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

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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

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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).

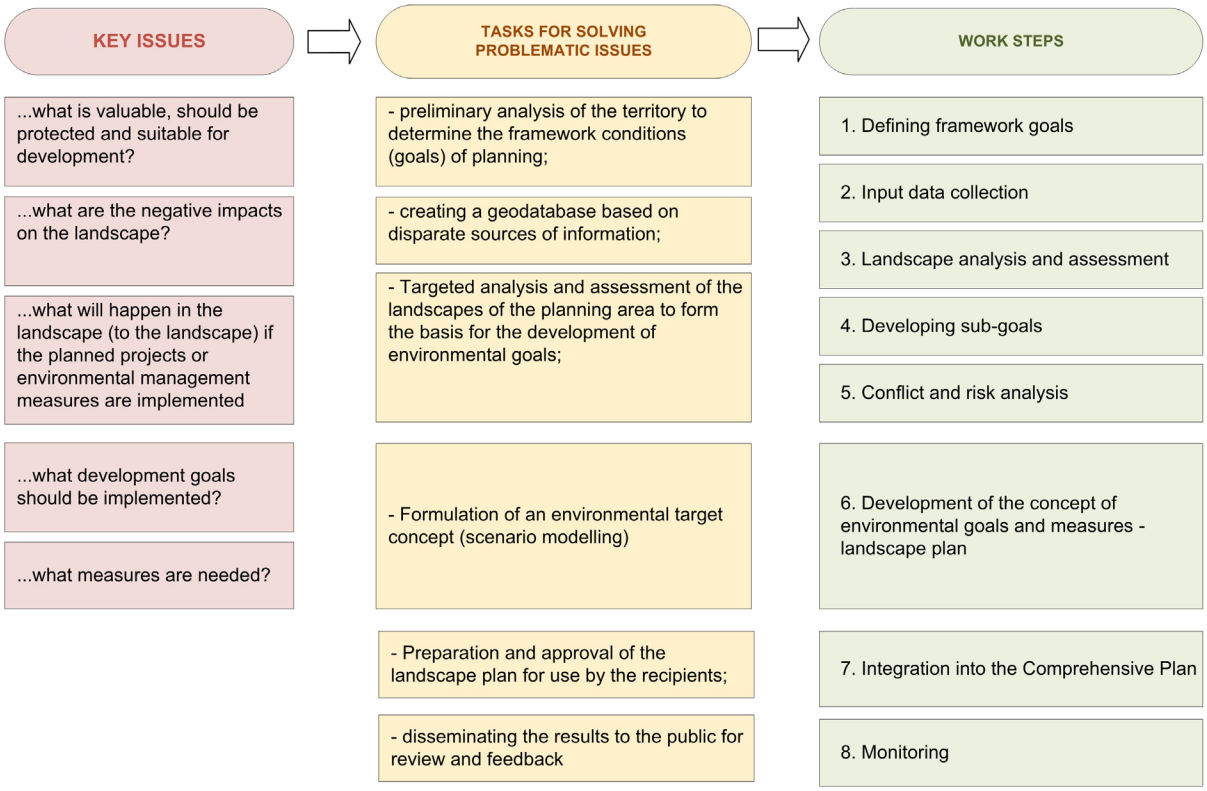

Figure 1. Tasks and Work Stages for Developing Landscape Plans (Key issues by von Haaren, 2004)

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.

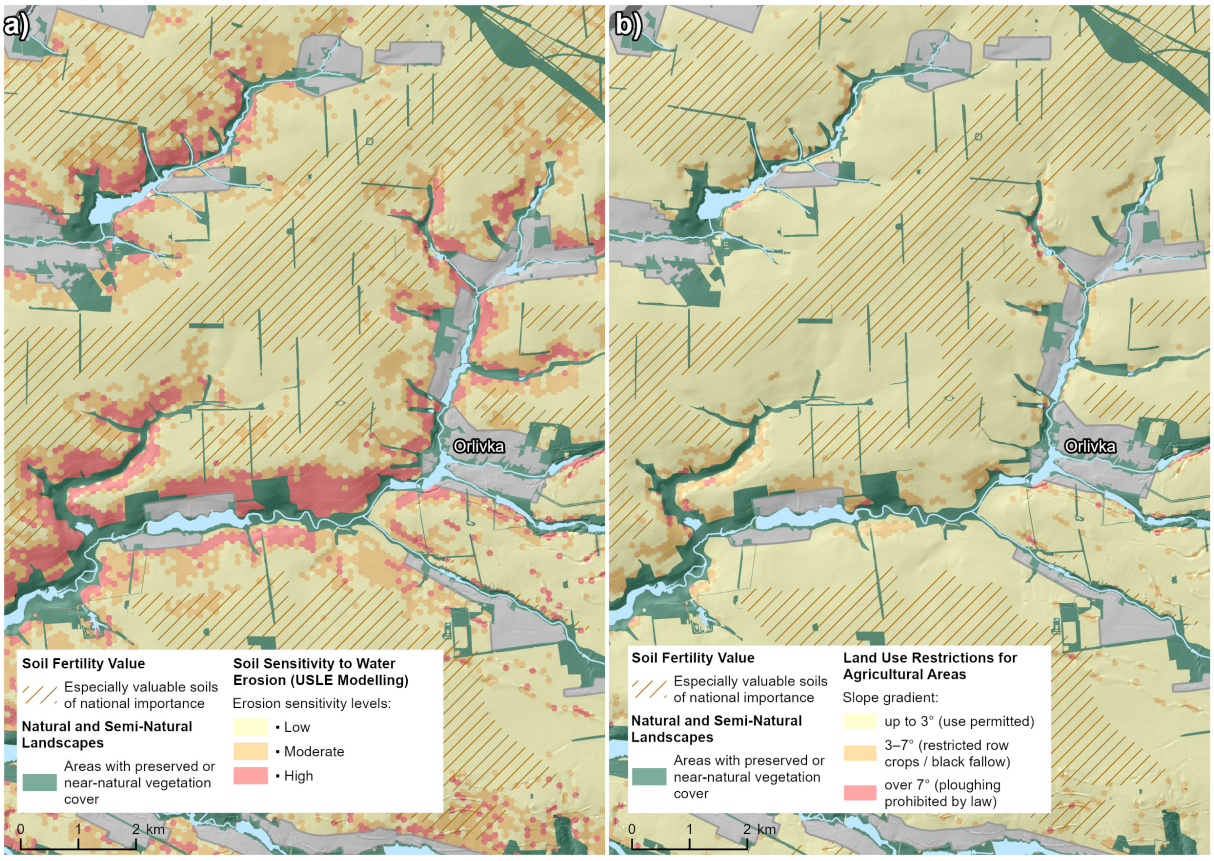

Figure 2. Soil Erosion Risk (a) vs. Legal Land Use Limits (b) on Valuable Agricultural Land: Case of Ocheretynska Hromada (fragment)

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).

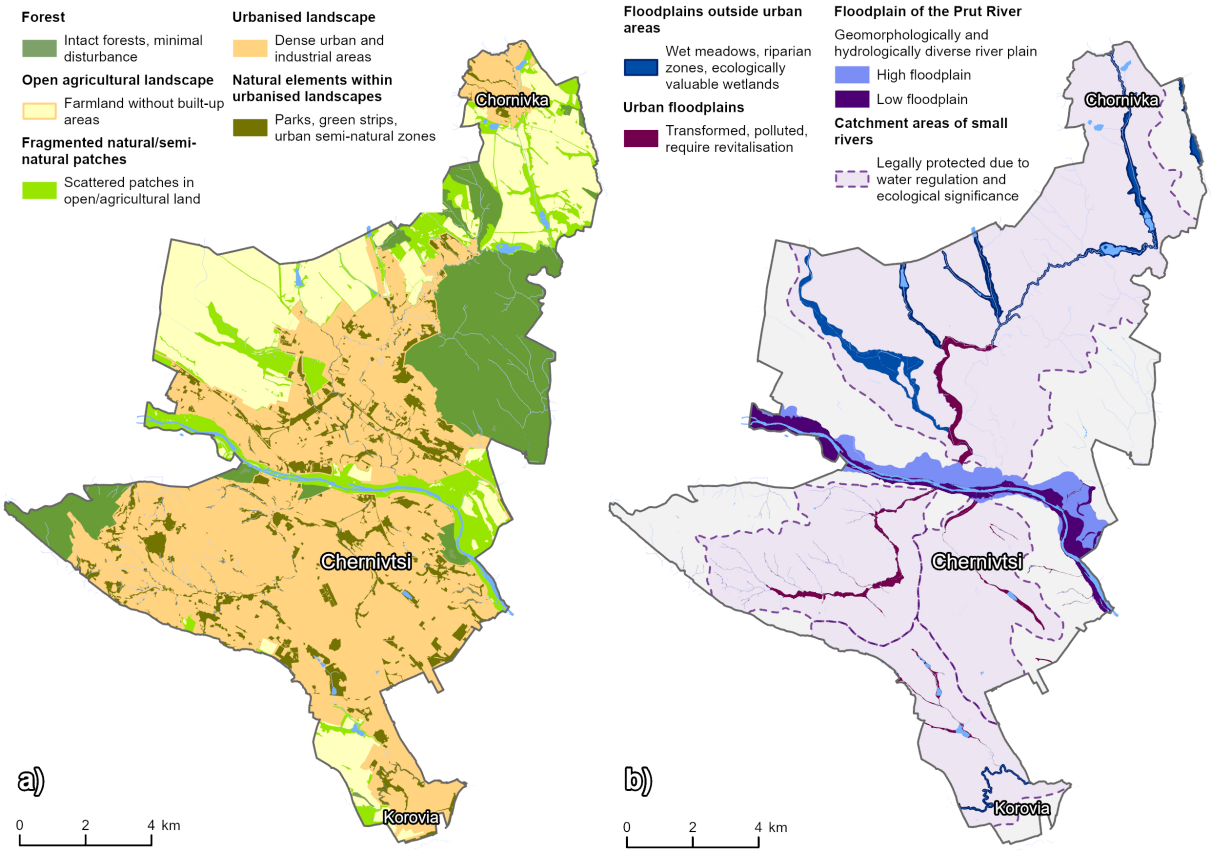

Figure 3. Land cover and hydrographic structure of the Chernivtsi hromada: (a) Landscape types; (b) Small rivers, floodplains, and catchments

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.

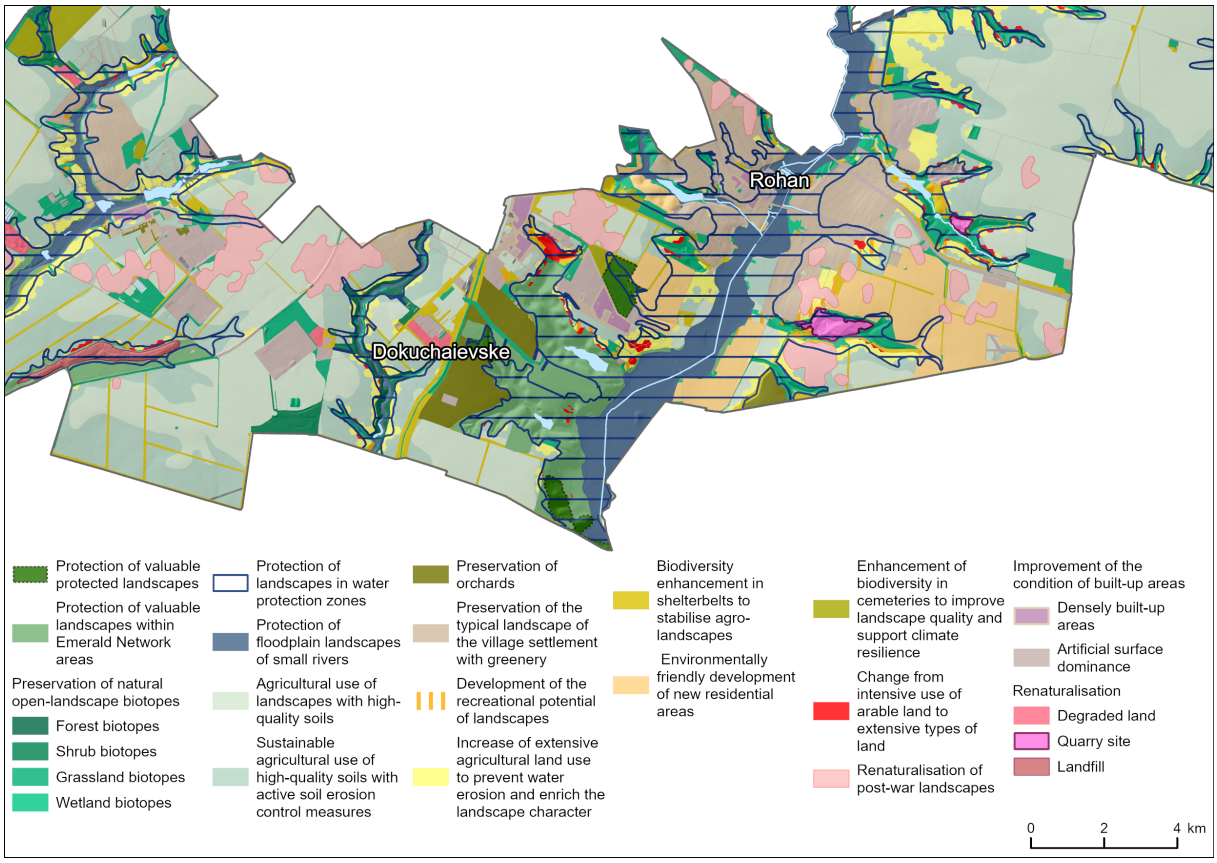

Figure 4. Landscape plan of the Rohan hromada (fragment)

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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