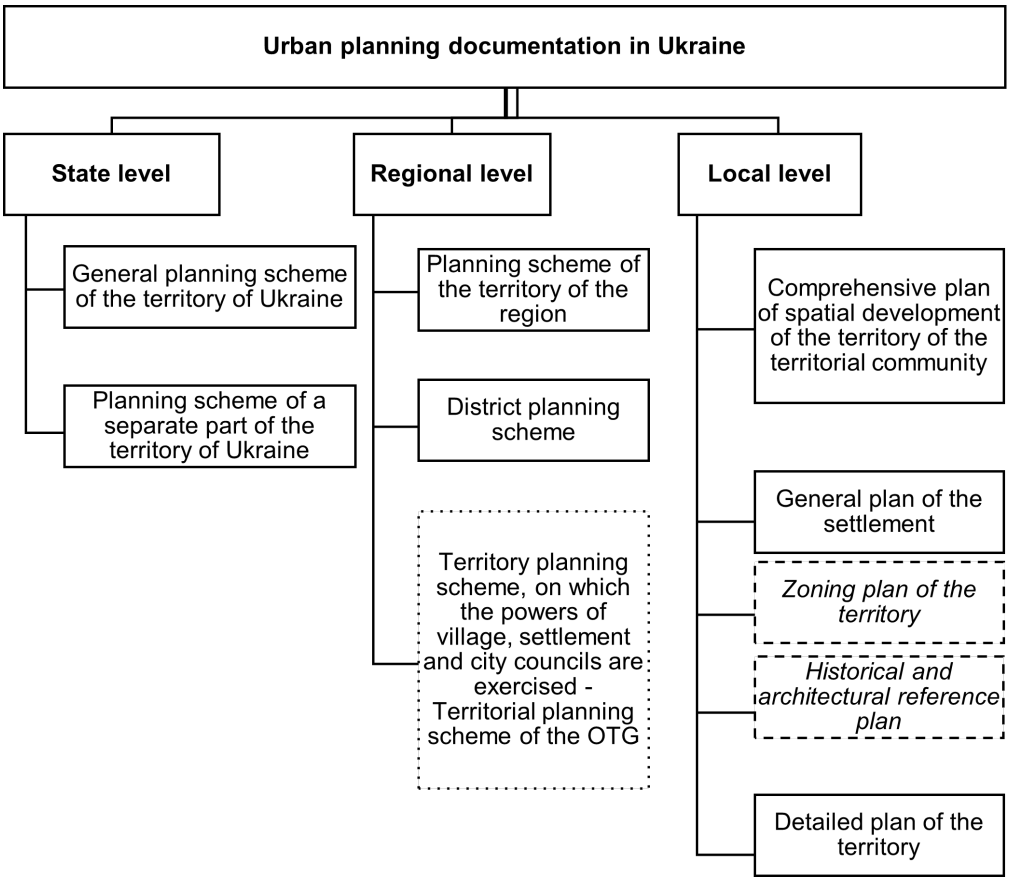

Figure 2. Hierarchical structure of urban planning documentation development in Ukraine
Source: author's generalisation based on the Law of Ukraine "On Regulation of Urban Development".

Graphical image	*Description*
	Type of urban planning documentation
	A type of urban planning documentation that has lost its autonomous status and is being developed as part of other urban planning documentation as a thematic section
	A type of urban planning documentation that is not currently being developed, but has an impact on documentation at the local level

Given that the basis of the legal mechanism of public administration in the field of spatial planning in Ukraine is the legislative and regulatory framework, it follows that transformations in the legal field that have significant impact on spatial planning are important. For example, after 2020 – and through the adoption of the Law of Ukraine "On Amendments to Certain Legislative Acts of Ukraine on Land Use Planning" - the main type of urban planning and land management documentation at the local level in Ukraine became comprehensive plans for the spatial development of individual territories of territorial communities.

In the context of spatial planning, a pronounced shift has occurred since the enactment of Law No. 711-IX in June 2020. At the centre of the reform agenda has been the local level of urban planning documentation development, given its key role in addressing land use and spatial organisation at the level of individual territories, with specific attention to actual land allocations (Verkhovna Rada of Ukraine, 2020). It follows that it is imperative to furnish territorial communities with contemporary and pertinent urban planning documentation. Documentation of this nature is referred to as a comprehensive spatial development plan for the territory of the territorial community. This comprehensive plan is the overarching document that guides the spatial development of the given community. For territorial communities whose territory consists of only one settlement, the development of a general plan for the settlement continues.

Despite the fact that the comprehensive plan is not a novel type of documentation, and its composition, content, procedure for development, and updating were proposed by the Resolution of the Cabinet of Ministers of Ukraine (2021), the state of development of comprehensive plans in territorial communities remains critically low. As of 12 October 2021, the Ministry of Communities and Territories Development of Ukraine reported that there were 1,469 territorial communities in Ukraine. Thereafter, the results of a survey of regional administrations conducted by the Ministry in April 2023 indicate that the majority of communities were in the initial stages of developing a comprehensive plan. 19.6% of communities have elected to pursue the development of a comprehensive plan; this is the inaugural declaration of intent to pursue this type of documentation. With regard to subsequent stages of the process, 4.97% of territorial communities have developed a comprehensive plan (see Fig. 3).

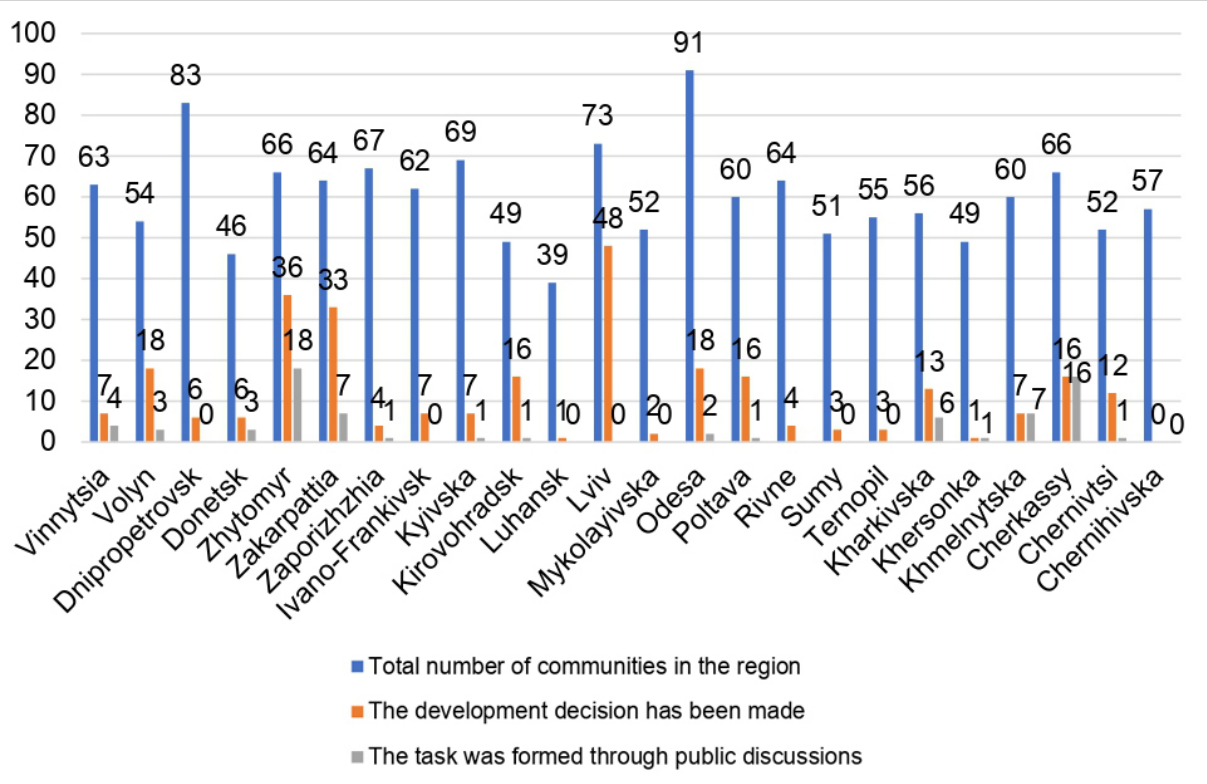

Figure 3. Number of decisions made, and tasks set for the development of comprehensive spatial development plans, by region
Source: Results of the survey of regional administrations conducted by the Ministry of Communities and Territories Development of Ukraine in April 2023.

Ukraine's Ministry of Communities, Territories and Infrastructure Development reported, in November 2023, that 345 territorial communities were then engaged in the process of developing a comprehensive plan. This figure, expressed as a percentage of the total number of territorial communities, is 23.49%. In other words, over the course of seven months, the number of communities engaged in the development process had increased by 3.89%. It follows that if that rate of development was maintained, it would take 11 years and 4 months to provide all territorial communities of Ukraine with comprehensive plans.

Given the country's legislative stipulations and prevailing circumstances, the necessity for local communities to formulate comprehensive plans is imperative. The absence of approved comprehensive plans in local communities can compromise their economic development, which is inextricably linked to its territorial development. This prompts the following question: why do local communities not provide themselves with such a document? The pivotal factor is the substantial cost associated with the work.

Notwithstanding the provisions of Ukrainian legislation which stipulate an annual subsidy from the state budget to local budgets for the development of comprehensive plans, the allocation of this subsidy has been suspended due to the imposition of martial law in Ukraine. Consequently, the financial burden of developing comprehensive plans now falls exclusively upon individual communities.

4.2. Spatial planning at the local level in Ukraine: Example of the Chernihiv region

Given the current stage of development of spatial planning at the local level, rapid changes are occurring across all regions of Ukraine. The selection of the Chernihiv region as a case study was not arbitrary. It is closely tied to the need to address the challenges and threats posed by the Russian-Ukrainian war and the subsequent recovery of the region. The level of destruction in the region is considerable. The administrative-territorial reform that took effect in 2020 resulted in the Chernihiv region being 'home' to 57 territorial communities. These include: 16 urban, 24 settlement, and 17 rural territorial communities, which are united into five districts: Koryukiv, Nizhyn, Novgorod-Siverskyi, Pryluky, and Chernihiv.

Since February 24, 2022, both Ukraine and the Chernihiv region have been confronted with a series of unprecedented challenges as a result of the full-scale invasion of the Russian Federation. All communities within the Chernihiv region were situated within the boundaries of the combat zone or under the control of occupying forces. The extent of the destruction is considerable. A considerable number of infrastructure facilities, including housing, educational buildings, healthcare, sports centre, cultural venues, administrative buildings, engineering networks, and road facilities, have been damaged or destroyed. In addition, a considerable number of businesses have ceased operations, either as a consequence of destruction or due to the disruption of access to markets and raw materials. Against this backdrop, a fundamental transformation is occurring not only in the system of inter-industry relations but also with regard the structure of the economy and the social sphere.

Despite the withdrawal of Russian forces from the Chernihiv region, the prevailing security situation remains unfavourable for the region's economic and social development. The Chernihiv region has a border that runs for in excess of 450 km with two countries with which it has hostile relationships: Russia, and its satellite, Belarus. The border communities of the region are under fire or in constant threat of the same. The ongoing crisis in Ukraine has compelled the region to pursue socio-economic development in an environment that is characterised by uncertainty.

The provision of urban planning documentation for Chernihiv Oblast represents a critical priority within the broader framework of comprehensive territorial restoration (Chernihiv Regional State Administration, 2023). It serves as a foundation for both sustainable and balanced regional development, while also delineating prospective avenues for growth and development at settlement and sub-regional levels. The availability of high-quality and up-to-date urban planning documentation in the region allows for the rational use of land resources and infrastructure, as well as facilitating control over the construction and development of social infrastructure facilities. The urban planning documentation enables the formation of a comprehensive urban planning vision for the region's development; facilitates effective spatial planning; provides a comfortable and safe environment for residents at the local level; establishes conditions for the development of the regional economy; and may ultimately attract investment based on a transparent and clear regional urban planning policy.

A survey conducted by the Chernihiv regional government at the beginning of 2023 revealed that three communities from within the region have already taken the initiative of developing comprehensive plans for the spatial development of their territorial communities. Several other communities were in the process of creating working groups to develop comprehensive plans at the same juncture in time.

It is noteworthy that the Osterska, Ivanivska, and Kiptivska rural territorial communities have initiated the formulation of comprehensive development plans. This process is being carried out in accordance with the guidelines set forth by the United States Agency for International Development (USAID).

In view of the recent changes in legislation pertaining to the hierarchical structure of urban planning documentation in Ukraine, settlements within the Chernihiv region that regard their master plans as outdated will be obliged to amend them by developing comprehensive spatial development plans for territorial communities. These plans will be integrated with master plans and/or planning decisions of master plans into comprehensive plans. This principle also applies to zoning plans; to be incorporated into either the comprehensive plans or the master plans for settlements.

The following section examines the general plans of settlements and the state of provision of this type of documentation at the local level of urban planning. This analysis considers both the situation in the Chernihiv region and broader trends across other parts of Ukraine. According to a survey conducted by the Ministry of Regional Development in April 2023, 42.32% of Ukrainian cities had approved and conditionally valid master plans. The documentation under consideration was developed after 2011, marking the beginning of a new phase in Ukraine's urban planning legislative reform. However, only a portion of localities currently operate under such updated plans. Specifically, 42.32% of Ukrainian cities have approved and conditionally current master plans developed after 2011 (Verkhovna Rada of Ukraine, 2020), while an additional 69.27% still rely on master plans adopted between 1991 and 2011. A comparable pattern is observed among settlements: 42.54% possess master plans prepared after 2011, whereas another 42.68% continue to use plans approved in the period from 1991 to 2011.

As evidenced by the findings of the aforementioned survey, a mere 16.39% of villages in Ukraine have master plans that can be deemed relevant. Additionally, the number of villages that had master plans approved prior to 1991 is also noteworthy, as this figure represents 64.39% of the total. i.e. over half of all Ukrainian villages lack current documentation. This is because the general plan, developed over 30 years ago, is no longer an effective spatial planning tool.

Post 2021, the Ministry has indicated that no locality has approved a master plan. It can be inferred that this scenario is related to the norm set forth in the Law of Ukraine "On Amendments to Certain Legislative Acts of Ukraine Regarding Land Use Planning." This norm stipulates that the development of urban planning documentation, such as a general plan of a settlement, is only permissible as part of (or detailing the provisions of) the comprehensive spatial development plan of the territory of the territorial community.

In the context of the Chernihiv region, official records indicate that, as of 2019, a total of 95 settlements had general plans either approved or still in use. Most of these plans had been developed in earlier decades, often prior to the introduction of the latest legislative reforms, and do not fully reflect current spatial development needs. This highlights the persistent reliance on outdated planning documentation at the local level.

In October and November 2023, the Department of Urban Planning and Architecture of the Chernihiv Regional State Administration conducted a survey of the region's territorial communities through the administrations of the district state as part of the collection of initial data for the preparation of the Program for the comprehensive restoration of the territory of the Chernihiv region. It was found that 464 (27.68%) of the 1,510 settlements within the region had developed general plans for their respective settlements (Fig. 4).

A significant proportion of approved master plans were developed either prior to Ukraine's independence or during preceding decades. It is evident that there is a pressing need for the updating of existing master plans, especially when one considers that the average proportion of irrelevant ones is approximately 43.75% (Fig. 5).

The majority of master plans developed for settlements in the Chernihiv region in recent years have already been integrated with territory zoning plans. In total, 102 territorial zoning plans (zonings) were approved within the region. These are distributed as follows: four in Koryukiv district, 16 in Nizhyn district, nine in Norhorod-Siver district, 42 in Prylutsky district, and 31 in Chernihiv district.

In light of the amendments to the legislation governing the hierarchical structure of urban planning documentation in Ukraine, settlements within the Chernihiv region that have identified that the general plans have a lack of relevance can implement changes through the development of comprehensive plans for the spatial development of the territories of the territorial communities. This is achieved by integrating master plans and/or planning decisions into comprehensive plans. A similar situation also exists with regard to territory zoning plans, which can be incorporated into either a comprehensive plan or a general plan of a settlement.

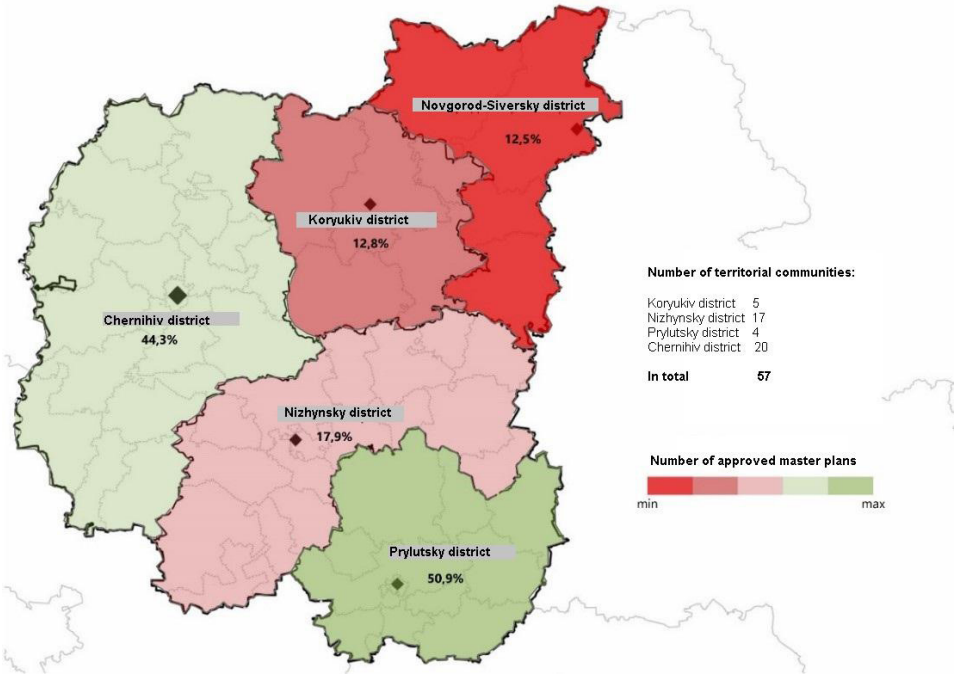

Figure 4. Number of approved master plans of settlements by rayons of the region as of October-November 2023.

Source: Compiled using QGIS open-source GIS software.

Note: The percentage reflects the share of settlements within each rayon that possess up-to-date master plans.

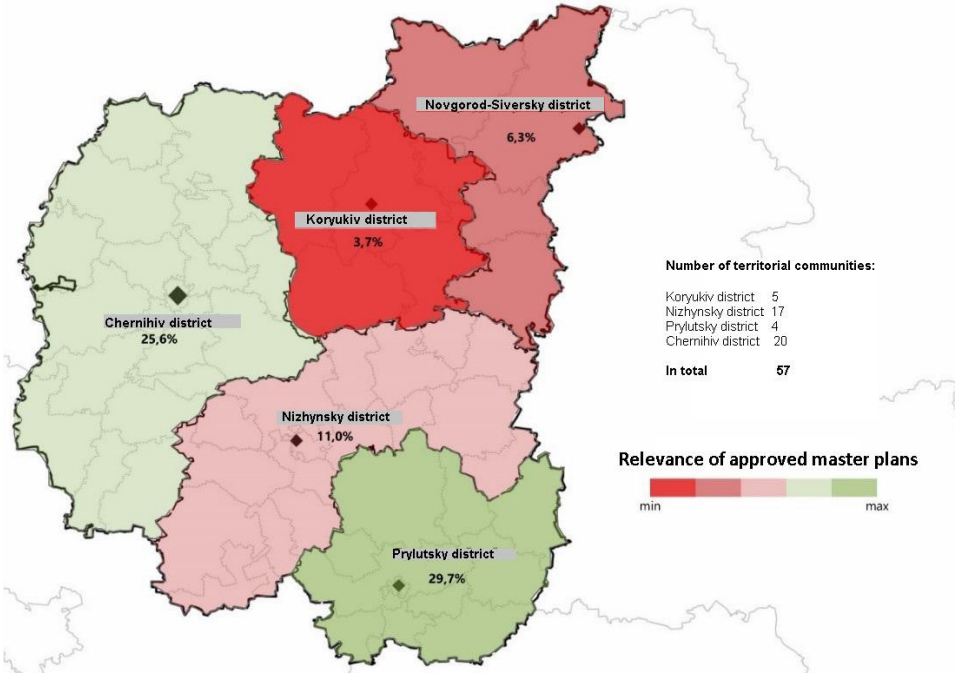

Figure 5. Relevance of approved master plans of settlements by districts of the region as of October-November 2023.

Source: Compiled using QGIS open-source GIS software.

Note: The percentage reflects the share of settlements within each rayon that possess up-to-date master plans.

5. Conclusions and their practical implementation

This study has indicated that strategic spatial planning in Ukraine is subject to considerable pressures from legal, institutional, and military sources. Despite the implementation of a contemporary regulatory framework, Law No. 711-IX, an ongoing discrepancy exists between national regulations and local practices. A review of extant literature reveals that most local communities lack the institutional, human, and financial capacity to implement comprehensive spatial development plans in a satisfactory manner.

Thus study's analysis of the Chernihiv region case study has also demonstrated that communities that have suffered extensive destruction are compelled to integrate short-term recovery needs with long-term spatial development objectives. This complicates the synchronisation of planning documents, particularly comprehensive recovery plans and programs. The dearth of adapted methodological solutions, the proliferation of technical contractors, and the paucity of citizen participation constrain the strategic potential of spatial planning.

A methodology combining regulatory analysis, institutional mapping, and empirical research has enabled this study to the the links which exist between formal instruments and actual implementation. The effectiveness of reforms has been demonstrated to be contingent not solely on the presence of legal norms but also on the existence of flexible management mechanisms, effective coordination between levels of government, and support for local capacity.

In order to reduce the gap which exists between planning regulations and practice, uniform methodological approaches should be developed for coordinating comprehensive recovery plans and programs. It would also be advisable to strengthen state support for communities that have suffered the greatest losses, through subsidies, training programs, and the establishment of regional centres of expertise. The expansion of digital tools, the enhancement of process transparency, and the engagement of the public can fortify trust and enhance the efficacy of planning decisions.

Future research should concentrate on the development of indicators for evaluating the implementation of comprehensive plans in the context of post-war recovery, and also undertake comparative analysis on the practices that exist in different regions. Such an approach would facilitate the identification of pivotal factors that contribute to the adaptability, resilience, and institutional effectiveness of spatial planning systems during periods of transformation.

References

Alexander, Elizabeth R. (2020) 'The Planner's Public Private Partnership: A New Paradigm for Urban Development', Journal of Planning Education and Research, 40(3), pp. 320–332. https://doi.org/10.1177/0739456X19887654.

Anisimov, Oleksandr, Maria Smirnova and Ievgeniia Dulko (2024) Spatial Planning in Ukraine: 2023 Country Profile. Aalto University School of Engineering. https://doi.org/10.5281/zenodo.10600560.

Bachynska, Lyudmyla (2022) 'Ways of choosing methods for the restoration of Ukrainian cities after the Russian invasion', InterConf+, 28(137), pp. 427–441. https://archive.interconf.center/index.php/2709-4685/article/view/2011 [Accessed 21 June 2024].

Bekkers, Victor, Gerrit Dijkstra and Menno Fenger (2007) Governance and the Democratic Deficit: Assessing the Democratic Legitimacy of Governance Practices. London: Routledge. https://doi.org/10.4324/9781315585451.

Booth, Wayne C., Gregory G. Colomb and Joseph M. Williams (2003) The Craft of Research. Chicago, IL: University of Chicago Press.

Brooks, Helen, Penny Bee and Anne Rogers. (2019). Introduction to qualitative research methods A Research handbook for patient and public involvement researchers. https://doi.org/10.7765/9781526136527.00012.

Catlaw, Thomas (2008) 'Book Review: Lynn L. E. Jr. Public Management: Old and New', American Review of Public Administration, 38(2), pp. 244–250. https://doi.org/10.1177/0275074007307372.

Cedos (2024) How to Engage Residents in Decision-Making in Communities: An Overview of Examples [In Ukrainian]. [Online] Available from: https://cedos.org.ua/wp-content/uploads/cedos_gajdlajn-dlya-gromad.pdf [Accessed 29 June 2025].

Chen, Jiyao, Richard M. Walker and Mohanbir Sawhney (2020) 'Public service innovation: a typology', Public Management Review, 22(11), pp. 1674–1695. https://doi.org/10.1080/14719037.2019.1645874.

Chernihiv Regional State Administration (2023) Chernihiv Oblast: From Recovery to Development strategy. [Online] Available from: https://www.cg.gov.ua/index.php?id=39531&tp=1 [Accessed 29 June 2025].

Chervonoslobidska Hromada (2023) What you need to know about the Comprehensive Spatial Development Plan of the Community Territory [In Ukrainian]. [Online] Available from: https://chervonoslobidskaotg.org.ua/index.php?route=blog%2Farticle&article_id=948 [Accessed 29 June 2025].

Council of Europe (2023) Local Democracy in Ukraine. [Online] Available from: https://www.coe.int/en/web/congress/co-operation-activities-ukraine_2023 [Accessed 14 August 2023].

Dahl, Robert A. (2018) 'The science of public administration: Three problems', in Democracy, bureaucracy, and the study of administration, pp. 60–76.

Dale, Allan, Karen Vella and Sarah Ryan (2020) 'Governing Community-Based Natural Resource Management in Australia', Land, 9(7), 234. https://doi.org/10.3390/land9070234.

Danielzyk, Rainer and Angelika Münter (2018) Raumplanung. Hannover: Akademie für Raumforschung und Landesplanung. Available at: https://www.arl-net.de/system/files/media-shop/pdf/HWB%202018/Raumplanung.pdf.

Danyliuk, Tetiana (2023) 'Resilience and Strategic Spatial Planning in Ukraine', Regional Policy Review, 7(1), pp. 10–20. https://regional-policy.org.ua/danyliuk2023.

Dawson, Catherine (2007) A Practical Guide to Research Methods.

Dolan-Evans, Elliot (2023) 'Devolution or decapitation? Decentralization during conflict in Ukraine', Journal of Intervention and Statebuilding, 17(1), pp. 16–38. https://doi.org/10.1080/17502977.2022.2147318.

Dudar, Ihor and Artur Brychanskyi (2023) 'Modern approaches to reconstruction and development of cities after the war', Open Ukrainian Citation Index (OUCI). [Online] Available from: https://ouci.dntb.gov.ua/en/works/45ZZaBvl/ [Accessed 21 June 2024].

ESPON (2019) European Territorial Reference Framework: Synthesis Report. [Online] Available from: https://archive.espon.eu/sites/default/files/attachments/ESPON_ETRF_Final_Report_Synthesis_Report.pdf [Accessed 21 June 2024].

European Commission (2023) EU Support for Ukraine's Reconstruction. [Online] Available from: https://commission.europa.eu/topics/eu-solidarity-ukraine/eu-assistance-ukraine/recovery-and-reconstruction-ukraine_en [Accessed 21 June 2024].

European Commission: Directorate-General for Regional and Urban Policy (2000) The EU Compendium of Spatial Planning Systems and Policies – Denmark. Publications Office.

Farazmand, Ali (2023) Global Encyclopedia of Public Administration, Public Policy, and Governance.

Gorzym-Wilkowski, Waldemar A. (2017) 'Spatial planning as a tool for sustainable development: Polish realities', Regional Barometer. Analyses & Prognoses, 15(2), pp. 75–85. https://doi.org/10.56583/br.439.

Hersperger, Anna M. Eduardo Oliveira, and Sofia Pagliarin (2018) 'Urban land-use change: The role of strategic spatial planning', Global Environmental Change, 51, pp. 32–42. https://www.sciencedirect.com/science/article/pii/S0959378017306829.

Hill, Carolyn J. and Laurence E. Lynn Jr. (2015) Public Management: Thinking and Acting in Three Dimensions. Washington, DC: CQ Press.

Keeling, Desmond (1972) Management in Government. London: Allen and Unwin.

Khvesyk, Mykhailo A., Ihor K. Bystryakov and Dmytro V. Klynovyi. (2018) 'Yevrointehratsiinyi kontsept zabezpechennia staloho prostorovoho rozvytku Ukrainy [Euro-integration concept of ensuring sustainable spatial development of Ukraine]', Rehionalna ekonomika [Regional Economy], 4(90), pp. 5–16. http://re.gov.ua/doi/re2018.04.005_u.php [Accessed 14 August 2023].

Komelina, Olha and Hanna Kondratyeva. (2023) 'Yevropeiskyi dosvid orhanizatsiino-pravovoho zabezpechennia staloho prostorovoho rozvytku [European experience of organizational and legal support of sustainable spatial development]', Ekonomika i rehion [Economy and Region], 2(89), pp. 23–31.

Kumar, Satish, Sushanta Sahoo, Weng Mark Lim and Leo-Paul Dana (2022) 'Religion as a social shaping force in entrepreneurship and business: Insights from a technology-empowered systematic literature review', Technological Forecasting and Social Change, 175. https://doi.org/10.1016/j.techfore.2021.121393.

Lakhotska, Elina (2018) 'Suchasne prostorove planuvannia u krainakh Yevropy ta Ukraini [Modern spatial planning in European countries and Ukraine]', in Stan i perspektyvy pryrodokorystuvannia v Ukraini: materialy III Vseukrainskoi naukovo-praktychnoi internet-konferentsii, 21–25 travnia 2018 roku, m. Uzhhorod [State and prospects of nature management in Ukraine: Proceedings of the 3rd All-Ukrainian scientific-practical internet conference, May 21–25, 2018, Uzhhorod], pp. xx–xx. Uzhhorod: Vyd-vo UzhNU "Hoverla". https://dspace.uzhnu.edu.ua/jspui/handle/lib/21558 [Accessed 21 June 2023].

Lytvynchuk, Myroslava Y., Olena O. Denysenko and Anatoliy L. Melnychuk (2022) 'Local Planning Instruments in Ukraine: Experiences and Changes from a Long-Term Perspective', Ukrainian Geographical Journal, pp. 45–54. https://ukrgeojournal.org.ua/en/node/757 [Accessed 21 June 2024].

Lynn Jr., Laurence E. (2006) Public Management: Old and New. London: Routledge. https://www.perlego.com/book/1606389/public-management-old-and-new-pdf.

Maier, Karel, Jan Kabrhel and Marcin Dąbrowski (2021) 'Cross-fertilisation between Spatial Planning and EU Cohesion Policy in the Czech Republic', ESPON EGTC. https://archive.espon.eu/sites/default/files/attachments/Cross-fertilisation%20between%20spatial%20planning%20and%20EU%20Cohesion%20Policy%20in%20the%20Czech%20Republic.pdf [Accessed 21 June 2024].

Makieiev, Denis (2021) 'Spatial planning as a modern tool for development', in Olena V. Panukhnyk (ed.) Formation of the mechanism for strengthening the competitive positions of national economic systems in the global, regional and local dimensions: Proceedings of the VII International Scientific and Practical Conference, pp. 78–80. https://elartu.tntu.edu.ua/bitstream/lib/36316/2/FMZKPNES_2021_Makieiev_D-Spatial_planning_as_a_modern_78-80.pdf [Accessed 11 August 2023].

Markina, Mariia (2023) 'Analysis of approaches to defining the definition of «Spatial Planning»: a managerial aspect', Public Administration: Improvement and Development. https://doi.org/10.32702/2307-2156.2023.8.17.

Markina, Mariia and Vira Ohorodnyk (2021) 'Theoretical aspects of public management in the field of spatial planning at the local level', Democratic Governance. Available at: https://science.lpnu.ua/sites/default/files/journal-paper/2022/feb/26990/3ohor.pdf (Accessed: 20 September 2024).

Markina, Mariia I. (2023) 'Spatial planning in Ukraine as the implementation of spatial development principles in EU countries: post-war aspect', in International security in the light of modern global challenges. Baltic countries - Ukraine: unity, support, victory: III International scientific-practical conference, Kyiv, June 8, 2023. Kyiv.

Markina, Mariia I. (2024) 'Transformation of public administration in the field of spatial planning at the local level in the context of Ukraine's European integration processes', Actual Issues in Modern Science. Series: Public Administration, 10(28), pp. 163–175. Available at: http://perspectives.pp.ua/index.php/sn/article/view/15479 (Accessed: date unknown). https://doi.org/10.52058/2786-6300-2024-10(28)-163-175.

Maruniak, Evhenia, Serhii Lisovskyi and Leonid Rudenko (2024) 'The spatial dimension of the war effects in Ukraine: An agenda for country recovery', Europa XXI, 44. https://rcin.org.pl/Content/240183/WA51_276510_r2023-t44_EuropaXXI-Maruniak.pdf.

Moynihan, Donald P. (2008) The Dynamics of Performance Management: Constructing Information and Reform. Washington, DC: Georgetown University Press. http://www.jstor.org/stable/j.ctt2tt51c.

Nowak, Maciej J., Roman Lozynskyy and Viktoriya Pantyley (2021) 'Local spatial policy in Ukraine and Poland', Studia z Polityki Publicznej, 8, pp. 11–27. https://d-nb.info/1271145812/34.

Nowak, Maciej J., Viktoriya Pantyley, Malgorzata Blaszke, Liudmila Fakeyeva, Roman Lozynskyy and Alexandru-Ionut Petrișor (2023) 'Spatial Planning at the National Level: Comparison of Legal and Strategic Instruments in a Case Study of Belarus, Ukraine, and Poland', Land, 12(7), 1364. https://doi.org/10.3390/land12071364.

Ohorodnyk, Vira and Robert Finger (2023) 'Envisioning the future of agri-tourism in Ukraine: from minor role to viable farm households and sustainable regional economies', Journal of Rural Studies, 103, pp. 154–164. https://doi.org/10.1016/j.jrurstud.2023.02.017.

On Amendments to Certain Laws of Ukraine Regarding Priority Measures for Reforming the Sphere of Urban Development: Law of Ukraine, document 2254-IX. Kyiv: Verkhovna Rada of Ukraine. Available at: https://zakon.rada.gov.ua/laws/show/2254-20#Text [Accessed: 30 August 2024].

On Amendments to Certain Legislative Acts of Ukraine on Land Use Planning: Law of Ukraine, document 711-IX (2020). Kyiv, Verkhovna Rada of Ukraine. https://zakon.rada.gov.ua/laws/show/711-20#Text [Accessed 30 July 2024].

On approval of procedures for the recovery and development of regions and territorial communities: Resolution of the Cabinet of Ministers of Ukraine, document 731-2023-p (2024). Kyiv, Verkhovna Rada of Ukraine. https://zakon.rada.gov.ua/laws/show/731-2023-%D0%BF#Text [Accessed 30 July 2024].

On Regulation of Urban Development: Law of Ukraine, document 3038-VI (2024). Kyiv, Verkhovna Rada of Ukraine. https://zakon.rada.gov.ua/laws/show/3038-17#Text [Accessed 30 July 2024].

On the approval of the List of historical populated places of Ukraine: Resolution of the Cabinet of Ministers of Ukraine, document 878-2001-p (2001). Kyiv, Verkhovna Rada of Ukraine. https://zakon.rada.gov.ua/laws/show/878-2001-%D0%BF#Text [Accessed 6 September 2024].

On the approval of the Procedure for the development, updating, amendment and approval of urban planning documentation: Resolution of the Cabinet of Ministers of Ukraine, document 926-2021-p (2021). Kyiv, Verkhovna Rada of Ukraine. https://zakon.rada.gov.ua/laws/show/926-2021-%D0%BF#Text [Accessed 6 September 2024].

Organisation for Economic Cooperation and Development (2022) Rebuilding Ukraine by reinforcing regional and municipal governance. OECD Multi-level Governance Studies. https://www.oecd.org/countries/ukraine/ [Accessed 21 June 2024].

Osborne, David (1993) 'Reinventing Government', Public Productivity and Management Review, 16(4), pp. 349–356. https://doi.org/10.2307/3381012.

Peters, B. Guy (2018) The Politics of Bureaucracy: An Introduction to Comparative Public Administration. London: Routledge. https://doi.org/10.4324/9781315813653.

Pollitt, Christopher and Sorin Dan (2011) The Impacts of the New Public Management in Europe: A Meta-Analysis. COCOPS Work Package 1 – Deliverable 1.1. https://www.researchgate.net/publication/321027230_The_Impacts_of_the_New_Public_Management_in_Europe_-_A_Meta-Analysis [Accessed 20 August 2023].

Rainey, Hal G. (2020) 'On the uniqueness of public bureaucracies', in The state of public bureaucracy, pp. 111–140.

Ro3kvit (2025) Rethinking Cities in Ukraine 2.0 – Educational Programme [In Ukrainian]. [Online] Available from: https://ro3kvit.com/ua/projects/rethinking-cities-in-ukraine-2 [Accessed 29 June 2025].

Shcheglyuk, Svitlana D. (2019) 'Institutional provision of spatial planning of united territorial communities', Socio-economic problems of the modern period of Ukraine, 3, pp. 10–21. http://nbuv.gov.ua/UJRN/sepspu_2019_3_4 [Accessed 21 June 2023].

Snyder, Hannah (2019) 'Literature review as a research methodology: An overview and guidelines', Journal of Business Research, 104, pp. 333–339. https://doi.org/10.1016/j.jbusres.2019.07.039.

Taylor, Nigel (2010) 'What Is This Thing Called Spatial Planning? An Analysis of the British Government's View', The Town Planning Review, 81(2), pp. 193–208. http://www.jstor.org/stable/40660677 [Accessed 11 August 2023].

Tyminskyi, Vladyslav (2022) 'Mobilization, assembling and translation of integrated urban development policy in Ukraine: Revealing strategies, actors and labors', Planning Practice and Research, 37(1), pp. 1–23. https://doi.org/10.1080/02697459.2022.2042922.

UN-Habitat (2023a) New Urban Agenda and Sustainable Development Goals. [Online] Available from: https://unhabitat.org/new-urban-agenda [Accessed 29 June 2025].

UN-Habitat (2023b) The Public Participation Handbook: A Guide to Public Engagement in Urban Planning Processes [In Ukrainian]. [Online] Available from: https://com-east.eu/wp-content/uploads/2024/03/the_public__participation__handbook_ua-1.pdf [Accessed 29 June 2025].

Van Buuren, Arwis, Jenny M. Lewis and B. Guy Peters (2023) Policy-Making as Designing: The Added Value of Design Thinking for Public Administration and Public Policy. Bristol: Policy Press.

Verkhovna Rada of Ukraine (2020) Law of Ukraine No. 711-IX "On Amendments to Certain Legislative Acts of Ukraine on Land Use Planning" (adopted on June 17, 2020). Official Bulletin of the Verkhovna Rada of Ukraine. https://zakon.rada.gov.ua/laws/show/711-20#Text [Accessed 30 July 2024].

Wilson, James Q. (2000) Bureaucracy: What Government Agencies Do and Why They Do It. New ed. Basic Books.

Zaspel-Heisters, Brigitte and Stephanie Henger (2015) 'Synoptic Overview of Spatial Planning in Germany', Journal of Planning and Land Safety, (2), pp. 1–30.

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SIMILAR AND DISTINCTIVE FEATURES OF URBAN DEVELOPMENT ANALYSIS: METHODIC POLICY APPROACHES

Olga Shevchenko[1*], Nataliia Kuzmynchuk[2]

Abstract

The challenges facing Ukrainian cities today require a thorough analysis of their socio-economic development. This article proposes developing a clearer toolkit for assessing the ability of individual cities to build their economic capacity and sustainability, based on studying the socio-economic situations of urban territorial communities from different regions within Ukraine. Based on estimates of socio-economic status, an algorithm was worked out to assess this development. Taking into account the integrative nature of urban policymaking, the framework, mechanisms, and instruments of such a policy were developed, and a scheme was built to link scenarios, strategies, and instruments of urban policy. These can be applied to urban territorial communities at different stages of development.

In this study, we relied on available statistical data. However, in practice, we encountered fragmented and incomplete data, particularly regarding the migration patterns of internally displaced persons, their potential contributions to given individual city's economies, and the impact of displacement on urban planning. This made it impossible to address the challenges of maintaining security, building resilience, and developing urban planning visions. To conduct a thorough analysis of cities' resilience to challenges while also needing to maintain security, we propose expanding the range of municipal statistical data and updating the statistical observation methodology.

The practical significance of this study lies in the possibility of applying the proposed approaches to collecting and processing data on urban development and modelling scenarios and strategies for developing urban policies in Ukrainian cities with similar development conditions. Particular emphasis is placed on complying with the principles of sustainability, security, and smartification when developing urban policies for Ukrainian cities.

Keywords:

Urban territorial community, urban policy, municipal statistic observation, indexes of city economy, city smart specialization, economic security, urban resilience.

1* PSc.D.in Economics, Professor, Department of Regional Studies and Tourism
Kyiv National Economic University named after Vadym Hetman
54/1 Beresteysky ave, 03057, Kyiv, Ukraine
kre_shevchenko.olga@kneu.edu.ua; tel: +38050 146 27 15
ORCID: 0000-0003-0386-7550

2 SSc.D.in Economics, Professor, Department of Marketing, Management and Entrepreneurship
V. N. Karazin Kharkiv National University
4 Svobody Sq., 61022, Kharkiv, Ukraine
nkuzminchuk@ukr.net ;tel: +38050-918-59-77
ORCID: 0000-0002-9844-3429

1. Introduction

Current urban development in Ukraine is influenced by a number of trends. Some of these, such as a weak resource base, have emerged over a long period. Others have been provoked by external military aggression. Cities currently need to survive and maintain minimum living standards and protect infrastructure, while also planning for their future development. The different initial situations of individual cities, and the threatening prospects which some of them face, necessitate not only the formation of a common urban development policy, but also the adoption of different approaches for different cities. Various factors hinder this, primarily the different dynamics of urban development, the different socio-economic situation that exists in wartime, and the lack of comparable spatial data on cities. This raises the questions of how disparate city data can show trends in urban development; which factors stimulate or constrain them; and whether these factors are the same in all cities.

Achievement of the above also requires a different approach to analysing urban development. It follows, that three issues are relevant to this study: finding comparable data from different cities; determining what data should be included in statistical observations; and building an algorithm to regulate urban development indicators that can handle rapidly changing disparate data. This research analyses the development of cities in different regions of Ukraine that are exhibiting quite different conditions; determines what data is missing for analysis; and solves the issue of collecting it. The research also develops tools for regulating spatial development for a particular city.

The study creates a clearer toolkit for assessing the socio-economic situation of cities based on statistical observations. The methodology for studying the socio-economic development of cities was updated and an additional range of data was included in the analysis. The resulting toolkit should be disseminated to other Ukrainian cities.

2. Literature review

Existent scientific literature focuses on current urban processes, their strategic management, and the development of research methodologies. Many of the studies we relied on present the broader context of urban development and urbanisation processes. Thus, urbanisation should be viewed as a process of change between different states. According to Alam (2022), 'the development of urban settlements is a sequence of processes known as the urbanisation cycle: reurbanisation, urbanisation, counterurbanisation and suburbanisation'. Suburbanisation was the dominant process until the 1960s. Since then, counterurbanisation has increasingly influenced urban development. Reurbanisation has been the most recent phenomenon; having emerged since the 1990s.' It follows, that all urban processes can be analysed in terms of the growing scale of urbanisation around the world and in relation to individual settlements.

This situation is precisely in line with the context of decentralisation in Ukraine, where the formation of Urban Territorial Communities (UTCs) has led to urbanisation spreading to surrounding areas.

Considerable attention has been given to reforming local self-government in Ukraine, particularly with regard to decentralisation; a process that has increased the powers of city councils. Zhuk et al. (2023) assessed the results of implementing the national decentralisation reform in terms of the voluntary amalgamation of territorial communities within agglomerations. They concluded that additional management forms and opportunities are needed to regulate agglomeration processes in Ukraine.

The impact of global urban trends on the development of cities as socio-economic systems was examined in depth by Loiko et al. (2021). Relatively recent urban development trends have emerged, and researchers distinguish between the following: the effects of the pandemic on cities with broad self-governing powers (Rodríguez-Pose et al., 2023); the digitalisation of urban life aspects, city management, and the principles of development and features of digital transformation of Ukraine's regions (Irtyshcheva et al., 2020). Considerable attention has also been paid to the development of the smart economy (Baraniewicz-Kotasińska et al., 2022). According to Shpyliova et al. (2022), strategic urban development is based on progressive global experience and involves the introduction of e-government, e-democracy, open data, digital security, digitalised infrastructure, e-services, and the digitalisation of medicine and education.

Authors have also paid considerable attention to explaining the differences in innovation between cities, and have emphasised the importance of cities being aware of the constraints and incentives that impact innovation (Heinelt et al., 2021). Current trends also include the need for, and commitment to, implementing a low-carbon transition and building a green economy (Marino et al., 2022). Modern, widely used methods of studying urban processes are presented in Li et al. (2022). Among these methods, we note the use of cluster and factor analysis to study spatial data.

The article by Bubenko et al., (2017) presents strategic tools for urban development within the framework of established EU urban policies. The article by Borshchevskii et al., (2022) formulates proposals for public authorities and local self-government bodies to strategise regional and urban development, harmonise the strategic plans of different levels (cities and regions) with each other, and use spatial advantages.

It was also correct to take advantage of research approaches obtained in other works, as this enabled us to address issues related to our topic more broadly, including those related to security, internally displaced persons, and the effects of the pandemic. Benton et al. (2022) and Glauben et al. (2022), for example, discuss the threats to global food and energy security posed by the war in Ukraine, whereas, Voznyak et al. (2023), Mykhnenko et al. (2022) and Jurić (2022) have addressed issues relating to internally displaced persons. In addition, Lima (2024) and Long & Evans (2023) examined issues relating to supporting investment in affordable housing and changes related to the coronavirus pandemic.

This study's findings are important for informing the government's economic policies during times of crisis. In Voigtländer, & Whitehead (2023) the researchers noted that interest in rent control has increased over the last two decades as housing affordability has deteriorated, and the private rented sector has become increasingly important. This has led to increased political pressure for tighter rent regulation and a growing body of research into different ways of developing a better functioning private rented sector, including how best to support poorer tenants.

Problems of spatial balance are discussed in Buchholz (2022) and Liu et al. (2022). Glaeser and Gottlieb (2009) reviewed the concept of spatial balance, and demonstrated how it can be employed to comprehend urban growth.

Despite existing scientific developments, there are currently no scientific ideas or practical proposals for designing an algorithm that can organise and predict the dynamics of urban development indicators when dealing with scattered and stochastic data. Such tools should also be able to identify potential threats and formulate recommendations for the further spatial planning of cities which takes into account the need to respond to threats and build strategic resilience.

3. Materials and Methods

3.1. General methodic approach and theory

The long-term management of cities is based on an understanding of their vulnerabilities and growing needs, as well as the need to apply new research methods. In order to determine the prospects for city development, a long-term framework should be developed. Urban management involves ensuring the implementation of innovations and changes in a given city through resource allocation, adaptation to the external environment, internal coordination, and anticipation of future changes in activities. Ukraine's system for the strategic management of urban development is based on the Ministry of Regional Development's Order "On Approval of Methodological Recommendations on the Procedure for Developing, Approving, Implementing, Monitoring and Evaluating the Effectiveness of Implementing Territorial Community Development Strategies" (2022). Each city currently has its own development strategy for 2021–2027; these are presently being updated.

In light of Ukraine's potential integration into the EU, the study highlights the Lugano Principles (Guidelines for the Reconstruction of Ukraine) and the Guidelines for Sustainable Spatial Development of the European Continent. It also explores how these principles can be coordinated with Ukraine's state regional policies and the concept of territorial community development.

This study is based on current urban trends, specifically new regionalism and neoliberal theory. New regionalism is characterised by two interrelated features: it transcends the boundaries of national economies, and it pits regional development actors, including cities, against each other in competition without assigning them new roles in the international allocation of labour (Yuzhu, 2020).

The most notable global trend is the empowerment of regional entities, including cities. This is evident in the transfer of functions from the national level to regional and local administrative units. Many countries in Europe have gained experience in this area. Belgium, for example, has implemented federalisation, while the United Kingdom has transferred significant power from the central government to local authorities. Ukraine has also undergone decentralisation; significantly expanding the rights and powers of cities. This transformation has also included the formation of urban territorial communities with strengthened material and financial resources, as well as expanded rights. At the same time, urban policy is implicitly considered in relation to other types of public policy, and is also incorporated into public regional policies.

This paper adopts a neoliberal theoretical framework to study cities (Li & Zhang, 2022). When measured by indices of economic freedom, neoliberalism tends to be associated with economic growth and rising incomes across social classes. According to Lane (2023), the concept of neoliberalism envisages the comprehensive development of the rights and freedoms of a region's or city's residents, as well as the implementation of their initiatives and responsibility for the region's or city's development. These provisions are relevant to achieving the goals of decentralisation reform. Neoliberal theory helps explain how to ensure social stability and a minimum level of well-being under market laws; essential for urban sustainability.

This paper takes a systematic approach to analysing urban processes, and thus considers the city in the context of regional and national processes and connections. This method of cognition enables us to view the city as not only a distinct administrative and territorial unit and economic entity, but also as part of the country's governance system as well as the national economy. This enables us to evaluate the influence of macroeconomic and social trends on its development.

In this study, we define a city as an urban territorial community (UTC) formed following the reform of local self-government and the organisation of territorial authority (completed in 2020). This reform involved the consolidation of administrative units, and means that a UTC includes the city itself, as well as several surrounding villages and towns. Each urban territorial community analysed is a regional centre. Each has its own approved development strategy which contains strategic goals and measures for their implementation. These strategies contain approaches to identifying areas of smart city specialisation.

The authors relied on these facts when conducting the study, particularly with regard to determining the urban development policy.

For the analysis, cities from a range of regions within Ukraine that had been affected by the war in different ways were selected: (1) rear cities; (2) cities under periodic shelling; and (3) frontline cities under constant shelling. The rear cities (1) are Vinnytsia and Zhytomyr (central macroregion); far from the front line. Cities that are periodically shelled include Kyiv (centre) and Lviv (west). Frontline cities (3) include Kharkiv (northeast) and Odesa (south). These cities were taken into consideration to provide a broad spatial representation of cities in Ukraine.

3.2. Similar and distinct features in spatial city data gathering and curation

Existent scientific literature extensively covers the topic of urban spatial planning based on spatial data analysis. The development strategies of any city, and the implementation of urban development policies, are based on the city's current resource potential and its vision for the future (Li et al., 2022). The unevenness of socio-economic development indicators in different cities is the leading criterion for urban development (Odongo et al., 2021; Heinelt et al., 2021). To formulate urban development policies, it is important to understand the nature of such disparities and their potential impacts on cities. The relationship that exists between neoliberalism and urban socioeconomic inequality is ambiguous. Over the past two decades, inequality in income or wealth has not increased in some regions of the world, and has even decreased (for example, in Latin America) (Rutar, 2023).

The unevenness of urban development has objective reasons relating to differences in potential that have developed over time, as well as reasons relating to the current state. The main reason for this is basic resilience to external threats, which is formed differently in different cities. In Ukraine, this inequality has intensified further under martial law. This prompted a research question to study these resilience features in cities.

Our analysis of Ukrainian cities shows that the same comparable data could be used to study the socio-economic development dynamics of cities (UTCs). Statistical analysis of socio-economic development allowed us to examine data on various aspects of urban life including: industrial development, construction, sales amount, capital investment and foreign direct investment, service exports and imports, cargo and passenger turnover, and average monthly wages. The available data was analysed using economic modelling.

The study's statistical limitations are the fragmentation of spatial data. Since the data for cities was scattered, we identified what data was missing in order to obtain a thorough analysis of the spatial development of a particular UTCs. The absence of homogeneous spatial data prevents us from understanding the deeper nature of the problem. In addition, time series for different indicators and cities often do not coincide. This necessitates a focus on operating with a small amount of data. Accordingly, we used estimated data and the results of its processing. Where necessary, we applied data extrapolation methods to the data. Our analysis was based on two types of indicator: official municipal statistics and expert estimates – measurable quantitative statistical data was supplemented by qualitative expert assessments. The ways in which both the quantitative and qualitative results of statistical observations and surveys can be taken into account are described by Shevchenko (2024).

Each city that is addressed herein has both common and distinctive statistical observation data sets that are relevant to the scope of the study. Municipal statistical observations are currently conducted by the State Statistics Service of Ukraine and its territorial bodies specifically for urban territorial communities. This data is publicly available on city council websites. Municipal observations and the urban statistics based on them now offer systematic data up to, and including, 2021. However, the city council websites also contained scattered data on certain types of activities in urban communities for 2022–2024; often estimated and forecasted. The results of processing this disparate data were used in the study. The differences in the use of data from different cities are further illustrated by an algorithm for forming similar and distinct approaches to assessing the socio-economic development of UTCs.

3.3. Ways of using spatial urban data (in different cities)

Based on the above justifications for assessing similar and distinct approaches to analysing the socio-economic development of cities, as well as expanding the list of spatial data on urban development, we have developed the following algorithm for assessing the socio-economic development of cities (Fig .1).

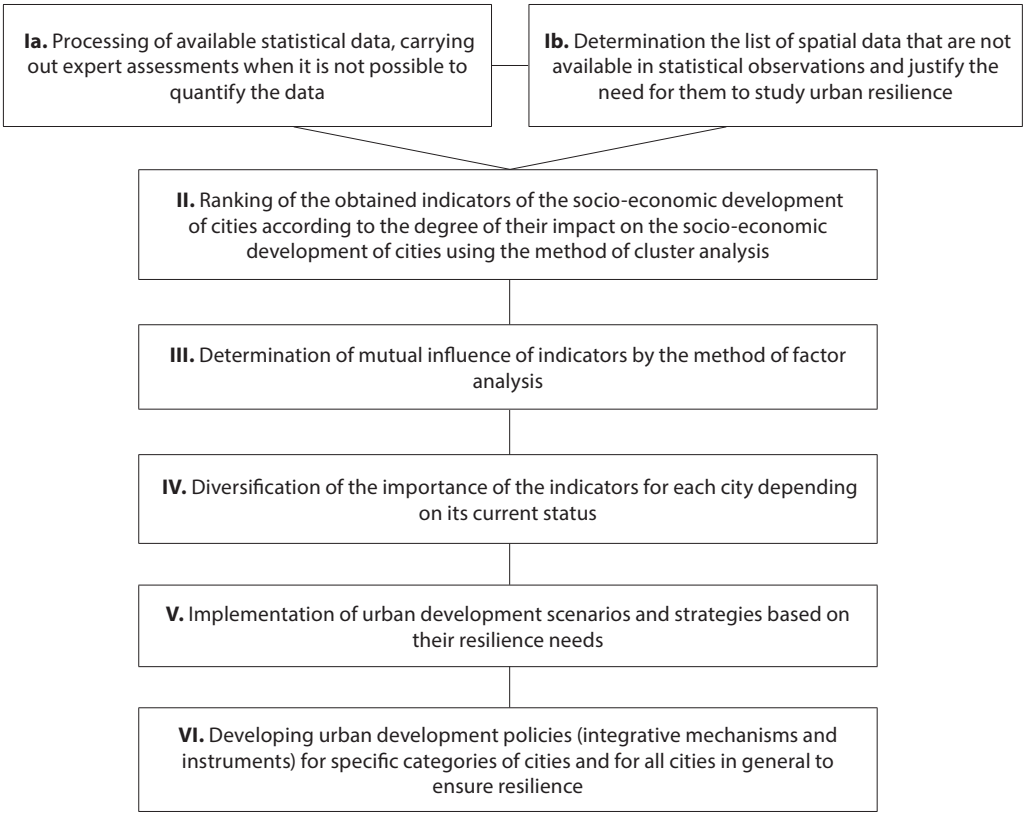

Fig. 1. Algorithm for forming similar and distinct features to assessing the socio-economic development of cities. Source: Author's elaboration.

We applied this algorithm to Ukrainian cities with different initial conditions (rear cities, cities under fire and frontline cities) and analysed the resulting data. This allowed us to identify the most appropriate scenarios for urban development policies. Further we provide a brief summary of the application of the study algorithm for six Ukrainian cities mentioned above and the results obtained. For the purposes of this study, we focused on scenario modelling (stage V) and the development of urban development policy (stage VI).

In Stage I, we compiled a list of data monitored in municipal statistics (Ia). We also determined what additional data should be included in the analysis, given the current situation in the cities (Ib). To perform further calculations on the available data, the socio-economic indicators of urban development were converted into an analytical form. Conversion of a certain indicator for a given city into an analytical form was carried out using standard unipolar indicator normalisation (Formula 1).

$$y(x) = \frac{x - x_{\min}}{x_{\max} - x_{\min}} \quad (1)$$

In Stage II, we ranked the indicators of socio-economic development obtained for cities according to their impacts on the city's integrated development. For this study, we employed the k-medoids clustering algorithm, which involves searching for cluster centres as medoids of points during each iteration, i.e. the cluster centre must be among the points of the cluster. This enabled us to identify common features of cities' development.

In Stage III, we evaluated the indicators for analysis. Factor analysis was used to select the most significant indicators of socio-economic development. Factor analysis is used in multivariate models to reduce dimensionality by identifying optimal parameterised variables while eliminating issues related to variable correlation. In other words, factor analysis involves reducing the original data, and replacing it with new variables (factors) that emphasise the most significant differences between the original variables. At the same time, variables with similar characteristics can be grouped into one factor. This study employed the quartimax method of factor analysis, and involved rotating the factor axes to maximise factor loadings while considering the structure of all the components.

In Stage IV, we interpreted the results obtained in Stages I, II and III. We identified the significant qualitative and quantitative characteristics of urban development and their dynamics for each of the case study cities. The use of fuzzy logic methods, which are currently implemented in forecasting and modelling economic processes in environments characterised by increased complexity, dynamism, and uncertainty, shows promise in the formation, evaluation, and interpretation of socio-economic development indicators for UTCs. These methods can be fully applied to multidimensional and poorly organised systems of urban development indicators. The potential of the fuzzy-set approach is not limited to quantifying qualitative information in conditions of high uncertainty; it can also be successfully applied to solving management problems. In this study, for example, it was used to develop urban development policy measures.

In stage V, we proposed city development scenarios and strategies depending on the results of the analysis. According to the theory of strategic planning, there are three development scenarios for each city. The inertial (trend) scenario occurs when the city's development indicators remain unchanged, and it continues in its current direction of movement. The optimistic scenario occurs when the city's indicators are significantly improving due to external influences and internal conditions, and the city has the ability to initiate growth. The pessimistic scenario is when the city's development conditions are significantly deteriorating, and the city is on the verge of survival. The scenario that can be implemented is determined based on calculations and forecasts of the city's socio-political and economic situation.

Depending on the scenario and the current situation of the city in question, strategies for city development are formulated. The strategies are as follows:

1) Survival: for cities that are losing their potential and must maintain minimum living standards.

2) Building resilience: for cities that have the potential for resilience and must formulate development strategies.

3) Ensuring growth: for cities with stable and relatively safe development.

In stage VI, we identified urban development policy approaches and tools for the individual case study cities as well as Ukrainian cities in general.

One way to implement urban development policy is to build resilience and, at the same time, develop strategies for survival and growth (in accordance with the three identified urban development strategies). This can be achieved by encouraging individual cities to develop smart specialisation and build development strategies on that basis. The smart specialisation of the country's economy, including cities, is discussed in detail in articles by Tsymbal (2022) and Tsymbal et al., (2024).

In Ukraine, smart specialisation has been developed at regional level (oblasts), with smart specialisation areas formed on the basis of the indicators — the most intensive level of innovation activity and high rates of innovation. Each region has three or four types of activity within the framework of smart specialisation. As a component of both the socio-economic sphere and the spatial development of the region, a city — especially if it is the centre of a region (in this study, we analyse regional centres) — can realise the potential of smart specialisation to the fullest extent, and may also have its own smart specialisation. By 2025, each community must prepare and approve its development strategy (or update an existing one); providing an opportunity to determine the smart specialisation of each urban community. Such smart specialisation should ensure both community sustainability and its ability to develop, i.e. demonstrate ways to transform the community. It follows, that the issue of urban innovation should be considered in the context of its ability to ensure sustainability, resilience, and capacity for development.

3.4. Scenarios, strategies, and integrity of urban policy realization

As previously mentioned, in order to implement Stages V and VI of the algorithm, scenarios, strategies and types of urban development policies should be developed. A scenario is a path along which a city can 'move', as well as being a way of describing how events will develop with minimal intervention from the given city's authorities. A strategy is a targeted set of measures taken by the city's authorities that take into account the

city's development goals and its current situation. While the strategy does not directly follow from the scenario, it is closely related to it and depends on it.

The developed strategies have enabled us to formulate urban development policies and their practical implementation, i.e. tools for managing urban development. The components of strategy development are based on different types of integration (e.g. territorial or managerial). The policy instruments themselves were formed based on the types of integration. We have identified integrated approaches to creating a system for planning urban spatial development and implementing urban policy. As urban development policies involve forming a shared vision of a city's future through the coordinated efforts of various services, the following types of strategy development integration should be applied:

1. Integrated interpretation of the situation: understanding the interrelationships that exist between the various factors influencing the development of the city, such as education, income and housing, as well as the cause and effect of those factors.

2. Territorial integration involves considering the city as part of a larger area (district, region, etc.), as urban problems and desired development outcomes usually depend, at least to some extent, on the larger system of which the city is a part.

3. Integrated policy: coherence of urban development policies of different organisations and institutions involved in the city's management.

4. Integrated actions: cooperation of all stakeholders in implementing the city's strategies.

5. An integrated management team with representatives from different organisations and sectors.

6. Integrated formulation of development strategies: taking into account the wishes and interests of all participants and using the formulation process itself as a means of involving participants in a common cause.

- Integrated use of resources involves attracting resources from various sources.

The choice of individual urban development policy depends on calculations, the chosen development strategy and scenario and, to a large extent, on the current situation in the country and the particular city. It follows, that, urban development policy, particularly its content, is an indicative rather than prescriptive (direct) tool of strategic management.

4. Results

In accordance with the developed algorithm for identifying similar and distinct ways to assessing the socio-economic development of cities (see Fig. 1), the following results were obtained.

In Stage I, we compiled a list of data monitored in municipal statistics and available in the public domain (Ia). The time series ran from 2017 to 2023–24 (see Table 1).

Table 1 – List of statistical data used in the analysis

Indicators in quantitative terms	***Indicators in value terms***
amount of products sold	new construction – total area of residential building
capital investment	putting housing into use
foreign direct investment	cargo transportation
export and import of goods	cargo turnover
export and import of services	passenger transportation
manufacture of construction products	passenger turnover
retail trade amount	
average monthly salary	

Source: compiled by the authors based on official municipal observations (cities' councils' websites)

We found (Ib) that there is currently no systematic data on the number of people affected, the number of internally displaced persons (IDPs) in cities, the totality of area destructed, the amount or nature of environmental pollution (e.g. air emissions and industrial construction waste), or the estimated funds needed for reconstruction.

Stage II revealed that the indicators can be ranked according to their degree of impact on the city's socio-economic development, from greatest to least (10 indicators with a visible impact were selected out of 14; see Table 2).

Table 2 – The degree of impact of statistical indicators on the UTCs socio-economic development

UTC	**Degree of influence (from greatest to least) on the integral development of the city**	**UTC**	**Degree of influence (from greatest to least) on the integral development of the city**
Vinnytsia	1. average monthly salary 2. foreign direct investment 3. new construction – total area of residential building 4. manufacture of construction products 5. export and import of services 6. export and import of goods 7. capital investment 8. retail trade amount 9. cargo transportation 10. passenger transportation	**Lviv**	1. average monthly salary 2. foreign direct investment 3. passenger transportation 4. cargo transportation 5. new construction – total area of residential building 6. export and import of services 7. amount of products sold 8. retail trade amount 9. capital investment 10. export and import of goods
Zhytomyr	1. average monthly salary 2. putting housing into use 3. manufacture of construction products 4. cargo transportation 5. passenger transportation 6. amount of products sold 7. capital investment 8. export and import of goods 9. export and import of services 10. new construction – total area of residential building	**Kharkiv**	1. average monthly salary 2. capital investment 3. export and import of services 4. retail trade amount 5. export and import of services 6. amount of products sold 7. passenger transportation 8. cargo transportation 9. foreign direct investment 10. cargo turnover

Kyiv	1. average monthly salary 2. foreign direct investment 3. export and import of goods 4. export and import of services 5. new construction – total area of residential building 6. cargo transportation 7. passenger transportation 8. amount of products sold 9. putting housing into use 10. manufacture of construction products	**Odesa**	1. average monthly salary 2. cargo turnover 3. amount of products sold 4. capital investment 5. retail trade amount 6. cargo transportation 7. passenger transportation 8. foreign direct investment 9. putting housing into use 10. passenger turnover

Source: calculated by the authors based on official municipal observations (cities' councils' websites).

As shown in Table 2, average monthly salaries had the greatest impact on the socio-economic development of all of the UTCs that were analysed for this study. The ranking of this indicator depended on the type of city. If a city was located further from the front line, pre-war indicators remained high (for example, construction production in Vinnytsia and foreign direct investment in Kyiv). If a city was under fire, activities that could be quickly secured or that allow for the transformation of logistics chains were of great importance, such as selling products in Odesa and exporting or importing services in Kharkiv. It follows, that the importance of different types of socio-economic development depends directly on the security situation in the given city, and this determines the given city's development strategies and polices (they forms the basis for distinct approaches in UTCs' policies).

Stage III analysis showed that the following five indicators had the greatest impacts on the socio-economic development of cities in general: average monthly wages, foreign direct investment, new construction, cargo transportation, and exports and imports of services. These indicators are used as benchmarks for forming a sustainability strategy for Ukrainian cities in general, and provide the basis for implementing a similar approach to urban policies.

During Stage IV, we analysed the results obtained in Stages I, II and III regarding the impacts of the indicators on urban development in order to identify the essential qualitative and quantitative characteristics of urban development and their dynamics. Having used the fuzzy plural tool we obtained the following results:

For rear cities (Vinnytsia and Zhytomyr), we found that, based on the potential of activities that produce good results regardless of the social situation, it is advisable to establish strategic guidelines for further dynamic development.

For cities under periodic shelling (Kyiv and Lviv), we advise restructuring the economic structure and changing the priority of activities to stabilise the situation and find growth opportunities.

For frontline cities under constant shelling (Odessa and Kharkiv), we advised the need for a reorientation towards service and logistics sectors to ensure an active life and protect activities from damage and destruction.

During Stage V, we proposed city development scenarios and strategies. These were determined based on our calculations, the results obtained during Stage IV, as well as expert forecasts pertaining to the socio-political and economic situation. In the context of the situation evident in the different types of cities, the following strategies were proposed:

- a survival strategy for cities close to the front line (Kharkiv and Odesa);

- a resilience-building strategy for cities under periodic shelling (Kyiv and Lviv);

- a growth-promoting strategy for rear cities (Zhytomyr, Vinnytsia).

Stage VI identified urban policy approaches and instruments for the analysed cities, as well as for Ukrainian cities in general. In doing so, we focused on smart specialisation approaches.

The impact of military operations on cities in Ukraine has varied between cities, and, as a result, their individual levels of resilience also vary. Post-war reconstruction can also be based on smart specialisation in cities if this is specified in individual city's development strategies. The concept of the smart specialisation of Ukraine's economic activity encompasses the following areas: ecologisation (expansion of green spaces, energy efficiency, etc.); socialisation; intellectualisation; technologization; and digitalisation. When it comes to updating UTCs strategies based on the similarities and differences that exist with regard to approaches to urban community strategising, the need for urban community reconstruction should be considered when defining smart specialisation.

The following is an analysis of the presence of descriptions of these smart components (in the form of strategic goals and priorities) in the city development strategies available – for Vinnytsia, Zhytomyr, Lviv, Kyiv, and Kharkiv.

The issues of ecological production and living are covered in Kyiv's development strategies: 'Kyiv – the Greenest Capital of Europe', 'Preservation and Development of the Dnipro Riverfront', and 'Green and Balanced City'. Zhytomyr's strategy is called 'Green City', while Lviv's is 'A City where it is Comfortable to Live, Study, and Work'. Kharkiv's strategy is called 'Comfortable City', and Vinnytsia's is 'Green Economy and Smart Specialisation' and 'Affordable, Safe, and Environmentally Friendly Environment'.

Energy efficiency is a key focus in the strategies of Kyiv's ("Saving Energy"), Lviv's ("Developing a Competitive and Innovative Economy"), Zhytomyr's ("Efficient City", "Green City"), Kharkiv's ("Comfortable City"), and Vinnytsia's ("Municipal Investments").

The socialisation factor is addressed by the following city strategies: 'Cozy City, Improves the Quality of Life' (Kyiv's); 'Inclusive City, Comfortable City' (Zhytomyr's); 'City where it is comfortable to live, study and work' (Lviv's); 'Comfortable City' (Kharkiv's); and 'Accessible, Safe and Environmentally Friendly Environment' (Vinnytsia's).

The factor of 'intellectualisation' is highlighted in the strategies of Kyiv ('Clear City with Transparent Governance'), via Zhytomyr's ('Effective City'), Lviv's ('City of Traditions, Knowledge, Culture, Tourism and Sports'), Kharkiv ('Creative Industries') and Vinnytsia's ('Municipal Investments').

The factor of 'technologisation and digitalisation' is present in the development strategies of Kyiv's ('Implementation of modern urban management technologies'), Zhytomyr's ('Innovative city'), Lviv's ('Developing a competitive and innovative economy'), Kharkiv's ('A digital and safe environment'), and Vinnytsia's ('Digitalising municipal spaces').

Our analysis of the foundations for smartification in urban development strategies reveals all the proposed smartification elements. However, unlike regional development strategies, which clearly prioritise one or two aspects of smartification, UTCs' strategies do not prioritise smartification at all.

In light of the need to update or develop strategies for cities, towns, and villages (due to the adoption of amendments to the Law of Ukraine 'On the Principles of Public Regional Policy' and the commencement of work on the Public Strategy for Regional Development for the next planning period), it is advisable to establish smartification priorities within UTCs' strategies. These should be activities with the highest level of innovation or competitive potential.

When developing urban policy measures, we relied on widely published recommendations regarding the impact of urban policy on socio-economic indicators of cities (Bragaglia et al., 2022; Lane et al., 2023). Table 3 shows the list of proposed scenarios and strategies, the selected type of urban policy, and their interconnections and conditionality.

As mentioned in Section 3 of this article, the scenarios are based on general methodological approaches to strategising: inertial, optimistic, and pessimistic. These theoretical scenarios are heavily influenced by the current situations in the cities and the extent of the damage caused by shelling. The main criteria are quality of life in cities, socio-economic and public safety levels, and the ability to ensure or maintain economic growth. This lends practical meaning to the proposed scenarios and makes it possible to implement them over a specific time period. It follows, that different cities may belong to different groups in different scenarios.

When it comes to the strategy stage, which involves basing decisions on a long-term planning horizon and taking into account future situations rather than current ones, it is proposed that 'upward' strategies should be used; ranging from stabilisation to improvement. Urban development strategies, therefore, fall into three categories: survival (for cities that are losing their potential and must maintain minimum living standards); building resilience (for cities that have the potential for resilience and must formulate development strategies); and ensuring growth (for cities with stable and more or less safe development).

However, depending on the scenario and the current and forecasting situation at different stages of the given UTCs development, the type of strategy may differ. This is particularly pertinent given the rapidly changing situation in Ukraine. For example, the pessimistic scenario for Kyiv and Lviv is survival, the trend scenario is building resilience, and the optimistic scenario is growth. Conversely, for Vinnytsia and Zhytomyr, which have much better initial conditions, both inertial and optimistic scenarios could be performed to select growth strategies. Conversely, cities with poor initial conditions, such as Odesa and Kharkiv, are most likely to require a survival strategy. Depending on the actions and priorities of city authorities, urban policy measures may also vary. Table 3 shows the scheme of the links between scenarios, strategies, as well as the urban policies in use in Ukraine at the present time.

Table 3 – Relationship between scenarios, strategies, and urban development policies in Ukraine

Scenario / **Inertial (trend)**	**Strategy**	**Urban development policy**
Rear city (Vinnytsia, Zhytomyr)	Ensuring growth	Stabilizing key indicators and laying the foundation for growth
The city under fire (Kyiv, Lviv)	Building resilience	Ensuring the parameters of socio-economic and public security and laying the foundations for economic growth
The city near the front line (Kharkiv, Odesa)	Survival	Defining security criteria and ensuring compliance with them
Optimistic	**Strategy**	**Urban development policy**
Rear city (Vinnytsia, Zhytomyr)	Ensuring growth	Shaping economic growth trends based on innovation and smart specialization
The city under fire (Kyiv, Lviv)	Ensuring growth	Turning sustainability fundamentals into a soft growth factor
The city near the front line (Kharkiv, Odesa)	Building resilience	Attempts to maintain parameters and quality of life
Pessimistic	**Strategy**	**Urban development policy**
Rear city (Vinnytsia, Zhytomyr)	Building resilience	Ensuring the functioning of the city without reducing the parameters and quality of life
The city under fire (Kyiv, Lviv)	Survival	Compliance with certain economic security criteria
The city near the front line (Kharkiv, Odesa)	Survival	Expanding security criteria and ensuring compliance

Source: author's elaboration

Different mechanisms and their implementation tools can be used to implement each type of integration of strategy and urban policy measures (elaborated in Section 3). The types of mechanisms, their mutual influence, and their essential expressions in urban policy are shown in Table 4.

Table 4 – Types of integration of the essential components of urban strategy development and their interpretation in urban policy

Type of integration	**Mechanisms and tools for implementing urban policy**
Integrated interpretation of the situation	Multidimensional scientific, analytical and expert research: policy briefs, opinion polls, monitoring, calculations
Territorial integration	Multidimensional scientific, analytical and expert research: cartographic methods, GeoAI, GIS, data visualization, logistics networks
Integrated policy	Comprehensive solution of issues: working meetings of stakeholders
Integrated actions	Discussion of proposals and consideration of the results of discussions: stakeholder workshops, strategy retreats
Integrated management team	Involving stakeholders in working groups and initiating discussions: meetings of working groups and situational discussions on urban development
Integrated development strategy formulation	Discussion of proposals and consideration of the results of discussions: meetings of working groups on strategy development; public discussions on the draft strategy
Integrated use of resources	Finding funding: budgeting, investing, borrowing

Source: author's elaboration

The integrative nature of the essential components of city strategies and their interpretation in urban policy, as presented in Table 4, enables a deeper understanding of the process of formulating city development goals and beginning work on the strategy. It also enables us to immediately identify ways to apply distinct approaches, mechanisms and tools to different cities. After all, each city has its own conditions, and these change dynamically over time. The long-term management of cities is based on an understanding of their vulnerabilities, strengths, and weaknesses.

5. Discussion

These scenarios and strategies should be used to form urban policies for different cities. The sustainability methodology is a common feature of the study of Ukrainian cities, but the specific content of such sustainability varies from city to city.

The capacity of individual cities was assessed by evaluating their existing potential and how it could be utilised. The first problem is the existence of a lack of data or fragmentation of data. The absence of systematic data on the number of people affected, internally displaced persons in cities, the total area destroyed, and environmental pollution, as well as the amount of reconstruction funds needed, reinforces the need to include such factors in a statistical observation system. It is necessary to determine the extent to which population changes and decreases in productive activity affect urban development indicators. Cities far from the front line that are periodically shelled, such as Vinnytsia and Zhytomyr, are also places where displaced persons are concentrated, and their potential should also be studied.

Since each city is unique, with characteristics that distinguish it from others, this potential can be transformed into innovative and creative potential. Given this, alongside existing innovation activity indicators such as 'patent activity' and 'number of cultural events held', we propose adding the following potential assessment indicators: 'city image' and 'actions of the city authorities and the community to improve sustainability'. Such

data can be collected through expert surveys. Introducing this data into municipal observations is the next step in developing the methodology for researching the distinctive features of each city. It follows, that the list of data in municipal statistical observations should be supplemented by various indicators that can be estimated using econometric models.

Given that it is often impossible to collect data through statistical observations defined at a national level, it is necessary to turn to alternative ways to obtain information. GIS could be used to collect data at the city level. This is particularly true of spatial data on land plots and their use.

The second research problem is to understand how cities can respond to today's challenges, and particularly those that result from warfare. It is important to identify how cities build resilience, and the criterion of 'ways of building urban resilience' is one of the future criteria by which urban development can be assessed. In other words, we have expanded the scientific research methodology to find responses to wartime challenges faced by cities affected by military operations.

The fundamental purpose of the algorithm proposed in this article (Fig. 1) is to make cities resilient to external influences. Strengthening cities' capacities to withstand current challenges is an important stage in urban studies. It follows, that the impact of the urban research algorithm's results on the social and economic security of cities is worth considering.

Each city has its own development potential, and assessing this helps to evaluate the opportunities that exist in the face of current threats, as well as opportunities for strategising and building resilience. Through six UTCs from different regions of being analysed, it was shown that these communities have different levels of initial potential and different ways of responding to military operations and threats. Previously, researchers have proposed categorising Ukraine's territories according to their level of security (Shevchenko et al., 2022); this categorisation can be applied to urban territorial communities too.

The current movement of resources (primarily human capital and investment) from one UTC to another has impacted economic security, and means that the methods used to monitor it must be updated. To preserve the integrity of Ukraine's urban spaces, steps must be taken to ensure the economic security of cities. This is indicated in Table 3 which shows the relationships that exist between scenarios, strategies and urban development policies. The first step is to assess the level of economic security in cities and to categorise them into groups. The second step is to assess potential risks to economic security. The third step is to minimise threats to cities with a low level of security, maintain a stable level of economic security, and strengthen the economic security of cities. The fourth step is to develop comprehensive measures for groups of cities according to their level of security, and to integrate these measures into urban policies.

The different levels of social and economic security should be compared with changes in population, investment, and the budget of UTCs. The relationship that exists between human capital indicators and changes in city performance should also be identified.

The proposed measures should prevent the growth of threats to the city's development and also promote sustainability management to maintain decent of living standards.

Further interpretation and research are required to understand the results obtained from the use of similar and distinct approaches to studying trends in the socio-economic development of UTCs.

5. Conclusion

This study develops a framework for applying similar and distinct approaches to urban policymaking. In so doing, it presents an algorithm for assessing the socio-economic development of urban territorial communities (UTCs) using a group of cities from different regions of Ukraine as an example. The algorithm considers the sustainability of urban policy. A list of statistical data for which statistical observations are carried out is provided, along with advice on analysing urban development. The high efficiency of socio-economic spheres

directly depends on the security situation present in a city and further determines the strategies and policies of that city's development; this forms the basis for the implementation of distinct approaches to policy-making in individual cities.

The basis for implementing a similar approach to urban policy in Ukraine was the finding that the following indicators have the greatest impacts on the socio-economic development of cities in general: average monthly wages, foreign direct investment, new construction, cargo transportation, and exports and imports of services. Such spheres can act as catalysts for development.

The authors propose three urban development scenarios — trend, pessimistic and optimistic — and their respective content. Three strategies for cities were then developed: survival, resilience and growth. The authors have demonstrated the connections that exist between these scenarios, urban development strategies, and the components of urban policies. They have also prove the variability of these strategies and the possibility of different combinations UTCs existing in different situations.

The components of the integrative strategy development process and their manifestation in the mechanisms and tools for implementing urban development policies have also been presented in this paper. These enable strategies to be formulated in reference to a dynamically changing situation, and the principles of urban sustainability and security to be implemented.

It is recommended that the list of statistical observation indicators should be expanded to include other quantitative indicators in the municipal observation system; these indicators are triggered by military operations. These indicators should cover changes in human capital, the extent of destruction, and the amount of funds allocated to economic and infrastructure recovery. Due to the uniqueness of each city, it is proposed that their individual innovation potential should be determined based on an analysis of qualitative indicators of the city's brand and the activities of the city authorities to promote it. The algorithm presented in this study expands the range of spatial data, particularly by including broader data on migration and internally displaced persons and their impact on the economy, as well as indicators of resilience to threats, the city's image, actions to increase resilience, and indicators of innovative city development. It also makes use of modern technologies for working with spatial data.

Including indicators of a city's resilience to internal and external threats, as well as its socio-economic and social security levels, can help develop policy mechanisms and protocols to prevent threats. Together, these indicators can help to ensure that cities are resilient to negative impacts. One element of sustainability is identifying the types of smart specialisation evident in a city's socio-economic activities. The necessity of identifying areas of smart specialisation in cities' strategies has been proven.

These results can be used as templates for assessing the socio-economic situation of cities, identifying threats and how they spread, and for planning further development.

The theoretical study and practical results obtained enable us to: identify the most dynamic areas of urban development and urban problems; develop ways to regulate vulnerable areas; expand the scope of municipal statistics; update municipal statistics to analyse the status of cities; and develop proposals to strengthen cities' resilience to threats. These recommendations also enable the experiences herein noted to be extended to other Ukrainian cities that are currently exhibiting an array of different conditions.

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References

Alam, Ayman. (2022) Urban trends and issues of urbanization. In: Cambridge International AS & A Level Geography Revision Guide. [Online] Available from: https://issuu.com/aymanalam/docs/cambridge_international_as___a_level_geography/s/10517426 [Accessed 25 March 2025].

Baliarsingh, Pinakadhar, S. Nanda, and L. Nayak. (2022) 'On statistical convergence of uncertain sequence of fuzzy numbers.' International Journal of Uncertainty, Fuzziness and Knowledge-Based Systems, 30(6), pp. 975–989. DOI: https://doi.org/10.1142/S0218488522500295

Baraniewicz-Kotasińska, Sabina. (2022) 'Smart city: four approaches to the concept of understanding.' Urban Research & Practice, 15(3), pp. 397–420. DOI: https://doi.org/10.1080/17535069.2020.1818817

Benton, Timothy G., Antony Froggatt and Laura Wellesley with Owen Grafham, Richard King, Neil Morisetti, James Nixey and Patrick Schröder (2022) The Ukraine war and threats to food and energy security. London: Chatham House—International Affairs Think Tank. [Online] Available from: https://www.chathamhouse.org/sites/default/files/2022-04/2022-04-12-ukraine-war-threats-food-energy-security-benton-et-al_0.pdf [Accessed 25 March 2025].

Borshchevskii, Viktor, Valentyna Zasadko and Oksana Vasylytsia. (2022) 'The Western Region of Ukraine in the context of modern challenges of globalisation: strategic development planning in the context of EU approximation.' Regionalna Ekonomika, 2(104), pp. 25–34. DOI: https://doi.org/10.36818/1562-0905-2022-2-3

Bragaglia, Francesca, Nadia Caruso. (2020) 'Temporary uses: a new form of inclusive urban regeneration or a tool for neoliberal policy?' Urban Research & Practice, 15(2), pp. 194–214. DOI: https://doi.org/10.1080/17535069.2020.1775284

Bubenko, Pavlo, and Olena Panova. (2017) 'The European dimension of the global urban development programme.' Business Inform, 11, pp. 52–60.

Buchholz, Nicholas. (2022) 'Spatial equilibrium, search frictions, and dynamic efficiency in the taxi industry.' The Review of Economic Studies, 89(2), pp. 556–591. DOI: https://doi.org/10.1093/restud/rdab050

Di Marino, Mina, Maija Tiitu, Inger-Lise Saglie & Kimmo Lapintie (2023) 'Conceptualizing "green" in urban and regional planning – the cases of Oslo and Helsinki.' European Planning Studies, 32(6), pp. 1–23. DOI: https://doi.org/10.1080/09654313.2023.2285811

Glaeser, Edward L., and Joshua D. Gottlieb. (2009) 'The wealth of cities: agglomeration economies and spatial equilibrium in the United States.' Journal of Economic Literature, 47(4), pp. 983–1028. DOI: https://doi.org/10.1257/jel.47.4.983

Glauben, Thomas, Miranda Svanidze, Linde Götz, Sören Prehn, Tinoush Jamali Jaghdani, Ivan Duric, Lena Kuhn (2022) 'The war in Ukraine, agricultural trade and risks to global food security.' Intereconomics, 57(3), pp. 157–163. DOI: https://doi.org/10.1007/s10272-022-1052-7

Heinelt, Hubert, and Georgios Terizakis. (2021) 'Innovative cities: how to explain differences between cities? An answer based on an interpretive approach.' Urban Research & Practice, 14(5), pp. 487–501. DOI: https://doi.org/10.1080/17535069.2020.1723032.

Irtyshcheva, Inna, and Olha F. Sievkevych. (2020) 'Digital transformation of Ukraine's regions: objective necessity, principles of digital development and regulatory features.' Regionalna Ekonomika, 1(95), pp. 14–21. DOI: https://doi.org/10.36818/1562-0905-2020-1-2

Jurić, Tomislav. (2022) 'Predicting refugee flows from Ukraine with an approach to Big (Crisis) Data: a new opportunity for refugee and humanitarian studies.' MedrXiv, 3. DOI: https://doi.org/10.1101/2022.03.15.22272428

Lane, David. (2023) 'Neoliberalism: a critique.' In Global Neoliberal Capitalism and the Alternatives. Bristol: Bristol University Press. DOI: https://doi.org/10.51952/9781529220933.ch003

Li, Yanmei, and Sumei Zhang. (2022) 'Research methods and the planning process.' In Applied Research Methods in Urban and Regional Planning. Cham: Springer. DOI: https://doi.org/10.1007/978-3-030-93574-0_1

Lima, Valesca. (2023) 'Pandemic housing policies: mitigation strategies and protection of rights.' Housing and Society, 51(1), pp. 34–49. DOI: https://doi.org/10.1080/08882746.2023.2266307

Liu, Qiang, Zheng Su and Wei Huang. (2022) 'Analysis of the influencing factors of the high-quality utilization of territorial space based on the perspective of spatial equilibrium: a case study of Hunan Province, China.' Sustainability, 14(19), p. 12818. DOI: https://doi.org/10.3390/su141912818

Loiko, Valeriia, Yuliia Zhukova, Andrii Sunduk and Pavlo Shvets. (2021) 'Global urban tendencies of city development as individual socio-economic systems.' Ekonomika ta Derzhava, 9, pp. 10–18. DOI: https://doi.org/10.32702/2306-6806.2021.9.10

Long, Fiona, and Joshua Evans. (2023) 'Doing what we can with what we have: examining the role of local government in poverty management during the COVID-19 pandemic.' Geoforum, 144, p. 103812. DOI: https://doi.org/10.1016/j.geoforum.2023.103812

Mykhnenko, Vlad, Elliot Delahaye and Nigel Mehdi (2022) 'Understanding forced internal displacement in Ukraine: insights and lessons for today's crises.' Oxford Review of Economic Policy, 38(3), pp. 699–716. DOI: https://doi.org/10.1093/oxrep/grac020

Odongo, Janes, and Donghui Ma. (2021) 'Perspectives in urban planning research: methods and tools.' Current Urban Studies, 9, pp. 759–778. DOI: https://doi.org/10.4236/cus.2021.94045

Rodríguez-Pose, Andrés, and Miquel Vidal-Bover. (2023) 'Decentralisation, unfunded mandates and the regional response to the COVID-19 pandemic.' Regional Studies, 59(1). DOI: https://doi.org/10.1080/00343404.2023.2279105

Rutar, Tibor. (2023) 'What is neoliberalism really? A global analysis of its real-world consequences for development, inequality, and democracy.' Social Science Information, 62(3), pp. 295–322. DOI: https://doi.org/10.1177/05390184231202950

Saatchi, Reza. (2024) 'Fuzzy logic concepts, developments and implementation: new applications in multiple criteria decision analysis II.' Information, 15(10), p. 656. DOI: https://doi.org/10.3390/info15100656

Shevchenko, Olga. (2024) 'Using strategic management principles in developing urban policies.' State and Regions: Economy and Entrepreneurship Series, 4(134), pp. 56–72. DOI: https://doi.org/10.32782/1814-1161/2024-4-5

Shevchenko, Olga, and Natalia Kuzmynchuk. (2022) 'Methodic approaches to the typification of territories in Ukraine for the restoration and management of the regional economy.' Problems of the Economy, 3, pp. 104–111. DOI: https://doi.org/10.32983/2222-0712-2022-3-104-111

Shevchenko, Olga, and Oleh Shevchuk. (2024) 'Modern urban processes as a basis for strategic management of urban development: a contribution to the methodology of scientific research.' Collection of Scientific Papers "Scientific Notes", 35(2), pp. 150–157. DOI: https://doi.org/10.33111/vz_kneu.35.24.02.13.089.095

Spyliova, Vira, and Oleksandr Cherevko. (2022) 'Strategic development of cities based on progressive world experience.' Modeling the Development of the Economic Systems, 1, pp. 129–137. DOI: https://doi.org/10.31891/mdes/2022-3-15

Tsymbal, Liudmyla, and Iryna Uninets. (2022) 'Development of smart cities: country analysis.' Management Theory and Studies for Rural Business and Infrastructure Development, 44(4), pp. 482–488. Vytautas Magnus University. DOI: https://doi.org/10.15544/mts.2022.47

Tsymbal, Liudmyla, Oksana Verdenhofa and Tymur Natsvlishvili. (2024) 'Comparative analysis of smart economy development in selected countries of Southeast Asia.' Baltic Journal of Economic Studies, 10(3), pp. 358–365. DOI: https://doi.org/10.30525/2256-0742/2024-10-3-358-365

Voigtländer, Michael, and Christine Whitehead. (2023) 'Rent controls – a timeless and controversial intervention.' International Journal of Housing Policy, 23(4), pp. 661–670. DOI: https://doi.org/10.1080/19491247.2023.2272383

Voznyak, Halyna, Olha Mulska, Oleksyi Druhov, Khrystyna Patytska and Danylo Sorokovyi. (2023) 'Adaptation of internally displaced persons in host communities under conditions of war in Ukraine: the role of local governments.' Problems and Perspectives in Management, 21(2), p. 323. DOI: https://doi.org/10.21511/ppm.21(2).2023.32

Yuzhu, Wang. (2020) 'New regionalism reshaping the future of globalization.' China Quarterly of International Strategic Studies, 6(2), pp. 249–265. DOI: https://doi.org/10.1142/S2377740020500116

Zhuk, Petro, and Zenoviy Siryk. (2023) 'Decentralisation reform and agglomeration administration in Ukraine.' Regionalna Ekonomika, 2(108), pp. 34–40. DOI: https://doi.org/10.36818/1562-0905-2023-2-3

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SMART SHRINKAGE FOR MYKOLAIV? SUSTAINABLE DEVELOPMENT IN STAGNATING AND SHRINKAGE SCENARIOS

Agim Kërçuku[1*], Dimitris Manoukas[1], Austėja Makarevičiūtė[2], Ilaria Mariotti[1], Federica Rossi[1] and Audrone Sadauskaite[2]

Abstract

In Ukraine, with the Russian invasion that started in 2022 still ongoing, the issue of considering a controlled shrinking strategy has become increasingly urgent when looking at the possible population scenario identified by the Mykolaiv Masterplan. Rather than considering the best-case scenario, we must consider the worst-case and baseline scenarios of demographic change. Planning for stagnation and decline must be prioritised to reduce disparities and enable sustainable development.

This paper presents possible demographic scenarios for Mykolaiv after the war, along with their socio-economic effects. We have chosen the city of Mykolaiv because of its unique characteristics. It has emerged as a crucial defence city for Ukraine since 2014. In light of the Russian invasion of 2022, securing access to Odesa and the wider southern coastline is especially important. Furthermore, Mykolaiv has experienced ongoing demographic shrinkage; exacerbated by the war. Within this context, we map the geography of knowledge produced by smart shrinkage, and reflect on the leading causes, strategies, consequences, contradictions, and opportunities. Our research questions are whether and how these strategies can be applied to the mounting recovery challenges in Mykolaiv.

Keywords:

shrinkage, smart shrinkage, degrowth, post-war, Ukraine, Mykolaiv, scenario analysis

1* agim.kercuku@polimi.it
DAStU-Politecnico di Milano (Italy)
https://orcid.org/0000-0001-6120-825X

2 Visionary Analytics (Lithuania)

1. Introduction

This paper focuses on the city of Mykolaiv, a key urban community in southern Ukraine. It is central to the economic, social, and infrastructural fabric of the Mykolaiv region and the country. It is a naval and shipbuilding hub in the Black Sea. During the Tsarist and Soviet periods, it was a significant military-industrial city; renowned for its grain exports, mechanical engineering, and shipbuilding. It has also served as an important logistical hub because of its rail links, seaport, and river port. Having a high population density of 1,852.4 people per km^2, Mykolaiv has conventionally played the role of the region's industrial centre with shipbuilding, engineering, IT, and food processing having been the main branches that have substantially driven the local economy (UNECE, 2023). However, similar to many cities in Ukraine, Mykolaiv has been deeply influenced by long-term demographic trends and the devastating impacts of the ongoing conflict with Russia. Its population, which in 2021 reached 476,100 residents, has steadily declined over the last two decades due to factors such as an ageing population and low fertility rates; in part also impacted by delayed childbirth (UNECE, 2023). This ongoing demographic shrinkage has been further impacted by the war, and has led to massive displacement and population loss. By the end of 2022, about half of all the city's citizens had managed to flee; reducing the number of residents to between 220,000 and 230,000 people (Rokytna, 2022).

For the future of Mykolaiv within the context of the ongoing war, three demographic scenarios can be distinguished: (i) baseline, (ii) worst-case, and (iii) best-case. The most likely scenario, according to experts, suggests that there will be gradual return of displaced residents, and that this will be driven by an improving security situation and emotional/family ties to the city (Ueffing et al., 2023). However, the long-term population decline trend is expected to continue, following pre-war trends. In the worst-case scenario, further instability and war may crucially undermine any prospect of population recovery; further degrading Mykolaiv's social fabric, and discouraging residents and investors alike. In the best-case scenario, a peace treaty is signed, and integration into the European Union is achieved. Realisation of this scenario may result in economic regeneration that acts as a defence against long-term demographic decline through resident repatriation and an influx of new settlers into the city. These are considered optimistic projections, and given the geopolitical uncertainties of the current situation, the probability of this outcome is low.

All these demographic changes have huge repercussions in the socioeconomic sphere. Casualties, forced migration, and displacement are exacerbating the preexisting demographic challenges faced by Mykolaiv: an ageing population, gender imbalances, and a declining workforce. These factors can, combined, result in increased pressures on social services, health care, and public infrastructure; especially because of the growth, in percentage terms, of the city's older population (Ueffing et al., 2023). Moreover, the war has undermined economic activity in the city which was previously centred around a large and lively industrial base on now disrupted- trade routes and industrial production. However, economic recovery opportunities may exist through infrastructure rebuilding and a restart of industrial activities. This case is likely to be further encouraged especially if the population returns and international aid supports reconstruction efforts.

Many cities in Europe and North America have faced similar challenges, with strategies adopted including, amongst others, "smart shrinkage" and "controlled degrowth". These frameworks deal with population shrinkage by optimising living standards, repurposing vacant land, and creating sustainable environments even when and where populations are shrinking (Hollander & Nemeth, 2011). This paper explores the demographic scenarios and the potential strategies to be followed in the context of Mykolaiv's ongoing conflict and population changes, and suggests a vision for a post-conflict recovery.

The paper is comprised of five main sections. An exploration of existent literature on urban and smart shrinking follows the introduction. The third section then explores Mykolaiv's demographic profile and, in so doing, identifies past and present trends and introduces three scenarios for the future. The fourth section suggests possible socio-economic effects resulting from the demographic scenarios introduced. Thereafter, conclusions and policy implications are proffered.

2. Global views on urban shrinking, planning, and smart shrinkage

The amplified emphasis on urban shrinking in Europe and North America started in the 1990s and has attracted the interest of spatial researchers (Haase et al., 2014). Urban shrinkage denotes the conditions under which demographic decline is accompanied by a decrease in activities. It frequently includes neglect of soils and urbanised spaces, degradation of social capital, and disuse of the built environmental as well as infrastructural legacies (Pallagst et al. 2017).

Today the topic of urban shrinking has been dismissed and overlooked (Pallagst et al. 2017). The term urban shrinkage still potentially carries unambiguous and stigmatised meanings. The topic has dominated disciplinary and public discourses, and has affected many projects, plans, and policies. While some ideas look at cities and their issues through the lens of growth, others attempt to address urban shrinkage by overturning conventional growth models and mobilising terms such as *smart decline* (Hollander 2020) and *less is more* (Oswalt, 2005). Shrinking is not only a cause for sorrow but also a chance to change the ways in which we think about the future development of cities.

The degrowth debate emerged from the social movements of the 1960s and 1970s. The term décroisance was coined by sociologist André Gorz in 1972's Club du Nouvel Observateur in opposition to the growth dogma (Ariès, 2007). Additionally, the report The Limits to Growth triggered additional debate on the topic in the period between DATE and DATE (Burkhart et al. 2020). The concept of décroissance has also gradually spread to other European contexts: decrescita in Italy, degrowth in Anglo-Saxon contexts, decrecimiento in Spain, and Postwachstum in Germany. It has become a social project (Latouche, 2007), a slogan, and a social movement (Burkhart et al. 2020). Degrowth has become an alternative to the capitalist development model and the dominant economic paradigm of continuous growth (Liegey and Nelson, 2020). The concept has also emerged in spatial planning debates in North America (Beauregard, 2003; Ryan, 2012). Smart shrinkage has become an alternative planning model by which to downsize urbanised areas and ensure good quality of life under conditions of shrinkage (Hollander, 2020).

3. Mykolaiv's Demographic profile: past, present, and future scenarios

The city of Mykolaiv is a key urban community in the region of xx. Mykolaiv city has the highest population density within the district and the oblast, with 1852.4 people per km^2 which is 22 times greater than the district's average density and 41 times higher than that of the oblast. The industrial sector of the region, comprising 40% of the area's overall industrial activity, was primarily centred around key areas including engineering, shipbuilding, IT and telecommunications, food processing, and logistics (UNECE, 2023). Within the Mykolaiv region, Mykolaiv city serves as the primary employment place, with over half of the registered employees in the Mykolaiv oblast working in the city (55.2%) (strategic documents prepared by Mykolaiv City Council, 2023).

As per data from Mykolaiv city's municipality[3], Mykolaiv city housed 476,100 residents in 2021. Compared to the earliest available data, the population decreased by around 40.300 individuals, or 7.80%, from 2001 to 2021; a consistent downward trend primarily due to an ageing population, low fertility rates and a rise in the average age of women at first childbirth (UNECE, 2023). The full-scale Russian aggression against Ukraine prompted a significant evacuation in the country as well as Mykolaiv. Apart from numerous casualties, the military operations within Ukraine resulted in a significant number of internally displaced people, mainly in the Western regions. Even though Russian forces were reportedly expelled from the Mykolaiv region as of April 2022 (Ukrinform, 2022), active combat continued in nearby Kherson until November 2022. By the end of 2022 it is estimated that approximately half of the population of the city had fled, reducing the number of inhabitants from around 480,000 to approximately 220-230,000 (Rokytna, 2022). In 2023, there was a gradual return of some residents to Mykolaiv, as well as an influx of displaced people from Kherson. By May 2023, it was estimated that population levels had reached 90% of pre-conflict figures (Visit Ukraine, 2023).

3 2018 Statistical Yearbook of Mykolaiv and 2021 Statistical Yearbook of Mykolaivska region

A recent study on demographic scenarios for the Mykolaiv Masterplan, produced by the authors of this article, highlighted three possible scenarios built using the ARIMA model and then validated through workshops and a Delphi survey with local stakeholders and international demographics experts (see Table 1). The baseline and most likely scenario, assuming a deintensification of war (e.g., frozen conflict) and increased sense of safety would, combined with emotional ties to family connections and cultural identity (EUAA et al., 2022, Alarababa'h, 2020, drive a return of displaced residents in the short-term (Ueffing et al., 2023). Population return in the baseline scenario would also be somewhat driven by a slow and gradual revitalisation of economic supply and demand, including business activity and purchasing power (Kugler et al., 2013, LIUC, 2023), as well as efforts to reconstruct residential buildings and community facilities (EUAA et al., 2022). However, long-term population levels are expected to decline at a similar rate to that observed pre-conflict; driven by ageing population dynamics and further exacerbated by the likely continuation of decreasing foreign investments (LIUC, 2023); key drivers of economic and demographic growth (Kugler et al., 2013, Ueffing et al. 2023).

The worst-case scenario assumes a prolonged war and instability which deeply impacts population dynamics as potential returners and newcomers evaluate the risks of settling in a region marked by instability (EUAA et al. 2022, Belmonte et al. 2023, Ueffing et al., 2023). A prolonged war could continue to disrupt the social fabric of Mykolaiv both in the short and long term and thereby make it difficult for displaced residents to return home and rebuild their lives in their previous cities of residence (Alrababa'h, A. 2020, Al Husein & Wagner 2020, Belmonte et al., 2023). Security risks would likely further deter investors, while also stifling economic growth and reconstruction efforts (Bahar et al., 2019, Ueffing et al., 2023).

The best-case scenario assumed the signing of peace treaty in the immediate future that, all else being equal, would reduce the psychological impact of conflict, qualm fears related to the likely renewal of hostilities, and, combined with strong emotional ties, encourage the return of displaced individuals, as well as attracting new residents (Belmonte et al., 2023, Ueffing et al., 2023). Specifically, the reopening of shipping routes in the Black Sea is likely to provide a critical boost to the local economy, augment trade and commerce, and (re)position Mykolaiv as a developing economic hub; attracting both former residents and new settlers to the area (LIUC, 2023). Under the best-case scenario, Ukraine's integration into the EU would likely drive a revitalisation of the city's economy and demographics. The best-case scenario would evidence a slow but positive growth trend motivated by the stabilised security environment, a revitalised economy, strategic international aid, and the path towards EU integration; a scenario that would help to address and overcome long-standing baseline trends related to ageing and decreasing fertility rates. It should be noted, however, that realisation of optimistic scenario is quite unlikely.

Table 1 – Mykolaiv demographic scenarios

BASELINE SCENARIO	**WORST-CASE SCENARIO**	**BEST-CASE SCENARIO**
Continuation of the conflict on the territory of Ukraine in 2025 and in the first half of 2026, with the establishment of peace in 2027. Perceived safety level in Myokaliv is moderate.	Continuation of the conflict on the territory of Ukraine at least until 2027 with the establishment of peace in 2028. Perceived safety level in Myokaliv is moderately low.	Continuation of the conflict on the territory of Ukraine in 2024 with the establishment of peace in 2025. Perceived safety level in Myokaliv is moderately high.
Results	**Results**	**Results**
In the short term: very slow population growth during the projected ongoing conflict. Rapid growth after the conflict's resolution. Population does not converge to the pre-conflict level.	In the short term: slow population decline during the projected ongoing conflict. Slower growth after the conflict's resolution. Population does not converge to the pre-conflict level.	In the short term: slow population growth during the projected ongoing conflict. Quick growth after the conflict's resolution. Population converges to the pre-conflict level.

4. Potential socioeconomic effects of the demographic scenarios suggested for the Mykolaiv Masterplan

This section advances possible socioeconomic effects that could result from the demographic scenarios discussed in Section 2. These effects were identified based on a literature review and can be divided into the following categories: (i) Economic effects (optimistic or pessimistic scenario); (ii) Sociodemographic effects; and (iii) Effects on public administration.

4.1 Economic Implications: Aspects of Recovery

According to the optimistic scenario, the population's return, (and especially young people of working age as well as those with high levels of education), could stimulate the labour market by filling the labour force that was reduced during the conflict. Existent literature on reconstruction after natural disasters (Skidmore and Toya, 2002) and on post-conflict recovery (e.g., Bozzoli et al., 2011) indicates that while regions may initially see economic declines, they frequently see a phase of increased economic activity in the long run as the rebuilding process gets underway, particularly with regards to regions that enjoy high rates of return. A population rebound may increase demand for consumer products and services, housing, healthcare, and education. By stimulating local businesses and attracting investment, and particularly so in real estate, retail, and service sectors, such increased demand may eventually return economic development to pre-conflict levels.

However, such expansion has its drawbacks including the high initial costs of the conflict and the need to successfully reintegrate the returning population. Furthermore, disruptions in logistics, labour supply, and infrastructure availability may counteract the favourable benefits of population return on economic demand and supply; as highlighted in the study by Mamedov and Denysenko (2023).

In addition, a city's economic revitalisation is highly dependent on international macroeconomic conditions (i.e., foreign demands for goods, global supply chains, availability of foreign capital) and labour supply. Population growth combined with favourable macroeconomic circumstances can boost the labour market by bringing back the workforce that the city needs. A post-conflict economic recovery frequently sees a quick reintegration of returning populations into the labour market, which can give manufacturing, and metallurgy sectors the workforce needed to stimulate industrial growth and innovation, (Kushnirenko et al, 2023; Giacomo et al. 2023). Commenting further, Horoshkova and Sumets (2022) contend that reorganising logistics and placing a strong emphasis on digitalisation will be key components of Ukraine's post-conflict economic development, and will enable it to effectively integrate with European standards and regulations.

After the end of the conflict, Mykolaiv's economy may expand into new economic sectors given its strategic reprioritisation and policy goals, as well as the idea of its becoming a post-industrial metropolis. Specifically, the city's authorities have identified a few important prospective growth sectors: tourism, IT and digital services, and the production of (green) energy. Finally, remittances – money transferred to Mykolaiv by family members living abroad – as well as the savings of the returning population (accumulated, for instance, during their stay in European Union nations) could have positive impacts on issues of economic supply and demand. Savings and remittances can be used locally to raise demand for goods and services, or could alternatively be invested in new projects to encourage entrepreneurship (Bahar et al., 2019).

4.2 Economic Implications: Risks of Decline

Under the pessimistic scenario, unfavourable macroeconomic conditions combined with additional population decline – whether from prolonged displacement or further emigration following the conflict – would have a detrimental impact on economic supply and demand. Commenting upon such scenarios, Bereslavska et al. (2022) claimed that post-conflict population losses typically result in smaller labour forces, lower demand and consumption, and ultimately a general decline in economic activity. Moreover, Kozak (2022) contended that military conflicts can cause supply interruptions linked to logistics and infrastructure, as well as a notable declines in domestic demand. These interruptions may result in reduced export prospects and strained long-term logistics connections (Melnyk & Negoda, 2022). Such economic downturns are likely to result in high rates of inflation and decreased real incomes, as highlighted by Mavrina & Belopolskiy (2023).

The main industries in Mykolaiv, such as manufacturing and logistics, rely heavily on machinery and infrastructure, and much of this has been destroyed. This has had direct impacts on trade routes and supply side issues. It is also the case that this might have disastrous long-term economic effects; especially if combined with low population return rates (KPMG, 2022). Similar situations have frequently occurred in other post-conflict settings. For instance, industrial production fell to about 5% of pre-war levels by the end of the Bosnian War, with almost half (45%) of the country's industrial infrastructure having been destroyed (Effron & O'Brien, 2004).

Population decline combined with an unfavourable security and economic environment could also worsen labour shortages, and make it extremely difficult for manufacturing to sustain output levels (Voth et al., 2022). A declining population could also result in reduced demand for goods produced in the area; affecting the economies of scale that manufacturers depend on to retain their competitive advantage.

Finally, unemployment could become an issue. Husein and Wagner (2023) examined the consequences of the Syrian civil war, and pointed out that 78% of young people were unemployed following the war. High unemployment rates can have negative effects on job options, may a promote criminal activity, and deplete human capital; especially among young people. The UNHCR (2006) reported similar difficulties in the Balkan region, and noted that high unemployment rates and economic stagnation made it difficult for returnees and the remaining population to find work; severely impeding efforts to accelerate economic recovery. A degree of unemployment combined with labour shortages can happen as a result of skills mismatches, but the realisation of such a scenario of extreme high unemployment is improbable in the Ukrainian context given that the nation is already showing signs of recovery.

4.3 Sociodemographic Shifts and Urban Pressures

Within xxx scenario, the pre-conflict trends would be confirmed or even exacerbated: a slow but steady population decline and an ageing society due to low fertility rates and increasing life expectancy, as well as a gender distribution skewed towards women. Conflicts can result in additional age and gender imbalances which are skewed toward older and female populations; a consequence of the nature of war casualties, which are mainly young men (ref). Increasing demand by older adults could put additional burdens on social services and healthcare systems because of the demographic shift. The decline in working-age and young populations could make dependency ratios worse, and make it more difficult to maintain economic productivity and support for dependents (Ueffing et al., 2023).

The process of urbanisation is strictly linked to demographic trends. Indeed, conflicts induce forced migration, and push people to seek refuge in safer urban settings; such as relocating from rural to urban areas. This phenomenon, called 'war urbanisation' by Schulz (2015), brings with it significant challenges and implications for urbanisation patterns, such as pressure on urban infrastructure which may result in congestion, environmental degradation, and challenges in service provision. In addition, it could increase the urban-rural divide, thereby widening disparities in economic opportunities, employment prospects, access to services such as healthcare and education, infrastructure development, and quality of life and socio-cultural aspects more generally (Ueffing et al., 2023). With regard to the case study of Mykolaiv, these effects should be seriously considered since most refugees in the city come either from the nearby Kherson region (heavily affected by direct fighting) or from surrounding rural areas. It follows, that urban planning and new approaches to master planning are crucial to addressing regional development disparities and ensuring inclusive growth.

4.4 Public Administration and Infrastructure Stress

The last category of effects which may result from the demographic scenarios outline is focused on impacts on public administration. One of the most important factors influencing a city's future is the availability of essential social services, such as social housing, healthcare, education, and pensions. With regard to Mykolaiv, 68% of health centres and 53% of educational facilities have been damaged, with 10% experiencing destruction. Deterioration or destruction of infrastructure can also reduce the availability of essential services, including energy supply, sewage, and heat and water supplies. Furthermore, environmental crises may worsen without an efficient solid waste management system. Large amounts of garbage make living conditions unfavourable, and this emphasises the urgency of investment in public infrastructure. However, given limited public budgets, housing restoration, and infrastructure modernisation efforts may take many years

We can also distinguish between two scenarios in this case: an optimistic one, with a growing population; and a pessimistic one, with a shrinking population. In the case of growing population and the linked greater demand for social services, the healthcare, education, pension, and social housing systems will probably be severely strained. Specifically, there may be increases in demand for social housing, which would result in a scarcity of housing options and worsen homelessness. For example, the burden on Syria's already compromised infrastructure was exacerbated by the country's growing population following the conflict (Husein & Wagner, 2020). In addition, the need for basic services such as healthcare and education rises sharply when people move back to their hometowns. However, the economic revival, combined with a growing tax base brought on by population growth, might give the public administration more money to finance reconstruction. Given sufficient financial support – which would also incorporate foreign aid and investment and a clearly defined modernisation plan – public administration may have a strong ability to supply and improve public infrastructure.

A scenario characterised by a shrinking population could lead to inefficiencies and underutilisation of existing infrastructure networks (Hummel & Lux, 2007). Population decline may put pressure on technical infrastructures, especially in low-density population areas, increase operating costs, and make it more difficult to access essential services. Such considerations emphasise the need for strategic planning and investment to ensure the resilience of infrastructure services. Specifically, decline may put a strain on water supply systems. Furthermore, a surplus of housing supply may result in empty premises and contribute to urban deterioration (Hummel & Lux, 2007).

5. Conclusion

This paper has presented possible demographic scenarios for Mykolaiv after the Russian invasion, and then explored the contradictions and opportunities of these processes for urban and regional planning. The three scenarios presented were: (i) the baseline scenario; (ii) the worst-case scenario; (iii) the best-case scenario. The first suggests that a de-intensification of war and an increased sense of safety could drive the return of displaced residents in the short term. This would be driven by a slow and gradual revitalisation of economic supply and demand, including business activity and purchasing power. However, long-term population levels are expected to decline at a similar rate to that observed pre-conflict; driven by ageing population dynamics and decreasing foreign investments. The worst-case scenario assumes prolonged war and instability; factors that would deeply impact population dynamics as potential returnees and newcomers weigh the risks of settling in a region marked by instability. Finally, the best-case scenario suggests the signing of a peace treaty in the immediate future which would reduce the psychological impact of conflict and encourage the return of displaced individuals. However, this optimistic scenario appears quite unlikely at this juncture within the conflict (June 2025).

All three scenarios affect society and demography, issues of the economy, and public administration to different extents. With regards society and demography, the gender distribution would be biased towards women, there would be a slow but persistent population reduction, and an increasingly aged society because of low birth rates and rising life expectancy. Impacts on the economy are related to the post-conflict disruptions to production facilities, trading routes, and supply chains. In addition, international macroeconomic factors and labour supply are critical to the city's economic revival. It should also be noted, that, favourable macroeconomic conditions and population expansion might stimulate the labour market by reviving the workforce. Finally, the impact on public administration could centre upon issues related the availability of essential social services. In contrast, and with regard to population growth (optimistic scenario), the government might have more money to spend on reconstruction, and thus be able to invest further in public infrastructure, and a well-defined modernisation plan.

Planning and adjusting to stagnation and decline must be a top priority if we ignore the best-case scenario, and instead consider the worst-case and baseline-case scenarios where we identified staging and shrinking demographic conditions. With regard to urban shrinking, it is possible to view the decline in population, consumption, and needs in the case of Mykolaiv as clear social advantages. Finally, future research should focus on exploring whether and how Mykolaiv could become an example of a city using degrowth and shrinking techniques to propel operations related to controlled shrinkage and networked compactness.

References

Alrababa'h, Ala', Daniel Masterson, Marine Casalis, Dominik Hangartner, Jeremy Weinstein, and Nasser Yassin (2020) Returning Home? Conditions in Syria, Not Lebanon, Drive the Return Intentions of Syrian Refugees. *Innovations for Poverty Action*. [Online] Available from: https://poverty-action.org/publication/returning-home-conditions-syria-not-lebanon-drive-return-intentions-syrian-refugees

Ariès, Paul (2007) *La Décroissance: un nouveau projet politique*. Paris: Golias.

Bahar, Dany, Cem Özgüzel, Andreas Hauptmann and Hillel (2019) 'Rapoport Migration and Post-Conflict Reconstruction: The Effect of Returning Refugees on Export Performance in the Former Yugoslavia' (IZA Discussion Paper No. 12412), Available from: https://ssrn.com/abstract=3408310

Beauregard, Robert A. (2003) *Voices of Decline: The Post-war fate of U.S. cities*. London-New York: Routledge.

Belmonte, Martina, Umberto Minora and Guido Tintori (2023) The effects of the war in Ukraine on population movements and protection-seeking in the EU. Luxembourg: Publications Office of the European Union. Available from: https://data.europa.eu/doi/10.2760/905196

Bereslavska, Olena Ivanivna, Stanislav Yevheniiovych Shishkov, and Nataliia Mykhailivna Shelud'ko (2022) Investment preferences of the population of Ukraine: response to shocks of martial law. *Ukraïnskij Socìum*, *83*(4), pp. 76–91. https://doi.org/10.15407/socium2022.04.076

Bozzoli, Carlos, Tilman Brueck and Tony Muhumuza (2015) Activity Choices of Internally Displaced Persons and Returnees: Quantitative Survey Evidence from Post-War Northern Uganda. *Bulletin of Economic Research,* 68 (4), pp. 329-347. https://doi.org/10.2139/ssrn.1948489

Bukhart, Corinna, Nina Treu and Matthias Schmelzer (eds) (2020) *Degrowth in movement(s). Exploring Pathways for transformation.* Portland: Zer0 Books.

Effron, Laurie and O'Brien F. S. (2004) *Bosnia and Herzegovina--Post-Conflict reconstruction and the transition to a market economy*. Washington, DC: World Bank. Available from: http://documents.worldbank.org/curated/en/415151468742482736

EUAA, IOM, OECD (2022) *Forced displacement from and within Ukraine: Profiles, experiences, and aspirations of affected populations*. Joint EUAA, IOM and OECD report. Available from: https://euaa.europa.eu/sites/default/files/publications/2022-11/2022_11_09_Forced_Displacement_Ukraine_Joint_Report_EUAA_IOM_OECD_0.pdf

Anastasia, Giacomo,Tito Boeri, Marianna Kudlyak and Oleksandr Zholud (2023). The labour market in Ukraine: Rebuild better. *Vox Ukraine.* [Online] Available from: https://voxukraine.org/en/the-labour-market-in-ukraine-rebuild-better/

Haase Annegret, Dieter Rink, Katrin Grossmann, Matthias Bernt and Vlad Mykhnenko (2014) Conceptualizing urban shrinkage. *Environment & Planning A*, 46 (7), pp. 1519–1534.

Hollander, John (2020) Smart shrinkage: the alternative use of abandoned urban spaces. *Domus*, 1049, pp.1-4.

Horoshkova, Lidiia and Alexander Sumets (2022) Eventual model of logistics assets location for regional socioeconomic development. *Ekonomìčnij Vìsnik Unìversitetu*, *53*, pp. 139–151. https://doi.org/10.31470/2306-546x-2022-53-139-151

Hummel, Diana and Alexandra Lux (2007) Population decline and infrastructure: The case of the German water supply system. *Vienna Yearbook of Population Research*, 5 (1), pp. 167-191, https://www.jstor.org/stable/23025603

Husein, Nawras Al and Natascha Wagner (2023) Determinants of Intended Return Migration among Refugees: A Comparison of Syrian Refugees in Germany and Turkey. *the International Migration Review/International Migration Review*, *57* (4), pp. 1771–1805. https://doi.org/10.1177/01979183221142780

Kozak, Ivanna (2022) State policy of activisation of economic development during war and post-war periods. *Demokratične Vrâduvannâ*, *15* (2), pp. 14–28. https://doi.org/10.23939/dg2022.02.014

KPMG (2022) *Post-war reconstruction: case studies*. Kyiv: KPMG Ukraine. [Online] Available from: https://kpmg.com/ua/en/home/insights/2022/12/post-war-reconstruction-of-economy-case-studies.html

Kugler, Tadeusz, Kyung Kook Kang, Jacek Kugler, Marina Arbetman-Rabinowitz and John Thomas (2013) Demographic and Economic consequences of conflict. *International Studies Quarterly*, *57* (1), pp. 1–12. https://doi.org/10.1111/isqu.12002

Kushnirenko, Oksana, Nataliia Gakhovich and Liliia Venger (2023) Strategic Scenarios For Sustainable Industrial Development Of Ukraine In The Post-War Period. *Baltic Journal Of Economic Studies*, *9* (1), pp. 89–99. https://Doi.Org/10.30525/2256-0742/2023-9-1-89-99

Latouche, Serge (2007) *Petit traité de la décroissance sereine.* Paris: Mille et Une Nuits.

Liegey, Vincent and Anitra Nelson (2020) *Exploring degrowth*. London: Pluto Press.

LIUC (ed.) (2023) Mykolaiv Contextualisation and Reconstruction Themes in One Works Foundation Enhancing Urban Planning in the City of Mykolaiv. Concept Masterplan, Output 1. pp. 263-290 [Online] Available from: https://issuu.com/one.works/docs/mykolaiv_concept_masterplan_output1_assessment

Mamedov, Alirza and Nataliia Denysenko (2023) Economic Consequences And Problems Of Post-War Reconstruction Of Territories. *Mìstobuduvannâ Ta Teritorìalne Planuvannâ*, *82*, pp. 220–231. https://Doi.Org/10.32347/2076-815x.2023.82.220-231

Mavrina, Maryna and Belopolskiy Mykola (2023). Using The Principles Of The Sharing Economy As A Method Of Increasing The Efficiency Of The Enterprise In The Post-War Period. *Ekonomìčnij Vìsnik Unìversitetu*, *56*, pp. 29–37. https://doi.org/10.31470/2306-546X-2023-56-29-37

Melnyk, Kateryna and Negoda Anna (2022) The Impact Of The Covid-19 Pandemic And The War In Ukraine On World Logistics. *Ekonomìka Ta Suspìlstvo*, *39*. Https://Doi.Org/10.32782/2524-0072/2022-39-3

Mykolaiv City Council. (n.d.). Strategic documents of the city of Mykolaiv.

Osvalt, Philipp (ed.) (2005) *Shrinking cities, Vol. 1: International research*. Berlin: Hatje Cantz Publishers.

Pallagst, Karina, Marco Bontje, Emmanuèle Cunningham Sabot and René Fleschurz (eds) (2022). *Handbook on Shrinking Cities*. Cheltenham: Edward Elgar Publishing.

Pallagst, Karina, Emmanuèle C. Cunningham Sabot, Helen Mulligan and Sylvie Fol (2017) The shrinking city awakens - Introduction to the special issue on shrinking cities. *Town Planning Review*, 88 (1), pp. 9-14.

Rokytna, Anastasia (2022) Resistance and Destruction in Mykolaiv Region. *Institute For War & Peace Reporting*. [Online] Available from: https://iwpr.net/global-voices/resistance-destruction-mykolaiv-region

Ryan, Brent D. (2012). *Design After Decline: How America Rebuilds Shrinking Cities*. Philadelphia: University of Pennsylvania Press.

Schulz, Nicolai (2015) Dangerous demographics? The effect of urbanisation and metropolisation on African civil wars, 1961–2010. *Civil Wars*, 17(3), pp. 291–317.

Skidmore, Mark and Hideki Toya (2002) Do Natural Disasters Promote Long-Run Growth? *Economic Inquiry*, *40*(4), pp. 664–687. Https://Doi.Org/10.1093/Ei/40.4.664

Ueffing, Philipp, Saroja Adhikari, Samir K C., Oleksii Poznyak, Anne Goujon and Fabrizio Natale (2023) Ukraine's population future after the Russian Invasion – The role of migration for demographic change. Luxembourg: Publications Office of the European Union. [Online] Available from: doi:10.2760/607962, JRC132458.

Ukrinform (n.d.). Practically no invaders left in Mykolayiv region – head of administration. [Online] Available from: https://www.ukrinform.net/rubric-ato/3451811-practically-no-invaders-left-in-mykolayiv-region-head-of-administration.html

UNECE, One Works (2023) Mykolaiv Masterplan. [Online] Available from: https://www.one-works.com/our-works/mykolaiv-concept-masterplan/

UNHCR (2006) The Balkans at a crossroads: Progress and challenges in finding durable solutions for refugees and displaced persons from the wars in the former Yugoslavia. [Online] Available from: https://www.semanticscholar.org/paper/The-Balkans-at-a-crossroads-%3A-Progress-and-in-for/c34a66572e9df870ff797550528494d8206edfc4

Visit Ukraine (2023) 90% of the population returned: how Mykolaiv and the region live today. [Online] Available from: https://visitukraine.today/blog/1824/90-of-the-population-returned-how-mykolaiv-and-the-region-live-today

Voth, Hans-Joachim, Bruno Caprettini and Alex Trew (2022) Fighting for growth: labor scarcity and technological progress during the British Industrial Revolution. CEPR Discussion Paper No. 17881. Paris and London: CEPR Press, [Online] Available from: https://www.semanticscholar.org/paper/Fighting-for-Growth%3A-Labor-Scarcity-and-Progress-Voth-Caprettini/57a19516ca57fb138a9fa1b2f45723279288e9e7

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THE ROLE OF LANDSCAPE PLANNING IN LOCAL SPATIAL PLANNING: THE FIRST UKRAINIAN EXPERIENCE

Oleksandr Golubtsov[1]

Abstract

Landscape planning is now a mandatory element of local spatial planning in Ukraine. Introduced as part of recent planning reforms, it is now required in Comprehensive Spatial Development Plans for Hromadas. Based on the German methodological model, the Ukrainian approach has been adapted to local conditions. This article draws on the author's practical experience to explore how landscape plans are developed and integrated into comprehensive plans. It provides examples from selected Hromadas, analyses how environmental objectives are reflected in final planning decisions, and discusses regulatory and practical challenges. The conclusions reveal key factors influencing integration, including legal clarity, data availability, coordination, and public engagement.

Keywords

Landscape planning, landscape plan, spatial planning, comprehensive plan, environmental objectives

1 Research associate
Dresden University of Technology
Institute for Landscape Architecture, Chair of landscape planning
Helmholtzstraße 10, Hülße-Bau
01069 Dresden, Germany
oleksandr.golubtsov@tu-dresden.de
https://orcid.org/my-orcid?orcid=0000-0001-8155-132X

1. Introduction

The reform of spatial planning in Ukraine is part of the broader policy shift in territorial governance that has been underway since 2015, and is commonly referred to as 'decentralisation.' The goal is to transfer decision-making authority on local matters from the regional to the Hromada level (a basic-level territorial community in Ukraine). Hromadas have gained resources and rights to define their own priorities and development directions. This process has been supported by the implementation of modern spatial planning approaches. A major change in local spatial planning in Ukraine was the introduction, in 2021, of a fundamentally new planning instrument – the Comprehensive Plan for Spatial Development of the Hromada (hereafter: Comprehensive Plan) (Law of Ukraine, 2011). The Comprehensive Plan is intended for long-term planning and functional zoning of territory both within and beyond the boundaries of (individual) settlements. It is also a land management document. The legislative changes have strengthened the institutional capacity of territorial Hromadas in the field of spatial planning, and has enabled them to establish executive bodies for urban planning and architecture.

One of the principles of the new spatial planning system is compliance with environmental requirements; particularly important in the context of implementing the Association Agreement between Ukraine and the EU. Ukraine has ratified the European Landscape Convention which requires the implementation of tools for the protection, management, and/or planning of landscapes. Within the framework of the Comprehensive Plan, legislation provides for the development of a 'landscape planning' section to analyse and assess nature and landscapes. Based on the results of this section, a special 'landscape plan' map is to be created, which is intended to justify project decisions aimed at sustainable ecologically oriented territorial development.

Landscape planning and related instruments have a long history in the EU, Switzerland, the UK, the USA, and Canada; similar concepts have also been developed in Ukraine (La Riccia, 2017; Hersperger et al., 2020; Wang et al., 2023). As a key instrument for the protection and sustainable management of landscapes, it addresses land use issues and promotes environmental conservation, with country-specific applications. In Germany, where landscape planning has deep-rooted traditions, it was legally established in 1976 as part of nature conservation (Bundesnaturschutzgesetz, 2009). 'Landscape planning, as spatial environmental planning, targets the multifunctionality of landscapes under the premise of sustainable land use' (Albert, Galler, and von Haaren, 2022, p. 27). The implementation of landscape plans is intended to support the preservation of biodiversity, and the functional and self-regulating capacity of natural ecosystems, as well as the diversity, uniqueness, and beauty of nature and landscapes. It is precisely in this understanding that landscape planning was introduced in Ukraine with the advisory support of German universities.

Landscape planning as a regulatory instrument has only recently been introduced into the practice of spatial planning. Ukraine lacks long-term experience in developing landscape plans and, in particular, with regard to the interaction of planners in using them to develop project-level plans.

2. Research aims and approach

The aim of this paper is to analyse the experiences of developing landscape plans within Comprehensive Plans and to assess their level of integration in local spatial planning. Here, integration is understood as the extent to which the recommendations of landscape plans are considered in the final project decisions of the Comprehensive Plan. These decisions are subject to approval by local authorities and are incorporated into land management documentation, including the functional designation of each territory.

This paper addresses the following questions:

1. What were the methodological preconditions for the emergence of landscape planning in Ukraine, and how have they influenced the current spatial planning process?
2. How did modern landscape planning emerge in Ukraine, and why is a comparison with the German experience important?
3. How does legislation define the content of the 'Landscape Planning' section and the 'Landscape Plan' map within Comprehensive Plans?

4. What is the typical workflow for developing landscape plans as part of Comprehensive Plans?
5. Which provisions of landscape plans – and to what extent – were integrated into the final project decisions of Comprehensive Plans in different territorial Hromadas of Ukraine?

The study is structured according to the following stages:

Content analysis of key scientific publications and methodological guidelines on spatial planning, so that academic traditions and their influence on perceptions of environmental recommendations can be identified. The initial hypothesis is that established scientific traditions and practices in the field of spatial planning affect how the recommendations of the landscape plan are perceived today.

Analysis of the initial steps of landscape planning in Ukraine. The results of pilot projects for the development of landscape planning documents and their implementation in spatial planning were analysed. Since the pilot projects were carried out with advisory support from German universities, the analysis also examined the extent to which the German experience was adapted to the Ukrainian system of spatial planning and to methodological approaches for landscape analysis and assessment. The sources analysed for this aspect include published works as well as the author's own experience participating in these projects.

Next, the study analyses how Ukrainian legislation defines the content of landscape planning within Comprehensive Plans, particularly when compared with the German Bundesnaturschutzgesetz.

The results of the first three research stages provide the methodological and legislative background for the practical implementation of landscape planning in Ukraine. The next stage involved an empirical assessment of specific examples of landscape plan development in Hromadas. The analysis was conducted using Hromadas located in different regions and natural zones of Ukraine: Novoborivska Hromada in Zhytomyr Oblast (mixed forest zone); Chernivetska Hromada in Chernivtsi Oblast (at the boundary of broadleaf forests and the Precarpathians); Pisochyn and Rohanska Hromadas in Kharkiv Oblast (forest-steppe zone); Druzhkivska and Ocheretynska Hromadas in Donetsk Oblast (steppe zone). These works were carried out between 2021 and 2023. Each Hromada is characterised by specific natural conditions, ecological situations, and the existence of different degrees of anthropogenic transformation of the natural landscape. The diversity of characteristics in these Hromadas allows for coverage of a broad range of key success factors and challenges in the implementation of landscape plans.

This stage consisted of two interrelated parts. First, the typical workflow for developing landscape plans was documented and supported by examples from the case Hromadas. Second, the degree of integration of these plans into project decisions during the working stage of Comprehensive Plan implementation was assessed. In each case, the content of the landscape plan was compared to the final project decisions of the Comprehensive Plan. The results of these comparisons are presented in tabular format, within with the level of integration for each element of the landscape plan (type of objectives) is indicated (Fully integrated or Partially integrated), along with a brief explanation of the reasoning behind the classification. Fully integrated means that the landscape plan recommendations were fully considered in the final planning decision either by maintaining the current functional designation of the area or by it being changed – for example, changing 'arable and fallow lands' to 'haymaking areas' or 'green spaces.' Partially integrated means that only certain aspects were reflected in project decisions for specific areas or were not considered at all. This approach allowed the level of integration to be documented and the systemic barriers or favourable conditions for incorporating environmental recommendations to be interpreted.

3. Methodological Preconditions for the Development of Landscape Planning in Ukraine

Between the 1980s and 2010s, several applied studies in Ukraine contributed to ecologically oriented planning approaches. Notably, the Constructive-Geographical Study of the Kyiv Dnieper Region proposed regional zoning based on landscape multifunctionality (Marynych et al., 1988), whilst landscape analysis principles were applied in regional planning (Shyshchenko, 1999). These approaches informed rational resource use strategies

(Marynych et al., 1990), and Territorial Comprehensive Nature Protection Schemes which were developed for cities such as Dnipro and Kryvyi Rih (Rudenko, Parkhomenko, and Molochko, 1991). A transitional stage was the study of landscape planning in the cross-border region of Polissia (Paliienko, Khomych, and Sorokina, 2013), which integrated landscape analysis with planning concepts.

The most important outcomes of these and other studies were the thoroughly developed methodological approaches to the collection, analysis, and interpretation of data on nature and landscapes. The primary area of application of these scientific developments in spatial planning is the 'comprehensive assessment of territory' (Panchenko, 2001). This comprehensive assessment, as an analytical-evaluative working stage at all hierarchical levels of spatial planning, was intended to provide an evaluation of the natural and anthropogenic elements of planning territory, and synthesise individual assessments for making planning decisions. However, in practice, spatial planners in Ukraine – who typically have architectural education without solid training in landscape science or ecology – focused mainly on technocratic regulatory constraints enshrined in State Building Norms.

It follows that, at the outset of implementing the Comprehensive Plan, a certain gap emerged between the academic Hromada and practicing spatial planners. The spatial planning system inherited Soviet-era approaches and remained closed and conservative (Anisimov, Smirnova and Dulko, 2024). Spatial planners were accustomed to working within the strictly regulated frameworks of existing legal norms and therefore approached innovations cautiously. Landscape assessment methods remained complex, and lacked clear explanations of results and mechanisms for implementing recommendations in practical projects.

4. Contemporary Landscape Planning in Ukraine and Its Connections to German Experiences

Contemporary landscape planning in Ukraine is based on pilot projects that were implemented by the Institute of Geography of the National Academy of Sciences of Ukraine between 2012 and 2020 (Rudenko et al., 2013; Rudenko et al., 2015; Rudenko et al., 2017). These scientific and practical projects were developed with advisory support from the Technical Universities of Berlin and Dresden and, therefore, adhered to the methodology of German landscape planning; both in content (principles and methods of landscape analysis and development of nature conservation tasks), and in structure (composition of landscape planning documents). The basis for the new methodological approaches was provided by the results of the aforementioned applied scientific studies.

The theoretical and methodological foundations of landscape planning in Germany have been extensively elaborated within existent scientific literature (e.g., Auhagen, Ermer and Mohrmann, 2002; Jessel and Tobias, 2002; Riedel and Lange, 2002; von Haaren, 2004; Albert et al., 2022). In the context of contemporary landscape planning in Germany, particular attention is given to publications on the concept of landscape resilience (Schmidt, 2020), climate change mitigation (Arndt and Heiland, 2024), the development of alternative energy sources (Reinke and Kühnau, 2017), and the transformation of cultural landscapes (Schmidt, 2017). Emphasis is placed on the increased integration of GIS technologies which are effective in all phases of landscape planning (Wende and Walz, 2017; Pietsch and Henning, 2025).

The adaptation of landscape planning in Ukraine contributed to a broader understanding of 'landscape' in spatial planning. Traditional Ukrainian landscape analysis – especially in earlier studies – relied on a genetic-morphological approach that was typical of Soviet and post-Soviet landscape science, in which landscape was viewed as a hierarchy of territorial units shaped by natural interactions, with humans acting as external influences. In contrast, landscape planning follows the concept outlined in the European Landscape Convention which has been ratified by Ukraine and defines landscape as 'an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors' (Council of Europe, 2000). The definition combines both perceptual and physical dimensions of landscape (Heiland, 2010), and these perspectives are not contradictory but complementary. Selecting the appropriate interpretation depends on the research question (Grodzynsky, 2005). Given this, pilot projects applied new methods to assess and define planning goals which sought to preserve aesthetic values, perceptions, and tourism potential (Golubtsov, 2018).

The practical implementation of landscape planning within pilot projects was carried out in Cherkasy Oblast. Landscape planning was implemented at three hierarchical levels in accordance with the German structure: the Landscape Programme for the oblast, the framework landscape plan for the district, and the landscape plan for the Hromada (Rudenko, Maruniak, and Lisovskyi, 2015). The 'Grünordnungsplan', which was developed in Germany for parts of settlements, was not considered. The landscape planning documents were developed in GIS using a unified methodology and included vertically coordinated nature conservation objectives and measures. An important contribution of the pilot projects was the experience gained in adapting the results of landscape analysis and assessment specifically for spatial planning purposes. In the projects at different hierarchical levels, methods for integrating landscape planning documents into spatial plans were tested in cooperation with spatial planners (Golubtsov, 2016).

The pilot projects laid the foundation for the implementation of landscape planning in Ukraine as a legal instrument that ensured compliance with environmental requirements and takes into account the natural characteristics of territories in spatial planning. Ukrainian landscape planning was based on a long-standing tradition of landscape analysis combined with German methodology in the planning component: interpretation of analysis results, development of objectives and measures, integration into spatial planning, and participation.

5. Content of the 'Landscape Planning' Section in the Comprehensive Plan

Landscape planning was introduced as a concept into the operational system of spatial planning in Ukraine in 2017 through the State Building Norms, which regulated the composition and content of territorial planning schemes for Hromadas. Initially, however, its scope of application was limited to the assessment of the recreational and tourism potential of areas. Since 2021 Landscape planning has become a mandatory component of local spatial planning within the Comprehensive Plan (Law of Ukraine, 2021). Landscape planning is developed as part of the Comprehensive Plan or, in its absence, the Master Plan and contains justification for project decisions regarding the sustainable use of natural conditions and resources within the planning area (Cabinet of Ministers of Ukraine, 2021). The content of the section is formulated in the context of the aforementioned pilot projects and includes the following tasks:

1. Assessment of natural conditions (climate and climate change, water, soils, biodiversity) and the ecological state as prerequisites for the territorial development of Hromadas;

2. Assessment of landscape degradation risks and conflicts between competing planned land-use decisions regarding the use of natural resources;

3. Justification of the spatial differentiation of territory based on the priorities of the conservation, development, or protection of landscapes; and development of appropriate measures;

4. Development of measures for the preservation of valuable landscapes or landscape denaturalisation;

5. Formation of the ecological network of the (given) area.

A landscape plan is created in a GIS environment and reflects the spatial data of the thematic section 'Landscape Planning.' In essence, it presents the zoning of the territory based on priority objectives and measures for the conservation, development, and/or protection of landscapes, as well as the sustainable management of natural resource, in accordance with the results of landscape analysis and assessment of the planning area. In this regard, the tasks of Ukrainian landscape planning correspond to the formulations in German nature conservation legislation. However, in Germany, the content of landscape planning documents is clearly and exhaustively defined (Bundesnaturschutzgesetz, 2009, § 9(3)); it does not allow for broad interpretations of the analytical scope.

It is also important to note that German nature conservation legislation explicitly states that there is an obligation to take the content of landscape planning into account in planning and administrative procedures. If the content of landscape planning cannot be considered in decisions, justification must be provided (Bundesnaturschutzgesetz, 2009, § 9(5)). Ukrainian legal regulations lack a clear provision requiring the

mandatory consideration of landscape planning conclusions. However, it is stipulated that landscape planning is an integral part of the Comprehensive Plan and contains justifications for project decisions regarding the sustainable use of natural conditions and resources in the (given) planning area (Cabinet of Ministers of Ukraine, 2021). Accordingly, landscape plans in Ukraine may only be developed as part of Comprehensive Plans. In Germany, they can exist as an independent type of sectoral planning documentation and are developed separately from general spatial planning documents.

An important difference between Ukrainian and German landscape planning is the absence in Ukraine of a vertically integrated system of landscape planning documents across different levels of administrative-territorial structures. In Ukraine, the landscape plan has been legally introduced only at the local level. At the regional level, legislation does not provide for the development of landscape planning documents to integrate ecological requirements into oblast or district-level territorial planning schemes. Ukrainian legislation provides for spatial planning at the national level, and includes the development of the General Scheme for Spatial Planning of the Territory of Ukraine and planning schemes for specific parts of the country. However, there is no equivalent to this in German landscape planning.

6. Workflow of the development of a Landscape Plan, and Assessment of Its Integration into Comprehensive Plans

As methodological guidance for landscape analysis and assessment, risk and conflict analysis, and the development of landscape plan objectives and measures, recommendations are used that were prepared based on the above-mentioned pilot projects and grounded in the experience of German landscape planning (Rudenko et al., 2014; Ailykova et al., 2020). Landscape planning is implemented through the sequential execution of workflow stages, with each addressing a specific task (Figure 1). The technological platform that ensures the coherence of the landscape planning stages, the integration of recommendations into spatial planning, and visualisation in the urban planning cadastre, is the geographic information system (GIS).

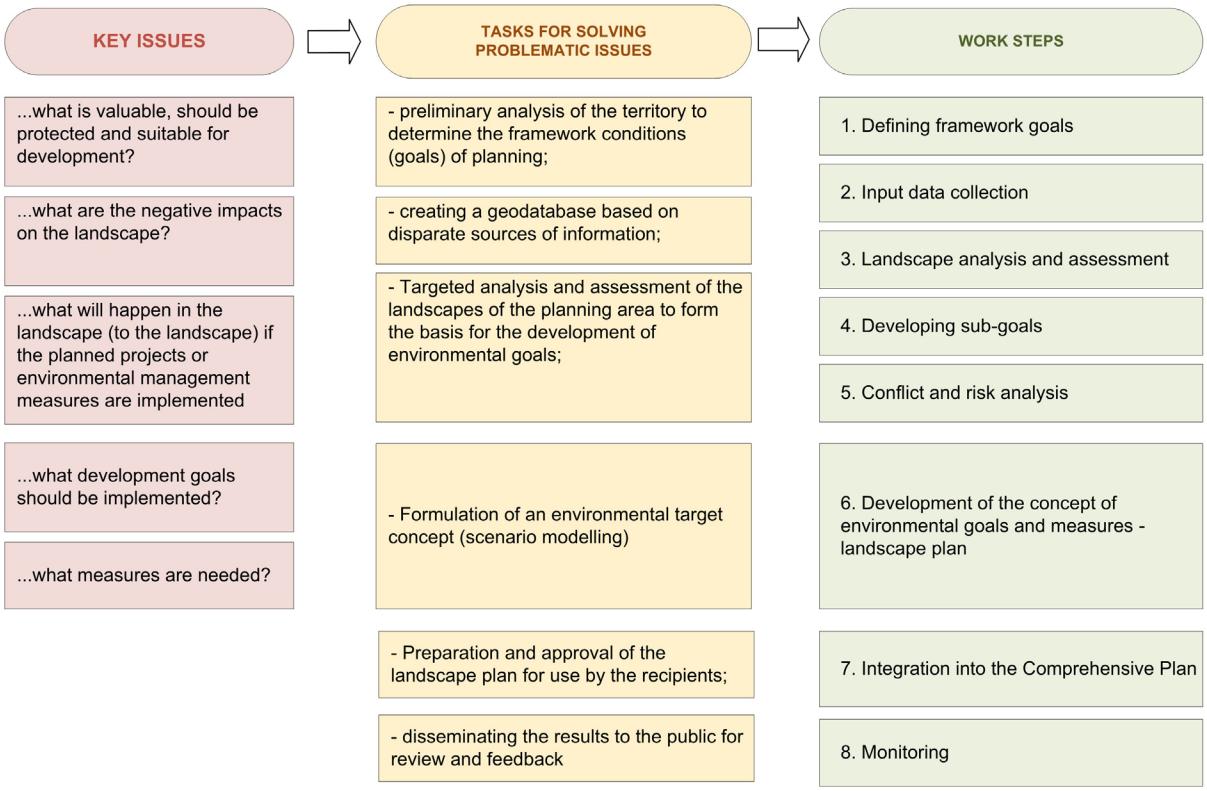

Figure 1. Tasks and Work Stages for Developing Landscape Plans (Key issues by von Haaren, 2004)

The main workflow stages of landscape planning are further examined in the context of implementing case studies from various Hromadas, with examples of how specific tasks were addressed.

6.1. Definition of Framework Objectives for Landscape Assessment and Formulation of Nature Conservation Tasks

The scope of the landscape assessment, as well as the framework objectives of landscape planning, are defined either in the technical assignment for the development of the Comprehensive Plan or in the Integrated Development Concept. Existing state planning documents are also used to determine framework objectives, including municipal and regional development strategies, comprehensive territorial recovery programs, and river basin management plans. At this stage, public participation plays an important role. At the beginning of the development of Comprehensive Plans, consultations are held with stakeholders and local residents.

6.2. Collection of Input Data

This stage involves the creation of a GIS-based database of initial geospatial data, and includes information on landscape components (local climate, water, soils, species and biotopes), as well as the structural characteristics of the current landscape. The primary method for obtaining input data is through requests to data holders and the use of topographic survey materials. In all case studies, there is a recurring issue with regard to accessing complete and relevant input data. Particularly problematic is the availability of information on the current ecological condition of territories, the results of environmental monitoring, and data on the presence and location of degraded lands. Alternative and supplementary sources include open-access geodata sets, scientific publications, and remote sensing data.

The initial data is provided in various formats, often analog. There is significant time investment when it comes to organising the data in GIS and preparing it for subsequent analysis. A common issue is the boundary accuracy of protected nature areas. These areas are a central theme of landscape plans, with legislation prohibiting or significantly restricting intensive economic activity. However, vector boundaries available in open sources often contain errors and do not always correspond to official founding documents; most protected areas lack properly established boundaries and are not registered in the State Land Cadastre. For example, during the work in the Chernivtsi Hromada, the boundaries of all 40 protected areas were verified and corrected in accordance with archival documents.

6.3. Landscape Analysis and Assessment

The goal of this stage is to undertake a targeted analysis and assessment of landscapes. The aim is to determine the spatial configuration of areas within the planning territory that are important for maintaining key landscape functions — particularly biodiversity conservation, the provision of productivity and functionality of natural resources, and the shaping of human experiences when it comes to perceiving nature and landscapes (Albert, Galler, and von Haaren, 2022). Generally, two assessment categories are used: landscape value, and landscape sensitivity. The value category is applied to assess the significance of a landscape in fulfilling a specific function – for example, the value of a landscape for agricultural production depending on soil fertility. Typically, the same area is valuable for multiple landscape functions (Albert, Galler, and von Haaren, 2022). The sensitivity category is used to indicate the landscape's vulnerability – its potential to lose value, and/or its ability to perform a certain function under the influence of anthropogenic or natural factors. For example, soil sensitivity to water erosion as a factor of fertility loss.

The following section, using case studies from individual Hromadas, illustrates how the analytical-assessment stage was adapted to cover key conservation topics despite the constraints of tight project timelines. The general methodological approach involved structuring the area into homogeneous zones based on the natural and anthropogenic characteristics of the landscape – such as agro-landscapes, preserved natural and semi-natural landscapes, urbanised areas, wetlands, and riparian landscapes. Within each identified category, the value and sensitivity of the landscape were assessed with regard to typical landscape functions. These zones subsequently served as a framework for developing the landscape plan.

A characteristic feature of the Hromadas under consideration is the significant degree of transformation that has occurred to their natural landscapes. The predominant part of their territory consists of agro-landscapes. The share of arable land is particularly high in Hromadas located in the forest-steppe and steppe zones. At the same time, agricultural production remains the main source of local budget revenues. In this context, an important task of the landscape plan is to develop balanced solutions which preserve the productivity of agricultural land and prevent its degradation. To this end, an assessment was conducted of soil value for crop production based on fertility indicators, as well as their sensitivity to degradation processes such as water and wind erosion, salinisation, and loss of humus (Figure 2). These processes are significantly exacerbated by climate change. Areas with erosion-prone soils were considered as potential sites for renaturalisation.

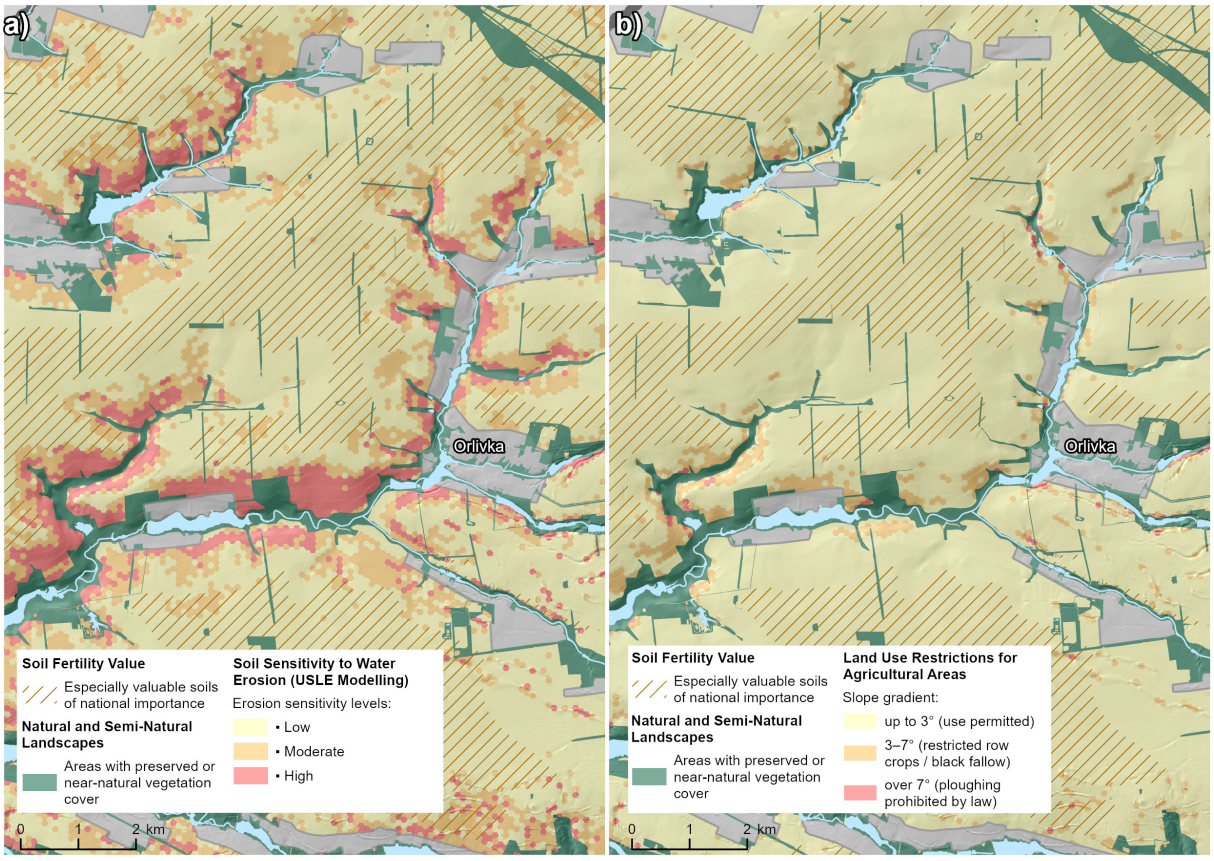

Figure 2. Soil Erosion Risk (a) vs. Legal Land Use Limits (b) on Valuable Agricultural Land: Case of Ocheretynska Hromada (fragment)

Particular attention was given to preserved natural and semi-natural landscapes – primarily meadows, steppes, and forests. These areas not only support biodiversity and retain the characteristic visual identities of the landscape, but also fulfil essential ecosystem functions such as moisture retention, erosion control, water filtration, and air purification. Some of these landscapes fall under legal protection, including the Nature Reserve Fund, the Emerald Network (equivalent to the EU's Natura 2000), and the State Forest Fund. Especially valuable are fragmented patches of natural vegetation – for example, steppe remnants in ravines (Druzhkivska and Ocheretynska), spontaneous afforestation (Novoborivska), and semi-natural plots within the urban area of Chernivtsi. Given increasing development pressure – particularly in the Chernivetska and Pisochynska Hromadas – early identification and integration of such areas into planning frameworks is essential (Figure 3a.). The functional assessments varied by location: in rural settings, the focus was on agro-landscape stabilisation and biodiversity, while in urban areas priorities included recreation, heat island mitigation, and air quality improvement.

A significant portion of these areas are located within floodplains (Figure 3b.). These landscapes, characterised by specific conditions (such as high groundwater levels, periodic flooding, and specific biotopes), are key to maintaining a sustainable water regime and supporting the hydrological balance. In all Hromadas, floodplains were identified within their natural boundaries and served as the basis for forming the framework of their

ecological networks. The degree of river transformation was also assessed, as many rivers are in critical condition due to agricultural pressure (Rohanska), or urbanisation (Chernivtsi).

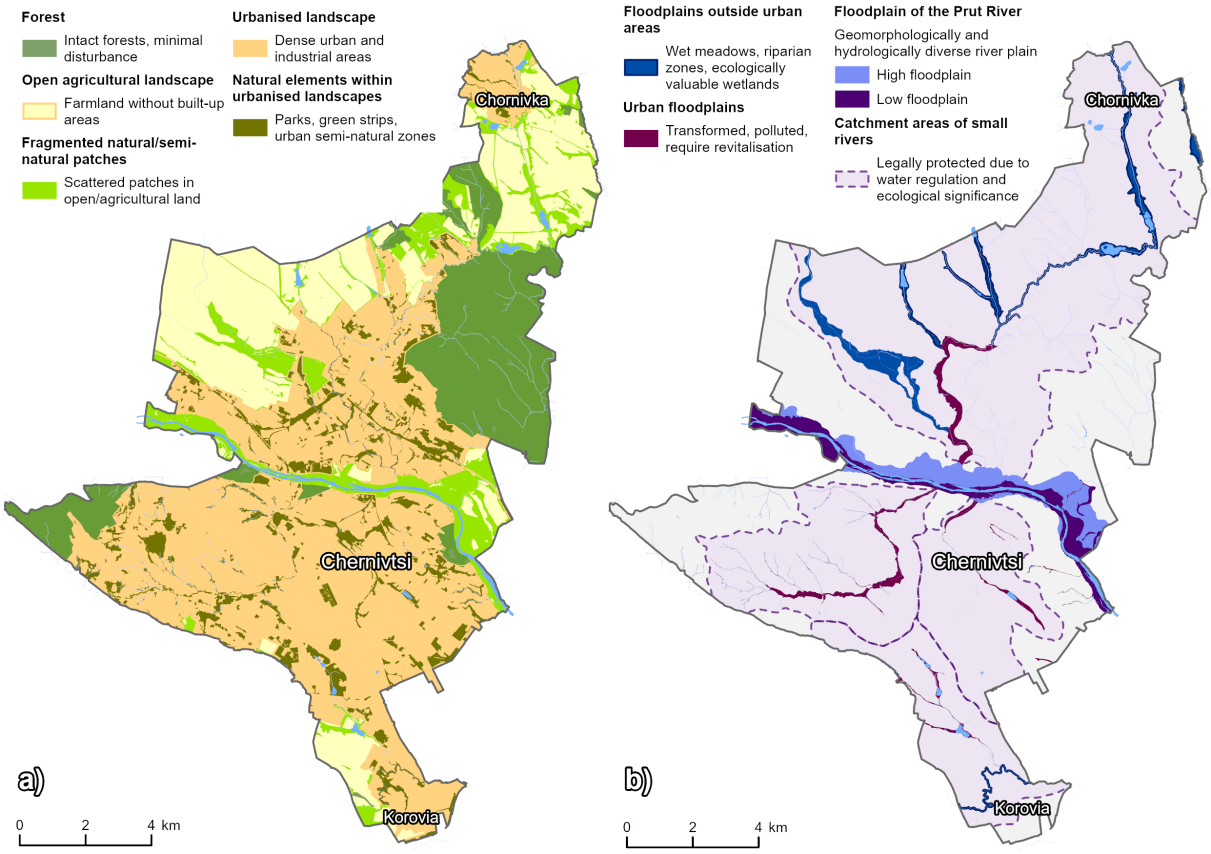

Figure 3. Land cover and hydrographic structure of the Chernivtsi hromada: (a) Landscape types; (b) Small rivers, floodplains, and catchments

Within built-up areas, the study's landscape analysis focused on identifying vacant plots that could be integrated into the given ecological network, support green infrastructure, and contribute to climate change adaptation. Special attention was also paid to identifying areas subject to environmental protection restrictions: protected natural areas, water protection zones, catchments and floodplains of small rivers, habitats of rare and endangered species, forests, especially valuable soils, and degraded and low-productive lands (Golubtsov, 2023).

6.4. Development of sectoral sub-goals

This intermediate technical stage involves formulating sectoral sub-goals based on landscape function and condition (Albert, Galler, and von Haaren, 2022). These are derived from prior analysis which compare landscape value with sensitivity to anthropogenic impacts (e.g., agro-landscapes):

1. Protection – for highly valuable and sensitive landscapes. Land use should be restricted, and approximate a protected regime (e.g., natural landscapes with intact structure and high ecological value).

2. Preservation of current use – for landscapes with high functional value and low sensitivity. Existing land use is maintained with minimal adjustments (e.g., fertile agro-landscapes not prone to erosion).

3. Development of potential – for moderately valuable areas. Measures aim to optimise use and enhance resilience (e.g., fertile but erosion-sensitive agro-landscapes).

4. Restoration – for degraded or highly sensitive areas with low current value. The goal is to prevent further degradation and restore ecological potential (e.g., steep-slope agro-landscapes with poor soils).

6.5. Conflict and Risk Analysis

This stage includes several tasks: analysis of conflicting sectoral sub-goals, assessment of current environmental issues, risk forecasting, and identification of land use conflicts and their impacts on landscapes.

Since many areas serve multiple landscape functions, sub-goals may compete or contradict with each other. For example, biodiversity conservation goals may conflict with recreational development due to infrastructure expansion and the pressures associated with increased visitor numbers. This stage identifies the conflicts to be addressed through prioritisation and stakeholder coordination. In the Hromadas under consideration, conflicts between sub-goals most frequently arose in natural landscapes near settlements. These areas are attractive for development or recreational use, but often (especially in the steppe zone) contain sensitive and rare biotopes that are important for biodiversity conservation. Another common conflict is the continued intensive agricultural use of arable land on soils sensitive to water erosion (Figure 2.); particularly in the forest-steppe and steppe zone Hromadas, development plans on agricultural or forest fund lands.

Typical environmental risks recorded in the Hromadas include pollution of surface and groundwater, soil degradation, biodiversity loss, and failure to achieve good ecological status of water bodies. In the Chernivetska Hromada a discussion arose regarding the development of the Prut River floodplain (Figure 3 b). The legally defined 50-metre riparian buffer zone is significantly narrower than the actual natural floodplain, which in some places exceeds 1 km in width. Regular floods and flash floods pose serious risks to development; exacerbated by the effects of climate change (Yushchenko et al., 2019). Artificial narrowing of the floodplain increased the danger to downstream settlements. A compromise solution involved preserving the undeveloped lowland part of the floodplain and, with regard to the elevated floodplain, adapting construction to landscape conditions while preserving wetlands, oxbow lakes, valuable biotopes, and the area's natural drainage network.

6.6. Development of the Landscape Plan and Integration into the Comprehensive Plan

This stage involves zoning Hromada areas according to priority goals and actions to maintain or improve landscape conditions. Goals are formulated not only in response to identified problems and conflicts, but also to enhance landscape value – including for human needs – and so as to activate previously underused natural resources.

In Comprehensive Plans, goals are typically categorised as: the protection of valuable landscapes, the maintenance of existing land use, the development of potential, and the improvement of landscape conditions. This classification, along with its visualisation in the Landscape Plan legend, facilitates public and stakeholder understanding of ecologically oriented planning actions. Goal-setting is based on prioritising sectoral sub-goals for each landscape function, informed by conflict and risk analysis, as well as legal land use constraints. Where conflicts arise, priority is given to functions of higher conservation value (e.g., habitats of Red Book species) over less specific goals such as recreation (Heiland, 2010). Goals are implemented through targeted actions (Riedel & Lange, 2002), and include expanding protected areas, conserving key biotopes, preventing development in floodplains, withdrawing erosion-prone lands from intensive use, and adapting to climate change via green and blue infrastructure. This stage outputs the thematic sections 'Elimination of Threats and Conflicts in Nature Use' and 'Formation of the Ecological Network,' and is visualised in the Landscape Plan map (Figure 4). Table 1 summarizes the landscape goals and measures across case Hromadas and their integration into final planning decisions.

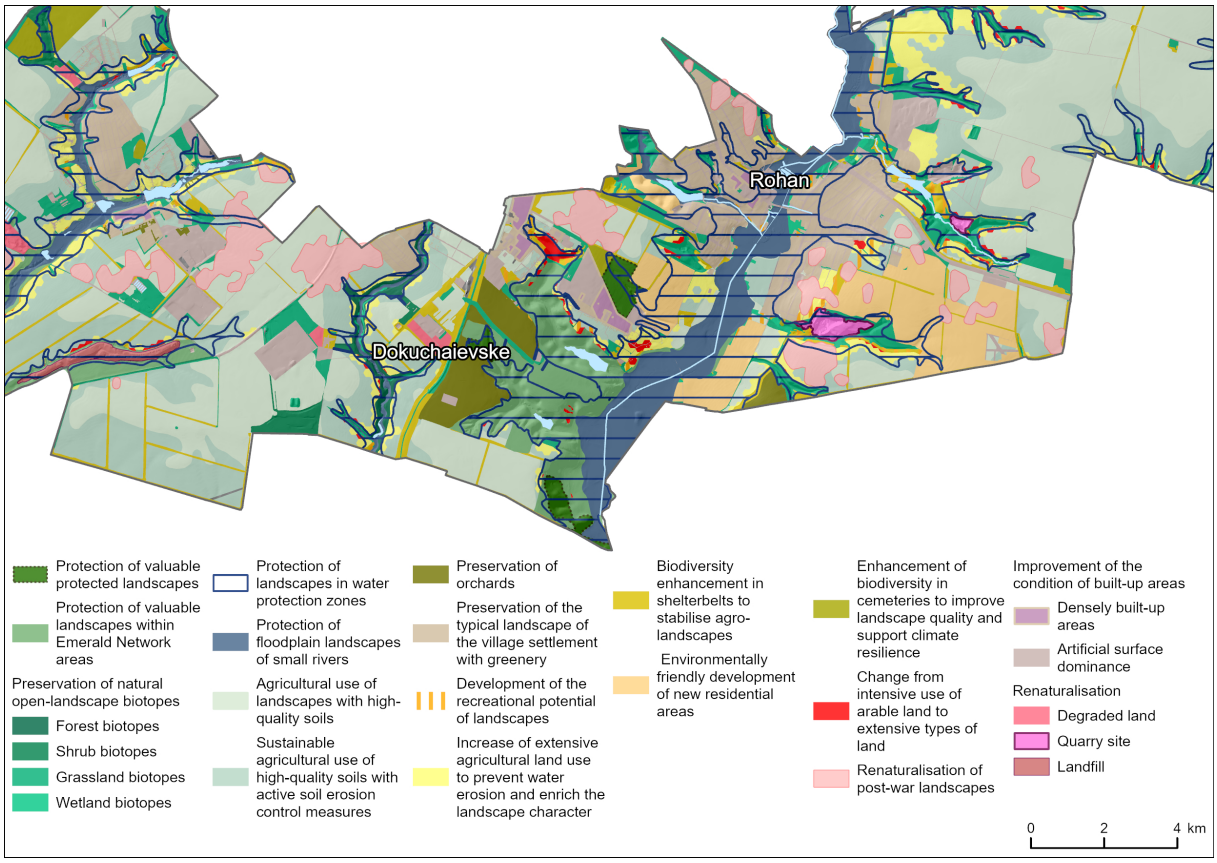

Figure 4. Landscape plan of the Rohan hromada (fragment)

Table 1. Examples of the content of landscape plans within Comprehensive Hromada plans

Goals / Type of restriction / legal source	Landscape characteristics	Assessment of goal integration	Barriers and conditions for integration
Protection and conservation of valuable landscapes			
Protection of valuable protected landscapes / Law of Ukraine 'On the Fund of Natural Reserves of Ukraine'	Territories of the natural reserve fund	**Partially integrated**	Compliance with environmental legislation on restrictions on the use of nature reserve areas is mandatory and must be taken into account in planning
Protection of valuable landscapes within Emerald Network areas / Bern Convention on the Conservation of European Wildlife and Natural Habitats, ratified by Ukraine	Biotopes listed in Appendix I and Resolution 4 of the Bern Convention, for which Ukraine is establishing the Emerald Network	**Partially integrated**	The status of Emerald Network areas is still not clearly regulated by Ukrainian legislation, which complicates the determination of the legal regime for their use
Protection of habitats of Red Book species / Law of Ukraine 'On the Fund of Natural Reserves of Ukraine'	Valuable biotopes outside protected areas requiring special conservation status	**Partially integrated**	Although the protection of valuable biotopes is provided for by law, in many cases there is a lack of reliable data on the presence of red-listed species, which requires additional research
Protection of landscapes in small river basins / Prohibited: reduction of natural vegetation and forest cover within the river basin / Water Code of Ukraine	Landscapes within catchment areas of small rivers	**Fully integrated**	Compliance with the requirements of the Water Code of Ukraine.

Protection of floodplain landscapes of small rivers / Prohibition of economic land use, including ploughing and alteration of river courses / Water Code of Ukraine	Floodplains of small rivers with biodiverse grassland and wetland biotopes	**Fully integrated**	Compliance with the requirements of the Water Code of Ukraine
Protection of landscapes in water protection zones / Prohibited: pesticides, cemeteries, landfills, animal burials, filtration fields, and untreated wastewater discharge / Water Code of Ukraine	River floodplains, terraces, steep banks, adjacent ravines, gullies, and nearby forests; within settlements, adapted to local conditions	**Fully integrated**	Compliance with the requirements of the Water Code of Ukraine
Preservation of current land use			
Agricultural use of landscapes with high-quality soils	Agrolandscapes with arable land on high-quality soils (especially valuable soils of national and regional importance)	**Partially integrated**	The agricultural use of valuable land is largely preserved, but vacant plots are often allocated for construction or infrastructure development
Preservation of orchards	Such biotopes are important for their positive impact on adjacent urbanised and agricultural landscapes.	**Partially integrated**	Mainly used for orchards, but in many cases conversion for construction is envisaged
Preservation of the typical landscape of the village settlement with greenery	Low-rise settlement with gardens and greenery	**Partially integrated**	Current use remains largely unchanged, but the functional purpose may change to residential multi-family, public or industrial development
Preservation of natural open-landscape biotopes to support sustainable landscape functioning	Natural/semi-natural biotopes in agricultural areas, including self-seeded forests	**Partially integrated**	The landscape is mostly preserved, but self-seeded forests on agricultural land are often returned to intensive use; vacant lots are also planned for development
Preservation of forest use. Conservation and protection of natural forests.	Forest landscapes of the State Forest Fund	**Fully integrated**	Forest lands generally retain their status. In the event of a change in functional purpose, mainly for construction, compensation is provided in other areas
Development of landscape potential			
Increase of extensive agricultural land use to prevent water erosion and enrich the landscape character / Restricted cultivation of row crops and black fallow on slopes 3-7° / Law of Ukraine 'On Land Protection'	Arable land on slopes where there is a high risk of soil degradation due to active erosion	**Partially integrated**	Mostly not followed. There are no effective mechanisms to encourage landowners to adopt extensive forms of land use
Biodiversity enhancement in shelterbelts to stabilise agro-landscapes	Shelterbelts in the agricultural landscape. Designed to protect arable land from water and wind erosion	**Partially integrated**	Shelterbelts are mostly preserved, but measures for their development are not implemented; systematic monitoring is required
Enhancement of biodiversity in cemeteries to improve landscape quality and support climate resilience	Cemeteries that are important for commemoration, potential for supporting biodiversity, especially in the steppe zone	**Partially integrated**	Cemetery planning measures are usually included in the plans, but their actual implementation requires monitoring
Development of the recreational potential of landscapes	Visually attractive and historic landscapes preserved in (semi-)natural state within urban areas, valuable for recreation	**Fully integrated**	Landscapes with high recreational potential are integrated into planning decisions, with development of recreational infrastructure foreseen
Change in the functional purpose of production areas/brownfields and their development	Derelict industrial sites causing environmental harm (e.g. flooding, heat islands, pollution); subject to functional transformation	**Partially integrated**	Implementation depends on local conditions and forms of land ownership

Improvement of landscape condition			
Change from intensive use of arable land to extensive types of land (perennial grassland for hay and pasture; afforestation) / Ploughing prohibited on slopes >7° / Law of Ukraine 'On Land Protection'	Arable land on steep slopes with high erosion risk or degraded soils	**Partially integrated**	Mostly respected at the level of land-use change – such areas are designated for afforestation or grassing. Actual implementation is hindered by the lack of clear mechanisms and incentives; monitoring is necessary.
Conversion of low-quality farmland to forest, grassland, or solar use to enhance ecological stability and mitigate climate impacts	Low-fertility soils and marginal lands currently used as arable land. Also includes drained lands	**Partially integrated**	Mostly not followed. There are no mechanisms to encourage extensive land use. The legal tool for conserving low-quality land doesn't really work.
Renaturalisation of damaged and degraded landscapes	Severely damaged landscapes such as degraded sites of quarries, landfills, or former industrial facilities	**Fully integrated**	Mostly respected at the planning level – land is designated for afforestation or grassing; further monitoring of implementation is necessary
Improvement or restoration of rivers and their floodplains / Alignment with River Basin Management Plans	Heavily modified rivers and streams in dense urban or agricultural settings, impacted by human activity	**Partially integrated**	Implemented selectively, depending on the request of local authorities and public support in specific areas.
Renaturalisation of river beds and floodplains / Alignment with River Basin Management Plans	River floodplains characterised by a high degree of transformation and risk of not achieving good status	**Partially integrated**	Applied selectively, if there is a request from local authorities and Hromada support within specific territories
Improvement of the condition of built-up areas, including measures to prevent the negative effects of climate change	Built-up areas with sealed surfaces, high pollution, overheating, flooding, and limited greenery	**Partially integrated**	Support is envisaged in the form of greening measures; implementation is possible as part of landscaping in individual settlements
Renaturalisation of post-war landscapes / Law of Ukraine 'On Protection of Land of Ukraine'	War-damaged open landscapes with debris, ammunition remnants, disrupted relief, and likely chemical contamination	**Partially integrated**	Applies to areas that have suffered significant landscape damage; some of these areas are promptly cleared or demined and returned to use

6.7. Monitoring the Implementation of the Landscape Plan

Monitoring the implementation of landscape plans should ideally be integrated with spatial planning monitoring. As there is no long-term experience yet, approaches to such monitoring are yet to have been developed.

7. Discussion

The practice of parallel development of landscape plans and planning proposals has demonstrated strong potential for effective cooperation with spatial planners in early planning stages. The introduction of mandatory landscape planning as part of the Comprehensive Plan has significantly expanded opportunities for integrating environmental protection considerations compared to the previous spatial planning approach. At the same time, case study analysis shows that the actual integration of landscape plans into final planning documents remains incomplete. Three primary levels of integration into final project documentation can be noted:

1. Full integration is achieved for recommendations with a clear legal basis, provided that the relevant areas and features are spatially unambiguously identified within the given planning territory. These include protected areas, water protection zones, the floodplains of small rivers, and confirmed habitats of species listed in the Red Data Book of Ukraine. Landscape assessments have proven especially effective in identifying these areas. For instance, floodplains were previously ignored in planning, with flooding and waterlogging viewed solely as problems to be 'fixed' through technical interventions. The presence of a clear legal framework for such recommendations facilitates their acceptance by spatial planners who are typically guided by formal regulatory constraints.

2. Partial integration applies to goals that formally reference legislation but remain vaguely defined within legal and regulatory documents. Such goals are often too general or ambiguous. A clear example is the Emerald Network, the legal status of which within Ukrainian legislation remains undefined despite the ratification of relevant international nature protection conventions. For example, in the Rohan Hromada's Comprehensive Plan process, a conflict arose over residential development plans in an area that is formally part of the Emerald Network. The conflict was resolved by confirming the presence of valuable natural habitats within the site, and thereby justified its preservation as a conservation area. A similar situation applies to goals related to ecological networks: although the preservation and development of regional and local ecological networks are stated policy objectives, the lack of clear legal regulation makes them difficult to incorporate into practical planning.

3. Low-priority integration applies to goals that are derived from landscape analysis and evaluation but lack a direct legal basis. These include preventing soil degradation, preserving biodiversity (including landscape-level biodiversity), and restoring rivers and floodplains. Particularly contentious are goals which involve the cessation of intensive agricultural land use or the conversion of land use types because these relate directly to property rights. Similarly, proposals for expanding or establishing new protected areas often face opposition; especially from local Hromadas. Concerns typically stem from fears of losing access to traditional recreational activities, or established land use practices (such as berry or mushroom gathering). Due to these conflicts of interest, even well-founded recommendations based on solid analytical evidence may be rejected by planners or other stakeholders. As a result, the most innovative and ecologically meaningful proposals are sometimes left unimplemented. Even where scientific evidence supports the existence of environmental risks, projects with clear economic or infrastructure utility tend to take precedence (Rudenko et al., 2022). Nonetheless, successful examples show the decisive role of public support and political will. In the Chernivtsi Hromada, for instance, goals related to the restoration of small river floodplains – justified in the landscape plan as essential for increasing the climate resilience of both urban and open landscapes – were incorporated into the project plan and influenced the alignment of major roads as well as new development layouts.

8. Conclusion

The pilot projects for adapting the German methodology of landscape planning gave a significant impetus to its implementation in Ukraine. As a result of the reform of the local planning system, landscape planning became a mandatory component of the Comprehensive Plan of territorial communities. Its institutionalisation represents an important step toward the systematic integration of environmental requirements into local spatial development.

This study, based on the author's direct involvement in pilot projects, made it possible to assess the process, effectiveness, and limitations of the first Ukrainian landscape plans. The integration of landscape planning into spatial plans was analysed through six case studies from different regions of Ukraine. The effectiveness assessment was carried out by comparing the formulated objectives of the landscape plans against the actual content of final project documentation.

The results revealed various integration scenarios, ranging from full incorporation of environmental objectives to their symbolic or formal reflection. Factors influencing the degree of integration included the clarity of legal requirements, availability and quality of spatial data, and the level of coordination that existed between different plan developers. Close cooperation between spatial and landscape planners proved to be a key factor in ensuring the inclusion of environmental aspects. Practice shows that adapting project decisions has, to date, been more effective during early planning stages than during final approvals, such as public hearings or consultations with stakeholders.

Nevertheless, there are ongoing challenges with regard to the implementation of landscape planning. These include low stakeholder awareness and limited public participation in open discussions. These barriers are likely linked to the novelty of the instrument, insufficient understanding of its purpose, and a lack of demonstrative success stories. Key improvements should focus on greater transparency of methodological approaches, the establishment of substantiated landscape objectives and measures, the standardisation of graphical materials, and clear visualisation. Overcoming these barriers is essential to improving the instrument's effectiveness.

It follows, that the results of the study confirm the significant potential of landscape planning to enhance the environmental orientation of spatial development. Landscape plans provide a structured basis for incorporating environmental objectives into local project plans that relies on the outcomes of landscape analysis and assessment. The existence of clear legal requirements and active public participation may considerably strengthen the effectiveness of landscape planning in the future.

9. Outlook

Future research should focus on analysing the outcomes of newly developed projects that are currently underway. Promising directions would be the exploration of the potential of GIS to improve the efficiency of landscape analysis, and the development of environmental objectives under time and resource constraints. It is also important to develop criteria and methodological approaches for monitoring the implementation of comprehensive plans and to analyse how these correspond with the realisation of landscape planning goals.

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References

Ailykova, Ganna, Oleksandr Golubtsov, Tetiana Krishtop, Serhii Lisovskyi, Yevheniia Maruniak, Yurii Palekha, Leonid Rudenko (ed.), Yurii Farion, Viktor Chekhniy, Lydia Chizhevska, Anja May, Stefan Heiland and Christian Jacobi (2020) *Integration of the ecological component into the spatial plans of Hromadas (methodical guidelines)*. Kyiv: Referat Publishing. [In Ukrainian].

Albert, Christiane, Carolin Galler and Christina von Haaren (eds) (2022) *Landschaftsplanung*. 2nd ed. Stuttgart: Ulmer.

Anisimov, Oleksandr, Maria Smirnova and Ievgeniia Dulko (2024) Establishment of a new planning system in Ukraine: Institutional change between Europeanisation and post-socialist path dependence. *Planning Theory & Practic*e, DOI: https://doi.org/10.1080/14649357.2024.2414973

Auhagen, Axel, Klaus Ermer and Rita Mohrmann (eds) (2002) *Landschaftsplanung in der Praxis*. Stuttgart: Ulmer.

Federal Republic of Germany (2009) *Gesetz über Naturschutz und Landschaftspflege vom 29. Juli 2009 (Bundesnaturschutzgesetz)*. [Online] Available from: https://www.bgbl.de/ [Accessed 10 January 2025]

Cabinet of Ministers of Ukraine (2021) *On Approval of the Procedure for Developing, Updating, and Amending Urban Planning Documentation. Resolution No. 926 of September 1, 2021*. [Online] Available at: https://zakon.rada.gov.ua/laws/show/926-2021-%D0%BF#Text [Accessed 10 June 2025]. [In Ukrainian].

Golubtsov, Oleksandr (2016) Landscape planning as a tool for the implementation of ecological requirements in territorial planning. *Ukrainian Geographical Journal*, 4, pp.29–36. [In Ukrainian].https://doi.org/10.15407/ugz2016.04.029

Golubtsov, Oleksandr (2018) Image of landscape: analysis and assessment in landscape planning. *Ukrainian Geographical Journal*, 1, pp.15–23. [In Ukrainian]. https://doi.org/10.15407/ugz2018.01.015

Golubtsov, Oleksandr (2023) Legislative environmental requirements in landscape planning in Ukraine. *Ukrainian Geographical Journal*, 4, pp.3–16. [In Ukrainian]. https://doi.org/10.15407/ugz2023.04.003

Council of Europe (2000). European Landscape Convention. Florence, 20 October 2000. Council of Europe Treaty Series - No. 176.

Grodzynsky, Mykhailo (2005) *Cognition of the landscape: Place and space*. Monograph in 2 vols. Kyiv: Publishing and Printing Center 'Kyiv University'. Vol. 1, p.431; Vol. 2, p.503. [In Ukrainian].

von Haaren, Christina (ed.) (2004) *Landschaftsplanung*. Stuttgart: Ulmer

Heiland, Stefan (2010) Landschaftsplanung. In: Henckel, Dietrich, Karsten von Kuczkowski, Peter Lau, Eva Pahl-Weber and Frank Stellmacher (eds) *Planen – Bauen – Umwelt: Ein Handbuch*. Wiesbaden: VS Verlag für Sozialwissenschaften, pp. 294–300.

Arndt, Saskia and Stefan Heiland (2024) Current status of water-related planning for climate change adaptation in the Spree River basin, Germany. *Natural Hazards and Earth System Sciences Discussion*s, 24, pp.4369–4389. https://doi.org/10.5194/nhess-24-4369-2024

Hersperger, Anna M., Matthias Bürgi, Wolfgang Wende, Simona Bacău and Simona R. Grădinaru (2020) *Does landscape play a role in strategic spatial planning of European urban regions?* Landscape and Urban Planning, 194, p.103702. https://doi.org/10.1016/j.landurbplan.2019.103702

Jessel, Beate and Tobias, Karl (2002) *Ökologisch orientierte Planung: Eine Einführung in Theorien, Daten und Methoden*. Stuttgart: Verlag Eugen Ulmer.

La Riccia, Luigi (2017) *Landscape planning at the local level.* Cham: Springer. https://doi.org/10.1007/978-3-319-57367-0

Law of Ukraine (2011) *On regulation of city planning activity: Law No. 3038-VI of 17 February 2011*. [Online] Available from: https://zakon.rada.gov.ua/laws/show/en/3038-17#Text [Accessed 10 January 2025]

Wang, Huixin, Jing Xie, Shixian Luo, Duy Thong Ta, Qian Wang, Jiao Zhang, Daer Su and Katsunori Furuya (2023) Exploring the interplay between landscape planning and human well-being: A scientometric review. *Land*, 12 (7), p.1321. https://doi.org/10.3390/land12071321

Marynych, Oleksandr, Maksim Palamarchuk, Volodymyr Hrynevetskyi et al. (1988) *Constructive-geographical foundations of rational nature management in the Ukrainian SSR:* Kyiv Dnieper region. Kyiv: Naukova Dumka. [In Russian]

Marinych, Oleksandr, Inha Gorlenko, Leonid Rudenko et al. (1990) *Constructive-geographical foundations of rational nature management in the Ukrainian SSR: Theoretical and methodological studies.* Kyiv: Naukova Dumka. [In Russian]

Paliyenko, Valentyna, Valeriy Khomich and Lyudmyla Sorokina (eds) (2013) *Problems of nature management in the transboundary region of Belarusian and Ukrainian Polesia:* Monograph. Kyiv: Publishing House 'Stal'. [In Russian].

Panchenko, Tamara (ed.) (2001) *Mistobuduvannia. Dovidnyk proektuvalnyka [Urban Planning: A Designer's Handbook]*. Kyiv: Ukrarkhbudinform. [In Ukrainian].

Pietsch, Matthias and Matthias Henning (2025) *GIS in Landschaftsarchitektur und Umweltplanung.* 1st ed. Heidelberg: Wichmann Verlag.

Reinke, Markus and Christian Kühnau (2017) Die räumliche Steuerung der Energiewende durch die Landschaftsplanung. In: Wende, Wolfgang and Ulrich Walz (eds) *Die räumliche Wirkung der Landschaftsplanung*. Wiesbaden: Springer Spektrum, pp 133–146. https://doi.org/10.1007/978-3-658-13556-0_9

Riedel, Wolfgang and Horst Lange (eds) (2002) *Landschaftsplanung*. Heidelberg, Berlin, New York: Springer.

Rudenko, Leonid, Halyna Parkhomenko, Anatolii Molochko et al. (1991) C*artographic studies of nature management (theory and practice).* Kyiv: Naukova Dumka.

Rudenko, Leonid, Oleksandr Golubtsov, Serhii Lisovskyi, Yevheniia Marunyak, Yurii Farion and Viktor Chekhniy (2013) Landscape planning in Ukraine: the first landscape planning program. *Geography, Environment, Sustainability,* 6 (4), pp.91–102. https://doi.org/10.24057/2071-9388-2013-6-4-91-102

Rudenko, Leonid (ed.), Yevheniia Maruniak, Oleksandr Golubtsov, Serhii Lisovskyi, Viktor Chekhniy, Yurii Farion, Stefan Heiland and Anja May (2014) *Landscape Planning in Ukraine.* Kyiv: Referat Publishing. [In Ukrainian].

Rudenko, Leonid, Yevheniia Maruniak, Serhii Lisovskyi, Oleksandr Golubtsov, Viktor Chekhniy and Yurii Farion (2015) The landscape plans system as a tool for sustainable development in Ukraine. In: Luc, Marta, Urszula Somorowska and Janusz Szmańda (eds) *Landscape analysis and planning*. Springer Geography. Cham: Springer, https://doi.org/10.1007/978-3-319-13527-4_13

Rudenko, Leonid, Yevheniia Maruniak, Oleksandr Golubtsov, Serhii Lisovskyi, Viktor Chekhniy and Yurii Farion (2017) Reshaping rural Hromadas and spatial planning in Ukraine. *European Countryside,* 9 (3), pp.594–616. https://doi.org/10.1515/euco-2017-0035

Rudenko, Leonid, Serhii Lisovskyi, Yevheniia Maruniak, Oleksandr Golubtsov, Olena Dronova, Artem Mozghovyi, Viktor Chekhniy, Yurii Farion and Alyona Varukha (2022) Analysis of regional and local development strategies of Ukraine on the way to achieving the '2030 GOALS.' *Ukrainian Geographical Journal,* 1, pp.8–17. [In Ukrainian]. https://doi.org/10.15407/ugz2022.01.008

Shishchenko, Petro H. (1999) *Principles and Methods of Landscape Analysis in Regional Planning:* Monograph. Kyiv: Phytosociocenter. [In Russian]

Schmidt, Catrin (2017) Den Landschaftswandel gestalten… Nur wie?. In: Wende, Wolfgang and Ulrich Walz (eds) *Die räumliche Wirkung der Landschaftsplanung*. Wiesbaden: Springer Spektrum. pp. 111-131. https://doi.org/10.1007/978-3-658-13556-0_8

Schmidt, Catrin (2020) *Landschaftliche Resilienz: Grundlagen, Fallbeispiele, Praxisempfehlungen*. Berlin, Heidelberg: Springer Spektrum. https://doi.org/10.1007/978-3-662-61029-9

Yushchenko, Yurii, Mykola Pasichnyk, Mykola Bilokon, Vitaliy Hryhoriichuk, Andrii Nikolaiev, Volodymyr Sivak and Yurii Shevchuk (2019) *The young landscape of the Prut River: past and present (within the Chernivtsi region):* monograph. Edited by Yurii Yushchenko. Chernivtsi: FOP Sadovskyi S.S. [In Ukrainian].

Wende, Wolfgang and Ulrich Walz (2017) Die räumliche Wirkung der Landschaftsplanung: Evaluation, Indikatoren, Trends – eine Einführung. In: Wende, Wolfgang and Ulrich Walz (eds) *Die räumliche Wirkung der Landschaftsplanung*. Wiesbaden: Springer Fachmedien, pp. 1–6. https://doi.org/10.1007/978-3-658-13556-0_1

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RECONSIDERING URBAN RESILIENCE ASSESSMENTS TOWARDS RECOVERY DURING CONFLICT. THE ARTUR FRAMEWORK APPLIED TO UKRAINE

Maria Moleiro Dale[1], Ramón Vivanco[2], Nataliya Makarova[3], Jan Barski[4], Jörg Rainer Noennig[5]

Abstract

In the face of global crises, resilience is a crucial approach to recovery. Urban resilience frameworks have proliferated in the last three decades, as support for policy-focused guidelines towards sustainable development. However, gaps in the adoption of urban resilience frameworks for local-level urban planning still exist. This study argues whether existing frameworks, despite addressing current global challenges such as climate adaptation or rapid urban growth, are suitable for contexts experiencing conflict. The methodological approach is guided by two themes: 1) How can an urban system be dissected into sub-components, to make it more relatable to resilience approaches? and 2) what qualities of resilience are needed for effective implementation? Both questions support the formulation of a novel urban resilience framework which is integrated into an adaptable digital instrument. A pilot conducted in two Ukrainian cities is presented as the implementation case. The outcome of this study summarises the learnings from implementation and highlights the relevance of integrating resilience assessments into digital platforms focused on local, decentralised planning contexts, to accelerate digital maturity and better prepare against future crises of unprecedented scale.

Keywords:

Urban resilience, digital tools, urban systems, Ukraine, war

1 Research Associate
HafenCity Universität (HCU) Hamburg
Henning-Voscherau-Platz 1, 20457, Hamburg, Germany
maria.dale(at)hcu-hamburg.de
https://orcid.org/0000-0001-7655-1309

2 Research Associate
HafenCity Universität (HCU) Hamburg
Henning-Voscherau-Platz 1, 20457, Hamburg, Germany
ramon.vivanco(at)hcu-hamburg.de
https://orcid.org/0009-0006-5483-6585

3 Professor for Public Health focusing on Women Health
Bochum University of Applied Sciences
Gesundheitscampus 6 – 8, 44801 Bochum, Germany
nataliya.makarova(at)hs-bochum.de
https://orcid.org/0000-0002-6850-7735

4 Postdoctoral Research Associate
HafenCity Universität (HCU) Hamburg
Henning-Voscherau-Platz 1, 20457, Hamburg, Germany
jan.barski(at)hcu-hamburg.de
https://orcid.org/0009-0001-2829-5627

5 Professor for Digital City Science
HafenCity Universität (HCU) Hamburg
Henning-Voscherau-Platz 1, 20457, Hamburg, Germany
joerg.noennig(at)hcu-hamburg.de
https://orcid.org/0000-0002-1681-7635

1. Introduction

Ukraine faces the unprecedented challenge of being part of the first contemporary large-scale war of the 21st century in the European context, having fallen victim of invasion by the Russian Federation in February 2022. Strategic thinking based on new technologies, i.e. drones, satellite imagery and artificial intelligence, has evolved, and thus intensifies uncertainties, and vulnerabilities (Clark, 2024). Information and networks demand the need to understand new challenges of territories in conflict, or as Osinga (2021) notes, the conduct of war, in a different way. As the socio-ecological systems of urban contexts have become more complex (Folke, 2006; Walker et al., 2004; Datola et al., 2022), its internal dynamics are consequently highly exposed and more vulnerable. This demands innovative approaches for agile solutions, for fast recovery and long-term, sustainable reconstruction. Learnings and reconsiderations of paradigms in strategic urban planning may be drawn through observation of the developments in Ukraine. The international community, as a larger agent, should support the formulation of effective, agile, and rapid solutions to avoid the consequences of greater impact.

Urban environments are adaptive systems of interconnected flows, materials, and relationships that define urban areas (Alberti, 2016; Batty, 2009; Bettencourt, 2021; Ortman et al., 2020). Cities highlight the concentration and interdependence of assets, dynamics, flows, and dwellers (Folke, 2006). The Russian war in Ukraine has also brought undeniable impacts beyond its borders (Winston, 2023). Sudden shocks in urban areas have demonstrated significant failures and ripple–effects, with consequences on physical, e.g. failing basic infrastructure; economic, e.g. loss of income and workforce; environmental, e.g. territorial degradation, loss of productive land, or flooding; and socio-psychological levels, e.g. loss of homes and displaced population. The displaced population within Ukraine and across Europe has had clear impacts on the social, economic, infrastructural and environmental tissue of the broader territory (World Bank, 2022). New approaches which provide more agile strategic planning must be devised (Kourtit et al., 2020). These must be flexible, dynamic methods that are able to address immediate and long-term challenges; both those that are known and those that are unexpected.

Urban resilience can play a significant role in shifting traditional approaches of planning. Nevertheless, despite the argued relevance of the concept of urban resilience to address recovery, its uptake and integration into operational planning practice at a local level remains fuzzy (Galderisi, 2014). Many existing frameworks are predominantly oriented at policy level and governance. They are strongly focused on indicators and indexes, and address common global challenges such as climate change adaptation, but do not necessarily focus on those challenges which come with the levels of uncertainty and threat that arise during armed conflict. In this case, deeper analysis, e.g. spatial data or mapping approaches, could highlight interdependencies across challenges and provide significant insights to consolidated frameworks. Such an approach might contribute to mitigate effects and enable preparedness for future urban system failures.

This paper identifies key gaps in urban resilience assessment at the planning level and examines whether integrative analytical approaches based on established frameworks can address them. These themes are discussed within the case of an implemented project in Ukraine, launched as part of the response to mounting challenges of recovery in the territory. From this case, learnings were collected from the application of digital tools for resilience assessments towards recovery planning.

The presented Ukraine case can serve as an example for the international community with regard to resilience measures in urban planning practice in this era of interconnected complex urban systems. The outcome of this work paves the way for further research and implementation cases which could streamline the path towards effective urban resilience planning strategies linked to digital tools for contexts undergoing deep transformations grounded in crises.

2. Problem Background

2.1. Urban Resilience as a Suitable Concept for Recovery

Coined in urban ecology (Holling, 1973) and transferred to multiple fields of urban studies, urban resilience can be summarised as the capacity of an urban system to withstand shocks, to recover and to transform from its learning, and be better prepared against future disruptions (Meerow et al., 2016). Resilience highlights a system's preparedness to confront threats and its ability to recover effectively (Ribeiro and Goncalves, 2019; Datola, 2023). This perspective, brought to the realm of urban planning, enhances the understanding of the interconnections and trade-offs that exist between different sub-systems, such as infrastructure, social networks, economic dynamics or natural ecosystems (Derrible et al., 2023; Chelleri, 2012). Urban resilience serves as a pathway towards long-term sustainability, it enables cities to absorb shocks and maintain stability. It is not a concept confined to particular patterns of physical urban forms (Goldschalk, 2003). It highlights patterns related to the flows of a dynamic system. This flexibility allows tailored responses to specific urban conditions, and encourages innovative thinking when becoming resilient. Acknowledging the complex nature of urban systems (Batty, 2009) underscores the utility of a holistic, integrated, and adaptable approach to strategic urban planning based on resilience notions.

2.2. Multi-faceted Concepts of Urban Resilience

The understanding of resilience as a concept varies across disciplines (Meerow et al., 2016). However, within the field of urban development, many definitions support it as a positive concept where systems are prepared to face failures, whether acute shocks or chronic stresses, and thrive through transformation. Still, the question as to whether it should be a unified resilience definition, and whether it is able to adapt on a case-by-case basis is debated. Within existent literature, definitions related to recovery from war is not broadly covered (Elfversson & Höglund, 2023; Rosvold, 2023). Many approaches towards urban resilience measures come from the need to address climate-related challenges, or general global challenges. However, addressing recovery from war has not been directly pinned to specific resilience frameworks (McCandless & Onbargi, 2023; Rosvold, 2023). This case could further revise the considerations of different parameters.

Over recent years, scholars have focused on coining a specific definition for urban resilience based on the situation in Ukraine. Soldak et al. (2024) refer to *emergent urban resilience*, to highlight the importance of differentiating previous definitions against a new one which should acknowledge unforeseen challenges arising in moments of acute crisis. Within this new approach, *emergent urban resilience* separates itself from the previous concepts which are intrinsically embedded in notions of structures and systems and consequently addressed from a predominant governance perspective. Instead, it focuses on the idea that in acute crisis, social cohesion, and local knowledge play a crucial role for recovery. This definition is also closely linked to the principles of poli-crises. Another case (Clark, 2024), suggests that in Ukraine, multiple discourses of resilience are being played at multiple scales. This is defined as *resilience multiple*, a concept that should be understood differently across various domains, such as urban planning, climate adaptation, security, and public health, since each realm brings its own spatial, temporal, and political implications. This multiplicity is not merely a theoretical observation; it has practical consequences on how resilience is implemented and experienced in different settings. Finally, a third study refers to *national resilience* in the Ukrainian context (Goodwin et al., 2023) and, in conjunction with *emergent resilience*, it refers to the role of social cohesion during recovery, and the relationships which exist between state and society. Given that these new concepts have opened multiple approaches, it is also worth challenging the notion that a one-size-fits-all solution to complex societal issues can succeed.

2.3. A Broad Spectrum of Resilience Frameworks

The concept of resilience for societal balance is a relatively recent approach in urban development. The transfer of applied concepts from other fields of study, i.e. ecology, physics and psychology; and the proliferation of urban resilience frameworks has only developed in the last three decades (Bautista-Puig et al., 2022). Driven by the emergence of sustainable urban development approaches, there is currently a broad number of resilient frameworks which make significant contributions to the mitigation of the common challenges that societies

face worldwide. These have been developed by governmental bodies or international development agencies (Krishnan et al., 2023; Sharifi & Yamagata, 2018). Starting in the 1990s, when the concept of *sustainable development* was coined, the first initiatives of this nature emerged (WCED, 1987). This was followed during the 2000s by those which were adapted to disaster risk management (ICLEI. org, n.d.) and, thereafter, in the 2010s by a higher trend of frameworks (the Rockefeller Foundation, 2013; UNISDR, 2015; United Nations, 2015; the Rockefeller Foundation and ARUP, 2015) and agreements such as the Paris Agreement, which consolidated the term of resilience linked to urban development. In recent years, initiatives have become even more focused on global impacts, such as the global pandemic or the EU Green Deal (e.g. UNDRR, 2021; World Bank Group, 2024), and have been applied to multiple locations with a strong-community based approach. They have sought to enhance measures such as energy transition, digital infrastructures, risk, security, investment, health, and social cohesion.

It can be argued that this spectrum of instruments has, rather than accelerated the effective uptake of a more streamlined methodology of practice, instead made its effective operationalisation cumbersome. The reliance of many of these frameworks on complex metrics and rigid standards (Datola et al., 2022; Figueiredo et al., 2018; Meerow et al., 2016; Arup International Development, 2013; Jabareen, 2013) might hinder their tailoring capacities to specific cases, slow down implementation, and limit their flexibility with regard to guiding future planning and projects from a generalised to a local scale.

2.4. Implemented Resilience Frameworks in Ukraine

In Ukraine, resilience measures have, over the last three years, been implemented at two levels: 1) those from international aid agencies and 2) national-level projects and measures. In both cases, the resilience measures have been carried out in an acupunctural manner, and have sought to tackle different cities in dialogue with individual local-level authorities.

At International Level:

- *The MCR2030* initiative has engaged with cities such as Lviv, Mykolaiv, Ostroh, Vinnytsia, and the Rivne region, and has implemented the UNDRR's Disaster Resilience Scorecard to assess vulnerabilities and plan for enhanced urban resilience. Facilitation activities by the MCR2030 Resilience Hub have been executed using a workshop-oriented approach (UNDRR.org, 2024).

- *The Ukraine Recovery Roadmap*, from ICLEI, is a roadmap that was launched in 2024 to assist Ukrainian cities in post-conflict recovery and sustainable development. It emphasizes decentralisation, climate neutrality, and integration with the European Local Green Deal. Consequently, it guides resilience assessments and adaptive risk governance. The efforts of ICLEI in Ukraine are mostly related to support energy transitions (Iclei-europe.org, 2022).

- *The Resilience, Recovery and Reconstruction Plan 2023-2026* was launched by the Council of Europe as an action Plan for Ukraine. It is focused on supporting issues pertaining to democracy, the rule of law and human rights. It has been delivered via webinars, conferences and training sessions (Council of Europe, 2024).

- *The Eurocities Sustainable Rebuilding Project* was initiated in 2023 as a pilot project to promote sustainable urban reconstruction and it involves 10 Ukrainian cities and 34 European counterparts. The project focuses on integrated planning, clean energy, disaster risk reduction, and circular economy principles. This content, which seeks to guide recovery efforts, has been compiled into a toolkit released in May 2024. The project is focused on capacity-building measures for sustainable development and climate neutrality practices and contains a strong governance approach (Eurocities, 2023).

- The *Strengthening Urban Resilience in the Areas of Supply Infrastructure and Housing* Project from the GIZ-UA is supported by the German Federal Ministry for Economic Cooperation and Development. This program (2023–2027) collaborates with external partners and Ukrainian cities to restore municipal infrastructure and housing. It also enhances local capacities through training and transfer of digital systems for damage assessment and urban planning. The approach of this specific project is more directly oriented at supporting the enhancement of integrated planning and physical infrastructure (GIZ, 2025).

At National Level:

National executive measures have focused strongly on the decentralisation of administrative power to assign more control to cities at community level. One example of this is the case of decentralised energy solutions to mitigate the impact of infrastructural failures (IEA, 2025). Another significant measure is the nationwide project *Points of Invincibility*, which was initiated in November 2022. It is now established in over 4,300 centres across Ukraine, and provides essential services such as heating, electricity, water, and communication during infrastructure outages; thereby enhancing community resilience amid ongoing hostilities. The initiative has been coordinated by the Ministry of Internal Affairs with support from local authorities and international donors (Kitsoft, n.d.).

The identified international measures applied in Ukraine since the beginning of the war, have the use of the term *resilience* in common. However, many of them aim at governance level measures, such as climate mitigation, energy transition, sustainable development goals, and EU compliance; making them less directed at local-level planning or tailored to conflict situations. In contrast, national level measures, although not explicitly linked to the term *resilience*, are a valuable approach, as they incorporate spatial-based strategies, e.g. the location of secure points over the territory or the decentralisation of critical infrastructure. Geographical exposure has a strong impact on notions of vulnerability (Turner et al., 2003). Both terms are spatial conditions that contribute to the identification of overlapping challenges as well as interdependencies that exist over a territory. These can support the design of urban planning strategies to prioritise the implementation of adequate plans at the city-scale. However, exposure and vulnerability are only a part of the parameters needed to monitor the different stages of urban resilience. According to the definition from the National Academy of Sciences, the path towards resilience is comprised of preparation, absorption, recovery and adaptation (Connelly et al., 2017). A more holistic assessment of urban resilience which monitors optimal state across all stages alongside spatial considerations has not been sufficiently explored.

2.5. The Advantage of Crowd-sourced Data

Data that is gathered by population, on a daily basis, from a combination of routine behavioural patterns and *IoT* devices has proven to be a valuable data asset when it comes to rapidly collecting immediate information from cities. It has the potential to complement historical or statistical data because it provides short-term and large-scale insights into the status of urban systems and their dynamics. This is especially important during emergency situations when cities are faced with sudden shocks and emergency operators must react fast (Qiu et al, 2022, Chaves et al, 2019). In Ukraine, since 2022, several crowd-sourced platforms have been implemented so that residents are aware of upcoming attacks from drones or other sources, and can seek shelter promptly. The *ePPO* app is just one of many examples that have activated Ukrainian citizens to act as spotters, and report sightings of missiles and drones. Citizens submit reports through the app, which aides air defence systems in tracking and responding to threats (Eppoua, 2023).

However, crowd-sourced data from the population is seldom integrated into existing resilience frameworks, although they could potentially serve as real-time learning mechanisms that anticipate situations and better prepare citizens and emergency operators after immediate failures. Soft data such as citizen knowledge and their behavioural patterns, are inputs that could balance quantitative approaches and authoritative knowledge, e.g. statistical data, historical data, or indexed data; it could also serve as a counterpart in urban resilience measures (Tavra, Racetin, and Peroš, 2021). Despite obvious setbacks, e.g. lack of validation or data privacy, the use of crowd-sourced data could significantly complement historical or statistical data, and provide more local-bound and real-time information (Albuquerque et al., 2016). This argument supports the previously presented concepts of *emergent* or *national resilience*, and the relevance of social cohesion and emotional distress during crises.

3. Methodological Approach

The study is guided by the conceptual framework depicted in Figure 1, and is based on the collected knowledge and identified gaps presented in section 2. It presents two guiding questions defining the research scope. Firstly, on the understanding of urban systems: How can urban system be dissected into sub-components, to make it more relatable to resilience approaches? Secondly, on the understanding of resilience: Which constituent qualities of the concept of resilience are needed to bring it to operational measures in planning strategies? Both guiding themes converge to formulate a novel urban resilience framework.

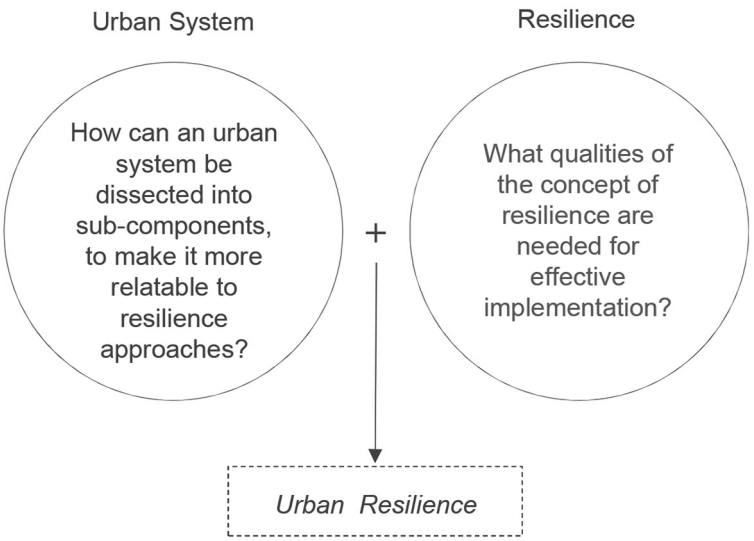

Fig. 1. Conceptual framework guiding the methodological approach.

The conceptual framework underpins the methodological approach that uses a qualitative framework synthesis approach that combines document analysis and thematic interpretation to inform the necessary parameters for the creation of a novel integrative resilience assessment framework. The document analysis focused on reviewing scientific literature and empirical reports. The thematic interpretation was based on a comparative framework analysis that sought to identify patterns and singularities from a sample of selected resilience frameworks.

3.1. Comparative Analysis of Resilience Frameworks

A comprehensive comparative review of relevant urban development resilience frameworks was conducted as part of the thematic interpretation of this study. The selection criteria for the considered frameworks were based on their relevance to the research problem, geographical coverage, and recent implementation. The selected frameworks were: The *Disaster Resilience Scorecard for Cities* (UNDRR, 2017), the *City Resilience Index* (the Rockefeller Foundation and ARUP, 2015) the *City RAP Tool* (UN-Habitat, 2020), and the *City Strength Diagnostic* from the World Bank (Lynch, 2018). From the identified resilience-related framework implemented in Ukraine, only the *UNDRR Disaster Resilience Scorecard for Cities* is considered in this study's comparative analysis. The other identified frameworks implemented to date in Ukraine were beyond the scope of this study's analysis, as they are either based on the collection of best practice from existing cases, i.e. ICLEI, Eurocities; or do not focus specifically on urban planning approaches, i.e. the Council of Europe.

The criteria for comparing the selected frameworks were determined as follows: 1) background, 2) method of application, and 3) output. The selected frameworks were subjected to document analysis as a method of qualitative inquiry. The key features, principles, and components of each framework were extracted from the developing agencies' public repositories´ documentation and organised into a comparative matrix[1] (Table 1).

1 An extended table of the comparative analysis can be consulted in Appendix 1.1 and 1.2.

Through conducting thematic analysis, the recurring patterns (commonalities), gaps, and unique elements (distinctions) were identified across the different frameworks. This enabled capture of both the shared foundations and distinctive contributions of each case. The insights collected in the performed comparative analysis are considered in this study's novel proposed framework (Fig. 2).

Table 1. Summary of the comparative analysis of the consulted frameworks.

Compared Resilience Frameworks		
1) Disaster Resilience Scorecard for Cities (UNDRR); 2) City Resilience Index (CRI); 3) City Resilience Action Planning Tool (City RAP); 4) City Strength Diagnostic (CSD)		
	Commonalities	**Distinctions**
Background		
Developing agency	All are aid agencies or organisations with an international scope.	
Year of creation	All created within the last two decades, where common goals are focused on global impacts, e.g. climate adaptation.	The CSD is the most recently developed framework, after 2020.
Contexts where applied	3 out of 4 (UNDRR, CRI and CSD) are involved in 4 continents: Africa, Asia, Europe, America. All refer to city-level applications.	Only City RAP is focused primarily in Sub-Saharan Africa. It is still relevant for its consideration of small and medium-sized cities.
Purpose	All focus on supporting prioritisation and drafting of action plans towards resilience.	Only CRI explicitly suggests monitoring over time. Only CityRAP targets an audience with low technical expertise and limited resources. UNDRR focuses on disaster risk reduction.
Target / End-user	The end-user is usually focused on governance-sector actors.	CityRAP focuses in small and medium-sized cities of developing countries. The CSD focuses in cities of low and middle-income countries. Urban planners is not explicitly mentioned, except in the CRI as part of the multi-stakeholder approach.
Methods		
Method of application	CityRAP and CSD involve a guided process. UNDRR Scorecard and CRI refer to self-assessment methods. / All refer to QUAL and QUAN methods of application.	UNDRR suggests a two-fold (rapid and thorough) method of application. CityRAP offers a bottom-up approach.
Data collected / Used	CityRAP and CSD focus on analog methods of data collection, via participatory approaches.	CRI focuses on expert level assessments. It is the only instrument offered fully online. UNDRR is offered online but executed offline.
Output		
Output	2 of 4 (UNDRR and CRI) are based on scoring from indicators. / 2 of 4 (CiyRAP and CSD) are focused on thematic clustering. / All offer best-practice recommendations.	None of their outputs produce spatial-based analytics.
Considered urban domains (areas, sectors, dimensions, pillars)	Common urban dimensions mentioned in the different frameworks: Economic (3 of 4), Social (4 of 4), Institutional (2 of 4) and Physical (4 of 4). Environment and Infrastructure are mentioned as different areas of actions.	Terms vary across the different frameworks. CRI is the only framework which adds a bridging layer of urban components between the four main urban dimensions and their indicators.
Considered resilience capacities (categories, qualities)	CSD and the CRI focus on similar resilience capacities. The term used varies but refers mainly to the characteristics of resilience which should be achieved to a certain extent, and thus should be considered and measureable.	UNDRR and CityRAP do not focus on specific resilience capacities to address, but consider an open approach for drafting recommendations.

3.2. The proposed novel ARTUR framework

3.2.1. Adopted Urban Dimensions

Datola et al., (2022) summarise five dimensions within urban systems from a socio-ecological perspective: physical, natural, economic, institutional, and social. For the proposed framework, the natural dimension is assumed to be part of the physical dimension; understanding this as inclusive of all elements of the physical environment, i.e. the natural, built, infrastructural, and technological realms of urban systems. The term *dimension* is also addressed differently across the consulted frameworks. For the proposed framework, the term *dimension* refers to the overarching four categories which organise the subcomponents of the urban sphere and allow assessment of urban resilience. The SETS theoretical platform (Mc. Phearson, et al., 2022), understands urban systems as social-ecological-technological systems, and serves as an additional disaggregation that is required to better reclassify the different indicators that the referenced frameworks provide. For that, the implementation-oriented framing for evaluation of urban resilience that Datola proposes, brings forward the institutional element that is required to complete an overview of urban dimensions. This sets the basis on which the urban resilience indicators are integrated. The following four urban dimensions organise the integration of urban resilience (UR) indicators: Social, Economic, Physical, and Institutional.

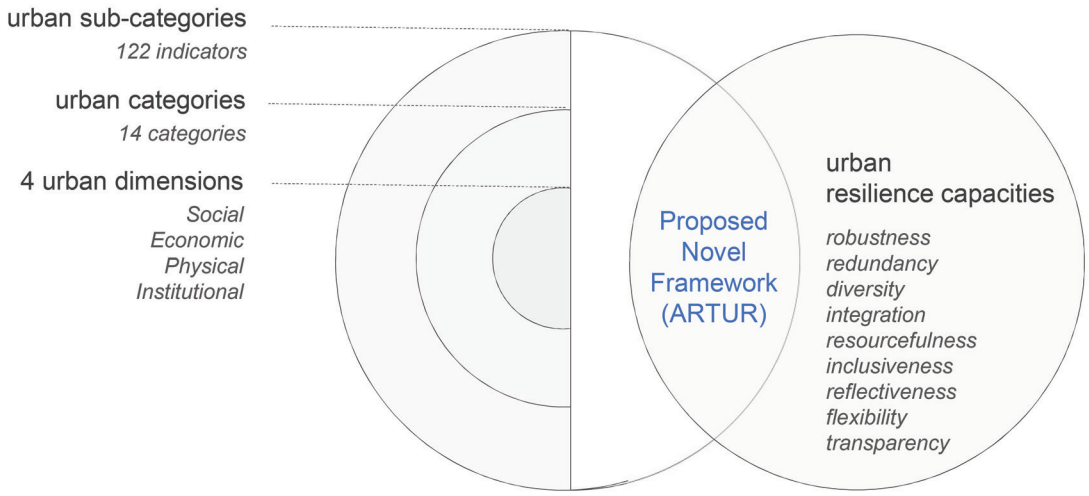

Fig. 2. Diagram of the proposed novel integrated resilience framework: ARTUR.

3.2.2. Adopted Categories

An intermediate categorisation step is necessary both to organise the indicators within each urban dimension, and to guide the selection of measures required as a consequence of the specific needs reported by individual cities. These categories are based on the definition of the goals or components of urban resilience that the consulted frameworks propose, for instance, the *core module* from the *City Strength Diagnosis*; the urban resilience *goals* from the *City Resilience Index*; and the *priority issues* from the *City RAP*. The set of proposed categories under the defined urban dimensions that are used to sort the adopted urban resilience indicators are detailed in Table 2.

Table 2. Urban resilience dimensions, categories distribution, and total indicators.

Urban Dimensions	Categories	Total Indicators
Economic	Economic activities	4
Economic	Economic impact	12
Institutional Physical	Governance	19
Economic Physical Social	Planning for resilience	24
Institutional Physical	Land use	3
Institutional Physical	Planning for risk and disaster	13
Institutional	Public health systems	4
Institutional Social	Security services	3
Physical	Communication	2
Physical Social	Ecosystem services	4
Physical	Major infrastructure	11
Social	Basic necessities	5
Social	Capacity building and public awareness	3
Social	Community support	15

3.2.3. Integration of Indicators

The compiled indicators were sorted into the four proposed urban dimensions and the sub-layers of corresponding categories using a thematic clustering approach based on existent literature (Datola, 2023, Galderisi, 2014). To ensure clarity and avoid duplicating measures of the same construct, a defined criterion which was focused on thematic relevance and non-redundancy clustering was adopted. Additional criterion, such as clarity, actionability, and conceptual consistency were assumed as givens, due to the ample implementation of the consulted frameworks. Table 3 illustrates the distribution of adopted indicators according to their corresponding sources.

Table. 3. Distribution and source of the adopted indicators for the ARTUR framework.

Number of indicators considered in consulted frameworks (*or questions; if not referred to as indicators)			Number of indicators adopted into ARTUR framework
Disaster Resilience Scorecard for Cities (UNDRR)	117+	>>	43
City Resilience Index (CRI)	150+	>>	43
City Resilience Action Planning Tool (CityRAP)*	75	>>	11
City Strength Diagnostic (CSD)*	92	>>	25
			122

3.2.4. Adopted Resilience Capacities

The need to integrate resilience capacities into resilience assessment frameworks, and the small number of existing methods that presently integrate them has been underlined (Datola, 2023). The adopted resilience capacities are partially based on the comparative analysis outlined in Section 3.1. Galderisi (2014) summarised 13 resilience capacities from four overarching fields of study: ecology and sustainability, risks and disasters, climate change and economy. From these, nine resilience capacities were assumed for our proposed resilience framework; six of which were identified as common capacities in Section 3.1. The adopted resilience capacities for this study are: robustness, redundancy, diversity, integration, resourcefulness, inclusiveness, reflectiveness, flexibility, and transparency.

The complementary value of local knowledge was garnered from expert discussions, in regards to how resilience in Ukraine has assumed particular significance. These pertain to the specific parameters that they perceive as having the ability to strengthen the resilience capacities of their cities. The work presented by scholars from the Kyiv National University of Construction and Architecture (KNUCA) in an online workshop, referred to the capacities of decentralisation, diversification and alternativity, multifunctionality, accessibility, and community cohesion as the most relevant for Ukrainian cities and their recovery (Apostolova-Sossa, 2024). When compared to the ARTUR framework, similar capacities are considered to be the most relevant (Fig. 3). Nevertheless, standardisation remains a challenge with regard to both the adoption of terms and the implementation measures.

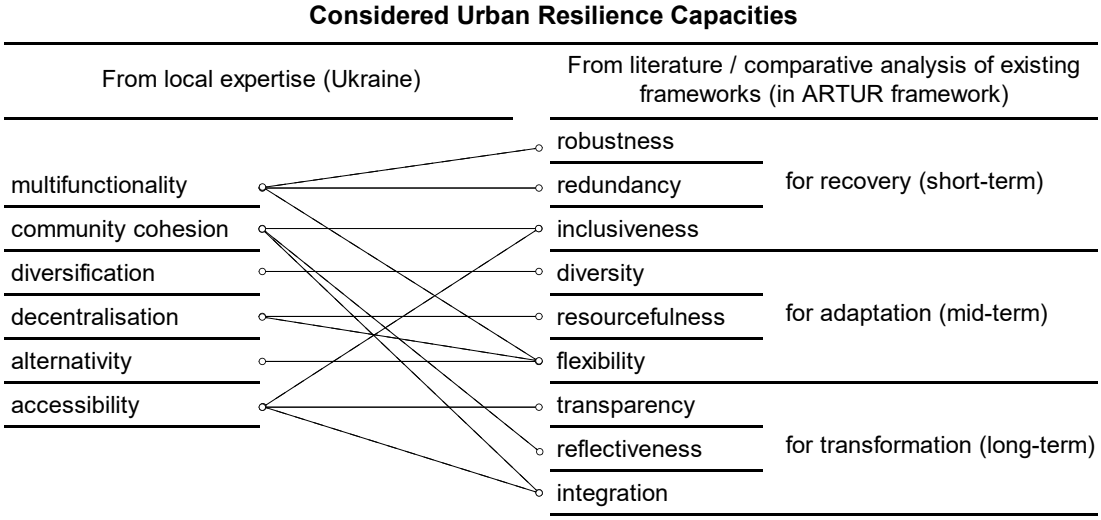

Fig. 3. Alignment of framework´s resilience capacities to local expertise

3.2.5. Calculation Method

The workflow noted in Figure 4 operationalises the cross-connection of components from the proposed integrated framework that are required to obtain a resilience score. The first step involved a second thematic clustering to link the set of indicators collected from the referenced frameworks to each of the nine urban resilience capacities. The workflow ensures the possibility of dissecting a specific problem that is cross-connected from each urban dimension to its corresponding urban resilience capacities by a specific set of indicators. Each indicator measures several urban resilience capacities, and each resilience capacity is affected by a selected group of indicators. A scoring system was established to transfer qualitative inputs to a quantitative scoring output. Each indicator is assessed through a questionnaire based on a four-level, best-worst scaling system. Each answer assigns a quantitative value as a score to each resilience capacity from the related indicator. Figure 4 details the sequential steps followed to perform the calculation method that was used to obtain an urban resilience score.

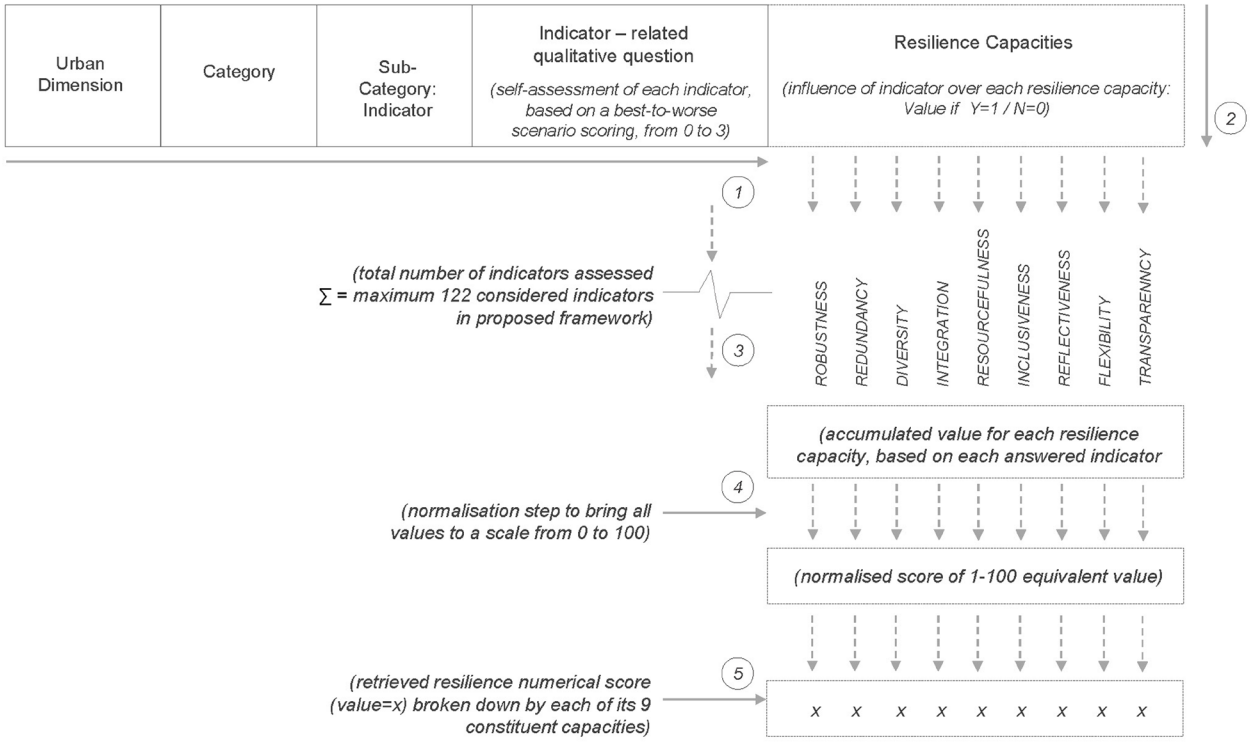

Fig. 4. Operational diagram of the calculation of a resilience score in the ARTUR framework.

In Figure 5 an example of one indicator, showcased in blue, is added into the calculation, to illustrate steps 1 and 2 from Figure 4. The highlighted grey cell illustrates the user's input in the self-assessment questionnaire and how this affected the score linked to this specific indicator. The process would then be repeated, considering as many indicators as required according to the type of challenges that the specific case demands. There is a maximum of 122 indicators embedded in the framework. The accumulated values and normalisation steps 3, 4 and 5 (from Figure 4) are not illustrated in this example.

Urban Dimension	Category	Sub-Category: Indicator	Indicator – related qualitative question				Resilience Capacities (9)								
Social	*Basic Needs*	*Safe and Affordable Housing*	*To what extent does the city have an adequate supply of safe and affordable housing?*												
			There is an acute shortage of affordable housing in the city. People lack security of tenure and property rights are not acceptable. There are large parts of the city where informal (unplanned) settlements have established unsuitable to live in.	*20 – 40% level of service (incl. Quality)*	*40 – 60% level of service (incl. Quality)*	*The supply of affordable housing meets demand. Requirements of residents (space and quality) are met. There is effective funding to provide safe housing. There are incentives and affordable financing mechanism to help upgrade the standard of existing housing stock.*	*ROBUSTNESS*	*REDUNDANCY*	*DIVERSITY*	*INTEGRATION*	*RESOURCEFULNESS*	*INCLUSIVENESS*	*REFLECTIVENESS*	*FLEXIBILITY*	*TRANSPARENCY*
			score 0 factor: 0.00 (lowest: worst)	score 1 factor: 0.33	**score 2 factor: 0.66**	score 3 factor: 1 (highest: best)	*0*	*0*	*0*	***1***	***1***	***1***	*0*	***1***	***1***
			value for each affected resilience capacity, based on one answered indicator >>							*0,66*	*0,66*	*0,66*		*0,66*	*0,66*

Fig. 5. Example, in blue, of one indicator calculated into the ARTUR framework.

3.3. From the framework to the interactive tool

Based on the principle of *boundary object* (Star & Griesemer, 1989; Meerow et al., 2016) applied in the fields of knowledge transfer (Carlile, 2002), information systems (Bowker & Star, 1999) and collaborative approaches (Trompette & Vinck, 2009), the ARTUR framework was transferred to a digital instrument that compounds both the notions of complex urban systems and resilience. This adaptation ensures its suitability for multiple contexts, while also providing the possibility to translate the framework into an operational tool.

The ARTUR digital prototype facilitates its remote take-up in diverse operational contexts, through a series of operational features. A GIS-based interface, or map-view allows consultation and the uploading of spatial data related to each case. The sunburst diagram (Fig. 6, top-left) showcases the indicators for prioritisation and selection. An online self-assessment questionnaire based on the selected indicators collects qualitative input from the user. The spider diagram (Fig. 6, top-right) presents a quantitative resilience score, from the questionnaire´s input. The Sankey diagram (Fig. 6, bottom-left) showcases the connection of the resilience capacities to each urban dimension. An urban resilience dictionary (Fig. 6, bottom-right) was integrated into the tool. It links related concepts and best-practice examples to be consulted with regard to how they translate to measures in the urban form. The complete toolkit is controlled via a user-interactive sidebar.

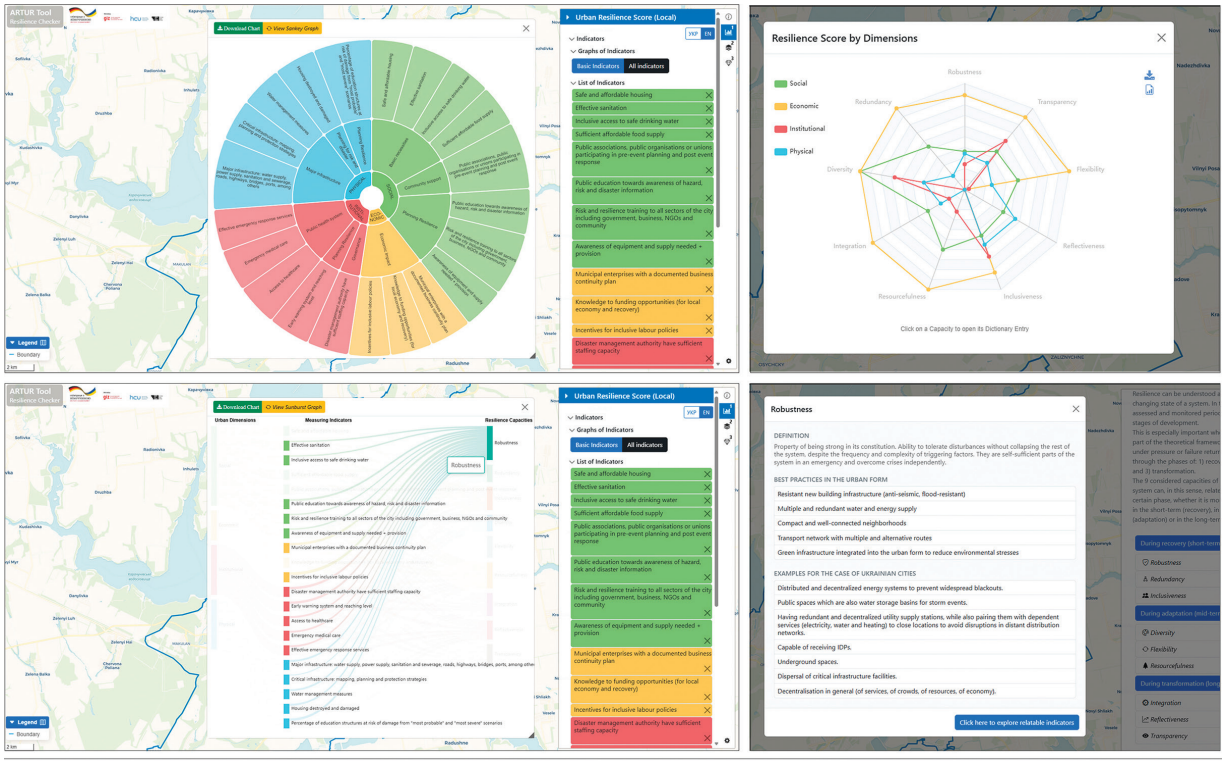

Fig 6. ARTUR interactive prototype tool.

4. Implementation

To test the ARTUR tool, two Ukrainian cities were part of the pilot activities: Nikopol and Kryvyi Rih. The activities linked to this study are based on the work carried out by the HafenCity University (HCU) Hamburg, between November 2023 and February 2025 as part of the German transitional development assistance which was commissioned by the Federal Ministry for Economic Cooperation and Development (BMZ), and implemented by Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH within the framework of the project `Strengthening of Urban Resilience in the Areas of Supply Infrastructure and Housing in Ukraine (SUR)´.

The pilot consisted of a remote collaboration with the two selected cities. During the initial stage, input data was collected via online workshops and individual discussions with members of each city council. This enabled identification of the specific challenges faced by both cities as well as their individual technical capacities and data availability. Thereafter the tool was further adapted to the two local contexts. The tool´s interface and content were prepared so as to be available in both English and Ukrainian languages. A first review of the indicators was conducted to adapt them further to local demands and constraints; including accuracy of terms used during translation.

The second phase focused on preparing guidance documentation on the methodology of use. The documentation was designed to enhance understanding of the ARTUR Framework with regard to its application using the prototype tool through a series of steps which would guide its users, in this case city representatives. The documentation supported cities not only in performing a resilience scoring, but also in monitoring progress over time. The developed methodology focused not only on the necessary technical steps needed to use the tool, but also on methodological recommendations, e.g. who should participate, and how often should the methodology be practiced for successful monitoring of prioritised measures.

The final phase was the hand-over of the digital tool to both cities. To ensure data protection, the tool was adapted so that each city had independent access; ensuring privacy of uploaded data. The time given to the cities to test the tool, conduct the exercise on their own and provide a feedback report to the research team was four weeks. At the end of the implementation phase, the two pilot cities retained permanent access to the online version of the ARTUR prototype tool.

5. Discussion

The outcome of the pilot implementation provided generally positive feedback from the city representatives with regards to the potential that this instrument has to address recovery measures in Ukraine. The feedback highlighted its advantage of use, as well as what features could be improved further before resilience assessment interactive tools such as ARTUR are fully adopted into existent local-level planning workflows.

An important observation from the pilot was the need to further streamline the adopted indicators in the proposed framework when adapting them to specific local contexts. The Ukrainian partners argued that the indicators should be more contextual-bound, and more adaptable to existent current administrative, legal and technical terms. These findings are in line with the argument presented at the beginning of this paper pertaining to the importance of understanding cities as complex systems, as well as the difficulty of making resilience frameworks a one-for-all solution. Nevertheless, the potential brought by the use of a digital platform is considerable when it comes to addressing this limitation. Digital platforms ease the ability to constantly update input data, e.g. new layers of information, and this can make resilience checks more accurate as cities evolve and change.

Another productive reaction from users was their interest in becoming full administrators of such a tool. This would accelerate a sense of ownership and independence when it comes to drafting strategies to support decisions based on local-data-based evidence, and also further enable planning for development without long-term dependence on international aid. For this, users also manifested the need to receive more technical training to ensure data-update and management; and shared their interest in its use to ensure more transparency in their local governance, as well as supporting the prioritising of investment measures.

In both cases, the pilot allowed users to reflect on their low-performing indicators, as well as the dimensions, and capacities of their cities. The outcome of the exercise exposed the ability to identify areas to focus upon with regards to planning and developing actionable implementation strategies based on the results retrieved from the ARTUR resilience scoring. In the longer-term, the outcome of this capacitation exercise would be a city's independent capacity to reassess its progress by iterating the assessment process, once certain implementation outcomes have emerged from scenario planning. The expected impact should be an enhanced urban resilient system, in which cities can further evaluate and monitor their performance, while adopting other indicators and urban dimensions.

With regards to the methodological approach of this study, beyond the pilot, the contribution of the prototypical interactive tool can be discussed. The proposed framework and tool were developed within the scope of a fast-paced, agile project which contains significant data access issues due to the security concerns associated with an ongoing war. Nevertheless, the tool was developed up to a level beyond proof-of-concept. The practical implementation carried out in Nikopol and Kryvyi Rih allowed the ARTUR resilience tool to reach a technology-readiness level that is high enough to be considered a novel resilience assessment prototype with potential for further development. The pilots demonstrated operationalisation of the framework, its ability to be transferred to external users, and the identification of limitations. The pilot testing allowed users to identify vulnerable areas in their cities, such as shelter accessibility, closeness to public health sites by walking or driving distance, population coverage analysis, and the criticality of the water distribution network. The possibility to enhance the framework's potential through deeper spatial-based analytics directly linked to the framework's indicators and capacities could potentially overcome other implementational gaps identified at the beginning of this paper.

6. Conclusion

This paper elaborated on the relevance of urban resilience as a means to adopt new assessment approaches for urban planning at a local level. The study argues that certain identified gaps hinder effective urban resilience assessment methods for planning-practice; and presents an integrated urban resilience framework which holds some of the identified limitations as novel features. The two Ukrainian case studies served not only as pilots for the implementation of the proposed framework and instrument, but also as lighthouse examples for the larger development landscape of how urban systems should embrace urban resilience approaches to prepare against future unprecedented challenges that are both of larger scale and unpredictable.

The proposed methodology involved the synthesis of identified thematic insights into a coherent and integrative framework. A novel framework combined the strengths of the reviewed frameworks while addressing identified blind spots. The result intends to contribute to a more context-responsive and comprehensive structure that can guide future research and practice in resilient and sustainable development. This approach aligns with established practices in qualitative meta-synthesis and conceptual modelling, particularly in interdisciplinary fields where theoretical clarity and practical utility are equally important.

Throughout the pilot in the two Ukrainian cities, empirical learnings were collected with regard to how local communities and organisations play critical roles in resilience implementation. Ukraine´s measures of decentralisation already seem to point towards the right path. Effective resilience planning must further engage multiple stakeholders, i.e. authorities, experts, and vulnerable populations, to ensure comprehensive and adaptable strategies. This research-backed consultation project provides Ukrainian cities with a structured framework to assess resilience, develop strategies, and promote sustainable urban development.

With the increasing complexity of urban systems, it is relevant to seek solutions that can address the cascading effects upon impact of an affected urban system. Digital tools model complex, dynamic systems, enhance data usage, and synthesise the knowledge needed for planning and decision-making. These instruments accelerate the generation of new output data in the form of analysis for concrete planning activities, and thereby facilitate agile and iterative evaluations such as scenario comparison. The pilot implementation of the proposed ARTUR resilience framework illustrated how integrating digitalisation into an urban resilience framework can enhance such needed analysis, iterations, and decision-making activities toward greater transparency and digital maturity for contexts that need rapid measures and long-term sustainable recovery.

Acknowledgment

This study is based on the work carried out by the HafenCity University (HCU) Hamburg, as part of the German transitional development assistance that was commissioned by the Federal Ministry for Economic Cooperation and Development (BMZ) and implemented by Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH within the framework of the project Strengthening of Urban Resilience in the Areas of Supply Infrastructure and Housing in Ukraine (SUR).

References

Alberti, Marina (2016). Cities That Think Like Planets: Complexity, Resilience, and Innovation in Hybrid Ecosystems. Seattle: University of Washington Press. https://doi.org/10.1515/9780295806600

Albuquerque, João Porto de, Eckle, Melanie, Herfort, Benjamin and Zipf, Alexander (2016). Crowdsourcing geographic information for disaster management and improving urban resilience: an overview of recent developments and lessons learned. In: Capineri, Cristina; Haklay, Muki; Huang, Haosheng; Antoniou, Vyron; Kettunen, Juhani; Ostermann, Frank and Purves, Ross (eds.) European Handbook of Crowdsourced Geographic Information. London: Ubiquity Press. pp. 309–321. doi: 10.5334/bax.w.

Apostolova-Sossa, Liubov (2024). *Strategies for resilient Ukrainian cities*. Expert Workshop on Knowledge transfer for resilient neighbourhoods in Ukraine. [Online] Available from: https://futurelearnlab.de/hub/course/view.php?id=426&section=1 [Accessed 31 May 2025].

Arup International Development (2013): City resilience index: understanding and measuring city resilience. New York City: Rockefeller Foundation (Arup International Development). Available from https://www.arup.com/de/insights/city-resilience-index/ [Accessed 29 May 2025].

Batty, Michael (2009). Cities as complex systems: scaling, interaction, networks, dynamics and urban morphologies. In: Meyers, Robert A. (ed.). Encyclopedia of Complexity and Systems Science. New York, NY: Springer, pp. 1041–1071. https://doi.org/10.1007/978-0-387-30440-3_69

Bautista-Puig, Núria, Benayas, Javier, Mañana-Rodríguez, Jorge, Suárez, Marta and Sanz-Casado, Elías (2022). The role of urban resilience in research and its contribution to sustainability. *Cities, 126, p. 103715*. doi: 10.1016/j.cities.2022.103715

Bettencourt, Luís M. A. (2021). Introduction to Urban Science. Cambridge, MA: The MIT Press. https://doi.org/10.7551/mitpress/13909.001.0001

Bowker, Geoffrey C. and Star, Susan Leigh (1999). Sorting Things Out: Classification and Its Consequences. Cambridge, MA: The MIT Press. https://doi.org/10.7551/mitpress/6352.001.0001

Carlile, Paul R. (2002). A pragmatic view of knowledge and boundaries: boundary objects in new product development. *Organization Science. 13(4), pp. 442–455*. doi: 10.1287/orsc.13.4.442.2953

Chaves, Ramon, Schneider, Daniel, Correia, António, Motta, Claudia L. R. and Borges, Marcos R. S. (2019). Crowdsourcing as a tool for urban emergency management: lessons from the literature and typology. *Sensors. 19(23).* doi: 10.3390/s19235235

Chelleri, Lorenzo (2012). From the "resilient city" to urban resilience: a review essay on understanding and integrating the resilience perspective for urban systems. Documents d'Anàlisi Geogràfica, 58(2), pp. 287-306. https://doi.org/10.5565/rev/dag.175

Clark, Janine Natalya (2024). Resilience as a "concept at work" in the war in Ukraine: exploring its international and domestic significance. *Review of International Studies. 50(4), pp. 720–740*. doi: 10.1017/S0260210524000305

Connelly, Elizabeth B., Allen, Craig R., Hatfield, Kirk, Palma-Oliveira, José M., Woods, David D. and Linkov, Igor (2017). Features of resilience. *Environmental Systems and Decisions, 37(1), pp. 46–50*. doi: 10.1007/s10669-017-9634-9

Council of Europe (2024). Council of Europe Action Plan for Ukraine 2023-2026: Steering Committee assesses the first year of its implementation. [online] Directorate of Programme Co-ordination. Available at: https://www.coe.int/en/web/ programmes/-/council-of-europe-action-plan-for-ukraine-2023-2026-steering-committee-assesses-the-first-year-of-its-implementation. [Accessed 29 May 2025]

Datola, Giulia (2023). Implementing urban resilience in urban planning: a comprehensive framework for urban resilience evaluation. *Sustainable Cities and Society, 98, p. 104821*. doi: 10.1016/j.scs.2023.104821

Datola, Giulia; Bottero, Marta; de Angelis, Elena and Romagnoli, Francesco (2022). Operationalising resilience: a methodological framework for assessing urban resilience through system dynamics model. *Ecological Modelling, 465, p. 109851*. doi: 10.1016/j.ecolmodel.2021.109851

Derrible, Sybil, Cheah, Lynette, Arora, Mohit and Yeow, Lih Wei (2021). Urban metabolism. In: Shi, Wenzhong, Goodchild, Michael F., Batty, Michael, Kwan, Mei-Po and Zhang, Anshu (eds.) *Urban Informatics. Singapore: Springer. pp. 85–114*. https://doi.org/10.1007/978-981-15-8983-6_7

Elfversson, Emma and Höglund, Kristine (2023). Urban growth, resilience, and violence. *Current Opinion in Environmental Sustainability, 64, p. 101356*. https://doi.org/10.1016/j.cosust.2023.101356

Eppoua (2023). єППО — закриваємо небо над Україною! [online] Available at: https://eppoua.com/ [Accessed 29 May 2025]

Eurocities (2023). Sustainable rebuilding of Ukrainian cities - Eurocities. [online] Available at: https://eurocities.eu/projects/ sustainable-rebuilding-of-ukrainian-cities/

Figuereido, Lorena, Honiden, Taku and Schuman, Abel (2018). Indicators for Resilient Cities. OECD Regional Development Working Papers 2018/02. Paris: OECD. https://doi.org/10.1787/6f1f6065-en

Folke, Carl (2006). Resilience: the emergence of a perspective for social–ecological systems analyses. *Global Environmental Change. 16(3), pp. 253–267*. https://doi.org/10.1016/j.gloenvcha.2006.04.002

Galderisi, Adriana (2014). Urban resilience: A framework for empowering cities in face of heterogeneous risk factors. *A|Z ITU Journal of the Faculty of Architecture*, 11(1), pp.36–58. Retrieved from https://www.az.itu.edu.tr/index.php/jfa/article/view/476

GIZ (2025). Supporting resilient cities and reconstruction in Ukraine. [online] www.giz.de. Available at: https://www.giz.de/ en/worldwide/137964.html

Goldschalk, David R. (2003). Urban hazard mitigation: creating resilient cities. *Natural Hazards Review, 4(3), pp. 136–143*. https://doi.org/10.1061/(ASCE)1527-6988(2003)4:3(136)

Goodwin, Robin, Hamama-Raz, Yaira, Leshem, Elazar and Ben-Ezra, Menachem (2023). National resilience in Ukraine following the 2022 Russian invasion. *International Journal of Disaster Risk Reduction, 85, p. 103487*. https://doi.org/10.1016/j.ijdrr.2022.103487

Holling, Crawford Stanley (1973). Resilience and stability of ecological systems. *Annual Review of Ecology and Systematics, 4(1), pp. 1–23*. https://doi.org/10.1146/annurev.es.04.110173.000245

ICLEI-europe.org. (2022). ICLEI Europe. Ukraine Recovery Roadmap. [online] Available at: https://iclei-europe.org/ukraine-recovery-roadmap [Accessed 28 May 2025].

ICLEI.org. (n.d.). ICLEI. [online] Available at: https://iclei.org/. [Accessed 28 May 2025].

IEA (2025). Ministers discuss Ukraine's route to a resilient and decentralised energy system - News - IEA. [online] IEA. Available at: https://www.iea.org/news/ministers-discuss-ukraines-route-to-a-resilient-and-decentralised-energy-system [Accessed 28 May 2025]

Jabareen, Yosef (2013). Planning the resilient city: concepts and strategies for coping with climate change and environmental risk. *Cities, 31, pp. 220–229.* https://doi.org/10.1016/j.cities.2012.05.004

Kitsoft. (n.d.). Map of the "Invincibility Points" on ONOVA GIS HUB. [online] Available at: https://onova.org.ua/en/news/mapa-punktiv-nezlamnosti-na-onova-gis-hub [Accessed 09 July 2025]

Kourtit, Karima; Elmlund, Peter and Nijkamp, Peter (2020). The urban data deluge: challenges for smart urban planning in the third data revolution. *International Journal of Urban Sciences, 24(4), pp. 445–461*. https://doi.org/10.1080/12265934.2020.1755353

Krishnan, Supriya, Aydin, Nazli Yonca and Comes, Tina (2023). RISE-UP: resilience in urban planning for climate uncertainty—empirical insights and theoretical reflections from case studies in Amsterdam and Mumbai. *Cities, 141, p. 104464*. https://doi.org/10.1016/j.cities.2023.104464

Lynch, Catherine (2018). CityStrength diagnostic: methodological guidebook (English). Washington, D.C.: World Bank Group. Retrieved from http:// documents.worldbank.org/curated/en/996471525721935888

McCandless, Erin and Onbargi, Alexia Faus (2023). Just transitions and resilience in contexts of conflict and fragility: the need for a transformative approach. *Current Opinion in Environmental Sustainability, 65, p. 101360*. doi: 10.1016/j.cosust.2023.101360

McPhearson, Timon, Elizabeth M. Cook, Marta Berbés-Blázquez, Chingwen Cheng, Nancy B. Grimm, Erik Andersson, Olga Barbosa, David G. Chandler, Heejun Chang, Mikhail V. Chester, Daniel L. Childers, Stephen R. Elser, Niki Frantzeskaki, Zbigniew Grabowski, Peter Groffman, Rebecca L. Hale, David M. Iwaniec, Nadja Kabisch, Christopher Kennedy, Samuel A. Markolf, A. Marissa Matsler, Lauren E. McPhillips, Thaddeus R. Miller, Tischa A. Muñoz-Erickson, Emma Rosi and Tiffany G. Troxler (2022). A social-ecological-technological systems framework for urban ecosystem services. *One Earth, 5(5), pp. 505–518*. doi: 10.1016/j.oneear.2022.04.007

Meerow, Sara; Newell, Joshua P. and Stults, Melissa (2016). Defining urban resilience: a review. *Landscape and Urban Planning, 147, pp. 38–49*. doi:10.1016/j.landurbplan.2015.11.011

Ortman, Scott G., Lobo, José and Smith, Michael E. (2020). Cities: complexity, theory and history. *PLOS ONE, 15(12)*. https://doi.org/10.1371/journal.pone.0243621

Osinga, Frans (2021). Strategic underperformance: The West and three decades of war. In: Johnson, Rob, Kitzen, Martijn and Sweijs, Tim (eds.). The Conduct of War in the 21st Century. Abingdon, Oxon and New York, NY: Routledge, pp. 2–25. ISBN:9781003054269

Qiu, Dong, Lv, Binglin and Chan, Calvin M. L. (2022). How digital platforms enhance urban resilience. *Sustainability, 14(3)*. doi: 10.3390/su14031285

Ribeiro, Paulo and Pena Jardim Gonçalves, Luís António (2019). Urban resilience: a conceptual framework. *Sustainable Cities and Society, 50*. https://doi.org/10.1016/j.scs.2019.101625

Rosvold, Elisabeth Lio (2023). Disaster resilience in conflict-affected areas: a review of how armed conflicts impact disaster resilience. *Current Opinion in Environmental Sustainability, 65, p. 101381*. doi: 10.1016/j.cosust.2023.101381

Sharifi, Ayyoob and Yamagata, Yoshiki (2018). Resilience-oriented urban planning. In: Yamagata, Yoshiki and Sharifi, Ayyoob (eds.). Resilience-Oriented Urban Planning. Lecture Notes in Energy. Springer International Publishing (65), pp. 3–27.

Soldak, Myroslava; Mezentsev, Kostyantyn; Batunova, Elena; Haase, Annegret and Haase, Dagmar (2024). Emergent urban resilience in Ukraine: adapting to polycrisis in times of war. *Ekonomichna ta Sotsialna Heohrafiya, 92, pp. 6–13*. doi: 10.17721/2413-7154/2024.92.6-13

Star, Susan Leigh and Griesemer, James R. (1989). Institutional Ecology, `Translations´ and Boundary Objects: Amateurs and Professionals in Berkeley's Museum of Vertebrate Zoology, 1907–39. *Social Studies of Science, 19(3), pp. 387–420.* doi:10.1177/030631289019003001

Tavra, Marina; Racetin, Ivan and Peroš, Josip (2021). The role of crowdsourcing and social media in crisis mapping: a case study of a wildfire reaching Croatian city of Split. *Geoenvironmental Disasters, 8(1).* https://doi.org/10.1186/s40677-021-00181-3

The Rockefeller Foundation (2013). 100 Resilient Cities. [online] Available at: https://resilientcitiesnetwork.org/ [Accessed 28 May 2025]

The Rockefeller Foundation and ARUP (2015). City Resilience Index: Understanding and Measuring City Resilience. London: ARUP. Available at: https://www.arup.com/perspectives/publications/research/section/city-resilience-index [Accessed 28 May 2025]

Trompette, Pascale, Vinck, Dominique (2009). Revisiting the notion of boundary object. *Revue d'Anthropologie des Connaissances, 3(1).* doi: 10.3917/rac.006.0003

Turner, Billie L., Kasperson, Roger E., Matson, Pamela A., McCarthy, James J., Corell, Robert W., Christensen, Lindsey, Eckley, Noelle, Kasperson, Jeanne X., Luers, Amy, Martello, Marybeth L., Polsky, Colin, Pulsipher, Alexander and Schiller, Andrew (2003). A framework for vulnerability analysis in sustainability science. *Proceedings of the National Academy of Sciences of the United States of America, 100(14), pp. 8074–8079.* doi: 10.1073/pnas.1231335100

UN-Habitat (2020). CityRAP Tool: City Resilience Action Planning Tool. Nairobi: UN-Habitat. Available at: https://unhabitat.org/sites/default/files/2020/05/cityrap_tool_booklet_2020.pdf [Accessed 29 May 2025]

UNDRR (2017). Disaster Resilience Scorecard for Cities: Detailed Level Assessment. Geneva: United Nations Office for Disaster Risk Reduction. Available at: https://www.unisdr.org/campaign/resilientcities/assets/toolkit/Scorecard/UNDRR_Disaster%20resilience%20%20scorecard%20for%20cities_Detailed_English.pdf [Accessed 29 May 2025]

UNDRR (2021). Disaster Resilience Scorecard for Cities | Making Cities Resilient. [online] Available at: https://mcr2030.undrr. org/disaster-resilience-scorecard-cities. [Accessed 29 May 2025]

UNDRR (2024). Ukrainian cities embark on resilience journey. [online] Available at: https://mcr2030.undrr.org/news/ukrainian-cities-embark-resilience-journey [Accessed 28 May 2025]

UNISDR (2015). Sendai Framework for Disaster Risk Reduction 2015–2030. Geneva: United Nations Office for Disaster Risk Reduction. Available at: https://www.undrr.org/publication/sendai-framework-disaster-risk-reduction-2015-2030 [Accessed 28 May 2025]

United Nations (2015). Transforming our world: the 2030 Agenda for Sustainable Development. A/RES/70/1. New York: United Nations. Available at: https://sdgs.un.org/goals [Accessed 28 May 2025]

Walker, Brian, Holling, Crawford Stanley, Carpenter, Stephen R. and Kinzig, Ann P. (2004). Resilience, adaptability and transformability in social–ecological systems. *Ecology and Society, 9(2).* doi: 10.5751/ES-00650-090205

Winston, Carla (2023). International norms as emergent properties of complex adaptive systems. *International Studies Quarterly, 67(3).* doi: 10.1093/isq/sqad063

World Bank (2022). Second Ukraine Rapid Damage and Needs Assessment (RDNA2) : February 2022 - February 2023. [online] World Bank. Available at: http://documents.worldbank.org/curated/en/099184503212328877/P1801740d1177f03c0ab180057556615497 [Accessed 28 May 2025]

World Bank Group (2024). Resilience Rating System (RRS). [online] World Bank. Available at: https://www.worldbank.org/ en/topic/climatechange/brief/resilience-rating-system-rrs. [Accessed 28 May 2025]

World Commission on Environment and Development (WCED), (1987). Our Common Future. Oxford: Oxford University Press. Retrieved from Report of the World Commission on Environment and Development. [Accessed 28 May 2025]

Appendix 1.1. Extended Table of Comparative Analysis of consulted Resilience Frameworks, showcasing Background-related Criteria.

COMPARED FRAMEWORKS		BACKGROUND				
		Developing Agency	Year of Creation	Contexts where applied	Purpose	Target / End-user
Disaster Resilience Scorecard for Cities (UNDRR)		UNDRR, based on the Sendai Framework for DRR. With the support of USAID, European Commission, IBM, AECOM	2014, updated in 2017.	Over 200 cities worldwide. Strong uptake in: Asia-Pacific (Philippines, India, Indonesia); Africa (Uganda, Tanzania, Mozambique); Europe (Italy, Portugal); Latin America (Peru, Mexico).	Helps cities assess disaster resilience and align with the Sendai Framework for Disaster Risk Reduction (2015-2030).	Supports the following areas: governance, risk identification, infrastructure resilience, and disaster response planning.
City Resilience Index (CRI)		Rockefeller Foundation / ARUP	2015	Part of the 100 Resilient Cities initiative research cities: North America (New York City, Los Angeles); Europe (Rotterdam, Thessaloniki, Paris); Africa (Kigali, Cape Town, Durban); Asia (Surat, India; Bangkok, Thailand); Latin America (Medellín, Colombia; Rio de Janeiro, Brazil). Tested in 5 cities: Shimla (India), Concepcion (Chile), Arusha (Tanzania), Hong Kong (China) and Liverpool (UK).	Enable cities to measure and monitor the multiple factors that contribute to resilience. It supports diagnosis of strengths and weaknesses and measure relative performance over time.	Oriented at city-level actors, both governmental and non- governmental, i.e. authorities, decision-makers, planners, community. Focused on measures against natural and man-made pressures, e.g. rapid urbanisation, climate change, terrorism and natural hazards risks.
City Resilience Action Planning Tool (CityRAP)		UN-Habitat	2016	Primarily Sub-Saharan Africa, including: Mozambique: Chokwe, Mocuba, Madagascar, Comoros, Zambia, Senegal, Cabo Verde, Malawi, Somalia.	To build resilience with limited technical expertise. Enabling local authorities and communities to develop resilience action plans.	Targeted at small and intermediate cities (local governments), particularly in low-income and developing regions with limited technical expertise.
City Strength Diagnostic (CSD)		World Bank	2024	Africa (Accra, Ghana; Addis Ababa, Ethiopia; Nairobi, Kenya), South Asia (Dhaka, Bangladesh; Kathmandu, Nepal), East Asia (Can Tho, Vietnam; Ulaanbaatar, Mongolia), Latin America (Medellín, Colombia; Santiago, Chile), Middle East (Amman, Jordan), Europe & Central Asia (Belgrade, Serbia; Tbilisi, Georgia).	Support for diagnostics and investment prioritization. Reduce impact of rapid urban growth.	Typically applied to city-level, from low- and middle-income countries.
THEMATIC CLUSTERING	**Commonalities**	All are aid agencies or organisations with an international scope.	All developed within the last two decades, where common goals are focused on global impacts, e.g. climate adaptation.	3 out of 4 frameworks (UNDRR, CRI and CSD) are involved in 4 continents: Africa, Asia, Europe, America. All of them refer to city-level applications.	All focus on supporting for the assessment, prioritisation and drafting of action plans towards resilience.	All focus on supporting for the assessment, prioritisation and drafting of action plans towards resilience.
	Distinctions		The CSD is the most recent developed framework, after 2020.	Only CityRAP is focused primarily in Sub-Saharan Africa and not in other contexts. It is however a relevant case due to its consideration of small and medium-sized cities.	CRI is the only framework which suggest monitoring over time. CityRAP is the only framework targeting an audience with low technical expertise and limited resources. UNDRR is focused on disaster risk reduction.	CRI is the only framework which suggest monitoring over time. CityRAP is the only framework targeting an audience with low technical expertise and limited resources. UNDRR is focused on disaster risk reduction.
Considerations into proposed ARTUR Framework		Enough empirical knowledge collected from the compared frameworks can be assumed, as they all work in multiple continents.	All frameworks with recent research and implementation cases can be considered relevant enough for the topic	All consulted frameworks present a ample contextual coverage to serve as a valid reference from previous implementation cases. 3 of the 4 frameworks have been implemented across 4 continents.	The majority focus on overarching global challenges, e.g. disaster risk reduction, climate mitigation, rapid urban growth. The term `conflict´ is mentioned on some frameworks but not as a core focus challenge, or directly related to war scenarios	City-level application and multi-stakeholder approach is most adequate to address the problem of resilience with manageable strategies. Most have a higher tendency toward governance-oriented measures. None mention explicitly, urban planning targets, instead higher level (governance) targets.

Appendix 1.2. Extended Table (part 2) of Comparative Analysis of consulted Resilience Frameworks, showcasing Methodology and Output Criteria.

COMPARED FRAMEWORKS	METHODOLOGY		OUTPUT		
	Method of Application	**Data Collected / Used**	**Output**	**Considered urban domains (areas, sectors, dimensions, pillars)**	**Considered resilience capacities (categories, qualities)**
Disaster Resilience Scorecard for Cities (UNDRR)	Self-assessments at two levels: Level 1, as a two-days workshop, based on 47 indicators, each with a 0–3 score; and Level 2, as a multi-stakeholder exercise of 1–4 months that can be a basis for a detailed city resilience action plan.	A downloadable excel tool for off-line use, to retrieve a score linked to indicators, and based on a self-assessment questionnaire. Includes 117 indicators, each with a score from 0 to 5.	A self-retrieved resilience score and action plan is produced. / Additionally, best practices and a glossary to improve disaster preparedness and recovery capacity are available in their platforms.	(4 areas) infrastructure, health, environment, and society.	This framework does not define specific capacities, categories or qualities of resilience. It rather focuses on resilience goals.
City Resilience Index (CRI)	Applies qualitative and quantitative conducted questionnaires or self-assessments in a digital platform that provides a resilience-index score which can be monitored over time, via iterations.	Via the online Platform, a self-assessment is conducted, as qualitative and quantitative prompt questions (1 to 5 scale). An index score is retrieved.	A digital resilience profile for cities, allowing them to benchmark their strengths and weaknesses and track progress over time.	(4 Dimensions) health and well-being, economy and society, infrastructure and environment, leadership and strategy. Overall the framework includes: 4 dimensions, 12 goals and 52 indicators).	Robust, Flexible, Redundant, Resourceful, Reflective, Inclusive, Integrated.
City Resilience Action Planning Tool (CityRAP)	Analog and participatory Bottom-up Planning Approach: engages local stakeholders through training and workshops, using a step-by-step approach to identify vulnerabilities, prioritize actions, and co-develop a city resilience action plan.	Data is collected via a self-assessment questionnaire (1 to 4 scale) and a mapping activity of threats and challenges in participatory sessions with communities.	A City Resilience Framework for Action Plan outlining short- and long- term strategies to enhance urban resilience, focsued on climate change, safety, inclusiveness, growth.	(5 pillars) governance, disaster-risk management, infrastructure and basic services, economy and society, planning, environment.	This framework does not define specific capacities, categories or qualities of resilience.
City Strength Diagnostic (CSD)	Uses a structured diagnostic approach with a qualitative, multi-sectoral guidelines, involving stakeholder engagement, workshops, and data analysis to identify vulnerabilities and opportunities for improving resilience.	Analog Process: stakeholder mapping, sectorised interviews, prioritisation of challenges, mapping of vulnerable areas in a participatory session, filling an interdependency matrix.	A prioritized list of interventions and recommendations for enhancing city resilience.	(4 Sectors) economic, infrastructural, social, environmental.	Robustness, Coordination, Reflective, Redundant, Inclusive
THEMATIC CLUSTERING **Commonalities**	CityRAP and CSD involve a guided process. UNDRR Scorecard and CRI refer to self-assessment methods. / All refer to QUAL and QUAN methods of application.	CityRAP and CSD focus on analog methods of data collection, via participatory approaches.	2 of 4 (UNDRR and CRI) are based on scoring from indicators. / 2 of 4 (CiyRAP and CSD) are focused on thematic clustering. / All offer best-practice recommendations.	Common urban dimensions mentioned in the different frameworks: Economic (3 of 4), Social (4 of 4), Institutional (2 of 4) and Physical (4 of 4). However, Environment and Infrastructure are mentioned as different areas of actions but for this study both are assumed as part of the physical realm of urban systems.	Both the CSD and the CRI focus on similar resilience capacities. The term used varies but refers mainly to the characteristics of resilience which should be achieved to a certain extent, and thus should be considered and measureable.
Distinctions	UNDRR Scorecard suggest a two-fold (rapid and thorough) method of application. / CityRAP is the only one with a bottom-up approach. / CRI and CSD provide more in-depth resilience analysis.	The CRI is focused on expert level assessments. It is the only instrument offered fully online. The UNDRR-Scorecard is offered online but is to be executed offline.	None of their outputs produce spatial-based analytics.	The terms to refer to their areas of action are not unified across the different frameworks. / CRI is the only framework which adds a bridging layer of urban components between the 4 main urban dimensions and their indicators.	UNDRR and CityRAP do not focus on specific resilience capacities to address, but consider an open approach for drafting recommendations.
Considerations into proposed ARTUR Framework	Workshop-based participatory approaches are a basis in 2 of the 4 consulted frameworks, intended for those contexts with lower technical expertise and income. Nevertheless, self-assessment methods can be adopted, for contexts where expert-level stakeholders are usually expected. This is accompanied by the right guidelines for proper independent use.	2 of the 4 Frameworks, those oriented at small, medium-sized cities or developing cities focus on analogue processes of data collection. Only 1 of the 4 consulted frameworks is available on a fully-online platform and suggests periodical monitoring of the retrieved score over time. This can suggest that when instruments are provided with a digital basis, they might enhance ease of monitoring for progress.	Indicators-based scoring as outputs is usually assumed for the self-assessment methods, and involve collected of mixed (qualitative and quantitative) data, via questionnaires. None of the identified outputs from the consulted frameworks offer spatial- based analytics, rather thematic-clustered output strategies, or indicators- based scoring.	Output is framed within 3 to 5 areas of impact. There are no unified terms to define these areas of action, also referred to as sectors, domains, pillars or dimensions. For this study, we assume the term Dimensions to refer to the most overarching realms of an urban system. Common Urban Dimensions mentioned in the different frameworks are: Economic (3 of 4), Social (4 of 4), Institutional (2 of 4) and Physical (4 of 4). Environment and Infrastructure are mentioned as additional areas of an urban system, but for this study both are assumed as part of the Physical Dimension.	This term is not unified across frameworks These can be referred to as qualities, capacities or characteristics. For this study, we assume the term Capacities, to refer to what constitutes an urban system to enhance and maintain their resilience. These capacities are grounded in a socio-ecological perspective. Common urban resilience qualities in 2 of the 4 consulted frameworks are: Robustness, Reflectiveness, Redundancy, and Inclusiveness.

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SPATIAL PLANNING IN THE UKRAINE'S NATIONAL HIGHER EDUCATION SYSTEM: PROGRAMS, APPROACHES, PROBLEMS

Roman Lozynskyy[1*], Iryna Zakutynska[2]

Abstract

This article analyses the role and content of spatial planning in contemporary higher education in Ukraine. It has been established that the system for training specialists who acquire knowledge across the broad spectrum of issues related to modern understandings of spatial planning is still in the process of formation. Contemporary educational programs related to spatial planning are, in fact, combined with regards to their content. They include educational components of the basic specialty, spatial planning, and other elements designed to attract prospective students. The state encourages connections between universities and non-formal education as they improve the practical orientation of educational programs related to spatial planning. The experience of Ukraine's neighbouring EU member states in training spatial planning specialists provides guidance to Ukrainian higher education institutions. The greatest obstacle to the total integration of spatial planning into the higher education system is its legal uncertainty within extant legislation. Accordingly, it is not institutionally possible in Ukraine to define spatial planning as an independent profession and, as a result, training specialists in this field involves numerous risks.

Keywords:

Spatial planning, Ukraine, higher education, educational programme

1* Professor, Doctor of Geographical Sciences,
Chairperson, Department of Geography of Ukraine,
Ivan Franko National University of Lviv, Ukraine
roman.lozynskyy@lnu.edu.ua
https://orcid.org/0000-0001-5435-7636

2 Associate Professor, Candidate of Geographical Sciences,
Department of Geography and Natural Science
Vasyl Stefanyk Precarpathian National University
irina.zakutynska@pnu.edu.ua
https://orcid.org/0000-0002-7072-8318

1. Introduction

Spatial planning in Ukraine fully reflects all features of the country's transitional economy (Lozynskyy et al., 2024). It is based on planning practices that have been inherited from the Soviet period and their corresponding tools. In its pursuit of European Union membership, Ukraine has sought to reform its spatial planning system to align it more closely with global, and particularly European, models. However, these reforms began late (only in the latter half of the 2010s) and have, to date, been inconsistent. This process was further delayed by the COVID-19 pandemic and nearly halted by the onset of the large-scale Russian aggression against Ukraine. Today, it is necessary to transform existing spatial planning tools and develop new ones to address the needs of post-war recovery and the reconstruction of the state (Maruniak, Palekha and Kryshtop, 2022).

Currently, Ukraine's spatial planning system cannot be described as entirely underdeveloped. Compared to other European states, it incorporates a number of positive innovations (Nowak et al., 2022; 2023). However, their implementation faces considerable challenges, and some components of the system remain unreformed. Notably, changes within the education system concerning spatial planning have been insufficient. In Ukraine, there is no distinct specialty for training specialists in spatial planning within higher education institutions. Instead, educational programmes in fields such as *Architecture and Urban Planning, Geodesy and Land Management,* and *Geography* offer modules related to spatial planning. Additionally, and prior to the large-scale Russian aggression, various local and international non-governmental organisations offered programmes and courses on spatial planning and its components to representatives of territorial communities and other interested parties as part of wider efforts to align Ukraine with European spatial planning standards.

2. The Aim of the Research

This article analyses the place of spatial planning in modern higher education in Ukraine and characterises its content in general terms.

3. Analysis of Literary Sources

Interest in spatial planning issues in Ukraine increased during the 2010s and was driven by the country's strategic orientation towards European integration, association, and, most recently, EU accession. Another factor that emphasises the importance of this research is the administrative and territorial reforms that took place between 2015 and 2020. Researchers have primarily focused on the local level of spatial planning due to its practical applicability. In contrast, spatial planning at the national level has received minimal attention, with few significant changes having occurred over recent decades. Amongst the various types of spatial planning, those which have been most extensively studied are urban, rural, and landscape planning.

There is a voluminous corpus of work on spatial planning in Ukraine that has been authored by experts in urban planning, architecture, public administration, law, geography, land management, and related disciplines. Of recent works, particular attention should be given to the article by Gabrel and Kosmii (2022), which examines the updated general scheme of spatial planning across Ukraine. An analysis of the outcomes of regional development programmes in Ukraine was conducted by a research team led by Radzikhovska (2023). Nowak, Lozynskyy, and Pantyley (2021) compared local-level spatial policies in Ukraine and Poland. Additionally, an international team of researchers analysed spatial planning tools in Central and Eastern European countries at the local level (Nowak et al., 2022).

Since 2022, Russian armed aggression against Ukraine and the challenges of post-war reconstruction have made spatial planning a critical area of research. Noteworthy in this regard is a review article by Maruniak, Palekha, and Kryshtop (2023) which addresses the development of spatial planning during the war in Ukraine and the subsequent rebuilding of the state.

However, there is a noticeable lack of peer-reviewed academic publications that have specifically examined the training of specialists in spatial planning in Ukraine. This issue is frequently raised at conferences and events

related to spatial planning development and in review publications which analyse various aspects of Ukraine's planning system (Lozynskyy et al., 2024).

4. Methods and Sources of Research

To determine the current state and challenges of spatial planning education in Ukraine, the research undertaken for this study was conducted in four stages:

Stage 1 : A brief description of the modern system of spatial planning in Ukraine. This stage focused on analysing Ukraine's legislation on spatial planning, particularly the Law of Ukraine 'On Regulation of Town-Planning Activities' (Law, 2011), as well as other related laws and regulations.

Stage 2 : Analysis of existing programmes related to spatial planning in higher education institutions in Ukraine. The Unified State Electronic Database on Education (YeDEBO) was used to select programmes (Education database, n.d.). Administered by the Ministry of Education and Science of Ukraine, the database provided access to descriptions of educational programmes posted on the official websites of higher education institutions. The analysis of educational components within these programmes was summarised into tables.

Stage 3 : Characteristics of the content of educational programs related to spatial planning. Educational programs in spatial planning at leading universities in Ukraine, as posted on their official websites, were utilized. The webpages contain information about the educational components that make up specific programs.

Stage 4 : Analysis of non-formal education in spatial planning in Ukraine and its importance for higher education. Using Google, institutions and organisations which offer educational courses and e-learning programmes on spatial planning were identified. The information garnered was further verified through direct contact and detailed analysis of selected websites.

Stage 5: Examination of specialist training in spatial planning in selected EU member states of Central and Eastern Europe in the context of Ukrainian perspectives. Official online resources of higher education institutions in these countries were consulted. For Poland, the RAD-on system, administered by the Ministry of Science and Higher Education (Ministerstwo Nauki i Szkolnictwa Wyższego), was used to gather information on fields of study (kierunki studiów). In Romania, data from the Romanian Agency for Quality Assurance of Higher Education (Agenția Română de Asigurare a Calității în Învățământul Superior) provided insights into fields of knowledge, majors, and specialties. With regard to the Czech Republic, information was obtained from the register of the Ministry of Education, Youth, and Sports (Ministerstvo školství, mládeze a tělovýchovy České republiky). The results were summarised into tables.

5. Results of Research

5.1 The Modern System of Spatial Planning in Ukraine: A General Overview

Modern Ukraine inherited the Soviet system of spatial planning, and this is reflected in the terminology that is used (Harat, 2019). The term 'spatial planning' is still undefined in Ukrainian legislation. Instead, the term 'mistobuduvannia' ('містобудування') is used, which applies not only to cities but also to regions, communities, and rural areas. 'Mistobuduvannia' is usually translated into English as 'urban planning', although the term derives from two Ukrainian words 'місто' (city) and 'buduvannia' (constructing). It follows, that its literal meaning is broader than exclusively urban-focused activities.

Spatial planning documentation is referred to as 'city constructing documentation'. Legislation also includes the concept of 'planning' *of* 'territories' (as opposed to 'territorial planning'), which is combined with 'building development' (Article 2 of the Law of Ukraine *On Regulation of Town-Planning Activities*). Terms such as 'spatial development', 'spatial planning', and 'spatial policy' have only been introduced into practice within the last decade.

The Ministry for Communities and Territories Development of Ukraine oversees spatial policy. The legal framework for spatial planning comprises hundreds of laws and regulations, with the main legislation being the Law *On Regulation of Town-Planning Activities* which was adopted in 2011 (Zakon, 2011). The spatial planning system in Ukraine operates at three levels: national, regional, and local. At the national level, the Law of Ukraine *On the General Planning Scheme of the Territory of Ukraine* which was adopted in 2002 remains in effect (Zakon, 2002). This law primarily concerns the General Scheme, which includes 27 drawings (maps) and textual material. Regional-level planning schemes covering regions, districts, and the Crimea, supplement the General Scheme.

Spatial planning tools in Ukraine are predominantly focused on documentation development. At the local level, these tools include general settlement plans, zoning plans, and detailed territorial plans. In 2020, a new administrative-territorial organisation was introduced, with territorial communities being designated as the lowest level. In June 2020, a new spatial planning tool was introduced: the comprehensive plan for the spatial development of the territorial community. However, other direct and indirect Ukrainian spatial planning tools remain insufficiently developed with regard to both regulatory documents and scholarly literature despite their practical use.

5.2 Educational programs related to spatial planning offered by higher education institutions

Students at higher education institutions in Ukraine study within specific educational programs that must periodically undergo accreditation, i.e. go through an evaluation process which judges their compliance with the requirements set by accreditation bodies. Educational programs can be developed within specific academic specialties or be interdisciplinary. There are relatively few interdisciplinary programs because their accreditation process is significantly more complex. In addition, educational standards are developed for each specialty, and these must be followed. The list of academic specialties approved by the state education authority has recently been updated (List, 2024). Spatial planning is not in this this. However, universities are free to choose the titles of their educational programs within their given specialities, with a single restriction: the title of an educational program must not include words that explicitly point to a different specialty.

Some academic specialties in Ukraine are designated as 'regulated', i. e., the state imposes additional requirements regarding admission procedures, the structure of the educational program, its content, the organization of the educational process, and the certification of graduates. These are specialties that lead to regulated professions and include those which involve high levels of responsibility such as law, nuclear energy, medicine, military service, and so on. The specialty *Architecture and Urban Planning*, which is directly related to spatial planning, is among the regulated specialties.

Educational specialties such as *Architecture and Urban Planning* as well as *Geodesy and Land Management* appear closely aligned with spatial planning. However, these broad fields prioritise general competencies during bachelor's and master's programmes, and are supported by well-developed educational standards. Narrower educational programmes specifically focused on spatial planning have not been developed as they are unlikely to attract sufficient demand.

As of the summer of 2024, 32 higher education institutions in Ukraine offered bachelor's programmes in architecture and urban planning (Education database, n.d.). None of these programmes directly address spatial planning. However, 6 of the 20 institutions offering master's programmes in architecture and urban planning include a dedicated *Urban Planning ('City Constructing')* programme.

In 2024, 49 institutions provided bachelor's training in geodesy and land management, and 40 offered master's programmes (Education database, n.d.). While bachelor's programmes rarely include spatial planning content, the master's programmes offered saw a notable increase in this area. Some institutions of higher education have already introduced new courses related to spatial planning. Notably, 17 Ukrainian universities have introduced courses based on the USAID *Program for Agrarian and Rural Development (AGRO)* methodology for comprehensive spatial development plans for communities (Decentralisation, n.d.).

Additionally, according to the data of YeDEBO, 18 educational programmes across Ukraine explicitly include *spatial, territorial,* or *urban planning* in their titles, or encompass significant spatial planning components within their curricula (Table 1).

Table 1. Educational programs related to spatial planning in higher educational institutions of Ukraine

№	Higher educational institutions of Ukraine	Specialty	Educational program
Bachelor's degree programme			
1.	Taras Shevchenko National University of Kyiv	Geography	Urban studies and urban planning
2.		Earth Sciences	Soil science, land management and territorial planning
3.	Ivan Franko National University of Lviv	Geography	Urban studies, spatial planning and regional development
4.	Vasyl Stefanyk Precarpathian National University	Geography	Geography and spatial organisation of territorial communities
5.	Ternopil Volodymyr Hnatiuk National Pedagogical University	Geography	Spatial analytics and territorial development of communities and regions
6.		Earth Sciences	Soil science, expert assessment of land and territorial planning
7.	Yuriy Fedkovych Chernivtsi National University	Geography	Regional development and spatial planning
Master's degree programme			
1.	Lesya Ukrainka Volyn National University	Geography	Regional development and spatial planning
2.	Donbas National Academy of Civil Engineering and Architecture.	Architecture and Urban Planning	Urban planning ('City Constructing')
3.	Taras Shevchenko National University of Kyiv	Geography	Urban Studies and regional development
4.	Kyiv National University of Construction and Architecture	Construction and Civil Engineering	Urban Studies and spatial planning
5.		Architecture and Urban Planning	Urban planning ('City Constructing')
6.	*Ivan Franko National University of Lviv*	Geography	Urban studies, urban planning and sustainable spatial development
7.	*Lviv Polytechnic National University*	Architecture and Urban Planning	Urban planning ('City Constructing')
8.	National University 'Yuriy Kondratyuk Poltava Polytechnic'	Architecture and Urban Planning	Urban planning ('City Constructing')
9.	Odesa State Academy of Civil Engineering and Architecture	Architecture and Urban Planning	Urban planning ('City Constructing')
10.	Poltava State Agrarian University	Geodesy and land management	Land management and territory planning
11	Yuriy Fedkovych Chernivtsi National University	Geography	Regional development and spatial planning

Compiled on the basis of: (Education database, n.d.).

In recent years, several Ukrainian higher education institutions have established separate structural units with names that explicitly refer to 'spatial planning'. Examples include:

- The separate structural subdivision of the Educational and Scientific Institute of Spatial Planning and Prospective Technologies of Lviv Polytechnic National University.
- The Faculty of Urban Studies and Spatial Planning at Kyiv National University of Construction and Architecture.
- The Department of Architecture and Spatial Planning, Faculty of Surface Facilities and Airfields of the National Aviation University.
- The Department of Construction, Urban Studies and Spatial Planning, Faculty of Transport and Construction of Volodymyr Dahl East Ukrainian National University.

The Ukrainian spatial planning system places significant emphasis on the development of documentation, including general settlement and detailed plans. Under Ukrainian law, the right to perform such work is enjoyed by companies employing certified specialists and an architect holding a qualification certificate for urban planning documentation development. To obtain this certificate, individuals must hold a relevant specialist's or master's degree and complete qualification improvement courses approved by the ministry. Currently, these courses are offered at four Ukrainian universities: Kyiv National University of Construction and Architecture, O.M. Beketov National University of Urban Economy in Kharkiv, Prydniprovska State Academy of Civil Engineering and Architecture, and Lviv Polytechnic National University.

Additionally, certified land engineers, whose qualification process is similar, are also required.

5.3. Content of educational programs related to spatial planning

Ukrainian educational programs related to spatial planning vary greatly with regard to their content. This is not surprising given that spatial planning as both a discipline and an independent profession is not clearly institutionally defined in Ukraine. This is why existing educational programmes in higher education institutions usually combine spatial planning with broader topics such as urban studies or regional development.

In addition, in educational programmes related to spatial planning for specialties such as *Geography, Earth Sciences,* or *Construction and Civil Engineering*, the largest proportion of educational components (in terms of academic hours) is allocated to developing competencies specific to these disciplines, in accordance with the approved standards of higher education rather than addressing notions of spatial planning.

A bachelor's degree program in Ukraine consists of 240 ECTS credits. Approximately 30 credits are allocated to subjects that seek to develop general competencies (such as foreign language, philosophy, Ukrainian for professional purposes, and so on, as well as basic military training – added in the 2023/2024 academic year. About 90 credits are allocated to subjects required by the educational standard for the specialty under which the given program was created. As a result, only about 60 credits – but sometimes even fewer in practice – remain for subjects directly related to the declared educational program. Finally, the remaining 60 credits are allocated to elective disciplines chosen by the student.

Within the *Geography* specialty (starting with the summer 2025 students intake, will be called *Geography and Regional Studies*), where educational programs related to spatial planning were introduced earliest, analysis of degree programme content shows significant variation depending on program title, the vision and competence of its authors, and the availability of qualified specialists. The subjects included in already accredited educational programs related to spatial planning at leading national universities (Kyiv, Lviv, Chernivtsi) differ considerably.

In Kyiv, where the educational program is titled *Urban Studies and Urban Planning*, the core curriculum includes courses such as 'Introduction to Urban Studies', 'World Geography: Cities', 'Methods of Urban Research', 'Introduction to Urban Planning', 'Urban Ecology', 'Urban Land Use Planning and Land Valuation', 'Urban Sociology', 'GIS for Urban Planning', 'Sustainable Development of Cities and Regions', 'Urban Theory and Practice' etc. Consistent with its title, the program is primarily one focused on urban studies (Program Kyiv, 2025).

In Lviv, the program is titled *Urban Studies, Spatial Planning, and Regional Development*, and urban aspects are also strongly present ('Foundations of Urban Studies', 'GIS in Urban Studies and Spatial Planning', 'Urban Planning', 'Urban Design'). However, there are also many courses specifically related to spatial planning ('Fundamentals of Spatial Planning', 'Spatial Planning in Ukraine', 'European System of Spatial Planning', 'Strategic Spatial Planning') (Program Lviv, 2024).

In Chernivtsi, the educational program *Regional Development and Spatial Planning* includes, in addition to subjects aligned with the program's title, such as 'Fundamentals of Territorial Planning' and 'Foundations of Regional Studies', there are courses that place a strong emphasis on cartography, GIS, ERS ('Earth Remote Sensing'), and information technologies. These include 'GIS and Mathematical Methods for Processing Geographic Data', 'Topography with Basics of Geodesy', 'Cartography and Geomatics with Fundamentals of ERS', and 'Processing Results of Regional Research.' (Program, Chernivtsi, 2023)

The general conclusion is that all of them are, in fact, combined educational programs. They include educational components of the basic specialty, spatial planning, and other elements designed to attract prospective students.

A detailed analysis of educational programmes in the specialty *Architecture and Urban Planning* from three leading institutions – Kyiv National University of Construction and Architecture, Lviv Polytechnic National University, and O.M. Beketov National University of Urban Economy in Kharkiv – reveals that bachelor's programmes provide only introductory knowledge of spatial planning. Core subjects close to spatial planning include courses such as 'Fundamentals of Urban Planning'. Some subjects in this field are offered only as a selective component. Spatial planning content increases significantly in master's programmes, and particularly within institutions that offer a specific 'Urban Planning' programme. This content is explained by the specifics of the Architecture and Urban Planning specialty mentioned above. It is regulated by the state.

5.4. The role of non-formal education

The Ukrainian state bodies that oversee the system of higher education actively encourage its integration with non-formal education in the belief that it will help universities strengthen their connections with practical professionals. The accreditation procedure for educational programs includes a specific requirement to incorporate non-formal education within the academic process. Failure to meet this requirement may negatively impact accreditation outcomes. Higher education institutions are required to develop internal regulations that enable them to:

- credit a student for a specific topic or even an entire academic course if the student submits a certificate (or other proof) of completing a relevant course, either online or in-person, within the non-formal education system, provided it is related to the educational program;
- recognize a certificate obtained by university instructors through non-formal education as a valid form of professional development (which is mandatory every five years), or as evidence of their qualification to teach assigned subjects.

In addition, university instructors actively contribute to the development of educational courses that are subsequently offered on specialized educational platforms. Non-formal education also serves as a valuable reference for university program developers as it helps them to evaluate the relevance of certain topics and themes.

Ukrainian non-formal education related to spatial planning began to develop during the implementation of the administrative and territorial reform which started in 2015 and was completed in 2021. Non-formal education most often involves measures such as educational programmes and courses for representatives of territorial communities, students, and the general public as well as e-courses on spatial planning, and webinars.

One of the first programmes to focus on this area was the *U-LEAD with Europe* programme – a collaboration between the Ukrainian government, the European Union, and its member states, including Germany, Poland,

Denmark, and Slovenia, which aimed to t create a multi-level management system in Ukraine. In August 2018, with the support of the *U-LEAD with Europe*, the educational platform for architecture and urban studies *CANactions School* initiated the educational and practice-oriented programme *Integrated Spatial Planning for United Territorial Communities*. This programme focused on adapting European approaches to urban and regional development for the newly created territorial units of Ukraine – the united territorial communities (CANactions School, 2018).

In recent years, *U-LEAD with Europe* has organised a specialised training programme, *Steps for Specialists*, on the topic of *Spatial Planning and Natural Resource Management*. This programme, designed for territorial communities, was implemented four times between 2021 and 2024. It covered topics such as *Principles of Spatial Planning, Spatial Planning in Ukraine, Spatial Planning in Territorial Communities, Challenges of Spatial Planning,* and *Land and Other Natural Resources in Territorial Communities* (U-LEAD, n.d.).

U-LEAD with Europe also offers a free online course, *Spatial Planning in a Territorial Community* (in Ukrainian, with a certificate of completion), for anyone interested in learning about the principles of spatial planning given the recovery and development needs of communities. The course, launched in summer 2024, covers topics such as *Fundamentals of Spatial Planning, Typical Challenges of Spatial Planning and Ways to Solve Them, Urban Planning Documentation: Types, Elaboration Process, and Requirements, and Methods of Public Involvement in Planning* (U-LEAD, 2024).

Another educational programme, *Spatial Planning for Territorial Communities*, is part of the project *Strengthening the Capacity of Communities to Rebuild through Piloting Their Interaction with Universities*. It is run by the Alliance of Ukrainian Universities with support from the Renaissance International Fund, is based at the Institute of Postgraduate Education of Taras Shevchenko Kyiv National University and is intended for employees of local self-government bodies. Four such programmes have been conducted. Experts from the Alliance of Ukrainian Universities share knowledge on spatial planning, including data selection and analysis for understanding territories, strategic planning for territorial community development, territory revitalisation, participatory approaches to spatial planning, and public participation in budget processes with community representatives (Alliance, 2024).

Julie's Data, a private company that provides services to local communities, with the data available including spatial analysis of territories, educational courses, and database development for territory management, has been offering the paid course *Geoinformation Systems in Spatial Planning* for several years. This course is intended for students working in areas related to territory analysis, geospatial data visualisation, and spatial documentation creation. The aims of the course are to familiarise participants with geographic information system (GIS) capabilities, and to provide them with essential skills for working with GIS effectively. In 2023, Julie's Data also launched the crowdsourcing project *Open Spatial Planning Tool for Ukraine*, which seeks to create quality spatial planning tools using a geospatial database that can be accessed by anyone without extensive operational measures (Julie's Data, n.d.).

In general, spatial planning is widely represented in the system of non-formal education, as it is a relatively new and increasingly relevant field. As noted, initially, educational courses in spatial planning were mainly targeted at representatives of local communities. However, even these courses were and are valuable for instructors, as they typically result in the publication of educational videos, presentations, and spatial planning manuals adapted to the Ukrainian context; all of which can be used in teaching students.

Most recent educational courses are primarily targeted at students. The most popular topics include GIS in spatial planning, transport planning and sustainable mobility, climate and environmental aspects of spatial planning, accessibility, barrier-free environments, and inclusivity. Every year, several new courses of this type appear on major educational platforms; however, their overall number still seems to be insufficient.

5.5. Foreign experience in training specialists in spatial planning: guidelines for Ukraine

Among the developers of educational programs related to spatial planning, there is uncertainty about the future of their 'creations', as the role of spatial planning within the higher education system remains undefined,

and there are concerns about a potential major shift in the 'rules of the game' imposed by the state. The Ministry of Education and Science might decide to strictly align spatial planning programs with the specialty *Architecture and Urban Planning*, or it might propose the creation of a new specialty based on these programs. If this were to happen; then most of the existing educational programs would require radical revisions, and some might even need to be discontinued entirely. In this context, public discussion about the future of spatial planning in the national higher education system is essential, especially one that considers the experiences of other countries, and particularly EU member states, given Ukraine's aspirations for European integration.

Research indicates that Ukraine's spatial planning system shares many similarities with the systems that exist in Central and Eastern European states that are members of the European Union, and particularly those that formerly had communist regimes (Nowak, Lozynskyy, and Pantyley, 2021; Nowak et al., 2022). During the European integration process, these states implemented reforms including ones related to spatial planning in order to align their practices with common European standards. Despite these advancements, many challenges persist in these countries which are also relevant to Ukraine. In order to compare the training systems for specialists in spatial planning internationally, this paper chose three states Poland, Romania, and the Czech Republic. Two of these countries are immediate neighbours of Ukraine.

A notable feature of higher education in Poland is the inclusion of a separate specialty 'gospodarka przestrzenna'; introduced after the country's administrative and territorial reforms. On their websites, Polish higher education institutions most commonly translate this field into English as 'spatial management', although it is sometimes termed as 'spatial development' or 'land management'. *The Gospodarka przestrzenna* curriculum focuses primarily on spatial planning, territorial management, and various aspects of architecture, urban studies, geography, economics, and law related to spatial planning. Students in this field are usually trained in departments or faculties associated with architecture, urban studies, geography, or Earth sciences. Classic spatial planning ('planowanie przestrzenne') is developing as an academic discipline in Poland.

As of October 2024, educational programmes in *Gospodarka przestrzenna* were offered at the first educational level (engineer/licentiate) by 31 state higher education institutions, and at the second educational level (master's degree) by 26 institutions. This means that training is provided by nearly all leading universities in the country. In some cases, *Gospodarka przestrzenna* appears as part of the title of other fields, such as *Geografia i gospodarka przestrzenna* (Geography and Spatial Management), *Gospodarka przestrzenna i geozarządzanie* (Spatial Management and Geo-Management), or *Nieruchomości i gospodarka przestrzenna* (Real Estate and Spatial Management) (RAD-on, n.d.).

In Romania, a list of fields of knowledge, specialities, and competencies has been legally established. In the bachelor's degree programme, there are specialities such as *Urban Design and Planning (Proiectare şi planiare urbană)*, *Territorial Planning (Planificare teritorială)*, and *Landscape Design and Planning (Amenajarea şi planificarea pejazaului)*. *Territorial Planning* falls within the field of *Earth and Atmospheric Sciences*, under the speciality *Geography*. *Urban Design and Planning* and *Landscape Design and Planning* belong to the field of knowledge *Architecture and Urbanism*, under the speciality *Urbanism* (Hotărăre, n.d.).

As of October 2024, there were five universities in Romania offering a bachelor's programme in Territorial Planning: the University of Bucharest (in the capital, as well as at its branch in the city of Drobeta-Turnu Severin), Babeș-Bolyai University in Cluj-Napoca (including a programme in Hungarian), Alexandru Ioan Cuza University (in Iași and at its branch in Focșani), the University of Oradea, and the West University of Timișoara. Bachelor's programmes in *Urban Design and Planning* and *Landscape Design and Planning* were offered exclusively at the Ion Mincu University of Architecture and Urban Planning in Bucharest (Hotărăre, n.d.).

There is no legally established list of master's degree programmes in Romania. As a result, the names of specialities related to spatial planning vary significantly between universities (Table 3).

Table 2. Master's degree programs related to spatial planning in Romania

University name	Field of study	Educational program
Technical University of Civil Engineering of Bucharest	Geodetic engineering	Engineering geodetic spatial planning and GIS (Geographic Information System) for sustainable development
	Civil construction and installations	Urban and regional development
'Ion Mincu' University of Architecture and Urban Planning in Bucharest	Urbanism	Spatial planning and regional development, Urban design, Urban mobility, Landscape and territory
University of Bucharest	Geography	Territorial planning and management of urban and rural areas
	Law	Urban and spatial planning law
Babes-Bolyai University in Cluj-Napoca	Geography	Regional planning and development
University of Oradea	Geography	Territorial management and planning with the help of GIS
Ștefan cel Mare University of Suceava	Geography	GIS and territorial planning
West University of Timisoara	Geography	Planning and sustainable development of the territory
Polytechnic University of Timisoara	Architecture	Urbanism and territorial planning

Compiled on the basis of: (Hotărare-master, n.d.).

In the Czech Republic, bachelor's and master's programmes in spatial planning (územní plánování, prostorové plánování) are offered at two universities: the Czech University of Life Sciences in Prague – bachelor's degree programme in *Territorial Planning* and master's degree programmes in *Spatial Planning and Landscape Planning*; and the University of West Bohemia in Pilsen – bachelor's degree programme in *Spatial Planning* (Registr, n.d.). Additionally, subjects on spatial planning are included in some programmes within specialities such as *Geography* and *Architecture and Urbanism* at other universities.

The experience of Central and Eastern states neighbouring Ukraine in the development of spatial planning related education leads to the conclusion that in Ukraine, the specialisation of academic institutions in the field of spatial planning is expected to evolve gradually, aligning with distinct subfields such as general spatial planning, urban planning, landscape planning, and regional planning. A noteworthy example can be observed in Poland, where a separate academic discipline – gospodarka przestrzenna – has been formally recognised within the national framework of higher education as an independent field of study, which involves acquiring knowledge of spatial planning, and territory management, in combination with various issues pertaining to architecture, urban studies, geography, economics, and law related to spatial planning. The realisation of a comparable interdisciplinary approach in Ukraine is, however, unlikely. It is also unlikely that a separate specialty in *Spatial Planning* will be introduced. This is unsurprising given that 'spatial planning' as a type of activity still does not exist in Ukrainian legislation. Spatial planning as an independent profession is not clearly institutionally defined and, as a result, the training of specialists in this field carries numerous risks.

The experience of Ukraine's European neighbours is also valuable in the context of developing educational partnerships between universities in different countries, and particularly so when establishing so-called dual degree programs. This is a relatively common practice in Ukraine's higher education system, and results in a student receiving two diplomas – one from a Ukrainian university and another from a partner institution in an EU member state. Developing such dual degree programs in the field of spatial planning appears especially feasible with universities in Romania or the Czech Republic, particularly at master's level.

6. Discussion and Conclusions

The research findings of this paper are significant for governmental bodies, other researchers, educators, and the general public. They provide an opportunity to identify and explain the development characteristics as well as the current state of education in the field of spatial planning in Ukraine – a nation that has undergone political transition since the late 1980s to early 1990s as it has continued to move from an authoritarian regime to a democracy. In such transitioning states, the development of spatial planning, including education in the field, has historically been very slow. Prior to the period of political transition, spatial planning in Ukraine had not emerged as a distinct professional activity or as an educational speciality that was separate from general urban planning. Contributing factors to the existence of this scenario include both the non-market nature of the economy, and the lack of democracy; both have hindered the development of public participation tools.

In Ukraine, where political transition remains incomplete, there is still no official recognition of the profession of 'spatial planning specialist'. Instead, there are 'urban planning documentation developers' (responsible for general plans, detailed territory plans) who are insufficiently trained in the economic, environmental, and social aspects of spatial planning. Additionally, there is no adequate training in regional planning. To address this gap higher education institutions, have, in recent years, introduced numerous programmes with titles such as *Spatial Planning, Territorial Planning*, and *Urban Planning*. However, these programmes present significant employment risks for graduates because the state still only officially recognises the profession of *urban planning documentation developer.*

At the same time, a system of informal education in spatial planning supported by international organisations has gained popularity in Ukraine. This is driven by state policies on European integration and administrative-territorial reforms, both of which require local government employees in communities to possess comprehensive knowledge of spatial planning. The state also encourages connections between universities and non-formal education as this improves the practical orientation of educational programs related to spatial planning.

Analysis of higher education in selected Central European countries such as Poland, Romania, the Czech Republic – nations that have already completed their political transitions and are democratic states – reveals that they have used diverse approaches to building robust systems of education in spatial planning, with varying degrees of success. Unlike Ukraine, these countries experienced shorter periods of authoritarian regimes and are members of the European Union; with the latter actively supporting the resolution of various educational challenges faced by its new member states. The experience of Ukraine's neighbouring EU member states in training spatial planning specialists provides guidance to Ukrainian higher education institutions and suggests promising directions for cooperation, particularly regarding dual degree programs.

The main challenges that modern Ukraine faces are: countering Russian military aggression, addressing its consequences, rebuilding destroyed cities and villages, and reforming society on its path to European Union membership. These challenges cannot be overcome without establishing an effective multi-level system of spatial planning, including comprehensive professional training in higher education institutions. To achieve this, Ukrainian legislation must explicitly define spatial planning as a distinct type of activity and institutionally establish spatial planning as an independent profession with clearly delineated competencies and areas of operation. The proactive efforts of higher education institutions in recent years to develop new educational programmes related to spatial planning demonstrate that Ukrainian researchers and educators are ready to ensure the training of such professionals.

References

Alliance (2024) The fourth training program 'Spatial Planning for Territorial Communities' of the Alliance of Ukrainian Universities began in Kyiv. [Online]. Available from: https://auu.com.ua/activities/u-kyyevi-rozpochalasya-chetverta-navchalna-programa-prostorove-planuvannya-dlya-terytorialnyh-gromad/ [in Ukrainian]. Accessed [18/10/2024].

CANactions School (2018) Integrated spatial planning for united territorial communities [Online] Available from: https://hromada.canactions.com/ [in Ukrainian]. Accessed [18/10/2024].

Decentralisation (n.d.) Ukrainian universities trained the first specialists in spatial planning in Ukraine. [Online] Available from: https://decentralization.ua/news/16826 [in Ukrainian] Accessed [18/10/2024].

education database (n.d.) The only state electronic database on education [Online] Available from: https://info.edbo.gov.ua/ [in Ukrainian] Accessed [18/10/2024].

Garat, Mykhailo (2019) Genesis of urban legislation in Ukraine. *Foreign trade: economics, finance, law*. 5, pp. 101–116. DOI: https://doi.org/10.31617/zt.knute.2019(106)09 [in Ukrainian].

Habrel, Mykola, Kosmii, M. and Habrel Mykhailo (2022) Meritocentric model of spatial development in Ukraine: updating the general scheme of planning of the state territory. *Spatium*. 47, pp. 21–31. DOI: https://doi.org/10.2298/SPAT211123008H .

Hotărăre (n.d.) Hotărâre pentru modificarea anexelor nr. 1–5 la Hotărârea Guvernului nr. 412/2024 privind aprobarea Nomenclatorului domeniilor și al specializărilor/ programelor de studii universitare și a structurii instituțiilor de învățământ superior pentru anul universitar 2024– 2025*). Agenția Română de Asigurare a Calității în Învățământul Superior. [Online] Available from: https://www.aracis.ro/wp-content/uploads/2024/08/HG-1030-2024_LICENTA.pdf Accessed [18/10/2024].

Hotărăre-master (n.d.) Hotărâre pentru modificarea anexelor nr. 1 și 2 la Hotărârea Guvernului nr. 413/2024 privind aprobarea domeniilor și programelor de studii universitare de master acreditate și a numărului maxim de studenți ce pot fi școlarizați în anul universitar 2024–2025*). Agenția Română de Asigurare a Calității în Învățământul Superior. [Online] Available from: https://www.aracis.ro/wp-content/uploads/2024/08/HG-1031-2024-MASTERAT.pdf Accessed [18/10/2024].

Julie's Data (n.d.). Julie's Data: Geoinformation systems for territory management. [Online]. Available from: https://juliesdata.com/ Accessed [18/10/2024].

Law of Ukraine 'About General scheme of planning of the territory of Ukraine' (2002) Information of the Verkhovna Rada of Ukraine. 30: 204. Available from: https://zakon.rada.gov.ua/laws/show/3059-14#Text [in Ukrainian].

Law of Ukraine 'About regulation of urban planning activity' (2011) Information of the Verkhovna Rada of Ukraine, 34: 343. Available from: https://zakon.rada.gov.ua/laws/show/3038-17#Text [in Ukrainian] .

List (2024) On Amendments to the List of Fields of Knowledge and Specialties for the Training of Applicants for Higher and Professional Higher Education. Resolution of the Cabinet of Ministers of Ukraine of August 30, 2024, No. 1021. [Online] Available from: https://zakon.rada.gov.ua/laws/show/1021-2024-%D0%BF#Text [in Ukrainian] [18/10/2024].

Lozynskyy, Roman, Oksana Sklyarska, Halyna Labinska, and Oksana Stetsyuk. Spatial planning problems in Ukraine: do we need a complete renewal reform? Society and national interests. № 5 (5). 2024. pp. 567–583. https://doi.org/10.52058/3041-1572-2024-5(5)-567-583 [in Ukrainian].

Maruniak, Eugenia, Palekha, Yurii and Kryshtop, Tetiana (2023) Planning of Spatial Development in Times of War and Reconstruction: a Vision for Ukraine. *Ukrainian Geographical Journal*, 4, 13–22. DOI: https://doi.org/10.15407/ugz2022.04.013

Nowak, Maciej, Roman Lozynskyy and Viktoriya Pantyley (2021) Local spatial policy in Ukraine and Poland. Studia z Polityki Publicznej / *Public Policy Studies*, Warsaw School of Economics, 8(3), November: pp. 1–17. https://doi.org/10.33119/kszpp/2021.3.1

Nowak, Maciej, Viktoriya Pantyley, Małgorzata Blaszke, Liudmila Fakeyeva, Roman Lozynskyy, and Alexandru-Ionut Petrisor Spatial Planning at the National Level: Comparison of (2023) Legal and Strategic Instruments in a Case Study of Belarus, Ukraine, and Poland. *Land, 12*, 1364. https://doi.org/10.3390/land12071364

Nowak, Maciej, Alexandru-Ionut Petrisor, Andrei Mitrea, Krisztina Filepné Kovács, Gunta Lukstina, Evelin Jürgenson, Zuzana Ladzianska, Velislava Simeonova, Roman Lozynskyy, Vit Rezac, and et al. (2022) The Role of Spatial Plans Adopted at the Local Level in the Spatial Planning Systems of Central and Eastern European Countries. *Land , 11*, 1599. https://doi.org/10.3390/land11091599

Program, Kyiv (2025) Educational and professional program 'Urban Studies and Urban Planning'. Taras Shevchenko National University of Kyiv. [Online] Available from: https://geo.knu.ua/wp-content/uploads/2025/02/ump_2025_bakalavr_proyekt-opysu.pdf [in Ukrainian] [21/05/2025].

Program, Lviv (2024) Educational and professional program 'Urban Studies, Spatial Planning and Regional Development'. Ivan Franko National University of Lviv. [Online] Available from: https://geography.lnu.edu.ua/wp-content/uploads/2025/02/OPP_106_bachelor_Urbanistyka_prostorove_planuvannia_i_rehionalnyi_rozvytok_20 [in Ukrainian] [21/05/2025].

Program, Chernivtsi (2023) Educational and professional program 'Regional Development and Spatial Planning'. Yuriy Fedkovych Chernivtsi National Universit. [Online] Available from: https://geo.chnu.edu.ua/media/x0nbxfn2/opp_rr_bak_23.pdf [in Ukrainian] [21/05/2025].

Radzihovska, Larysa, Hulivata, Inna, Husak, Liudmyla, Nikolina, Iryna and Ivashchuk, Oleh (2023) Peculiarities of evaluating the results of implementation of regional development programs in Ukraine. *Scientific Bulletin of National Mining University*, 2, 171–176. DOI: https://doi.org/10.33271/nvngu/2023-2/171

Registr (n.d.) Registr vysokých škol a uskutečňovaných studijních programů. Ministerstvo školství, mládeže a tělovýchovy České republiky. [Online] Available from: https://regvssp.msmt.cz/registrvssp/csplist.aspx Accessed [18/10/2024]

Studia (n.d.) Studia prowadzone na określonym kierunku. RAD-on. Ministerstwo Nauki i Szkolnictwa Wyższego. [Online] Available from: https://radon.nauka.gov.pl/dane/studia-prowadzone-na-okreslonym-kierunku Accessed [18/10/2024]

U-LEAD (2024) U-LEAD launches the online course 'Spatial planning in a territorial community' Available from: https://u-lead.org.ua/news/470 [in Ukrainian] [18/10/2024].

U-LEAD (n.d.) U-LEAD educates communities about spatial planning. [Online] Available from: https://www.ukrinform.ua/rubric-regions/3587441-ulead-navcae-gromadi-osoblivostam-prostorovogo-planuvanna.html [in Ukrainian] [18/10/2024].

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CROSSING BORDERS: ACTIONABLE KNOWLEDGE FOR INTEGRATED URBAN DEVELOPMENT PLANNING IN UKRAINE

Frank Schwartze[1], Antonia Breckwoldt[2], Detlef Kurth[3], Anna Kuzyhshyn[4], Yana Maksymchuk-Hagelstein[4], Poliksen Qorri-Dragaj[4], Silke Weidner[5], Christoph Wessling[6], Sepideh Zarrin Ghalam[6]

Abstract

This paper explores various initiatives that have been implemented with a view to strengthening integrated urban development in Ukraine. It emphasises the importance of actionable knowledge and international academic cooperation and it highlights the challenges posed by Ukraine's political decentralisation and war-related crises; both have strained urban planning capacities. Programmes such as Ukraine Digital and German-Ukrainian partnerships address these needs through digital education, scholarships, and joint courses. The Competence Platform for Integrated Urban Development presented here offers modular courses, tools, and case studies that promote interdisciplinary learning. Teaching modules include lectures, seminars, design studios, and workshops focused on urban resilience, reconstruction, and participatory planning. These initiatives aim to prepare students and municipalities for sustainable and resilient development. Future goals include establishing dual degree programmes and expanding international cooperation to comprehensively rebuild Ukraine's cities, in line with the principles of the New Leipzig Charter.

Keywords:

Capacity building; urban planning study programmes; integrated urban development; reconstruction; digital learning .

1 Prof., Professorship Urbanism and Planning, Technische Hochschule Lübeck, University of Applied Sciences, Germany
frank.schwartze@th-luebeck.de

2 Technische Hochschule Lübeck, University of Applied Sciences, Germany

3 Prof. Dr., Chair of Urban Planning, RPTU Kaiserslautern, Germany,

4 RPTU Kaiserslautern, Germany

5 Prof. Dr., Head of Department Urban Planning, Chair of Urban Management, Brandenburgische Technische Universität Cottbus-Senftenberg (BTU), Germany

6 Brandenburgische Technische Universität Cottbus-Senftenberg (BTU), Germany

1. Introduction and Overview

In order to successfully manage a targeted and sustainable reconstruction in Ukraine in line with the "Building Back Better" framework, there is a need to establish and/or empower suitable institutions that are capable of taking action. A key factor in this empowerment will be the provision and transfer of instrumental and methodological knowledge for practical application by relevant actors at Ukrainian universities. Among other areas, this need also applies to urban planning, which is a tool for managing infrastructural and spatial development, especially at the local level. Urban planning also plays a central role in the implementation of sustainable and integrated urban development, as outlined in the European Leipzig Charter – and Ukraine is already engaged in EU accession negotiations (BMI 2024).

The implementation of an integrated urban development approach poses particular challenges for relevant actors in Ukraine. This is for two primary reasons. First, since the political upheavals in Ukraine in 2014, there has been an increased shift of competencies and decision-making powers to municipalities as part of the decentralisation process, although the simultaneous development of corresponding professional capacities has almost not kept pace. Second, decentralisation has transferred new requirements to the municipalities including the creation of integrated urban development concepts; a completely new technical and methodological approach to spatial planning for many of the municipalities. Moreover, the implementation of these partly informal planning instruments and their integration into the planning culture remains a challenge. The role of their steering effect as non-formal instruments is viewed critically, their function is often limited to participation functions, and they are not regarded as genuine "real" spatial plans (Steinkemper, Vlasenko 2024).

Given this context, various initiatives have arisen in Ukraine since the outbreak of the war to support planning capacities and knowledge. There is a growing community in Ukraine that is driving the establishment of new courses and initiatives to build actionable knowledge for integrated planning and reconstruction. Such initiatives include, amongst others,

- "New European Bauhaus Lab "Actions for Ukraine" which has been organised by the Ukrainian partners Ro3kvit,
- "ReThink", the Covenant of Mayors East and the Architects' Council of Europe (New European Bauhaus, 2023),
- "Urban Recovery Guide" by the non-profit civil society organisation "Urbanyna" (Urbanyna 2023).

As a further development of these initiatives, existing and future degree programs in urban planning will play an important role in shaping the development of planning culture and expertise. They impart methodological and technical knowledge while also contributing to the reflection and further development of planning practice. However, there are still no complete bachelor's and consecutive degree programs in urban and regional planning in Ukraine. In particular, there are no programs that comprehensively collect and disseminate planning knowledge and go beyond a purely design- or economically-determined distribution of functions and forms in space. In some European countries, urban planning has been and continues to be integrated into degree programs such as architecture, civil engineering, or geography. The advanced approach of our own programs should serve as an example, with initial developments such as those at KNUBA pointing the way forward.

Against this background, this paper presents a practice-oriented case study based on the experiences gained through Ukrainian-German cooperation projects in the field of integrated urban development planning. It explores how the insights gained from these experiences can inform and support the future development of planning curricula at Ukrainian universities. The paper illustrates the same via reference to and consideration of projects carried out in programmes funded by the German Federal Government through the German Academic Exchange Service (DAAD) and the German Agency for the International Cooperation (GIZ), and also presents measures that have been implemented through international cooperation that has occurred between several universities. The authors, representing three German planning schools, have worked intensively with six universities in Ukraine offering urban planning courses in the panforukraine network (www.panforukraine.de) since summer 2022. They are part of the «Reconstruction Modules project funded by the DAAD emergency aid programme «Ukraine digital», through which joint courses in various formats on integrated urban development planning and reconstruction have been held over the last two years.

The article begins with an overview of the DAAD programme "Ukraine digital," and outlines its goals to support digital learning and academic continuity during wartime. This is followed by a section focused on needs assessment and a survey of Ukrainian universities which identifies key gaps in urban planning education. The article then shifts to practical responses, and describes the development of collaborative teaching modules as well as the creation of a digital competence platform. Multiple examples of lecture series, seminars, design studios, and workshops illustrate how these modules have been applied. The article concludes by reflecting on the role of actionable, and transdisciplinary knowledge in transformative planning, before highlighting the importance of sustained international cooperation, digital tools, and localised content for rebuilding Ukraine's cities and planning education system.

2. Actionable Knowledge for Integrated Urban Development in Ukraine

2.1 DAAD Programme Ukraine digital - Ensuring academic success in times of crisis

International exchange and cooperation offer institutions and individuals opportunities to expand their knowledge and experiences beyond their own horizons and may also promote intercultural competences. In addition, such initiatives are essential for building communities of responsibility to solve common problems and global challenges. In this context, university cooperation projects, such as those funded by the DAAD, are used specifically to develop new options and support joint learning that goes beyond the individual benefits which can be accrued for students and teachers. In May 2022, the DAAD launched the emergency funding programme 'Ukraine digital - Ensuring student success in times of crisis for the first time. The Russian war of aggression against Ukraine has hit universities hard: Many university buildings have been deliberately destroyed, and many teaching staff and students have either had to flee, or been conscripted into the military. Despite these pressures, most Ukrainian universities have managed to maintain their study programmes in digital form. The DAAD funding programme aims to support Ukrainian universities in maintaining and expanding digital teaching via a virtual learning platform. The specific objectives of the programme are: To identify needs for digital teaching within current study programmes in Ukraine; the expansion of digital teaching programmes; making the same available to students; integrating academics and university lecturers, particularly those who are refugees, into the initiated teaching programmes; and establishing the necessary skills and structural framework conditions for the continued digitalisation of the participating German and Ukrainian universities.

In addition, scholarships have been awarded to Ukrainian academics and students, especially refugees. The programmes created lasting connections that are important not only for reconstruction, but also future German-Ukrainian university cooperation.

2.2 Demand and needs for future urban planning programmes

In addition to the range of structures, tools, and financing available in international and cooperative study and exchange programmes, content development that generates added value for participants and responds to existing demand is an essential component.

The concept of actionable knowledge refers to information or insights that can be directly applied to decision-making or practical tasks, and lead to tangible outcomes. In the field of urban planning, and especially with regard to integrated planning, the link between knowledge and demands – often from different sectors – as well as concrete actions and decisions are an essential basis. The framework for action and decision-making is characterised by collective processes and the existence of a direct link to implementation and application.

For these reasons, the requirements for knowledge transfer and practical skills in urban planning study programmes have developed strongly towards trans- and interdisciplinary methods over recent decades. New formats, in particular for practice-oriented teaching and learning, have been developed; for example, in so-called integrated project studies. A main basis for the accreditation of planning study programs in Germany is the criteria formulated by the Association of urban planning study programs (Akkreditierungsverbund für Studiengaenge der Architektur und Planung ASAP) which encompass knowledge, skills, social competencies,

and independence. These criteria are set out in a qualification framework and supplement general accreditation standards (ASAP 2022). Experience from the introduction of standalone urban planning programmes in other countries was also evaluated. The implementation of urban planning studies at Polish universities such as Gdansk and Wroclaw in the 2000s shows that there are general elements such as urban development, urban regeneration and urban design which are connected with theoretical and legislative fundamentals as well as sectoral links. However, it is also evident that each country must find its own approach within its own existing higher education system (Frank; Kurth; Mironowicz 2012/ Frank; Kurth 2010). Besides the challenges in war regions, we are facing a number of other urgent challenges including: a turning point in the use of land and construction, the mobility transition, issues pertaining to climate protection and biodiversity, migration, and social cohesion. It is high time to develop a pathway towards transformative planning and develop processes and instruments for implementation of the same across the board. In order to achieve this, universities and planning practise need to change their existent values and also adjust their t goals, planning, and decision-making processes. Approaches pertaining to transformative teaching and research, as a productive contribution to science, have already been outlined by the German Advisory Council on Global Change (WBGU) in 2011, the New Leipzig Charter 2020, and the 'House of the Earth' at international and European levels. In Germany, the Association of German Architects (BDA) has formulated positions for climate-friendly architecture in the city and countryside as well as recommendations for teaching. The Academy for Territorial Development in the Leibniz Association (ARL) named concrete implementation steps for sustainable spatial planning in 2021, and there has also been analysis of the situation pertaining to transformative aspects in the curricula of planning studies "The Great Transformation for Sustainable Spatial Development as a Challenge for University Education" (Wagner et al 2024). First paths of action for readjusting activities at urban and regional planning levels can be found in the DASL Berlin Declaration from 2022 and – focusing on education and universities - the Basel Theses 2024. Universities and colleges play key roles as educational centres for future experts in transformative planning: they promote cultures of social, ecological, and economic responsibility; prepare future decision-makers and designers for the tasks ahead; generate the necessary knowledge; draw conclusions for application in planning; and test pioneering concepts.

2.3 Surveys and exchange to analyse needs

In order to respond to the above-mentioned requirements in the future design of study programmes in urban planning, various forms of needs assessment - with a specific focus on the existing programmes at the partner universities in Ukraine - were carried out as part of the cooperation.

At the end of 2022, the seven universities involved in the DAAD partner project (see Figure 1) were contacted with a detailed questionnaire. The questionnaire included a general survey on the structure of urban planning programs and the number of students engaged upon the same, the consequences of the war for the implementation of those programs, the organisational requirements and needs for cooperation, and the specification of thematic priorities. The question categories were divided into four to six sub-questions, which each answered in written form by the partner universities in free text responses. The answers were provided by those involved in the program or those responsible for it, or by the respective deans, and in one case by the International Office. For this article, a qualitative analysis of two master's programs from 2018, which was carried out as part of a peer exchange between lecturers, was also taken into account. The survey was enriched by expert interviews and various online expert workshops organised by our group. In addition, the real-world labs conducted at the end, which were prepared together with colleagues from Ukraine and students from both countries, provided additional insight into the experiences gained, particularly in the implementation of interdisciplinary and transdisciplinary formats.

The results and assessment presented below identify a range of focal points as well as indications for the further development of urban planning programmes in Ukraine. They are the results of practical cooperation and concrete case-based activities undertaken by a selection of cooperation partners. Despite these methodological and qualitative limitations, it is possible to generate an initial orientation for the future direction of the programmes.

2.3.1 Findings from Cooperative Development of Master's Degree Programmes

The cooperative development of masters' degree programmes in urban planning in Ukraine, which took place in 2018, provided initial insights into which topics and content could be relevant for Ukrainian programs. The exchange at that time took place with and on the planning study programmes in Poltava and Chernivtsi and compared their approaches with German curricula.

The general structure of study programmes varied across disciplines. For instance, planning theory was less intensively integrated into the curricula at the universities in Poltava and Chernivtsi, with both planning processes and the social role of urban planning receiving only limited attention. Significant discrepancies existed between universities in Ukraine and those in Germany regarding interdisciplinary teaching; notably, social science approaches and methods were not explored to the same extent. Similarly, planning law and planning management issues were not regarded as integral components of the curriculum. In general, the universities placed a strong emphasis on urban design, and focused predominantly on the construction of large new developments, while the redevelopment of existing buildings and the critical evaluation of established urban structures received little attention. There was some overlap in teaching content between the institutions, particularly in urban planning and building theory, and with regard to aspects of sustainable urban planning - especially those related to energy efficiency. In discussions with colleagues about the existing subjects in their curricula and in relation to the challenges of urban development, the need for transdisciplinary research and the importance of integrating research findings into practical and academic work was identified. This process, a two-way exchange between science and everyday practice, has largely not taken place in Ukraine to date.

2.3.2 Results of a Survey of Needs and Challenges of Teaching at Ukrainian Partner Universities

Another source for identifying needs was the survey conducted at the beginning of the DAAD project 'Digital Learning Platform - ReConstruction Modules and Integrated Urban Development'. The question was in which thematic key areas German universities could support Ukrainian partners in addressing the educational challenges during the war.

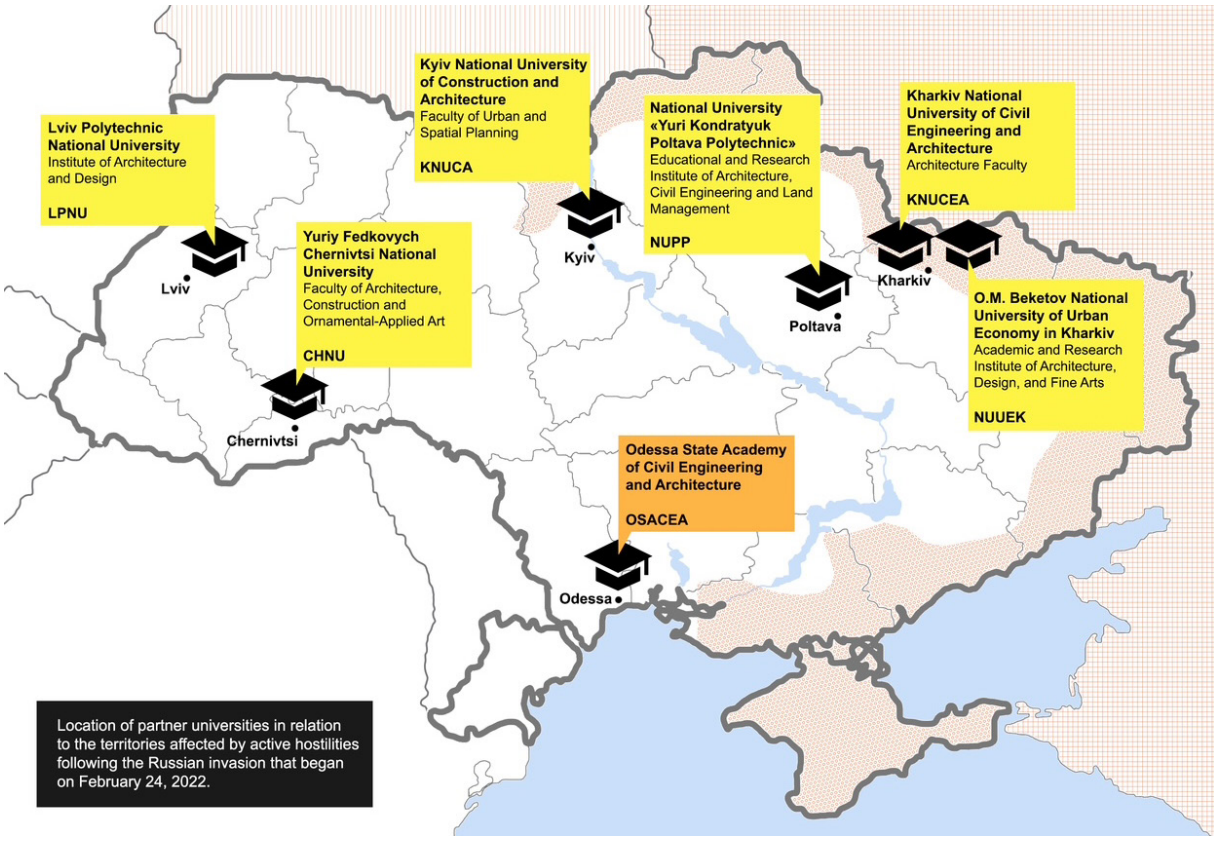

Fig. 1: Ukrainian Partner Universities (Source: Authors).

Since the full-scale Russian invasion, four universities have switched completely to online learning with a further have switched partially; this has enabled displaced students and staff to continue their education. The technical infrastructure and skills developed by universities, faculty, and students during the COVID-19 pandemic enabled a rapid transition to digital learning under wartime conditions. However, persistent challenges such as permanent bombardments, unstable internet connectivity, and power cuts continue to hinder educational processes.

Since 24 February 2022, the number of active students at universities located in the regions of Ukraine most affected by military hostilities has decreased. This reduction is primarily due to their forced displacement to western and central Ukraine or their relocation abroad. This has particularly affected students from Kyiv, Odesa, and Kharkiv universities (Fig.2).

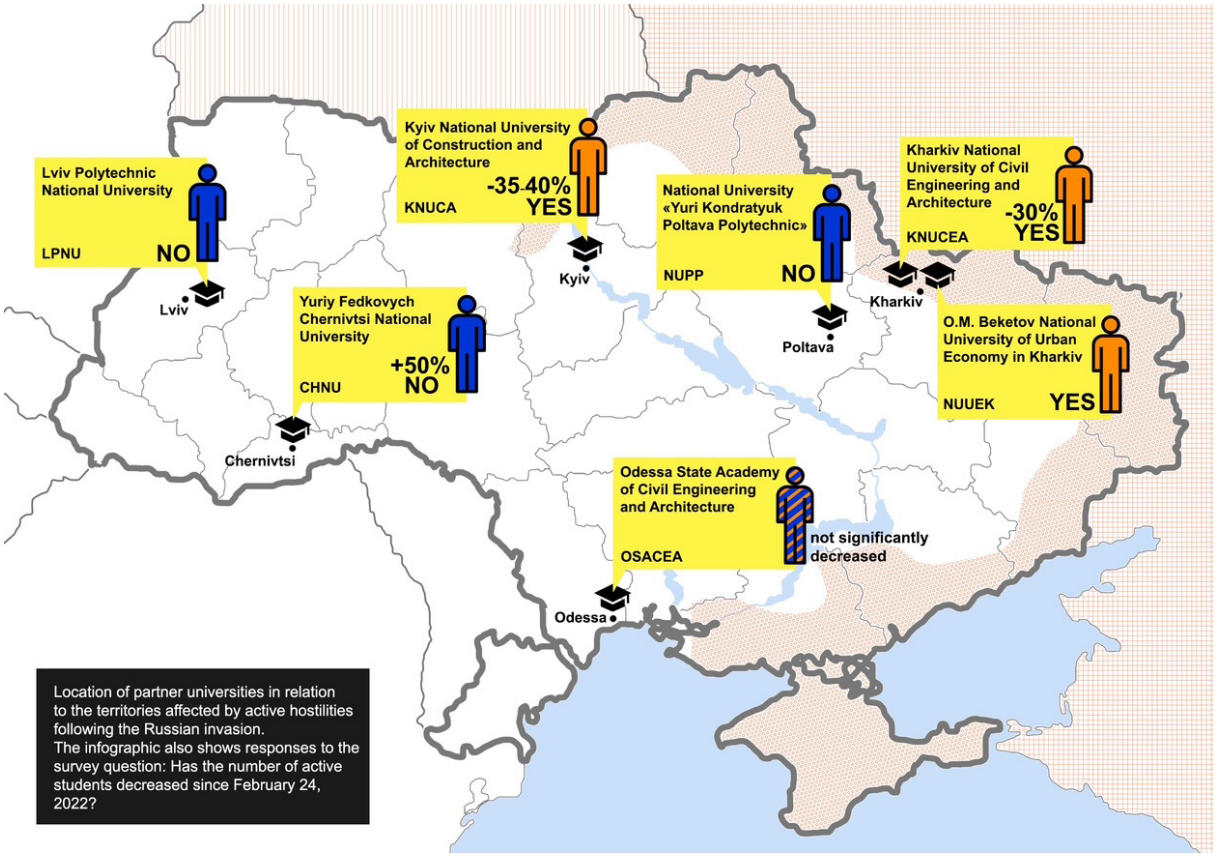

Fig. 2: Statistics on the number of active students in Ukrainian universities as of 24 February 2022 (Source: Authors).

All participating institutions expressed a strong interest in collaboration and identified several urgent training needs. These include post-conflict urban reconstruction and rehabilitation, integrated urban planning strategies, housing solutions for internally displaced persons (IDPs), sustainable and resilient urban development, and enhancing public participation in spatial planning processes.

To address these needs, the institutions proposed joint student consultations on diploma projects, the integration of German academic content into existing curricula, and faculty development through targeted workshops. Ukrainian universities also reported significant gaps in their curricula, particularly in areas such as urban rehabilitation strategies; modern planning models like those outlined in the Leipzig Charter; participatory approaches to urban development; and the principles of sustainable and resilient city planning.

In addition, there was a marked interest in gaining deeper insights into the German planning system. This included a want for greater understanding of planning laws and instruments, exploration of urban development methods and theories, and learning about non-formal instruments used in urban development practices.

The survey showed that, while all partner universities were largely able to maintain their teaching digitally, there were also shortcomings due to a lack of teaching staff.

On the basis of the results of the two surveys, the intensive interviews undertaken, and expert workshops held with the Ukrainian partner universities, formats and content for collaborative Teaching Modules for Integrated Urban Development were developed and implemented with the support of funding. This included the awarding of scholarships for students and teachers to implement the teaching modules. In addition, a second GIZ-funded programme established a digital Competence Platform for Integrated Urban Development to provide knowledge and self-learning offers. Both are briefly described in the following section.

3. Capacity Building Projects and Activities for Integrated Urban Development

3.1 The Competence Platform for Integrated Urban Development

Digitalisation in the education sector is generally considered to play an important role in supporting the task of transformation (ref). It enables access to knowledge and skills regardless of time and place, and is therefore particularly suitable in crisis situations as a complementary or substitute for education. In addition to the physical activities of the co-operation described below, a brief overview of the competence platform developed as part of the activities is given. The competence platform is a digital learning environment that offers teaching and learning courses on key topics in the field of integrated urban development and reconstruction in Ukraine. It is available to all interested parties for further development and use. It is available in two languages, Ukrainian and English. The platform is designed to be modular and expandable; enabling it to be used according to educational interests and different needs. It can be flexibly adapted and used for both curricula development in university study programmes and in continuing education within municipalities.

In the first development phase, the focus of the platform is on its use in the context of further education. To this end, four courses have been developed; they are modular and consistent in their internal structures. The first topics identified for the four courses were: Processes and Formats of Spatial Planning, Integrated Urban Planning and Development, Urban Design and Urban Regeneration and Reconstruction.

The platform consists of several courses as well as a collection of tools and a series of case studies. Each course includes a theory sections, tools, and case studies. The theory component includes lectures and assigned readings; the tools section provides essential resources for integrated urban development; and the case study section showcases Ukrainian and international good practices. All three sections are closely interconnected and run concurrently throughout the courses. All tools and case studies used and presented in the courses are collected in the tool and case study collections.

The courses consist of 8 chapters; each divided into theoretical sections, tools, and case studies. Each chapter has a total length of 60 to 90 minutes, and is divided into several lessons. A lesson consists of a video of 10-15 minutes and/or a text/reading part of 10-15 minutes. Each chapter ends with a short summary, and a review and test section. The tools used and presented in the courses are collected in the Tool Collection. The tools are briefly described in 5 -15 minutes videos.

The cases used and presented in the courses are collected in the Case Study Collection. The case studies are briefly described in 5 - 15 minutes videos. The platform primarily presents case studies from Ukraine.

In close coordination with the identified needs for integrated urban development in Ukraine, the content was created by mixed teams of two experts; one German/international expert and one Ukrainian expert. Depending on the focus of the specific content, selection was made from either the academic or the practical field. Graduates of the modules can continue to use the modules independently with other groups (e.g. from administrative units), and are supported by a peer-to-peer exchange. Thanks to the open approach, the platform offers the possibility of establishing a community of practice which, by evaluating the questions, may provide additional insights for the further development of teaching and learning opportunities (e.g. new master's level programmes) in Ukraine.

3.2 Examples of Teaching Modules for Integrated Urban Development

The project involved more than 100 students who received DAAD scholarships. Different teaching modules were developed for them, and these are also open to other students and academics. The modules were divided into the following different formats as lecture series, seminars, urban design studios and workshops.

3.2.1 Lecture series

Every semester, an online lecture series was held to provide a basic understanding of the main topics of integrated urban development and urban reconstruction. It took place every two weeks for students, researchers and academics from Ukraine and Germany. Experts from academia and practice enriched the discourse with their invaluable perspectives from global projects as well as the Ukrainian and German contexts. There was meaningful dialogue on the pressing challenges and prospects for Ukrainian cities.

During the lecture series, the necessary concepts and procedures for the other modules ware presented, supplemented by concrete case studies and related to planning practice in Ukraine. At the final event of each lecture series with the Ukrainian partner universities, the students present the results of their work.

3.2.2 Seminars

Several seminars focused on post-disaster reconstruction strategies, resilience strategies, refugee shelters, and public space design. They were based on the 'Build Back Better' approach, which aims not only to rebuild disaster-affected areas, but also to increase their future resilience through holistic and long-term reconstruction strategies. International and diverse case study comparisons identified institutional capacity and commitment, as well as public trust in these institutions as key factors for successful and truly 'better' reconstruction. Such trust may be achieved, among other things, through early action to strengthen social cohesion and social capital in the long term.

Students also explored different tools and case studies for reconstruction, with a focus on affordable housing. Questions arose pertaining to which established instruments could be optimised, and how innovative and short-term measures could meet acute housing needs. Flexible models of refugee accommodation were analysed to determine their suitability as permanent housing. They also compared different models of affordable housing and analysed alternative housing models. As the housing market in Eastern Europe is almost exclusively owner-occupied, recommendations were developed for more rental housing, as well as more social housing.

The course «Town and House: Reconstruction of Historic Cities» sought to familiarise students with the complex aspects of urban reconstruction, particularly in war-affected areas of cultural significance, as part of an integrated urban development process. The course consisted of seven biweekly online sessions in which students received input from academics from partner universities. These lectures covered several interrelated topics, including: urban morphology, the logic of cities, urban renewal, participatory planning, building back better, and integrated recovery planning. Throughout the semester, students worked on assignments linked to the lectures, such as analysing urban and morphological structures, assessing the current state of planning, conducting stakeholder analyses, and studying international case studies. The final aim was to formulate recovery visions and guidelines for selected case study areas in Ukraine.

Fig. 3: Student practice on post-war recovery planning of Kharkiv's historic area as a potential to enhance public spaces (Source: Authors).

Another course, delivered in a hybrid format, focused on linking integrated urban development planning with urban design in the context of Chernivtsi. Given the challenges posed by the ongoing war, the course aimed not only to respond to immediate needs, but also to shape long-term visions for a resilient and sustainable city. The central theme was the redevelopment of the area around Chernivtsi's main railway station, including the creation of a new mobility hub, strengthening connections between the station and the old town, and the transformation of a nearby industrial area into a mixed-use neighbourhood.7

A key strength of the course was its combination of face-to-face workshops with online lectures and consultations. The first workshop in Chernivtsi, open to Ukrainian students, focused on surveys, mapping, and analysis. The second workshop in Mannheim brought together Ukrainian, German, and international students to not learn from a similar case in Mannheim, but also develop concrete and contextualised design proposals for Chernivtsi. For many Ukrainian students used to studying mainly online, these face-to-face workshops provided opportunities for direct engagement and multicultural exchange. Beyond the academic collaboration, the involvement of city officials from Mannheim and Chernivtsi enhanced the practical impact of the course, and allowed the students' proposals to contribute to real urban development discussions.

3.2.3. Urban Design Studio New Housing for IDP

There were various urban design studios on topics such as new housing, urban regeneration, and public spaces. Most of the meetings took place online, but there were also some week-long face-to-face workshops in Ukraine and Germany. These in-person workshops were very important for enhancing personal understanding and analysis of the local genius of the project area.

An urban design studio entitled 'Resilient urban neighbourhoods - strategies for the development of a medium-sized city to overcome the housing shortage' was offered for the city of Drohobych in 2023. This city is located in western Ukraine and is facing a housing shortage due to the large number of refugees who have arrived in it from war zones. After a detailed analysis of the city as a whole, a site was selected for the development of an innovative and sustainable urban district; students developed alternative scenarios and an urban design for the same. The students first created visions for the area before starting to develop urban design concepts. The studio was accompanied by a series of lectures on the basics of urban planning. Important initial findings for resilient urban development were: the need for an autonomous energy supply, the need for protective structures to protect the population and critical infrastructure, the need to establish mixed use developments with regard to the productive city, as well as ensuring that it was decentralised, reused redundant structures, and the development of a circular economy.

7 The results of this course can be found here: https://miro.com/app/board/uXjVLuezvic=/?share_link_id=324665856613

Fig. 4: Future vision for city of Drohobych (Source: Authors).

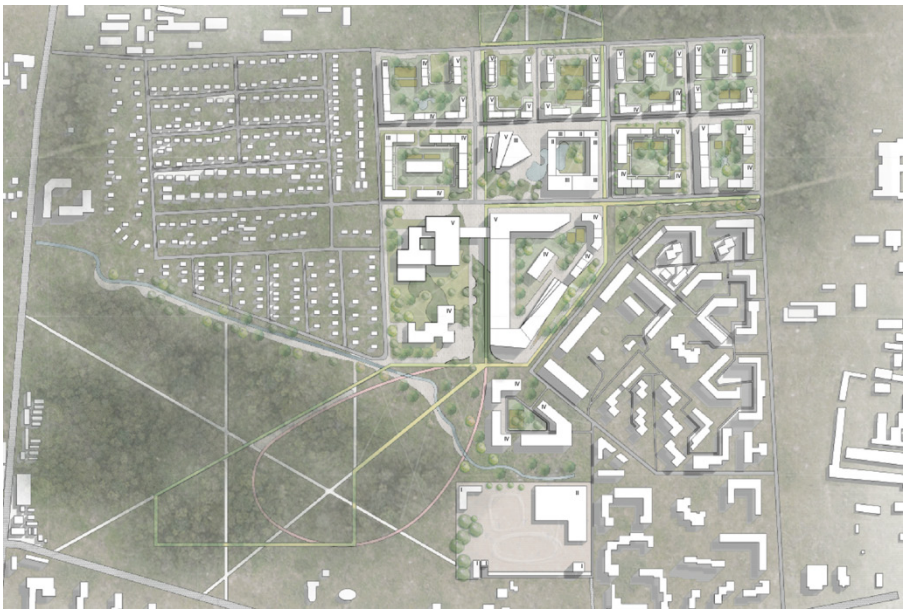

Fig. 5: Future vision for city of Drohobych (Source: Authors).

3.2.4 Urban Design Studio Common Spaces with IDP

Another studio for the city of Drohobych, Common Spaces, focused on the design of public spaces and street furniture. The main guiding principles of the project were to support the integration of IDPs in the new city so as to enhance social resilience and create new narratives in the city for new arrivals whilst also preserving the self-identity of the IDPs, and establishing a trilateral exchange between 'new' citizens, existent local citizens and local authorities.

Dialogue between IDPs and locals usually takes place in public spaces. It is in this space that new narratives can emerge - it is the 'living room' of a city, where every resident, regardless of age, gender or status, feels integrated and identifies with it. The hypothesis was that IDPs would become 'new' residents through the use

of co-designed spaces and participation in workshops and project implementation. By contributing their ideas and resources to the redesign of public spaces, they are given an environment that becomes part of their new history. Students learned to design public spaces based on participatory processes and potential conflicts, as well as how to realise street furniture together.

The project showed that, in times of crisis, public space can be used as a place where IDPs and residents can meet and create new urban identities for their future. Participants not only worked on the theory and design of public spaces, but also discussed and built street furniture on site, which will enhance and revitalise the city centre in the long term.

Fig. 6: Students design and built street furniture for city of Drohobych (Source: Authors).

Fig. 7: Collaborative built street furniture for as a new meeting point (Source: Authors).

3.2.5 Workshops with young lecturers

In addition to the digital teaching programmes, a series of face-to-face workshops were organised for young lecturers and academics in Cottbus and Berlin. These workshops focused on topics such as integrated urban development and urban regeneration. The primary aims of the programmes were to foster personal exchange among participants, deepen the thematic content of the accompanying lecture series, and explore the process-oriented implementation of integrated urban development in greater detail.

The structure of the workshops was built around several core components including: preparation and inventory, the development of visions, objectives, scenarios, and guidelines, as well as aspects of communication, participation, and urban governance. Spatial and detailed planning were also integral parts of the programme. These themes were initially introduced through expert presentations and thereafter explored during guided city walks to selected urban development projects in Cottbus and Berlin. The workshops provided opportunities for critical reflection, particularly through the sharing of examples and experiences by the Ukrainian participants.

The in-person format proved especially valuable, as the small-group city walks encouraged meaningful engagement and spontaneous discussions. These interactions highlighted the importance of direct, face-to-face exchanges as complementary aspects of digital learning formats, as well as their importance in enriching overall educational experiences-.

Fig. 8: Workshop at TU Berlin 2022 (Source; Authors).

All of the classes were recorded and made available on the digital learning platform. In addition, the Ukrainian-language offering will be continuously expanded in order to overcome language barriers and to enable translation of specialist vocabulary in the field of integrated urban planning into a glossary. The aim of collaboration in presence and online is to intensify exchanges with the Ukrainian partner universities and to jointly develop a stable (digital) learning infrastructure. This will provide the basis for a transition to long-term cooperation after the withdrawal of the Russian occupying forces, with face-to-face workshops (as before the war) and projects being undertaken to help mould and shape a sustainable and democratic future for an independent Ukraine. In the medium term, there are plans to create double degree master's programmes in urban planning and reconstruction in Germany and Ukraine which will be based on existing teaching modules.

5. Conclusion and Outlook

At its core, this article addresses the issue of actionable knowledge for integrated urban development and examines how this knowledge can be implemented within the Ukrainian context. The needs analysis conducted at Ukrainian planning universities highlighted the importance of complementary programs - especially non-formal planning along with its associated processes and instruments. The article also suggests that new methods for reconstruction and urban regeneration have to be developed in the context of destruction and urban resilience.

By showcasing two examples of a competence platform and different teaching module formats, the article has provided practical solutions to the challenges mentioned above. With regards to the same, emphasis has been placed on localising these formats to suit the Ukrainian context and ensuring their relevance. Localisation is achieved on the digital learning platform through the selection and application of case studies based on projects in Ukraine, whilst collaborative teamwork further strengthens the connections that exist between learning content and the practical work environment of the learners; thereby fostering actionable knowledge.

The diverse courses and formats within the teaching modules underscore the necessity of face-to-face interactions. Such interactions are vital for both ensuring the critical and creative exchange required to develop solutions for spatial problems, and for the practical learning and application of transdisciplinary approaches in urban development; all are aspects that are hard to implement in wartimes. A characteristic feature of transdisciplinary projects is that the problem definition is the result of a joint effort by all participants from science and practice. The teams working on such issues can be multidisciplinary, and they are expected to generate transformative knowledge, i.e., insights that are helpful for integrated development. Transdisciplinary integration addresses the implementation of the insights gained and refers to both dissemination of xxx, and the measures that practitioners can take.

Moreover, this article has shown that, addressing the issues and needs of different population groups - whether through direct participation in activities or through the integration of teaching activities into municipal planning via on-site workshops and project studies – has emerged as a crucial area for the ongoing development of planning education in Ukraine.

As the New Leipzig Charter states, urban development is highly complex, and the added challenges of wartime are so critical, that a specific integrated, comprehensive urban planning approach is needed to rebuild Ukrainian cities: Whilst, in times of crisis, immediate action is necessary to rebuild cities and municipalities, there is also a need to take a more strategic and measured approach. In the study modules, we tried to address this contradiction and parallelism by establishing implementation-oriented development concepts. In such a dynamic situation, finding the right approaches is not easy; all participants must remain flexible and sensible.

The further introduction and development of expertise in integrated development planning to complement and expand traditional urban planning training will, alongside many others, remain an important task in the future. Crossing Borders means creating exchanges between different countries and their planning cultures, so as to enable the transfer not of ready-made solutions, but of problem definitions and possible strategies for dealing with them. Crossing Borders also means overcoming sectoral boundaries in the sense of the Leipzig Charter and seeking effective solutions through transdisciplinarity exchanges between science and practice.

References

ASAP (Akkreditierungsverbund für Studiengaenge der Architektur und Planung) 2022: Fachliche Kriterien für Stadt- und Raumplanung. Available from: https://www.asap-akkreditierung.de/de/fachrichtungen/stadtplanung-raumplanung Accessed [03/05/2025]

Deutsche Akademie für Städtebau und Landesplanung e.V.: *Basel Theses, Universities as Resources for a Transformative Planning Culture*, Berlin 2024, 1st edition [Online]. Available from: https://dasl.de/wp-content/uploads/2024/11/241106_lay_e_baslerthesen_210x210_x3.pdf [03/05/2025]

European Commission (2020) *New Leipzig Charter: The transformative power of cities for the common good.* [Online]. Available from: https://ec.europa.eu/regional_policy/sources/brochure/new_leipzig_charter/new_leipzig_charter_en.pdf Accessed [30/01/2025] [03/05/2025]

European Commission (2023) *New European Bauhaus* [Online]. Available from: https://new-european-bauhaus.europa.eu/about/about-initiative_en Accessed [30/01/2025].

EVZ Workshop (2023) 'Common Spaces', Drohobych [Online]. Available from: https://www.facebook.com/Magicalsaltcities Accessed [30/01/2025].

Frank, A.; Kurth, D.; Mironowicz, I., (2012) Accreditation and quality assurance for professional degree programmes: comparing approaches in three European countries, Quality in Higher Education, 18:1, 75-95

Frank, A., Kurth, D. (2010) Planning Education in Germany: Impact of the Bologna Agreement. disP - The Planning Review, 46(182), 25–35. https://doi.org/10.1080/02513625.2010.10557099

panforukraine platform. *Panforukraine* [Online]. Available at: www.panforukraine.de Accessed [30/01/2025].

Steinkemper, M. and Vlasenko, Y. (2024) *Background paper on the governance and legal framework for spatial planning and reconstruction in Ukraine*. UNESCE, UN4Ukrainian Cities.

Urbanyna (2023) *Urbanyna* [Online]. Available from: https://www.urbanyna.com/en/home Accessed [30/01/2025].

Wagner, M., Knieling, J., Weiland, U. (2024) *The Great Transformation for Sustainable Spatial Development as a Challenge for University Education*, "Raumforschung und Raumordnung | Spatial Research and Planning" Issue Vol. 82 No. 5 (https://doi.org/10.14512/rur.2533)

Weidner, S., Terletsky, M. and Viderman, T. (2018-2020) *Citymakers course I & II: City Makers Lviv, Urban Development in Lviv* [Online]. Available from: https://www-docs.b-tu.de/fg-stadtmanagement/public/CityMakers2_Terletsky_Weidner_Viderman_new.pdf Accessed [30/01/2025].

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SPATIAL PLANNING BEYOND ALGORITHMIC LOGICS. ON THE BENEFITS OF USING PUBLIC PARTICIPATION IN CREATION OF SPATIAL PLANS IN UKRAINE

Joanna Kopacz-Gruzlewska[6]

Abstract

Ukraine is currently in a state of war and is experiencing significant demographic changes as well as shifts in residential living and the organisation of its industries. The impacts of the war will require the rebuilding of the country, and this presents opportunities to improve the living and working environment of Ukrainians while also introducing new sustainable solutions. There is a need to establish new strategies for spatial planning that include new technologies and broad public participation through the development of National Spatial Data Infrastructure. This paper explores the potential solutions, opportunities and risks of developing a new spatial planning approach in Ukraine.

Keywords:

Spatial planning, spatial data, public participation, spatial data infrastructure

6 Architect, Urban Planner
PhD Candidate at the Faculty of Architecture
Silesian University of Technology
Gliwice, Poland

1. Introduction

The full-scale invasion of Ukraine in February 2022 resulted in the extensive relocation of inhabitants across the country's major cities. Providing these inhabitants with appropriate housing is regulated by the Law of Ukraine No. 77-VII (dated 28 December 2014) which notes the importance of ensuring the rights and freedoms of internally displaced persons and imposed the responsibility of local state administrations and local self-government bodies to provide such accommodation. The relocation of inhabitants has been compounded by the changing structures of industrial and employment centres across the country. The Ukrainian Cabinet of Ministers passed a resolution of martial state law that suspended access to the State Land Cadastre (Resolution No. 263 "On the maintenance and functioning of the State Land Cadastre under martial law", dated March 2022) which has been an impediment to the efficient management of accommodations for displaced persons.

The large-scale destruction of housing as well as cultural and governmental buildings requires the introduction of new goals, guidelines and methods to enable the reconstruction of cities once the war ends. This new approach to urban development needs to account for the significant changes in social structures that have occurred since 2022. The war period has had a significant impact on urban development policies and practices. Specifically, participation in these processes depend not only on city residents based on their rights and obligations, but also on attendance of new city users who use urban resources occasionally for professional purposes or tourism.

The Committee of the Verkhovna Rada of Ukraine (dated April 2023) on basis of the document "On State Power, Local Self-Government, Regional Development, and Urban Planning", established the Working Group on the Development of the Urban Planning Code of Ukraine to define guidelines for spatial planning. In November 2023, UN-Habitat established a headquarters in Ukraine to support governmental efforts and to launch the collaborative project "Towards Inclusive and Resilient Urban Recovery in Ukraine" (UN-HABITAT, 2023). One aim of this project is to align the reconstruction process with long-term spatial planning decisions. The project embraces the revitalisation of destroyed residential districts as well as planning for new recreational areas and multifunctional developments. The new investment plans will require changes in land use that will be informed by public consultations. Facilitating public consultations and enhancing feedback procedures are included in the second component of the UN-Habitat project.

The outbreak of war did not impact the development of the National Spatial Data Infrastructure (NDSI). In 2021, the Ukrainian Parliament adopted Resolution "On Procedures for the Functioning of the NDSI" and the Law of Ukraine 'On the National Spatial Data Infrastructure' (Kondratenko et al., 2023). The continued development of the NDSI provides opportunities to enhance public participation in spatial planning processes.

2. Significance of public participation.

The significant changes to the social structures of Ukrainian cities due to the war has raised important questions about how residents can participate in spatial planning decision-making processes. There is a view that urban development should not only be conducted for the residents but also influenced by them. Public participation is strongly promoted in the latest amendment to the Resolution of Cabinet of Ministers of Ukraine (dated March 2025) which notes the importance of ensuring public participation in the formulation and implementation of state policy through the establishment of social councils in individual ministries and local government institutions. Public participation is also an important component of the Urban Recovery Framework (URF) which is led by UN-Habitat and comprised of a group of partners and stakeholders who are seeking to create a roadmap for "building back better". The URF has invited non-governmental institutions to cooperate in mediation between local authorities and community members. However, social mediation requires the development of a set of tools for assessing the needs of a given community. These tools should also serve to support and enhance public participation in decision-making.

Arnstein's ladder characterises various stages of public engagement, ranging from passive (nonparticipative) to active (public control) (Arnstein, 1969). Laura Puttkamer, a participatory planning consultant, notes that post-Soviet cities are implementing strategies to encourage inhabitants to engage in urban planning

processes. These strategies are typically undertaken by activists from non-governmental institutions, i.e. Cedos (Khelashvili et al., 2023). However, there has been a notable lack of community members attendance at such meetings as well as general disinterest from the public with regard to engaging in such processes. Ukrainian planning processes typically involve tokenistic activities pertaining to information provision, consultation and placation (Puttkamer, 2017). Given this, there is a need to enhance these activities to encourage residents to be more engaged in decision-making processes while also ensuring that such greater engagement will not result in significant increase in time or financial inputs. Such a balance could be achieved through the development of an effective information strategy, data collection based on surveys and public enquires, and enrolling citizens in administrative and activist committees.

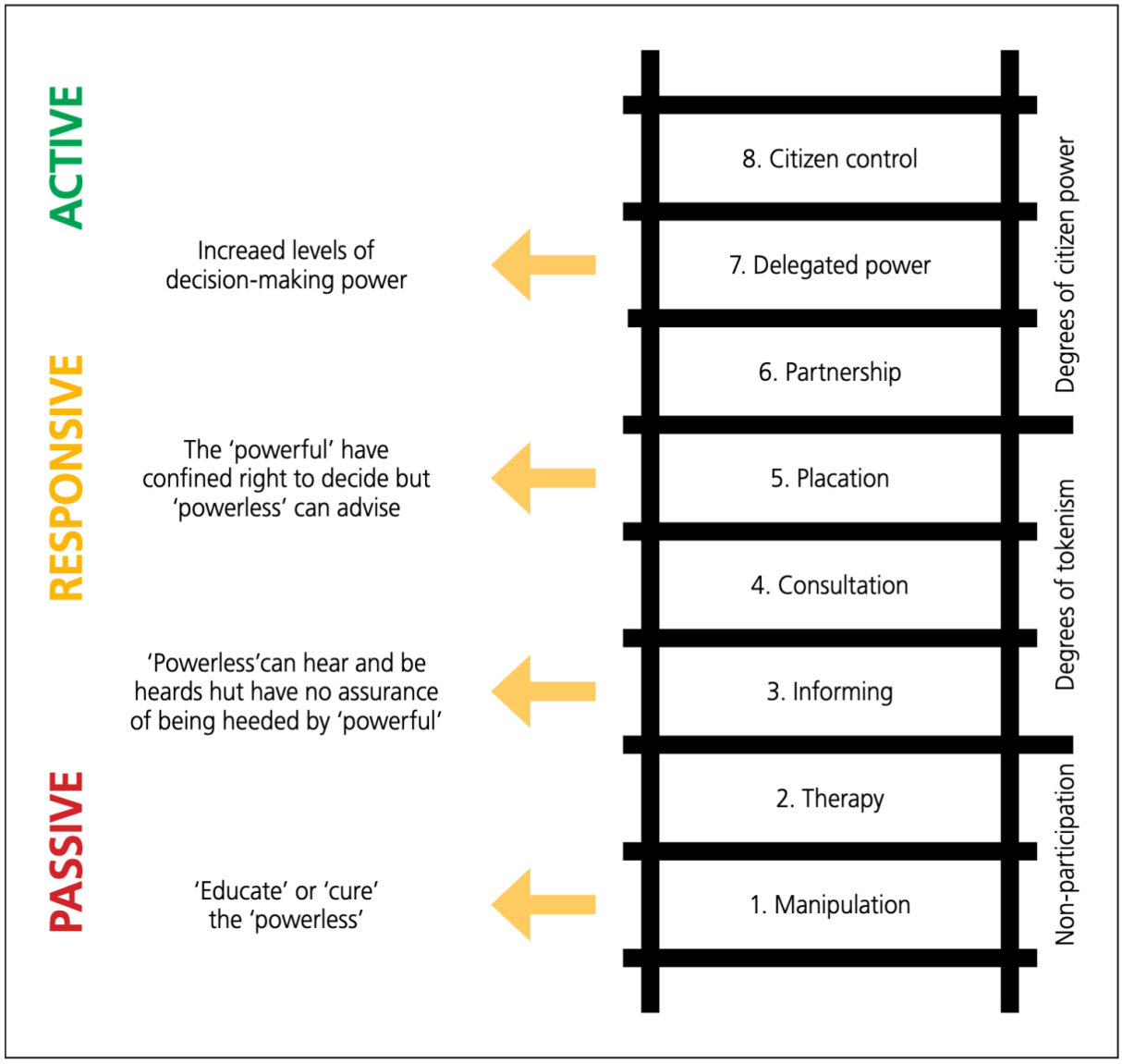

Fig. 1 Arnstein's ladder (source: https://journals.co.za/doi/10.10520/ejc-ajpa_v15_n1_a3)

Enhancing participatory planning in Ukrainian cities cannot, however, be achieved without an appropriate and legible environment of collaboration that is founded on transparent and de-centralised governance, new organisational approaches to support multisectoral, interoperative activities and the fostering of open and interactive arenas of information exchange (Janczar, 2021).

3. Smart City.

'Smart City' objectives are intended to optimise the management of strategic cities' services including storm water management, waste management, traffic regulation and the operation of emergency services. They also provide citizens with access to real-time information and assure that there are effective interactions between residents and collective resources (Sauvage, 2021). To achieve Smart City objectives, it is necessary to build an effective information network that allows for the rapid and efficient exchange of data. The development of such networks is expected to include Information and Communication Technology (ICT), the Internet of Things (IoT), consideration of human and social capital and the provision of opportunities for collaboration between the private and public sectors (Sauvage, 2021).

3.1. Stages of the Smart City development.

Boyd Cohen proposed three stages of Smart City development (Cohen, 2015):

Smart City 1.0: The first stage is experimental and involves the implementation of new technologies without awareness of the far-reaching implications or active engagement of citizens.

Smart City 2.0: In the second stage, the local authority takes on the role of technology and data governor. Administrative bodies take control of data access and sharing while also utilising the data to improve urban functions and the quality life of residents. Here, rigid legal regulations drive the Smart City agenda with minimal input from residents.

Smart City 3.0: The third stage involves the final development of the Smart City; residents are involved in decision-making. The local authority serves as an intermediary which connects residents and smart public services. This stage is characterised by bottom-up regulating which seeks to maximise inclusiveness and sustainability values.

Ukrainian cities are currently in the second stage of Smart City development; technology and data are controlled by national and administrative institutions including the State Geo Cadastre, the Ministry of Regional Development and Housing of Ukraine, the Ministry of Ecology and Natural Resources, the State Agency of Water Resources, the State Agency of Forest Resources, the Ministry of Culture of Ukraine, the Ministry of Health and State Service of Statistics (State Service of Ukraine for Geodesy, Cartography and Cadastre, 2018). The ongoing war and the necessity of assuring high levels of data security have, to date, prevented the transition to the third stage of Smart City development (Makarenko, 2022).

3.2. Data collection mechanisms.

According to Janczar, there are three types of data that play significant roles in the spatial planning decision-making processes: 2D data, 3D data and statistical data (Janczar, 2021). Statistical data is most impacted by the political situation in Ukraine, environmental factors and the interchangeable roles of consumers and prosumers in the extending circular economy. Statistical data requires constant updates with properly designed data collection tools adjusted to current social perceptions and conditions, i.e. customer attitudes and the dynamic structure of the given city's population.

State institutions including public administration, oblast- and regional authorities and hromada offices are typically responsible for collecting and archiving statistical data. These institutions acquire data from residents who are legally required to register their marital status in person while civil registry offices collect demographic data on births and deaths. The Ministry of Internal Affairs is responsible for vehicle registration. The Ukrainian Ministry of Justice and Department of State Registration collects data about company registration, business licensing and permits. The state social insurance authority collects data on public health and accidents.

There is a growing trend to automate data collection processes. Energy and water distributors as well as municipal infrastructure network managers have installed devices with remote reading capabilities for private and institutional utility customers (Sauvage, 2021). The increasing number of e-services that have increased

accessibility and simplified handling procedures has resulted in a reduction in resident involvement in data collection processes.

Current data collection tools include new technologies that are based on wireless data transmission such as mobile phone networks that make it possible to determine the number of users within the given city, and the wireless internet network that records phenomena in the city such as rainfall levels, traffic volume, employment levels and the availability of health services (Komninos, 2019). Social media platforms provide copious amounts of information about social behaviour including places of concentration, preferred forms of housing, employment, and entertainment. In many cases, this type of data can be acquired without public participation or consent.

4. Infrastructure for Spatial Information.

The extensive rollout of digitalisation has involved the development of IT infrastructure. The elements of this infrastructure can be divided into two main groups: data sets and network services. A requirement of a well-functioning IT infrastructure means coherence across territorial and administrative (official) divisions. Spatial Information Infrastructure is organised via two models of information flow which are: product-based, and process-based (Janczar, 2021).

4.1. Generations of spatial data infrastructure.

Williamson et al., (2007) identified three generations of spatial data infrastructures. The first generation involves a product-based approach. Data is a resource, and public administrations are responsible for archiving, maintaining quality standards and developing protocols for sharing spatial data products such as maps, databases, datasets and public registers. These, in turn, are made available in their entirety without being customised to address specific needs. This first generation of spatial data infrastructure requires central data management. The second generation includes a process-based approach which incorporates a wide range of decentralised data collection and management and can provide e-services to support extensive, multi-criterial public participation. This generation of infrastructure development makes data more accessible to users but requires a higher degree of data customisation. The third generation of data infrastructure expands data management and responsibility beyond public administration. Data is produced in the same way as for state institutions, and is subject to the same rules regarding collection, standardisation and use. However, expanding responsibility beyond public administrations carries a range of consequences. A network of connections between data production and data use may blur boundaries between data producers and users. In addition, the higher volume of data disseminated to users makes it necessary to process and adapt the data to the needs of particular users.

This third generation of Spatial Information Infrastructure aligns with the objectives of Smart City 3.0. However, the proliferation of data operators and automation of data acquisition processes results in significant increases in the availability of spatial data, and this has the potential to lead to there being less control over the entire infrastructure as well as reduced opportunities for public participation. It also raises questions about how to process and customisedata for specific applications. There is also a risk that single participants may build databases based on their individual needs, resulting in various actors competing with one another and producing either contradictory data or unnecessarily duplications of data resources. It follows, that there is a need to introduce regulatory standards and policies to manage the Infrastructure of Spatial Information.

4.2. Standardisation of spatial databases.

A specific example of spatial database standardisation is the European INSPIRE Directive which includes guidelines for member countries related to shared requirements for their data networks. With Ukraine being a potential candidate for membership of the European Union, these guidelines could serve as a foundation for an Infrastructure of Spatial Information in Ukraine and contribute to the Spatial Data Infrastructure in Europe.

The European INSPIRE Directive is a document containing specific guidelines; its implementation is expected to result in an increased level of interoperability of spatial data (INSPIRE, 2007). There are three types of

interoperability within the Spatial Data Infrastructure. Technical interoperability involves data management systems (devices, data transmission, operating system standards and data protocols), and their syntactic aspects (data language and format). Semantic interoperability requires a clear understanding of information exchanged and disseminated by users. Organisational interoperability requires consistent legal regulations, organisational, economic and personnel procedures, as well as the development of precise definitions of both dependencies and responsibilities within organisational structures.

Modern information systems offer services rather than products (also referred to as service-oriented architecture). Services related to spatial information include five main activities: searches of data sets and services; exploration of data sets represented by activities such as display, navigation, zooming in and out, scrolling and displaying symbol legends; downloading of data to personal devices; reshaping the content of data sets; and the launching of services related to spatial information.

To enable these activities, there is a need for strategies which both harmonisemetadata and regulate the structure of dispersed data sets. Metadata is defined as 'information describing spatial data sets and related services enabling recognition of their location, inventory and imposing their usage' (Janczar, 2021). In contrast, the harmonisation of spatial data requires establishing metadata in ways that guarantee the coherence of all datasets within the Spatial Information Infrastructure, identifying methods of data collection, and identification of the institutions that are responsible for the creation, administration, maintenance and distribution of data sets and services (Janczar, 2021). The INSPIRE Directive emphasizes the significance of spatial data set conformity by implementing rules to control the quality and validity of spatial data sets and specifying the limitations of public access as well as providing justifications for those limitations. The rules also establish conditions for access and using the spatial data sets and spatial data services, as well as applicable fees.

Spatial data sets include information from a wide range of fields including land-use and spatial governance, cultural heritage and environmental protection, technical infrastructure, agriculture, natural water bodies and forest governance, environmental risks due to flooding, fire and landslides and social and military security. These data sets are stored by various institutions with distinctive competences. It is also important to maintain the coherence of the data as it is circulated from regional spatial development plans (план просторового планування області), through area spatial development plans (план просторового планування району) to the spatial plans of individual municipalities (генплан міста/села). It is important to note that different municipalities have different data management systems. To facilitate data interoperability, a clear and legible system of data identification is required (Janczar, 2021).

The data identification model is intended to protect data from changes in functional value by specific administrators. An example of such a model is the GCM (Generic Conceptual Model) which was introduced by the European Commission in 2014 and defines requirements for external object identifiers. These external object identifiers are supposed to identify the main features of the object including, for example, uniqueness, durability (unchangeability), identifiability and enforceability. These features do not influence the structure and content of existing data sets, but identify subject groups that can be used for specific processes or procedures. Applying identifiers to data also creates labels that can be utilised in subsequent algorithmic processes.

4.3. Data processing.

The city processes are assumed to be driven by integrated human, machine and collective intelligence (Komninos et al., 2019). Human intelligence plays a role in creativity and city innovation, while collective and collaborative intelligence establishes quality levels for the functioning of public and administrative institutions. Machine intelligence (or Artificial Intelligence) supports data processing and analysis, while also providing a foundation for decision-making processes.

4.3.1. Machine Learning

Machine learning involves a specific set of Artificial Intelligence tools that produce algorithms to apply to provided data. Machine learning involves learning from the provided data instead of the machines being programmed (Kmetz, 2023). There are four methods of machine learning and supervised learning is the most common method to create algorithms using labelled data to find correlations among them. In this method, the inputs and outputs of the algorithm are specifically defined.

Ensemble-based methods such as Decision Trees and Random Forests are the most popular algorithms used to select data within supervised models. They are frequently used in spatial data analysis. Both of those algorithm types are used for data classification and to extract numerical values that can provide future predictions. They are useful in the implementation of smart urban forms and procedures to increase inclusiveness within urban environments. Other algorithms support geospatial applications by using morphological tools such as Support Vector Machines (SVM) and neural networks. These are used in Urban Planning to identify patterns and trends from spatial data sets, and for the classification of land uses (Casali et al., 2022). They are used to plan roads, and to delineate road network acquisitions. Convolutional Neural Networks (CNN) are efficient tools by which to extract specific features from spatial data while Recurrent Neutral Networks (RNN) are used to produce precise urban simulations.

Decision-making processes are crucial in the establishment of spatial plans based on public participation. They provide simplified depictions of urban environments to encourage interaction between stakeholders, citizens and the governing administrations. Decision-Support Systems (DSS) can be used to integrate various databases and simplify interactions between stakeholders during debates about spatial solutions. Classification and Regression Trees (CART) are further tools to classify land use and develop future predictions.

Tools using Machine Learning are commonplace today and are often used to recognisespeech and natural language, to conduct medical analyses, to manage self-driving vehicle processes and to predict natural phenomena (Komninos et al., 2019). The collection and processing of data are central to the functioning of smart cities. Nonetheless, many complex aspects of cities such as sustainability, social inequality, poverty, industrial distribution and employment have significant impacts on spatial planning and need, therefore, to be considered in wider contexts. There is a need for properly formulated questions and the selection of appropriate input data. These initial actions need to be informed by a combination of human and collective intelligence.

4.3.2. Data processing within Smart Cities.

Smart Cities utilisevarious fields of technology: the Internet of Things (IoT) encompasses connected devices, diverse blockchains are responsible for information transition, whilst digital platforms and social media networks allow for public access to information sources as well as its production (Komninos et al., 2019). All these fields are subservient to the underlying algorithmic logics that govern their functions. The most prominent threats of technological governance perform the lack of transparency and control over data processing, the misalignment of technological and social optimisation goals, and the questionable proportion of control capacity. In the regression conducting tools such as Decision Trees and Random Forests (combinations of Decision Trees) predictions and classification results are clear and credible because the processing patterns are determined in advance. Conversely, the tools that draw upon Deep Learning and Neural Networks only allow for the manipulation of Input and Output Layers while processing nodes are located within a Hidden Layer. It follows, that the entire process of pattern production remains illegible.

Data processing that relies solely on Machine Learning tools lacks transparency and clear correlations between input and output information (Komninos et al. 2019). Technological optimisation does not always go hand in hand with social optimisation. Concentrating efforts on technological optimisation has the potential to ignore human aspects and can result in social polarisation when it comes to output decisions. Algorithmic logics should be supported by human agents and human communities through the establishment of networks of humans, communities and machines. This perspective nevertheless raises questions about how to establish effective platforms for public participation.

5. State Land Cadastre and data management in Ukraine.

The Ukrainian State Land Cadastre was created in 2013 as a result of the World Bank Project (State Service of Ukraine for Geodesy, Cartography and Cadastre, 2018). The cadastre is owned by the Ministry of Agrarian Policy and Food but is governed by the Ukrainian State Service for Geodesy, Cartography and Cadastre, the executive authority on topography, geodesy, mapping, land relations, land management, control of land-use and land protection. Article 1 of the Law Of Ukraine ‘On the State Land Cadastre’ defines this digital source of spatial information as following: ‘The State Land Cadastre is the single state geoinformation system of land

information located within the state borders of Ukraine, their designated purpose, and also governs restrictions on their use as well as data on the quantitative and qualitative characteristics of land among owners and users' (State Service of Ukraine for Geodesy, Cartography and Cadastre, 2018).

5.1. State Land Cadastre and Land Reform.

The objects included in the State Land Cadastre define the land within the state borders of Ukraine, land within the boundaries of administrative-territorial units, restrictions on land-use and information about each land plot. This information is structured using 46 indicators such as registration number, the standardised names of geographical objects in Ukrainian and Latin alphabets, the types of geographical objects, the administrative status of settlements, administrative-territorial reference numbers, geographical coordinates (longitude and latitude), historical names, and so on (State Service of Ukraine for Geodesy, Cartography and Cadastre, 2018).

The State Land Cadastre is the largest spatial data set and includes approximately 20 million land parcels which cover 73% of Ukrainian territory. The system has enabled online services to be established, such as the possibility to extract information from the State Land Cadastre, including personal information about land parcel owners, the online registration of land parcels, creation of normative land valuation and digital verification of land users based on personal ID number (State Service of Ukraine for Geodesy, Cartography and Cadastre, 2018). Access to the Cadastre is supervised by anticorruption authorities, local governments, the police, fiscal services, notary officers and land surveyors. The State Land Cadastre plays a significant role in the regulation and implementation of legislation involving land use (Kondratenko et al., 2023).

The State Land Cadastre service is divided into 24 territorial departments which represent each region. Due to the Administration and Land Reform in Ukraine that decentralised governmental power, 1,47 million hectares of agricultural land were transferred from the central government to 648 conglomerated territorial communities. Some Land Reform acts weakened the operability of the State Land Cadastre (Kondratenko et al., 2023) by transferring land ownership. In 2020 a Decree of the President of Ukraine dated October 15, 2020, No. 449/2020 "On Certain Measures to Accelerate Reforms in the Sphere of Land Reform" was issued. The decree accelerated the transfer of state-owned agricultural land plots to municipalities through the State Land Cadastre. The transfer process required changes to ownership status, normative valuation and taxation, the identification of lease rates and the transfer of management responsibilities for territorially defined parts of cadastre to new local governing structures. Further development involved the implementation of the National Spatial Data Infrastructure which sought to improve the disposal of resources control and to manage data more effectively (Kondratenko et al., 2023).

5.2. National Spatial Data Infrastructure.

In 2007 the Ukrainian Cabinet of Ministers adopted the European INSPIRE Directive (Directive 2007/2/EC) which includes guidelines for the creation of National Spatial Data Infrastructure. Despite several trials to develop concepts of NSDI Law, the draft of the law was not produced until 2018. This draft was based on European best practices with some specific features also being derived from post-Soviet land structures. A group of stakeholders was appointed to create the NSDI including the Cabinet of Ministers to approve the methodology, the Ministry of Agrarian Policy and Food to write NSDI policy, the State Service of Ukraine for Geodesy, Cartography and Cadastre to implement the NSDI policy and the State Enterprise under State Geo Cadastre to administrate the NSDI (State Service of Ukraine for Geodesy, Cartography and Cadastre, 2018). The NSDI project standards of data harmonisation are based upon international standards including ISO 19 100 'Geographical Information / Geomatics' and the State Land Cadastre is designated as the principal data holder. In 2020 the Resolution "On procedures for the functioning of the National Spatial Data Infrastructure" was adopted and since 2021 the Law of Ukraine "On the National Spatial Data Infrastructure" has been in force. In 2023 the Central Service of the State Land Cadastre signed the Protocol of Information Interaction between the Information System of the State Land Cadastre and the NSDI Pilot Project. The Protocol is intended to provide objectivity, reliability and completeness of information in State Land Cadastre and regarding the National Spatial Data Infrastructure (Kondratenko et al., 2023).

The National Spatial Data Infrastructure is designed to meet citizens requirements, as well as being used as decision support system for public administration and crisis that is based upon information from economic,

social, defence, scientific, and environmental fields. The greatest challenge for the cadastral structure is the fragmentation of local information about the state and its territories. This requires coherence in data indication methods and registration systems with both following clearly defined legislative procedures. Another challenge involves the creation of an effective and properly secured system for interested organisations to obtain information. One of the most urgent issues involves the development of an efficient information exchange protocol between the State Land Cadastre and the National Spatial Database Infrastructure. This is crucial for the development of territorial communities and the involvement of community members in decision making processes. It follows, that there is a need to provide relevant information and analytical support that is accessible to territorial communities, business representatives, investors and research institutions (Kondratenko et al., 2023).

6. Discussion pertaining to the prospects of increasing public participation in Ukraine.

The ongoing war in Ukraine has resulted in a need for the creation of a range of guidelines and requirements to support public participation. A key factor is data security and control procedures that allow for data accessibility and use specifically with respect to downloading and sharing data as well as launching new data distribution services. Cybersecurity requires restricted use of statistical and spatial data to a limited number of public institutions that can control data flow and access as well as various stages of data processing. Data access is governed through procedures to detect, select, register and legitimiseusers.

Innovative security in Ukraine goes beyond data security and is a necessity in the establishment of a stable economic platform that will allow the country to participate in the European arena (Vavdiichyk, 2022). Ukraine is an EU membership candidate, and this opportunity requires the country to innovate in various fields so that it may build resilience to internal and external threats, implement sustainable solutions and regulate research and scientific activities. Competing in the international arena is a crucial aspect of strengthening a country's security. To protect both national interests and meet the needs of society, it is also vital to spread knowledge of data policies among citizens.

In the pre-war Ukrainian economy, the consumer approach was a common social behaviour based upon liberal market trends, the dominance of the private sector and the existence of a highly competitive nature of service. There was an emphasis on producing finished products and services independently rather than co-creating them. This approach had its roots in the pre-war conditions of economic instability and the insufficient domestic activities of many of Ukraine's industrial branches. Insufficient financial support for small- and medium-sized businesses as well as minimal guarantees for the protection of intellectual property shifted the focus of civic entrepreneurship from production to commerce (Vavdiichyk, 2022). A product-oriented customer approach increases entitlement and reduces confidence in an individual's agency, thereby providing a basis for reduced social participation. Today, constructive participation is crucial to develop and strengthen existing urban structures and there is a need to find appropriate tools to encourage it.

The spatial planning process can be divided into two stages: the first stage involves public administration, while the second involves public participation (Janczar, 2021). Elements of public participation include the submission of proposals to be assessed in the initial stages of spatial plan development, the assessment of existing public perceptions of planning conditions, discussions of solutions in the draft phase of spatial plans that are under public scrutiny, the formulating and submitting of public comments on the given plan and involving citizens in the work of the individual municipal council.

Early engagement of citizens in spatial planning processes makes them more effective as participants. Participation is encouraged in the final amendment to the Resolution of Ukrainian Cabinet of Ministers No. 996 dated 2010 with the amendment dated 2025 that was entitled "On ensuring public participation in the formulation and implementation of state policy". It remains important to develop a clear and comprehensive approach to present proposed planning solutions. There is also a need to ensure a transparent decision-making process to enhance trust in the administrative authorities as well as confidence in citizen agency.

Geoparticipation is also an important way to regulate adequacy and correctness when using automated systems to interpret spatial data (Komninos, 2019). Providing up-to-date data from individuals (human intelligence) as well as collective intelligence is necessary to accurately depict societal expectations, deficiencies, ideas and sentiments.

A key factor in the development of platforms for such debates is shifting the nature of development plans from products to processes (Janczar, 2019). The database in such an approach is the sum of the individual outputs of the geoparticipatory processes. There are also opportunities to integrate such a database with public participation tools such as e-panels, e-petitions and e-surveys that can be developed in the NSDI. However, the shift to a process focus requires the harmonisation and standardisation of data to ensure interoperability, the standardisation of the scope of spatial data used by municipalities, consistent defining of data sets and adopting unambiguous data identifiers.

7. Conclusion.

The reconstruction of Ukraine will require the introduction of new land use plans. For this to be achieved effectively, there will be a need to implement innovative technologies such as mobile applications, IoT devices, social media monitoring and Geographic Information Systems while also developing processes to gather, store and process spatial data in data bases. Such data also needs a capability of being translated so that it can be used by a wide range of end users in both public and private sectors as well as members of civil society. The data bases need to be designed for different purposes, i.e. creation of mobile network, coordination of different modes of public transport, the detection and registration of weather conditions, organising of housing cooperatives as well as in data production. The range of end users may include car drivers and cyclists, public transport users, industry actors, governmental offices, health centres, municipal infrastructure network operators and housing stock managers. Spatial Data Infrastructure will need to be standardised to ensure the interoperability of the collected data. The Ukrainian State Service for Geodesy, Cartography and Cadastre will be responsible for the standardisation of metadata to manage statistical information at different territorial levels. Through such innovations, the nature of spatial planning will change from analogue- to process-based, while the data content will need to be tailored to specific needs, resulting in significant increases in the usability and availability of data.

Data processing is another important factor in spatial planning. In the era of intensive automation and the development of communication techniques, data processing is increasingly conducted through machines and algorithms. However, these mechanisms do not always produce results that are aligned with the expectations and needs of society. It follows, that the implementation of innovative technologies needs to be accompanied by effective techniques and mechanisms which will encourage public participation. The draft National Spatial Data Infrastructure provides an opportunity to develop broad and effective public participation approaches when developing new spatial plans. Citizen decision-making is an effective way to ensure that urban spaces are designed and built to meet the needs of end users.

References:

Arnstein Sherry R. (1969) Ladder of citizen participation, *Journal of the American Planning Association*

Casali Ylenia, Aydin Nazli Yonca, Comes Tina (2022) Machine learning for spatial analyses in urban areas: a scoping review, *Sustainable Cities and Society*

Cohen Boyd (2015) The 3 generations of smart cities, *Inside the development of the technology driven city*

Dyrektywa 2007/2/WE Parlamentu Europejskiego i Rady z dnia 14 marca 2007 r. ustanawiająca infrastrukturę informacji przestrzennej we Wspólnocie Europejskiej (INSPIRE

UN-HABITAT (2023) Towards inclusive and resilient urban recovery in Ukraine, https://unhabitat.org/

Janczar Ewa (2021) *Smart city zaczyna się od nowoczesnego planowania przestrzennego. Procesowe e-planowanie partycypacyjne,* Wydawnictwo Uniwersytetu Warszawskiego

Khelashvili Alina, Miloserdov Valerii, Khassai Yelyzaveta, Fedorova Lorina, Gryshchenko Mariia, Polishchuk Olga (2023) Guideline "How to Engage Residents in Decision Making in Hromadas: An Overview of Examples, Cedos.org.ua

Kmetz Ryan (2023) The Power of Machine Learning in Geospatial Analysis: Enhancing Decision-Making and Insights, *Medium*

Kondratenko D.Y., Stanislavskiy V.P. (2023) Legal Issues of Information Interaction Between the State Land Cadastre and the National Spatial Data Infrastructure, *№ 4: Аналітично-порівняльне правознавство*

Komninos Nicos, Panori Anastasia and Kakderi Christina (2019) *Smart cities beyond algorithmic logic: digital platforms, user engagement and data science,* Elgar Online

Koutra Sesil and Ioakimidis Christos S. (2022) Unveiling the Potential of Machine Learning Applications in Urban Planning Challenges, MDPI

Makarenko Dmytro (2022) State Land Cadastre in Ukraine under the Martial Law, *State Service of Ukraine for Geodesy, Cartography and Cadastre*

Puttkamer Laura (2017) Voices from Vinnytsia, Urban Solutions Journal, parCitypatory.org

Sauvage Marie (2021) Smart City and users: Improving Territorial Management, *Synox*

State Service of Ukraine for Geodesy, Cartography and Cadastre (2018), Country Report of Ukraine – 2018, Towards digitalization, e-government and geospatial initiatives, United Nations Committee of Experts on Global Geospatial Information Management (UN-GGIM)

Williamson Ian, Rajabifard Abbas, and Holland Peter (2007) Towards a Spatially Enabled Society, the University of Melbourne

Vavdiichyk Irina (2022) Innovative security of Ukraine in the conditions of European Integration, *Державне управління: удосконалення та розвиток*

Voloshyn Roman, Vitroviy Andrey, Rozum Ruslan, Buriak Mykola (2021) Certain Aspects of Territorial Communities Land Management on the Decentralization Conditions, West Ukrainian National University in Ternopil

Zhang Yuejin, Liu Fangyao, Gu Zhiqiang, Chen Zhengxin, Shi Yong, Li Aihua (2019) Research on Smart City Evaluation Based on Hierarchy of Needs, *Procedia Computer Science*