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Contact information:
Sapientia Hungarian University of Transylvania
Faculty of Târgu Mureș, Department of Horticulture
Târgu Mureş - Corunca, 1C, 540485 Târgu Mureș, Romania
E-mail: horticultureandlandscape@ms.sapientia.ro
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- establishing and maintaining collaborative relationships between participants;
- involving young researchers in scientific life;
- encouraging research work;
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CONFERENCE VOLUME

GUSTAV LANGE AND THE ROLE OF DESIGN PHILOSOPHY

Frank Sleegers [1*]

[1]Department of Landscape Architecture and Regional Planning, University of Massachusetts Amherst, USA

Correspondence:
First AUTHOR: Frank Sleegers
Sleegers@larp.umass.edu

Abstract: Landscape architect Gustav Lange has been one of the most successful designers in the 1990's in Germany. Lange is well-known for following design principles that are based on formal-geometrical visual arts while his intricate and multi-layered design philosophy is much less revealed and studied. The purpose of this paper is to synthesize knowledge on Lange and key elements of his overarching personal design philosophy. Information was provided through Lange's rare written comments and descriptions of projects, and occasional public talks. This information was supplemented through images of built and unbuilt work of key projects. Three leading, correlating themes and concepts could be identified to be key to Lange's design philosophy: the entertaining a dialogue of nature and culture, the inclusion and legibility of historic layers, and engaging interstitial space and coincidence. The paper adds complimentary knowledge on Lange's focus on form-led design language and compositions. His key, personal themes are leading elements of his design philosophy and can be traced from large to detail scale. While this study adds material for further research on Lange, it also reinforces the necessity of thinking in larger dimensions, contexts, and concepts for entertaining discussions about meaning and purpose in designing public landscapes.

Keywords: design philosophy, design concepts, public landscapes, design principles, landscape architecture, principal form

Introduction

Landscape architect Gustav Lange (1937-2022) has been one of the most successful and recognized designers in the 1990's in Germany. The Mauerpark Berlin (GER) stands out as his most renowned and largest project. It reveals the essence of Lange's design language that balances a personal, socio-political philosophy and the role of public open space with crafting a spatial framework that is based on geometric principles (**Fig. 1**). Lange created the void of the former "Death Strip" between two political systems as a place of life, a testament of openness and freedom.

Lange's intricate and multi-layered personal design philosophy is much less revealed and studied than other designers of the same era. As a landscape architect, Lange practiced from 1969 to 2005 from the city of Hamburg, Germany and was professor for Open Space Planning at the University of Kassel from 1989-2002. Aside from Mauerpark (1993-2020), his most prominent projects were the Ehrenhof Bundesrat [Federal Council] (2000), the courtyards Oberbaum-City of former Narva/Osram in Berlin (1998), and the European Patent Office (1990). Given the opportunity, Lange's work in the public realm displayed his democratic and socially critical attitude. His art project "Treppe ins Nichts" [Stairway into Nothing] (1992-2000), for the art exposition "documenta IX" on Königsplatz, Kassel (GER) was a symbol for democracy on a baroque plaza. Not without controversy, the stairway was torn down in 2000. Searching for

analogies and images to create of specific atmospheres and character of place was Lange's lifelong approach and method. These images are leitmotifs and are applied from the early design process and used iteratively even during project construction.

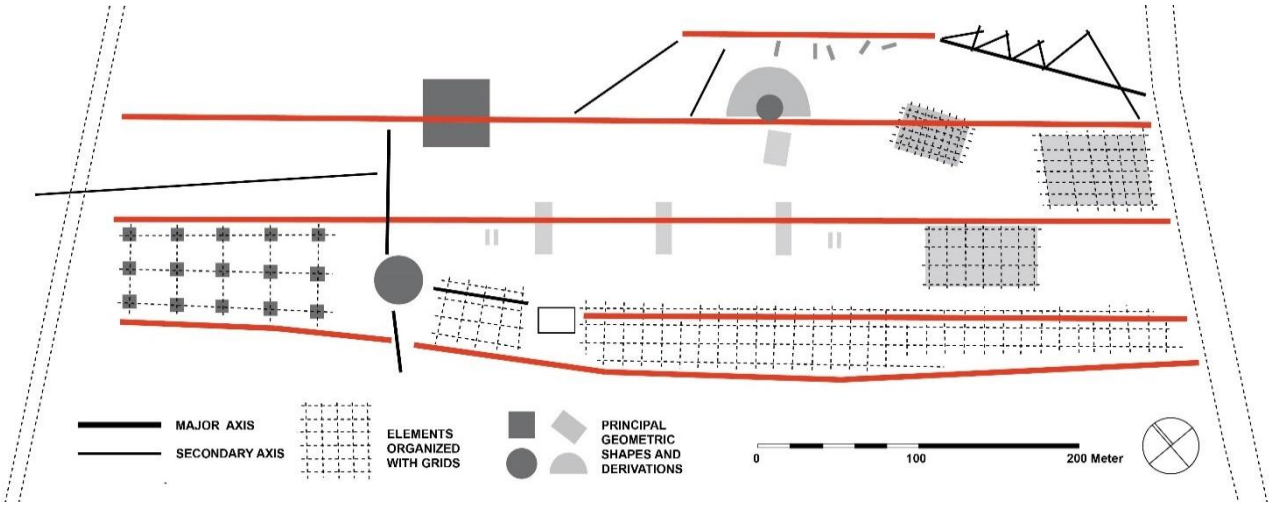

Fig. 1. The spatial composition of Mauerpark Berlin is based on principles of visual arts and geometry. The organization of major walking corridors and places along axes that reference the history of the park, the matching superimposition of grids for the alignment of trees or smaller places, and the use of principal shapes for important spaces in the park is typical for Lange´s design language.

Materials and Methods

The scope of the paper is to synthesize knowledge on Lange and the key elements of his overarching personal design philosophy. Information was retrieved through a review of written essays and statements by Lange published in books and was verified through personal collaboration and interviews with Lange. This information was supplemented through images of built and unbuilt work of key projects that were taken from publications or personal site visits. No peer-reviewed literature about Lange was accessible at this time. Mauerpark Berlin, one of Lange's most prominent works was a critical resource for this investigation. Historic and recent construction plans were available and were supported by site visits and study of aerial photographs.

Results and Discussions

Three leading key principles of Lange's design philosophy could be identified through the review of written essays and statements by Lange that were published in books or publicly available essays. These are, *Dialogue of Nature and Culture*, *Inclusion and Legibility of Historic Layers*, and *Interstitial Space and Coincidence.*

Dialogue of Nature and Culture

Entertaining a dialogue of nature and culture in designing landscapes is a central theme in Lange's design philosophy (Lange, 2004). This can expressed through elements and fragments as finds, "Fundstücke" that are taken out of their natural context. Blocks or walls that are broken or sawn in a quarry or excerpts of landscape typologies are brought into a new, cultural context of a garden, courtyard, urban plaza, or park. About the saw-cut, cubic blocks out of tufa stone at Oberbaum-City, Berlin, Lange drew an analogy to pebbles that people find in nature: "We stoop down to pick [the pebble] it up, we weigh it, touch it, and sometimes, we take it back with us in our pocket. The same pebble thus arrives in town, like a piece of nature, like a piece of memory. Culture and its emergence maintain themselves as if on the edge of memory and the future." (Lange, 2002; Lange, 2004). The meaning and expression of the imported element is transformed through the new, juxtaposing context and can be reinforced through other natural elements such as water or plants. "Blocks of stone, water, and plants, both huge and infinitely small, install themselves in the town, like a 'part' of nature, as a counterpoint to the term of the 'urban landscape.' " (Lange, 2002), (**Fig. 2**). Lange explains the relationship of culture and nature in his design for a garden at Marbach: "The work represents an attempt to introduce a unique, new language of images and materials into the dialectic tension in the relationship between culture and nature. … …we tried in our design to reveal the wonders to be found in the super[im]posed layers of culture and nature." (Lange, 1996). Lange explicitly describes the aesthetic effect of bringing water and stone together to make the stone more beautiful. "To blossom and shine they [stones] they require water." (Lange, 2002). Another, more literal example for "Fundstücke" are the large boulders at the Copse of Ashes at Mauerpark that intermingle informally and randomly with the grid of trees.

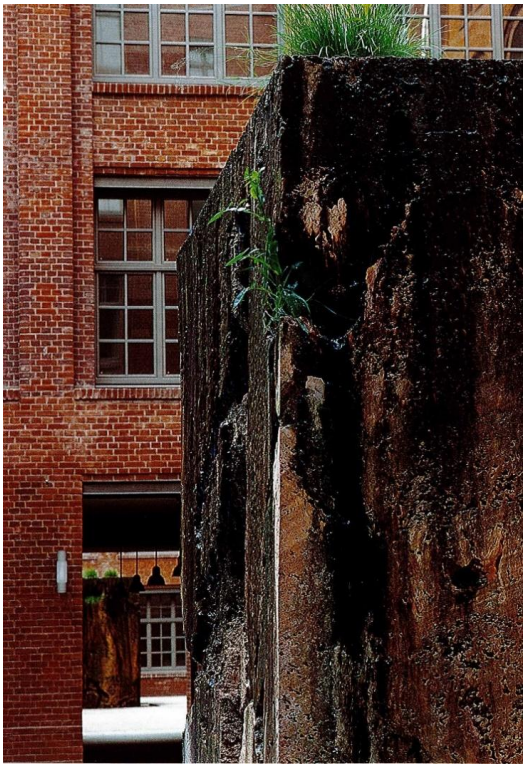

Fig. 2. One of four courtyards with saw-cut blocks out of tufa stone at Oberbaum City, Berlin as a juxtaposition of culture and nature (Lange, 2002, Photo credits Erik-Jan Ouwerkerk, 1998).

On a larger spatial scale, Lange imported excerpts of natural landscape typologies as analogies into the cultural context of gardens, courtyards, urban plaza, or parks. One typology is the *Pine Forest* – this is one of his preferred typologies that Lange has referenced in multiple projects. Pine forests and their plant communities are typical for the sandy soils of the heathlands in the north of Hannover, Brandenburg close to Berlin, or the northeastern forests of Bavaria. Exemplary are the courtyard of KKH, Hannover (**Fig. 3**), the Stone Circle at Mauerpark, Berlin, or the courtyards of the O2 Headquarters, Munich.

Fig. 3. The *Pine Forest* as a landscape typology is brought into the courtyard of the headquarters of an insurance company. Courtyard KKH, Hannover (GER), (Photo credits: Sleegers, 1998).

Another typology is the *Birch Grove* at the northern edge of Mauerpark Berlin that references the Siberian forests not only as a landscape but also as part of a formerly separated political system that is now used the park as a symbol of unification between east and west (**Fig. 4**).

Fig. 4. The *Birch Grove* at Mauerpark Berlin references the Siberian forests as a symbol of unification between east and west (Photo credits: Sleegers, 2020).

Another prominent example for the use of birches as a reference for a natural landscape is the Birkenatrium [Birch Atrium] for one of the courtyards of the Jakob-Kaiser-Haus for the Deutsche Parlamentarische Gesellschaft [German Parlamentarian Society] that dates from 2002.

In Lange's work, nature is not only referenced as a simple copy or interpretation of plant communities that are brought into the cultural context. The applied design media – living and structural ones – are intended to create a meaningful, three-dimensional composition that includes all natural elements. This is expressed by Lange in more depth about the Raschplatz, Hannover. He explains the plants and their habitus, the surfaces of a plaza and their textures, and the principal geometrical forms of a pool and contributing parts. He delves into the metaphoric importance for the choice of the trees and the symbolic quality of the planned pool: "The ground cover is porous, of an aggregate lying between coarse sand and fine gravel; it is open, unsealed, an area that can breathe. There are willows for the wind and for dreams; columnar oaks serve as arboreal leitmotif for the new architecture. The circular pool on the gravel mirrors the sky. The image-fragments that break out of the mirror are surface signs of a distant, foreign world." (Lange 1996). The quote embraces Lange's attention to the spiritual and immaterial qualities of nature and the atmospheric, transcendental qualities he intends to create with the media of the landscape (**Fig. 5**).

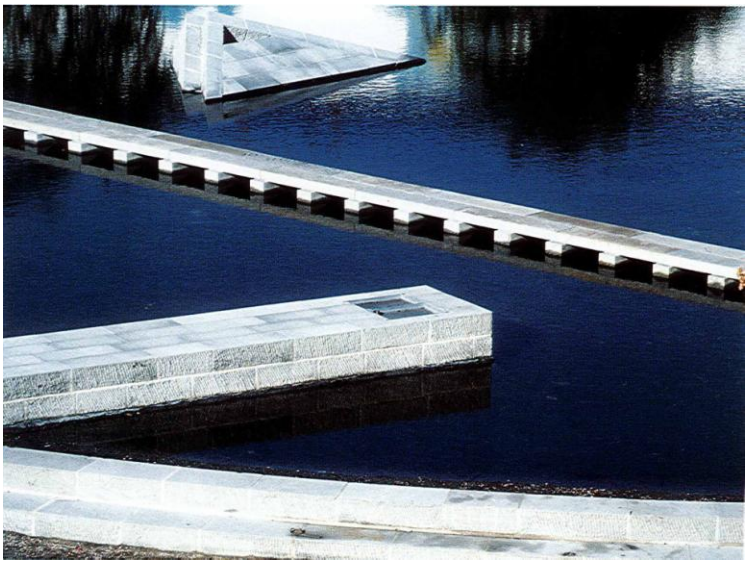

Fig. 5. Raschplatz (Andreas-Hermes-Platz), Hannover (GER) with circular pool, fragments, and willows (Lange 1996).

Inclusion and Legibility of Historic Layers

Including and revealing historic layers as elements of the landscape is another leading principle for Lange. This applies to surfaces, objects and their remnants on a detail level and is also applied on a conceptual, spatial level (Lange, 2004). At Mauerpark Berlin the central design idea was keeping the void of the former Death Strip as lasting spatial reference while offering a new place for new experiences and allowing the transformation into a place of freedom. A further example at Mauerpark is the revelation of the cobblestone pavement of Schwedter Strasse **(Fig. 6)**. This street was an important south-north connection that dates to the mid-1860's and was covered with sand as part of the "Death Strip" of the Berlin Wall in 1961.

Fig. 6. The historic Schwedter Strasse was revealed after the fall of the Berlin Wall. The street has been a connection from the core of the city to the north for over hundred years before is became defunct after the separation of Berlin and Germany during the Cold War. From 1961 to 1988, the Berlin Wall ran only a few meters beyond the curb to the right of this image (Photo credits: Sleegers, 2021).

There are other examples in the park that reveal the history of the place as an overgrown railyard and underutilized urban wasteland. Lange kept the diverse and different surface materials, random rails in the ground and also kept the self-seeded trees in the western part of the park that has never been part of the fortification system of the Berlin Wall. Newly planted alleys of trees create a new, legible layer that intermingles with the elements of the past.

The winning, unbuilt design competition entry from 1996 for Lustgarten in Berlin Mitte is another, prominent example of how Lange deals with historic landscapes **(Fig. 7)**. His design preserved the surface of the pavement that was part of a contaminated Nazi-German history. He added a detached, new layer of potted azaleas and boxwoods. While this idea allowed for a critical dialogue between old and new, the city's senate preferred the second-placed design that followed the conservative approach of a "critical reconstruction" from Karl-Friedrich Schinkel's design from 1828 (Petrow, 2013).

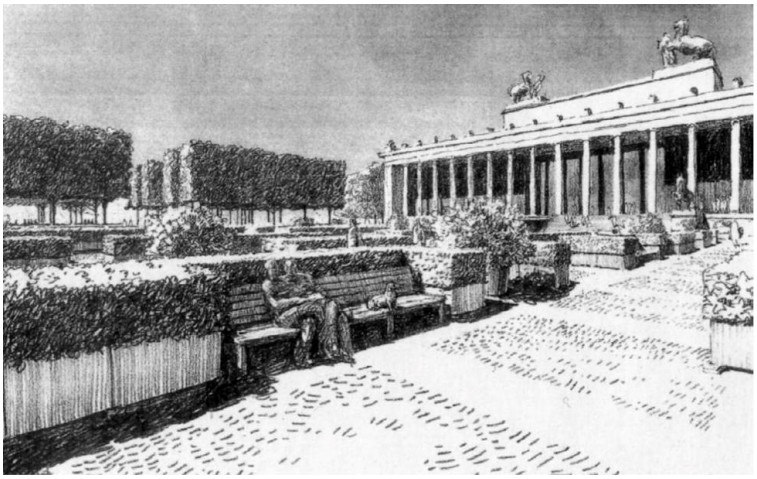

Fig. 7. Illustration of the winning design competition for Lustgarten in Berlin Mitte by Lange. The design added a detached, new layer of potted azaleas and boxwoods (Photo credits: Lange, 1996 as published by Petrow, 2013).

Interstitial Space and Coincidence

Interstitial space and *coincidence* are correlating themes in Lange's design philosophy (**Fig. 8**). He describes the role of *interstitial space* as a socio-cultural aspect and necessity for designing public, democratic landscapes of freedom. Interstitial space and joints are necessity for exchange between political and cultural systems (Lange, 1996; Lange, 2004), and, "Life takes place in the 'spaces in between' in unorganized structures." (Lange, 1996).

Fig. 8. The "Carpet of Turf" at Mauerpark Berlin represents an interstitial space in a city. Lange conceived it as space of freedom between cultural systems (Photo credits: Sleegers, 2021).

About Mauerpark, he confirms: "The interstices and seams are the free space of the city. The space in-between is freedom. Spontaneity is essential for life and living in the city." (Author, 2020). This position is pursued on multiple scales, the large scale as applied to the grander spatial openness of a park or plaza and on the small, detail scale, when designing the spatial relationships between objects. For example, granite blocks or other stonework is set with gaps, hardscapes are preferably porous or contain permeable joints. This allows for spontaneous vegetation and vagabonding self-seeding plants. Lange states "Nature is the best designer with compositions that human beings will never be able to execute." (Author, 2020) (**Fig. 9**).

Fig. 9. Spontaneous vegetation and vagabonding self-seeding plants in the joints of the pavement represent interstitial space on the small scale at Mauerpark Berlin (Photo credits: Sleegers, 2019).

Interstitial space relates to the concept of *coincidence* because this is a place "where things can happen" (Author, 2020). This is grounded in Lange's belief that places should catalyze a process of self-appropriation that can exist without distinct and prescribed programming or influence by authorities. For Lange, *coincidence* also relates to *nature*. Talking about Oberbaum City, Berlin on the occasion of retirement as a professor: „I made the effort to create something with the stones that provides the base for something insignificant. Something that is not filled up with meaning. A place for *nature* that provides a space for *coincidence*. " (Lange 2004, 56).

Being prepared for the moments of coincidence, discovery and exploration or taking the unbeaten path for the sake of getting an unfamiliar perspective on things was also part of Lange's teaching pedagogy as a professor (Lange, 2004; Mann, 2004). In this context, he referenced Jack Kerouac's "On the Road" (Kerouac, 1957). Kerouac's script of a free-roaming journey of searching and discovery was as a major inspiration for him when he was a young man himself and travelled extensively (Lange, 1996; Lange, 2004). On a more literal level, the concept of *coincidence* is adapted by Lange as a formal design tool as "randomly placed" structures and plants do not follow strict geometric principles and are juxtaposed within a framework of formal design strategies (**Fig. 10**).

Fig. 10. Randomly placed boulders at the Copse of Ashes juxtapose with the grid of trees. (Photo credits: Sleegers 2021).

Conclusions

This research defines three leading themes in Gustav Lange's design philosophy. *Dialogue of Nature and Culture*, *Inclusion and Legibility of Historic Layers*, and *Interstitial Space and Coincidence* as three overlapping, intertwining themes that are forged into a formal, unifying spatial framework of real physical places. While Mauerpark Berlin as Lange's most renowned and complex project is key to this study, his statements about other projects and his approach to teaching provide a more detailed and synthesized knowledge and evidence about Lange's and his design thinking. Lange's multi-faceted and sensitive design approach is best represented in this statement: "Recombination of the existing is important to me, not the planning of newly designed complexes. We have enough of those." (Lange, 2004).

For Lange, the relationship between a physical form-based design framework and a personal overarching philosophy is essential. This paper invites for further research on design concepts and the underlying philosophy and standing of their authors in landscape architecture. It also reinforces the necessity of thinking in larger dimensions, contexts and concepts for entertaining discussions about meaning and purpose in designing for people.

Acknowledgments

The author thanks Gustav Lange and his family for this ongoing journey of discovery.

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CONFERENCE VOLUME

FRAMEWORK AND RESULTS OF A DESIGN-BASED LEARNING EDUCATIONAL PROGRAM WITH THE LOCAL LANDSCAPE IN FOCUS IN A HUNGARIAN HIGH SCHOOL

Tayana PASSOS ROSA[1*], Zsombor BOROMISZA[2]

[1 2] Department of Landscape Protection and Reclamation, Faculty of Landscape Architecture and Urbanism, Hungarian University of Agriculture and Life Sciences, Budapest, Hungary

*Correspondence:
Tayana PASSOS ROSA
tayanapr@gmail.com

Abstract: This study presents a pilot program developed as part of a research project. The goal was to develop and evaluate an extracurricular educational program using the methodology of Design-Based Learning and the principles of landscape architecture to improve environmental education in a Hungarian school community. Ten students participated in the program, which was conducted at the Polytechnicum of Economics Alternative High School in Budapest. Their goal was to design a sustainable and multifunctional intervention for the schoolyard. The program was divided into three sessions with pre-selected activities followed by an evaluation session and encouraged student autonomy in finding challenges and developing concepts using 21st century skills. Four schoolyard interventions were designed and evaluated based on feasibility and student development. Feedback from students, teachers, and support staff revealed strengths, limitations, and opportunities for improvement. The work showed that overall, the ideas became more complex while still meeting the needs of the schoolyard. Students' perceptions of the design process and the impact of natural elements on health and the environment changed positively. This study highlights the effectiveness of design-based learning and landscape architectural principles in environmental education and provides ideas for future project development.

Keywords: learning by doing, future skills, landscape-human connection, environmental education, landscape design**.**

Introduction

The human pressure in the environment grows exponentially, meanwhile, actions towards the mitigation of the consequent challenges struggle to make due. The last 30 years were significant for the global understanding that the climate crisis is a real risk that requires immediate assessment. The UN efforts to bring nations together to tackle the crisis is a significant step in the process. Among the 17 sustainable development goals, established by the UN, quality education made it number four, including sub-target education for sustainable development which was given special importance by the UN (Barrable, 2019).

Jefferson and Anderson (2017) believe that schools, as primary venues for the exercise of creativity and a sense of community, are the most promising sites for social change. The effective and meaningful teaching of environmental knowledge in public education is of great importance because it will shape the future of quality of life and foster environmental engagement from an

early age (Hudson, 2001; Gamage, 2022). To reach respectful and engaged people, environmental education must provide a sense of fulfilled hope and satisfaction, preferably in a fun and inspiring environment (Hudson, 2001).

However, the human and the natural systems cannot be considered separately to address the climate crisis. Both systems are simultaneously evolving and this complex structure characterizes a transdisciplinary network that requires an equally complex network of solutions (Dale and Newman, 2005).

Furthermore, there are some factors that are necessary for educational success, especially in the early years. In order to achieve respectful and engaged individuals, learners must have the freedom to explore the areas that interest them and decide for themselves the level of involvement and engagement in order to find creative solutions (Gamage, 2022). Additionally, education in the new, ever-evolving environment should not only be student-centered, but also meet the needs of the twenty-first century, and this is only possible with the 4Cs skills, namely creativity, critical thinking, collaboration, and communication (Jefferson and Anderson, 2017). Dale and Newman (2005, p. 351) support that "these skills reflect the complex nature of social-ecological reactions, thus interdisciplinary appreciation and skills are integral to sustainable development literacy".

Finally, another success factor that should be considered in the future of environmental education is "creating direct experiences in the environment of daily life." Integrating this approach helps create sensitive, well-informed citizens who can connect their experiences globally (Toorn, 2007, p. 461). More specifically, as supported by Gill (2014) in his systematic literature review, promoting experiences in nature during childhood is important for more than mental and physical healthy development. Also important and well supported by the literature review are the following claims: Exposure to nature during childhood has been correlated with the development of environmentally conscious attitudes and an improved sense of connection with the natural world in adulthood. This also contributes to a greater sense of place. Also, among children engaged in gardening initiatives in schools, better scientific comprehension has been observed in contrast to their non-participating counterparts. Time spent in nature has also been linked to a heightened level of environmental knowledge.

The crescent need for quality environmental education is represented in many programs all-inclusive. Building upon this foundation, the world leader international initiative dedicated to advancing education for sustainable development is the Eco-schools program. It was established in 1994 in direct response to the 1992 Earth Summit in Rio, which marked the inception of the global pro-environment movement. Eco-Schools present educational institutions worldwide with an adaptable framework for instituting environmental management systems and facilitating environmental education. The primary objective of this initiative is to equip students with a comprehensive understanding, aptitude, perspectives, and essential principles, achieved through the seamless integration of sustainable topics with dynamic and participatory learning methods (EU, 2018).

Similar to the Eco-schools program, but under a particular framework more focused on carbon emissions, is the Green Schools Project, which started with Kingsmead School in England, where the poor handling of energy consumption and waste management led the school community to self-initiate an Eco-team which started an energy-saving campaign that escalated to other actions, such as recycling, school garden, walking to school weeks, among others. These actions generated a

behavioral change that spread to the school staff and the local community beyond saving the school over £35,000 in the course of three years (Green Schools Project, 2017).

Another meaningful project that motivated and enabled the development of the present research is the Hungarian LADDER Living Lab. This project has the objective of democratically transforming school environments by bringing university and NGO landscape professionals to facilitate the development of tailored landscape architecture solutions in conjunction with school communities. The initiative prioritizes the engagement and empowerment of children and young individuals, encompassing teachers, staff, parents, and external stakeholders. International and local landscape architecture students play a pivotal role in this collaboration, utilizing theoretical knowledge in landscape democracy and participatory planning alongside practical fieldwork within school environments. This multifaceted collaboration seeks to popularize democratic school environment design, fostering a connection between academia and school communities, and promoting collective efforts toward enhancing the quality of educational spaces. A special highlight of the initiative work is the project done with Dr. Ámbédkar School, a Buddhist school for the Roma community in Miskolc and its surroundings. Together with the international LED2LEAP course, an intensive program was held, and the landscape architecture students worked together with the local and Roma community towards the improvement of the schoolyard and the integration of both communities (Reith et al., 2022).

Landscape Architecture, as defined by the European Council of landscape architecture Schools, plays a crucial role in consciously shaping the external environment to meet diverse human and natural needs. This discipline engages in planning, design, and management to create aesthetically pleasing, functional, and environmentally, socially, and economically sustainable landscapes (Bruns et al., 2010). Guided by the regenerative principle, effective Landscape Design must adapt to local dynamics (Motloch, 2000). The landscape architect, as a professional, employs complex knowledge and skills to establish sustainable landscapes, balanced communities, and harmony between social interests and ecological factors (Boromisza et al., 2020). This approach enables the creation of new experiences within living environments (Toorn, 2007). The evolving field of landscape architecture is increasingly people-oriented, embracing sustainability, social and economic considerations (Toorn, 2007; Bruns et al., 2010). This shift aligns with the landscape profession's growing significance for environmental literacy, sustainable development, and global environmental challenges. Today's digitally connected youth possess information on sustainability yet may lack an intimate connection with their surroundings (Hudson, 2001). Engaging them in participatory planning enhances their environmental consciousness (Özdemir, 2019). Transferring Landscape Architecture skills, such as understanding and transforming spaces (Nijhuis, 2013), through practical activities fosters a sense of ownership and partnership, motivating environmental stewardship (Özdemir, 2019). Thus, the synthesis of landscape principles and participatory methodologies holds promise for nurturing environmental action and instilling a profound sense of belonging in the younger generation, besides promoting the comprehension of the landscape systems, their interconnection, and their function.

For the pilot program for the present research, the pedagogical methodology of choice for experimentation to meet the above needs in education is Design-Based Learning, which is based on incorporating the design process into schooling and aims to support curriculum content through real-world challenges to be solved using problem- and inquiry-based strategies (Raber, 2015). This learning approach also encompasses the 4Cs, as all of these skills are inherent in the design process,

while the nature of the design process is focused on discovering, planning, creating, and doing (Davis et al., 1997; Raber, 2015). Considered an effective methodology for the learning of transdisciplinary and complex systems, merges the physical, cultural, and social spheres (Davis et al, 1997).

This paper presents the framework, results, and reflections of a project conducted as a thesis for the Master's Degree in Landscape Architecture and Garden Design at the Hungarian University of Agriculture and Life Sciences during the spring semester of 2021-2022, which was a pilot study. The project will be continued and expanded to conduct further experiments in Brazil and in Hungary and to include other social groups.

The goal was to develop an educational program combining the methodology of Design-Based Learning with the principles of landscape architecture to improve environmental education in a Hungarian school. The partner school was the Polytechnicum of Economics Alternative High School. The activities took place in four one-and-a-half-hour sessions and ten students participated in the program. The goal of the program was to design an intervention for the schoolyard that considers multifunctionality and sustainability.

The purpose of the study is to explore the combined potential of the Design-Based Learning methodology and landscape architecture applied knowledge and skill to bridge the environmental education gap with a framework based on positive landscape transformation using design tools.

Materials and Methods

The goal and scope of the research were determined through a literature review of design-based learning methods, design methods, landscape design, principles of landscape architecture, environmental education, environmental literacy, and 21st-century education. The partner school, Polytechnicum of Economics Alternative High School, was selected based on its English-speaking community and previous involvement in participatory design activities. Site visits and research were conducted on the school's history, pedagogy, programs, and community.

The program was designed to fit in four occasions, following the principles of the design process and the development process based on action research principles

Polytechnicum of Economics Alternative High School

The Polytechnic of Economics, founded in 1991, is an alternative school focused on providing forward-looking education aligned with labor market expectations and the personal needs of students. It follows a system of democratic decision-making and emphasizes democratic values, autonomy, tolerance, and social and cultural diversity (Poli, 2014). The school integrates modern pedagogical methodology, including cooperation, creativity, project work, and activities-based learning (Nagy, 2011). The school's principles align well with the research program. And school groups had previously engaged in activities related to landscape architecture and the development of the schoolyard (Mihály, 2022), the data from these activities was used for the initial schoolyard assessment.

It is supported by the Budapest Polytechnic Foundation and aims to meet the needs of 21st-century education (Nagy, 2011). The school community consists of middle- and upper-income Hungarians who prioritize international language learning and a modern educational background. The school is bilingual and offers a year of English leveling.

The school is located in District 9, Budapest, in an urban setting surrounded by residential and administrative buildings and Semmelweis University. The school premises consist of four buildings for classrooms, workshops, and physical education (PE) activities (Jakab, 2010) as can be seen in **Figure 1**. Discussions with the school administration have taken place about improving the appearance and functionality of the sports court and reducing the excessive parking areas. And in this primary assessment, it was also identified that the schoolyard lacks green spaces, social areas, and attractive features.

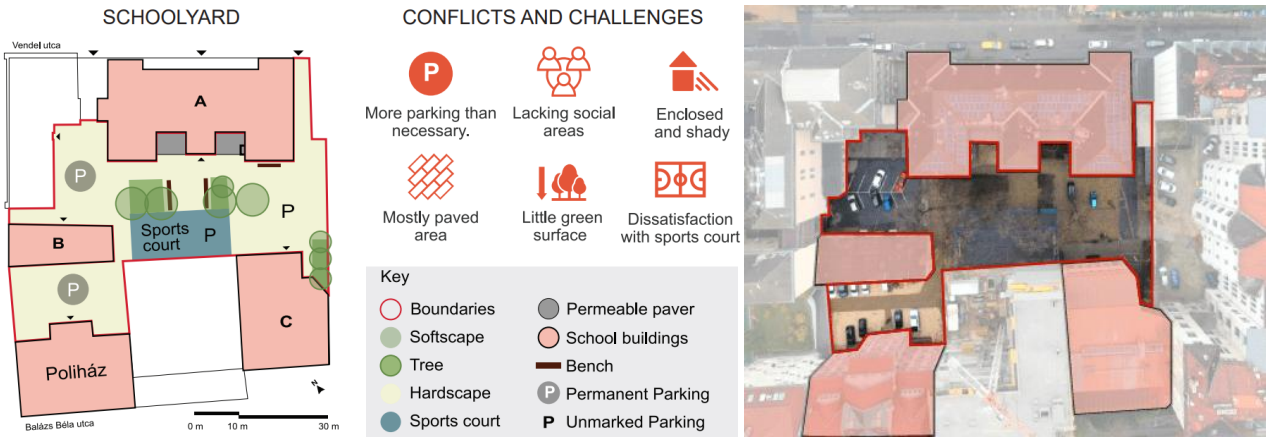

Fig. 1. Left: School plan and primary assessment. Source: author, 2022. Right School aerial photography. Adapted: picture by Áron Felszeghy in Közgazdasági Politechnikum, 2019.

Program design

The program was formulated by breaking down the design process into three working sessions, each with pre-selected activities, plus a fourth meeting for the solutions presentation, assessment, and reflection on the entire process. The students had the autonomy to develop their designs and were required to improve their understanding of the place, natural and man-made elements, and design attitudes through learning by doing. As the sessions advanced within the program, there was an increasing expectation for the exploration of the 4Cs, through group work and the increased complexity of the tasks. Additionally, time pressure was a limitation turned into a tool for fast-paced learning and fostering creativity and innovative solutions.

For the selection of the activities, besides following the design process, landscape principles, and landscape design-related tasks were incorporated. In this way, students were actively engaged in addressing the challenges they identify in their schoolyard by proposing design interventions, by introducing existing or newly learned landscape architecture concepts to design solutions for a place that is familiar to them and to which they feel connected. Through this process, they should gain an understanding of the various factors involved and the potential outcomes of their proposed interventions. In this way, not only the students' connection with their landscape is strengthened but also the gap between landscape architecture knowledge and real-world problem solving is reduced. **Table 1** is a summary of how the design process was divided into the four available weeks and the subsequent expectations from each week based on the activities' development.

Table 1. Framework summary

Design process steps per week	**Expectations for the phase**
Week 1 1. Define the problem 2. Collect information	Assess students' interest in the landscape; Promote, through self-discovery, the potential to introduce natural elements to urban environments; Initial individual prototyping testing as brainstorming of innovative ideas for the schoolyard; HW: initial personal assessment of the schoolyard's values and challenges.
Week 2 3. Brainstorm and analyze 4. Develop solutions, build a model	Practice analytical skills using the previous session's HW, and recollection of the first session; Introduction of landscape and design principles and elements; Fostering group communication, collaboration, and critical thinking through debates about landscape, design, and environment and their effects on health and natural systems; Connecting the content of the day to the real-life context; HW: initiating conceptualizing and study prototyping in smaller groups.
Week 3 5. Presentation and feedback 6. Improve the design *4. Build model	Practice communication and analytical thinking through group assessment of the concepts; Apply lessons learned from group assessment and improve the groups' concepts by creating one final concept for the entire group. Create a prototype for the final concept. HW: Finalize the concept and prepare how to communicate it effectively to the facilitators.
Week 4 5. Presentation and feedback Reflection session	Final assessment and evaluation of students' development and evolution of ideas; Assessment of strengths, weaknesses, and next steps for implementation; Involvement of the school community by sharing students' ideas for the schoolyard; Confirmation of theories, identification of valued information learned, and student feedback; Identification of challenges and valuable outcomes; Understanding students' awareness of what was learned and areas for program improvement.

Note: HM - homework; * - Jump back in the process.

Data collection

Data collection for this study utilized a mixed methods approach, incorporating questionnaires, interviews, observation, analysis of program productions, and visual documentation. The primary focus was to answer several key questions. Firstly, it sought to determine the level of student engagement during the activities through guided observation. Also it aimed to assess students' emotional states during the sessions, by analyzing their body language, facial expressions, and communication with peers and facilitators. This was done in order to readjust the pace of the program, as possible, to improve or maintain the student commitment.

Further qualitative analysis was conducted to identify patterns and characteristics in the data, guided by specific assessment guidelines. These guidelines encompassed questions such as whether

the assigned tasks were completed and submitted in a timely manner, whether students effectively utilized the information provided in previous meetings and assignments, whether their understanding and perception of the schoolyard improved, whether their 4Cs skills (communication, collaboration, critical thinking, and creativity) showed enhancement and whether design concepts demonstrated progress and refinement over time.

Results and Discussions

The four weeks of application were documented in detail and assessed based on the main questions for data collection. The first occasion showed high engagement on the students' side, which reflected their great wishes in improving their schoolyard experience. They showed good 4Cs on collaboratively developing green solutions to a posed challenge. And also showed to be creative in developing quick independent solutions to the schoolyard through an instant prototyping activity. On this occasion, a wide variety of ideas for the schoolyard and possibilities of green solutions were learned with the aim of creating more references for future activities.

However, already in the second week, student rotation and engagement posed challenges. The lack of commitment to homework hindered some of the expectations for the occasion. Engagement showed a decline due to the more conversational character of the session in comparison to the first one. Although the practical activities of the day were rather unsuccessful, the students showed good critical thinking and understanding of design and landscape architecture principles and natural systems when discussing aspects of the natural world and the schoolyard.

In the third week, adjustments were made to address the lack of engagement in homework and more practical activities were in place. The original expectation was to merge the entire group for the creation of one final solution to the schoolyard, which would require better administration of the learning from the previous sessions. However, the concepts in small groups were not completed, thus merging all the works was not possible. Besides the setbacks, the group work and idea collection demonstrated the students' evolving thinking and understanding of the space. Collaboration skills were evident, particularly in the groups that showed higher engagement in previous activities.

The final week saw the completion of the homework for week three, albeit one week later than expected. Although the whole expected results were one session late, lacking the final proposed group work which was the one requiring the biggest practice of the proposed soft skills and the knowledge gathered during the experience under, the also expected limitation of, time pressure. Despite this setback, interesting features emerged. There was a clear desire among students to improve the soft scape of the schoolyard and to improve comfort and social areas.

The program resulted in four designed interventions for the schoolyard that were presented on the school’s sustainability day, **Figure 2** displays the concepts developed by the students, numbered 1 to 4 (left to right). The further development of the ideas is still being discussed. The students’ productions were varied in proportion, functionality, and application of natural elements. They were assessed following a feasibility criteria list as shown in **Table 2**.

Fig. 2. Student concepts. Source: participants' and supporting staff's visuals, 2022.

Table 2. Description and summarized assessment of the students' concepts.

Concept 1 - Multifunctional stair-room 1. Short description: Social area, serving as a space divider and offering seating opportunities. Includes a grass roof, a seating area with a rope mesh and social space with soft furniture inside the structure. 2. Aims and benefits: Provide a functional and enjoyable space, enhance the schoolyard's appeal, create seating options, and offer a secluded area for students. 3. Material: Wood or concrete. 4. Workforce: Specialized force needed for construction, can include the school and community in the construction. 5. Time frame and budget: Requires a moderate timeframe and a moderate budget compared to other concepts. It can be further conceptualized for the improvement of these criteria.
Concept 2 - Cozy corner 1. Short description: Modular cozy corner in the schoolyard, using a shelf structure with hanging plants as dividers and a focus on reusable materials. 2. Aims and benefits: Create an attractive space with greenery, allow for different uses and easy reassembly, and utilize recycled materials. 3. Material: Use of recycled materials for construction and furnishings, mainly wood for structure. 4. Workforce: Can be put together by the school community in a relatively short time. Very good concept to include the local community in the planning and assembly of the structure. 5. Time frame and budget: Requires a small budget, and short timeframe.
Concept 3 – Neat jungle 1. Short description: Restructuring the schoolyard area, including repositioning the sports court, creating a wavy pathway, adding drinking fountains, and incorporating unconventional seating areas. 2. Aims and benefits: Minimize hardscape, add various levels of vegetation, including trees, shrubs, and lawn surface and adding furniture. 3. Material: Reuse existing pavement material for the pathway system. Addition of green and furniture elements. 4. Workforce: Requires specialized workforces for detailed planning and execution. 5. Time frame and budget: Requires a longer timeframe and a bigger budget compared to other concepts.
Concept 4 – Drinking fountain 1. Short description: Pedal activated drinking fountain. 2. Aims and benefits: Supply a need in the schoolyard, in the current state there are no drinking water sources. 3. Material: industrial element, installation required material (water and energy connections). 4. Workforce: Requires specialized workforce for execution. 5. Time frame and budget: Requires a shorter timeframe and a regular budget compared to other concepts.

The results of the work demonstrated that the majority of students' ideas became more complex while remaining realistic and addressing the needs of the schoolyard. This indicated an increase in their understanding of the provided information and critical thinking skills. Despite facing limitations, the students exhibited excellent communication and were able to achieve results. Engagement throughout the program showed to be high on the first occasion, low on the second, then increasing again on the third and fourth occasions.

In summary, 3 out of 4 proposals incorporated green elements and multifunctionality, and all considered users' needs and emotions, and the schoolyard's needs with a variety of approaches.

Overall, the participants demonstrated increased preparedness and motivation to improve the schoolyard and showed a deeper understanding or enhancement of the proposed learning objectives, such as integrating green elements, understanding the positive effects of softscape for health and natural systems, connecting with the landscape on a personal level, reading and understanding spatial arrangements, comprehending the design process, and developing soft skills. The improvement observed throughout the experience highlighted the value of these outcomes in accomplishing the proposed activities.

The introduction of Landscape Architecture principles and the establishment of a strong connection between the schoolyard and student autonomy significantly improved the quality of the results achieved. Through this work, the students developed a heightened perception of the schoolyard. As confirmed by the participants, they now see its potential for improvement, better understand possible changes, possess a collection of ideas and concepts that can be refined and implemented, and, recognize the positive outcomes that can arise from these changes.

Assessment of the program

The design-based learning framework and the selection of activities employed in the workshop were evaluated by the students, teachers, and facilitators, revealing, in the majority, positive outcomes. Group discussions and reflection showed that the students displayed strong communication and collaboration skills, effectively explaining their ideas despite English language challenges. Group communication was highly successful and enjoyable, as indicated by questionnaire responses and observations.

Regarding the students' relationship with their surroundings, the group working on the larger schoolyard area (concept 3), had the most significant impact followed by the groups working on the concepts 1 and 2. The scale and necessary investigation of the environment played a vital role in fostering a sense of connection and the multifunctionality of the proposals also led to more investigation on the natural elements that fit into the concepts.

Student self-assessment of critical thinking and learning about landscape architecture leaned towards the negative side, contrasting with the results shown by the productions, which suggested positive outcomes in these areas. It is possible that the student’s expectations for improvement were higher than what they believed was achieved, likely not fully recognizing their own self-development.

Positive feedback was received for incorporating green elements and the design process into the concepts, reinforcing learning. The students expressed enjoyment and a strong desire to continue working on the concepts, indicating a constructive impact and a willingness to promote change.

Overall, the workshop fostered improvements in critical thinking, analysis, problem-solving, and innovation. The students developed a deeper understanding of analytical practices, followed a structured process, identified solutions, and recognized the potential of different spaces, and different interventions. Among the topics discussed were also health, and the use of design to improve quality of spaces. Challenges such as time pressure and limited materials - although less favored - played crucial roles in developing effective communication, creativity, and quick problem-solving skills.

The students' varied expectations for the workshop highlight the importance of clarifying focus and objectives beforehand. However, the workshop received high satisfaction levels, with participants appreciating the general information and its impact on them.

Upon reflection, it is evident that the program fell short in adequately addressing intricate landscape dimensions. While the activities predominantly emphasized green elements, as noted by the active involvement of the students, they remained deficient in encompassing a comprehensive understanding of other crucial systems. For instance, the program exhibited a notable oversight in addressing water systems, elucidating life cycles within gardens, comprehending soil and biological systems, and particularly accounting for climate factors. It is imperative that these substantial gaps are rectified in subsequent iterations to fully harness the potential inherent in the proposed methodology and tools, thereby garnering a more profound appreciation of their effectiveness.

Conclusions

In conclusion, the workshop showcased both positive and negative outcomes. The activities fostered in the students an understanding of environmental concepts and encouraged collaboration, effective communication, and critical thinking. However, challenges such as technical issues and limited homework completion affected the program's progression. Future iterations should address these issues to further enhance the effectiveness of the workshop. However, although limitations were present, the basic expectations for the framework were met and appreciated by the participants.

The design-based learning methodology and framework applied in the educational program proved to be highly valuable in achieving the program's expectations. By adopting a hands-on and experiential approach to learning, students were actively engaged in the design process, allowing them to develop a better understanding of design principles and local landscape challenges. However, more complex landscape systems knowledge was mostly left unexplored. Through the iterative nature of the design-based learning methodology, students were encouraged to explore multiple solutions, refine their ideas, and incorporate feedback from various stakeholders. This process not only nurtured their creativity and critical thinking skills but also enables them to tackle complex real-world problems. The framework provided a structured approach to guide students through the design process, ensuring that they considered essential factors such as sustainability, accessibility, and aesthetics. Overall, the design-based learning methodology and framework were instrumental in empowering students to think innovatively, collaborate effectively, and make meaningful contributions to the program's objectives. It provided an engaging and enjoyable experience that resulted in tangible learning outcomes related to environmental education. Furthermore, the outcomes showed that important environmental literacy aspects were fostered, such as the improvement of the student’s knowledge of power and agency toward the landscape.

However, from the landscape architecture standpoint, although the students did improve their understanding of the conscious shaping of the environment for both human and natural needs and, to some extent, adaptation to local dynamics, the solutions developed didn't show much attention in ecological factors other than increasing green surfaces and elements for human health. The importance of the balance and interconnectedness between human and natural factors needs to be integrated into the program with more emphasis on the ecological benefit and addressing the climate crisis.

Possibilities for future development

Design-Based Learning is a valuable methodology for the instruction of complex concepts. It is not limited to youth since it can be introduced to any non-specialized focus groups. It is flexible and has the potential to be applied in projects involving various stakeholders. It can be especially meaningful if including socially marginalized individuals and/or underserved communities. The flexibility of the DBL process enables a more user-centered design, fostering a stronger connection between the community and the landscape. It can be utilized as a pedagogical method but also has the potential for use in any participatory process, emphasizing design-related competencies.

This project served as a pilot study, and future experiments will be conducted in various communities after refining the method. Through an iterative process, the goal is to develop a flexible framework and toolkit that can be applied in any learning environment to enhance the environmental literacy of communities. The program will utilize the design process focusing on local landscape challenges, as a means of facilitating learning. The aim is to continuously improve and adapt the program to suit different contexts and effectively promote environmental awareness and literacy.

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CONFERENCE VOLUME

CASE STUDY: GELENCE, LANDSCAPE AND NATURAL HERITAGE PROTECTION

Zoltán PARA[1*]

[1] Doctoral School of Landscape Architecture and Landscape Ecology, Hungarian University of Agriculture and Life Sciences, Budapest, Hungary

*Correspondence:
Zoltán PARA
zoltan.para@enviro.ro

Abstract: In recent decades, the social and economic transformations that have taken place in Central and Eastern Europe have greatly influenced the social needs of the population. The landscape use phenomena that have developed as a result of these processes accelerate the disappearance of the lifestyle that shapes the landscape. The direction of the current global economic culture poses an increased threat to communities living in harmony with nature, as these demands are not aligned with the regeneration rhythm of the landscape. Having current basic surveys, appropriate legal regulations and transparent methods is of utmost importance therefore from the perspective of landscape heritage protection. The methodology of the present study consisted in a collaborative research elaborated through community involvement, conducting interviews in the form of questionnaire surveys, as well as through examining legislation and regulations. The main methodological points of the research were: planning, data collection, data analysis, report preparation. A complex value cadastre was prepared, followed by: the description of the social effects associated with the specific landscape heritage; the definition of the constituent elements of the landscape; the elaboration of a basic research essential in terms of landscape protection; the determination of the breakout points serving the purpose and the formulation of conclusions that contribute to a sustainable landscape management and protection.

Keywords: landscape use, landscape heritage protection, declaration as protected, value protection, complex value cadastre.

Introduction

The decision to initiate a landscape conservation research under the supervision of the doctoral school was preceded by ten years of work in environmental engineering and nature conservation. In the course of this work - whether it involved nature conservation or various impact assessment studies – it became apparent that the examination of the complete picture was still missing in most cases. Even with regard to larger nature conservation areas, something was lacking in terms of area management. It became more and more clear, that in order to understand the environmental effects, it is crucial to gain knowledge of at least the processes related to the landscape unit. This is how the real environmental impact of a measure, regulation or economic activity, as well as their relation to landscape-shaping processes can be actually seen.

Owing to the financing opportunities of various sectors, the region where I live has undergone an almost unprecedented development in recent years. In many domains, such as agriculture, forestry, area and settlement planning, this development - consisting typically in plan-based

activities - has led to landscape transformations and landscape interactions. Unfortunately, in most cases, due to the lack of landscape surveying data, the topic of landscape protection does not figure clearly enough in the plans. This research is proposed therefore with the aim to elaborate a landscape assessment methodology which is generally applicable to the surrounding settlements. As a first step, three settlements located in different landscape units were selected. An important aspect consisted in that, among the typical social and economic processes, there should be similar or markedly different landscape-shaping areas between the investigated settlements. The present thesis focuses on the examination carried out in the settlement of Gelence in Kovászna county, designated as the first investigation area.

Taking into account the versatility of the investigation and the planned methodological steps, a professional team- competent in analyzing the field data - was assembled.

The professional leader of the investigation was Dr. Herczeg Ágnes, landscape and garden architect; additional participants: Anna Aninger, landscape architecture student, György Darabos, photographer, Vivien Szpiszár, Attila Kovács, landscape architects, Brigitta Telek, landscape architecture student, Gergely Halász, human ecologist, Luca Molnár, ethnographer.

Specific goals were thus formulated, promoting a more decisive presence of landscape protection in the life of the community and facilitating future planning in such a way that landscape values can be preserved. A further objective consisted in determining the cultural, economic and social processes that take place in the research area and highlighting the complexity of these processes. At the same time, the landscape use aspects of typical processes, as well as the systems of traditional and current ecology and sustainability processes were examined. Last, but not least, land use conflicts and negative trends were analyzed, and future landscape protection options were proposed (Herczeg, 2014; Herczeg et al., 2015; Herczeg, 2016; Para, 2022).

Starting point

The transformation of the traditional landscape use of the Szekler region has accelerated. The lack of application of the legal framework for landscape protection has resulted in the absence of a complex landscape and natural value cadastre.

The settlement plan doesn’t involve a complex landscape assessment, green area research or landscape heritage protection study, external area regulation or green area regulation. (Cluj Management and Planning Group 2014, F.B.S.A. Consulting & Partners 2007, Urban project 1998)

The preparation of landscape work parts, if ever prepared, is not done by landscape architects.

Research area

Gelence consists of four Szekler villages, Alszeg, Felszeg, Szaladár and Ladia, originally formed from the merger of Szaladár and Ladia, and wedged tightly in the valley of the foothills of the Eastern Carpathians.

The motto of the research

”It is impossible to understand the present of a landscape, village or community without understanding its past.” (https://www.arstopia.hu/copy-of-taji-oeroeksegvedelem).

The main objective of the research was to develop a general landscape surveying methodology that is suitable for conducting basic landscape surveying research in Szeklerland.

The surveying in Gelence was the first step in a series of planned area assessments. Other goals of this study consisted in the complex exploration of the landscape, natural features and cultural-historical values of the inner and outer area of Gelence, in order to provide insight into the current state of affairs, the potential of the landscape, the relationship, at present, between nature and the community, and the latter’s situation in the landscape.

Materials and Methods

The research methodology was segmented into the following subsequent steps:

1 Field visit - landscape observation

1.A. Land value cadastre inclusion of landscape, landscape and natural values: data sheet, photo coordinate recording on the map

1.B. Examination of unique landscape values

1.C. Examination of landscape use and historical maps, as well as recording in the field the current state on a map

1.D. Land use conflicts, cadastre of conflicts, creating a conflict map

2. Conducting interviews

3. External data studies

- monographs
- Natura 2000 area, other nature conservation areas (at national, county and local level)
- archaeological topography
- outlying monuments - data collection
- public domain, forestry, municipality.

4. Data processing - map analysis

5. Evaluation, conclusion, regulation-proposal

(Csemez , 1996; Táj-terv műhely kft-Város-teampannon kft konzorcium, 2017)

1. A. Field visit

Before landscape surveying, it is recommended to read the autumn aspect. It is very important to organize a joint field trip with people who know the place well. When feasible, individuals engaged in various sectors should be approached or considered. The aim of the field inspection consisted in:

- searching for observation points, great views, panoramic locations/ drone footage
- recording the land use aspect

- searching for linear landscape elements, roads, waterways, pipelines and railways, looking for indicatives of changes
- walking around and evaluating the examined area systematically, determining the conflicts. (Herman Otto Institute, 2015)

It is recommended to have a joint meeting with colleagues at the end of each day, and immediately record all that has been said, and, if possible, process primary data.

Today's readily available image recording technology made it easy to take aerial photographs, showing an excellent overview of the current landscape use. The technical tools used: Camera: Cannon EOS 90 D, drone: KSF E99

1. B. Examination of unique landscape values

Unique landscape values were sought, that had been created naturally or by human activity, and which were of major importance for the society from a natural, historical, cultural-historical, scientific, or aesthetic point of view.

Field examination must be planned (**Fig. 1**) and needs to be considered, the area that can be covered in one day and the amount of collected information processable on the same day should be considered.

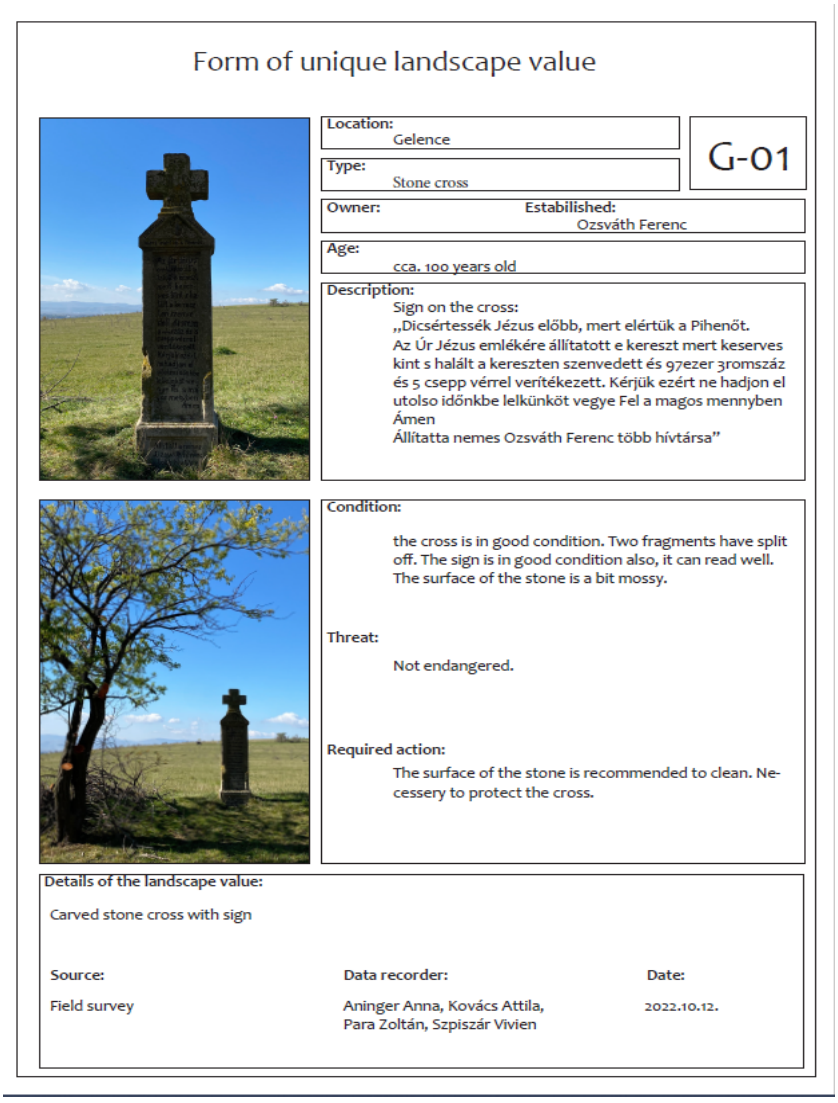
Fig. 1. Rout planning, field visit (photo by Szpiszar Vivien)

Unique landscape value cadastre: a crucial aspect of the survey was to create a transparent landscape value data sheet (**Fig. 2**) that would present the relevant information in a user-friendly format.

2. Interviews

The interviews represented the part of the survey that required great attention, as it was crucial to gather information from credible community members. It was necessary to talk to residents from different social strata and with various lifestyles. When organizing the interview, a special attention was payed to the importance of the following aspects (Kumar, 2011):

- knowing in advance whom the team would visit and pre-formulating the specific questions
- indicating the location of the interviewees on the map for more efficient order planning.
- formulating an easily understandable explanation regarding the research objectives (in this case, the landscape survey might easily be confused with an ethnographic survey)
- determining clearly what purpose the question set serves in the research.
- compiling question sets that are in line with the qualification level of the interviewees
- avoiding the suggestion of the answers when formulating the questions (e.g. ”Have you collected medicinal plants?” vs. ”What herbs are collected in the area”?)
- posing the question set to each interviewee; small differences may occur, additional information


Form of unique landscape value

Location: Gelence

G-01

Type: Stone cross

Owner: Estabilished: Ozsváth Ferenc

Age: cca. 100 years old

Description:
Sign on the cross:
„Dicsértessék Jézus előbb, mert elértük a Pihenőt.
Az Úr Jézus emlékére állítatott e kereszt mert keserves kint s halált a kereszten szenvedett és 97ezer 3romszáz és 5 csepp vérrel verítékezett. Kérjük ezért ne hadjon el utolso időnkbe lelkünköt vegye Fel a magos mennyben
Ámen
Állítatta nemes Ozsváth Ferenc több hívtársa”

Condition:
the cross is in good condition. Two fragments have split off. The sign is in good condition also, it can read well. The surface of the stone is a bit mossy.

Threat:
Not endangered.

Required action:
The surface of the stone is recommended to clean. Necessery to protect the cross.

Details of the landscape value:
Carved stone cross with sign

Source:	Data recorder:	Date:
Field survey	Aninger Anna, Kovács Attila, Para Zoltán, Szpiszár Vivien	2022.10.12.

Fig. 2. Data sheet model for describing individual landscape values (concept by Kovách Attila)

The questions formulated during the interview cover the following topics:

- Values linked to landscape.
- What makes your place of residence different from the surrounding settlements?
- What are you proud of in the settlement?
- What is absolutely shown in the settlement/landscape if you have a guest who has never been here before?

- Do you know the natural values of the area, can you name them?
- A special hydrographic formation?
- Do they have a popular spa culture?
- Is there a nature reserve in the area?
- Where did you travel as a child?
- Where is the best view?
- Do you ever collect herbs?
- How do you use it?
- Do you know related locations, or a person who knows where it is worth collecting?
- How did they farm in the old days?
- How do they farm today?
- Are there any regional vegetables and fruits that can no longer be found in the settlement?
- How is it utilized?
- Are there buildings typical of this region and landscape?
- Do you know local legends, fables, tales, folk customs and traditions related to nature?

3. External data studies

Useful pieces of information were provided by diverse regulatory plans and already existing, valid researches related to the settlement, such as: (Kumar R. 2011)

- urbanistic plans
- studies, monographs, theses
- Natura 2000 nature protection area
- other nature conservation areas (at national, county, local level)
- archaeological topography
- outlying monuments
- data collection: public domain, forestry, municipality etc.

Results and Discussions

The elaboration of the survey is underway. The collected data are being processed in the office. The formulation of conclusions is due in the subsequent period.

Field work has uncovered that there are different strategies, plans and surveys related to the settlement and its surroundings, such as the settlement plan of the village or the forest and pasture plant plans. A first-round investigation of the latter reveals clearly the absence of a coordinated, unified direction that would outline the landscape values. There are also examples of individual land developments initiated on larger arable lands. It is expected that the owner wants a residential park development. Implementations of this type do not take into consideration sustainable developments based on potential. In certain cases, there is an explicit economic interest in the background.

The legal framework regarding the protection of natural values is absent or very ineffective.

The presence of the fortress church - of historical significance due to the religious culture - is of paramount importance.

Ancient crafts, which could constitute the starting point for a landscape potential-based development, are relegated to the background, or are on the verge of disappearing.

The present survey consequently contributes to recording the present, defining the potential and opportunities of the landscape, as well as to highlighting the necessity to coordinate landscape-shaping processes. (Egyed, 2012; Péter, 2012)

A couple of examples:

Photos (**Figures 2-4**) of the typical landscape of Gelence

Fig. 3. View of the settlement wedged between the mountains (photo by Darabos György)

Fig. 4. View of agrarian areas (photo by Darabos György)

As shown in the pictures (**Figures 5-6**), the small-plot cultivations are still visible. Regrettably, agricultural subsidies favor the cultivation of extensive plots, leading to the imminent disappearance of this traditional form.

Fig. 5. Gelence is considered to be a large settlement in the county (photo by Darabos György)

Fig. 6. Photos taken from above show adequately the proportions (photo by Darabos György)

It proved to be imperative to complement the wide-angle photos shown above with detailed ones (**Figures 7-9**) which contain crucial information for the investigation.

Fig. 7. Dried up stream bed (photo by Szpiszár Vivien)

Fig. 8. Abandoned quarry (photo by Para Zoltán)

Fig. 9. Religious and historical monument (photo by Kovach Attila)

The objects indicated on the data sheets were marked on the map, so that additional information can be obtained based on their location.

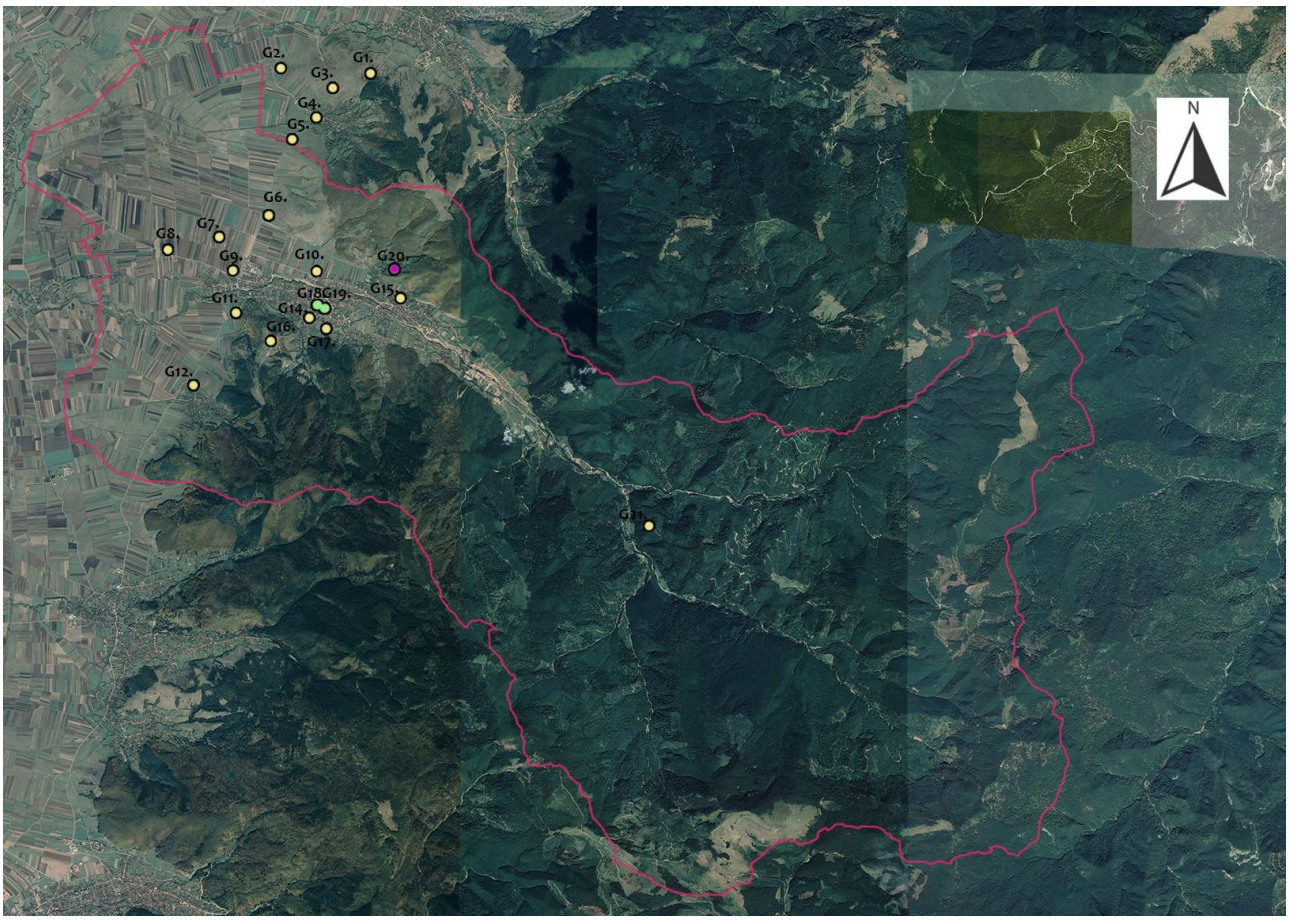


Fig. 10. Display of individual landscape values on the map (designed by Brigitta Telek). Source: Aerial photo Google earth, http://lpis.apia.org.ro/. Yellow dot: stone crosses; Green dot: mansions type buildings; Purple dot: old garden

1.C. Overview of historical maps

In most cases, historical military surveys provided authentic information about the region, these having been the most accurate measurements from the times before satellite images.

Fig.11. I. Military survey (1763-1787). Sources: Grossfürstenthum Siebenbürgen Arcanum Digitalis Historical Maps

Fig.12. II. Military survey (1806-1869) indicating the administrative boundary line of Gelence. Sources: Grossfürstenthum Siebenbürgen Arcanum Digitalis Historical Maps (designed by Brigitta Telek)

The contemporary and current landscape use surfaces were projected onto the digitized military surveys, allowing the observation of different trends. This facilitated the formulation of the methodological details of the landscape survey that ensured the collection of effective and characteristic information concerning the examined area (**Figures 11-17**).

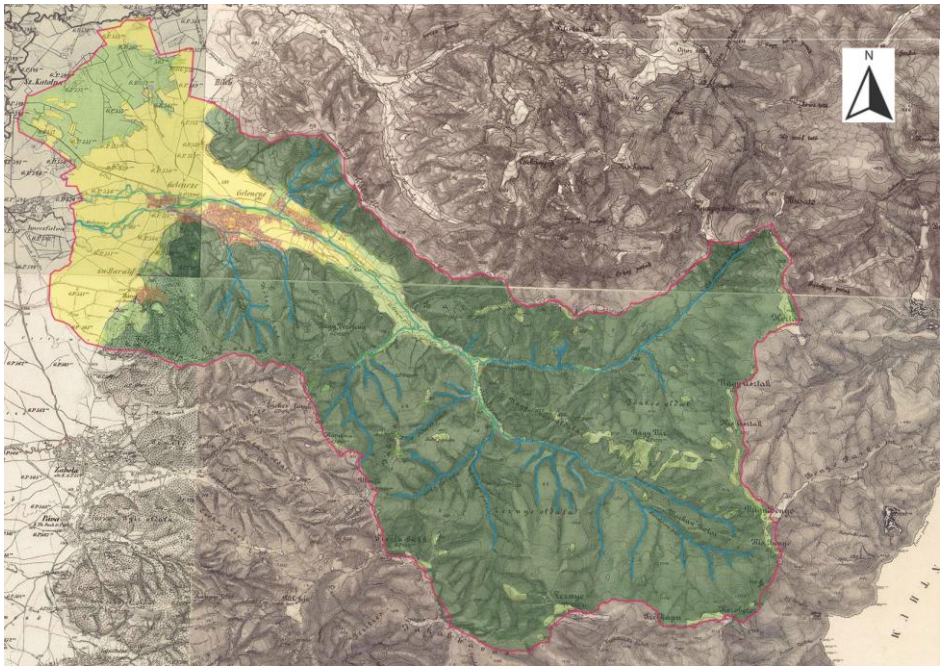


Fig.13. II. Military survey (1806-1869) indicating the administrative boundary line and landscape coverage of Gelence. Sources: Grossfürstenthum Siebenbürgen Arcanum Digitalis Historical Maps (designed by Brigitta Telek)

Fig.14. III. Military survey (1872-1884) indicating the administrative boundary line of Gelence. Source: Military History Institute and Museum Map Library - from the Arcanum Database (designed by Brigitta Telek)

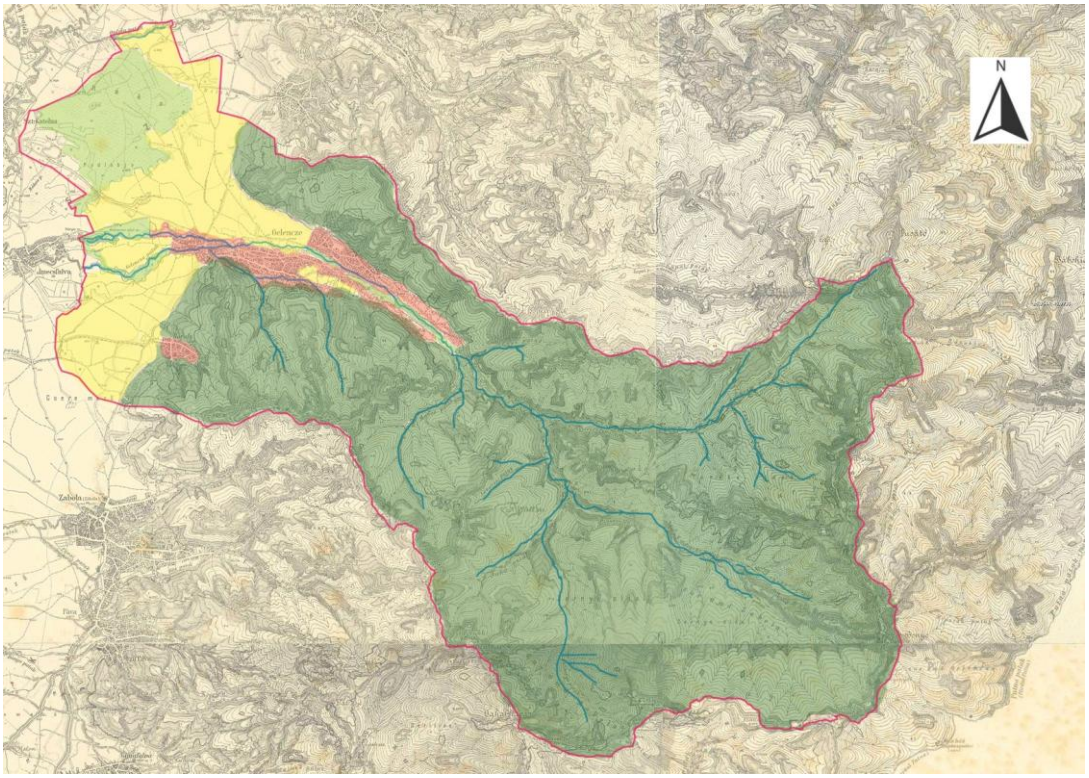


Fig.15. III. Military survey (1872-1884) indicating the administrative boundary line and landscape coverage of Gelence. Source: Military History Institute and Museum Map Library - from the Arcanum Database (designed by Brigitta Telek)

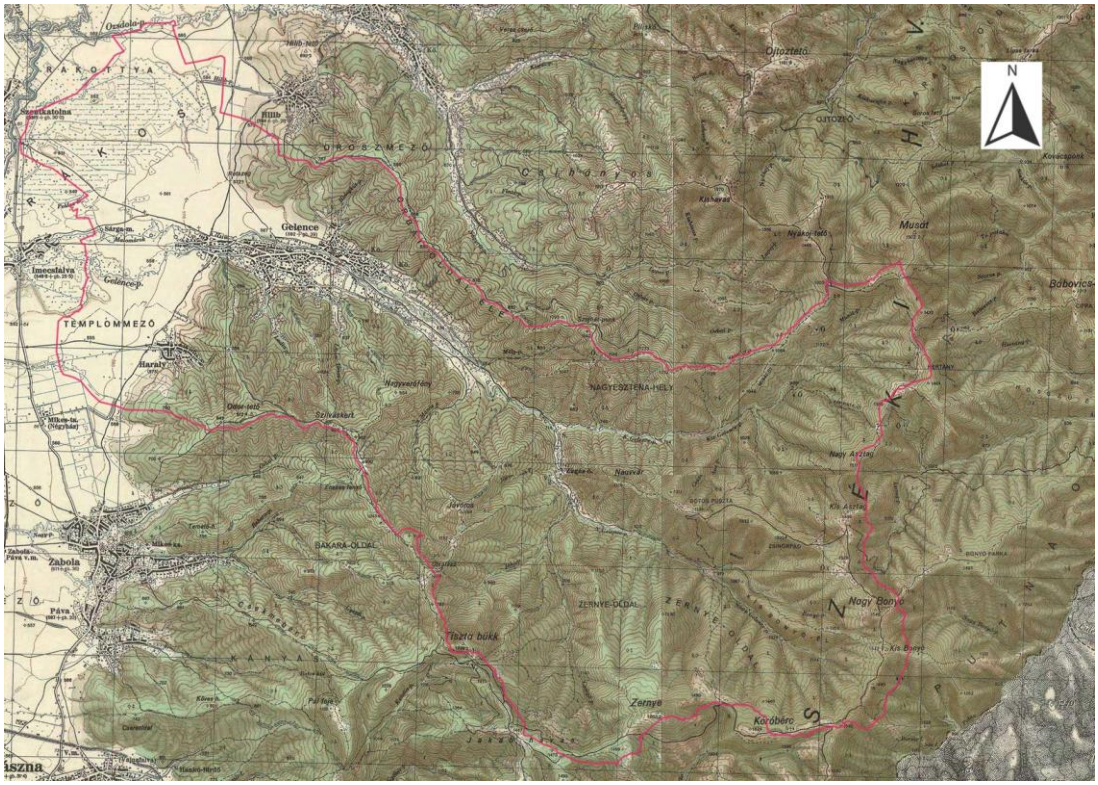


Fig.16. 1943 Military survey indicating the administrative boundary line of Gelence. Source: Military History Institute and Museum Map Library - from the Arcanum Database (designed by Brigitta Telek)

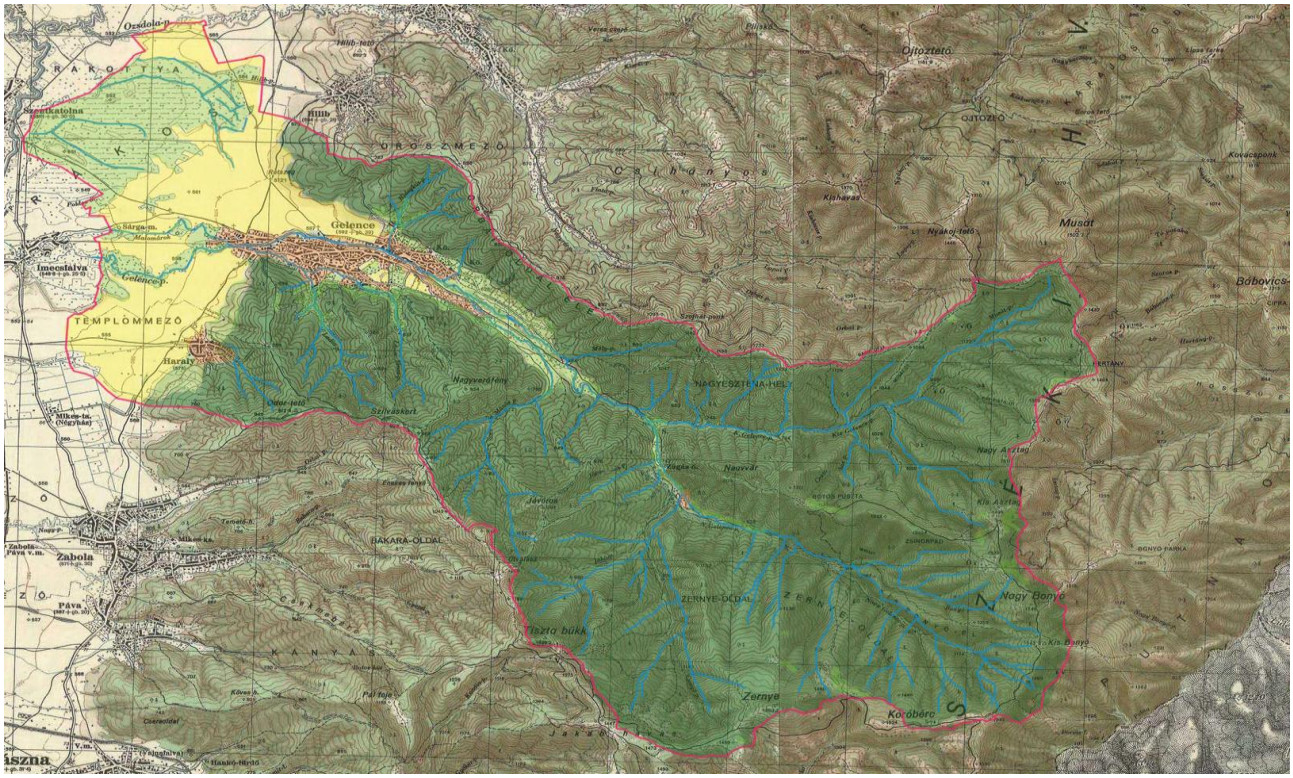


Fig.17. 1943 Military survey indicating the administrative boundary line and landscape coverage of Gelence. Source: Military History Institute and Museum Map Library - from the Arcanum Database (designed by Brigitta Telek)

Archive photos (**Figures 18-19**) often provided useful visual information, and confirmed the data gathered from the documents or interviewees.

Fig.18. Zernye colony, a former wood processing plant (source: Kovács Attila, private collection)

Fig.19. Zernye colony, a former wood processing plant (source: Kovács Attila, private collection)

1.D. Land use conflicts

Landscape use conflicts (**Figures 20-23**) - whether related to utilization, visual aspects or ecological concerns - often yielded valuable insights, enabling the formulation of proposals for conserving the character of the landscape.

Fig.20. Spontaneous clay mine (Photo by author, 2022)

Fig.21. Crude oil extraction pump (Photo by author, 2022)

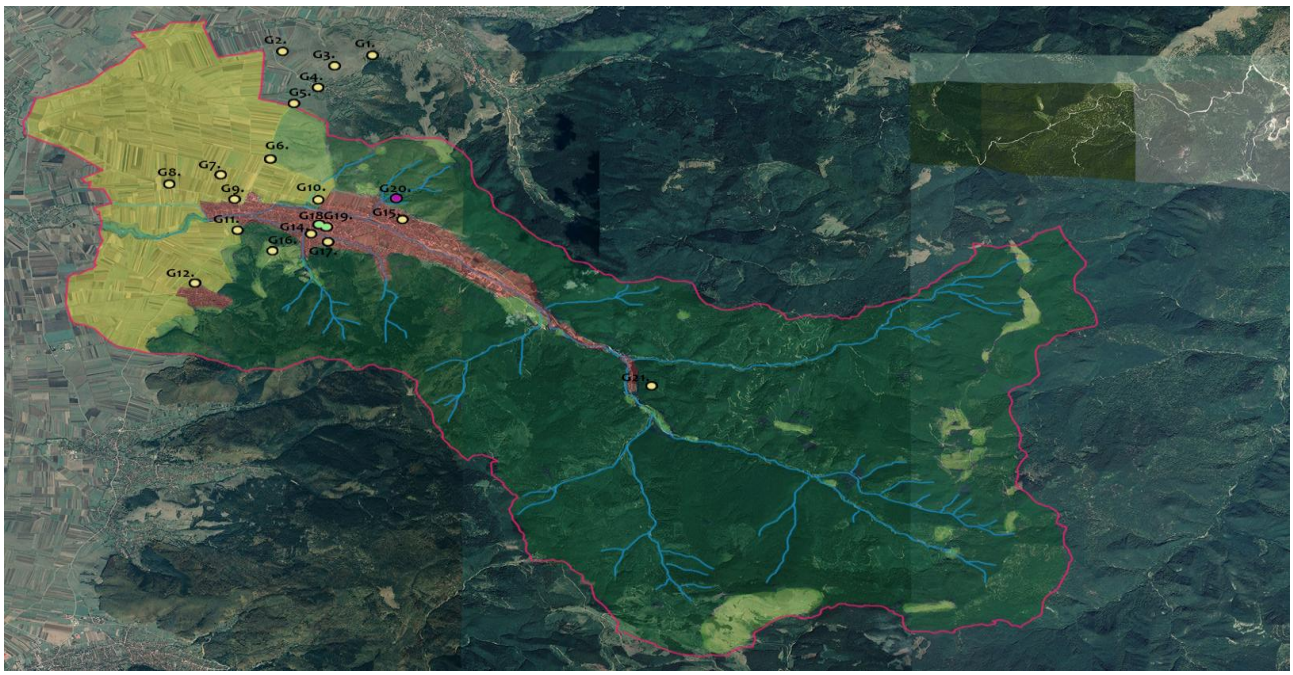


Fig.22. Display of individual landscape values on the map (designed by Brigitta Telek) Source: Aerial photo Google earth, http://lpis.apia.org.ro/

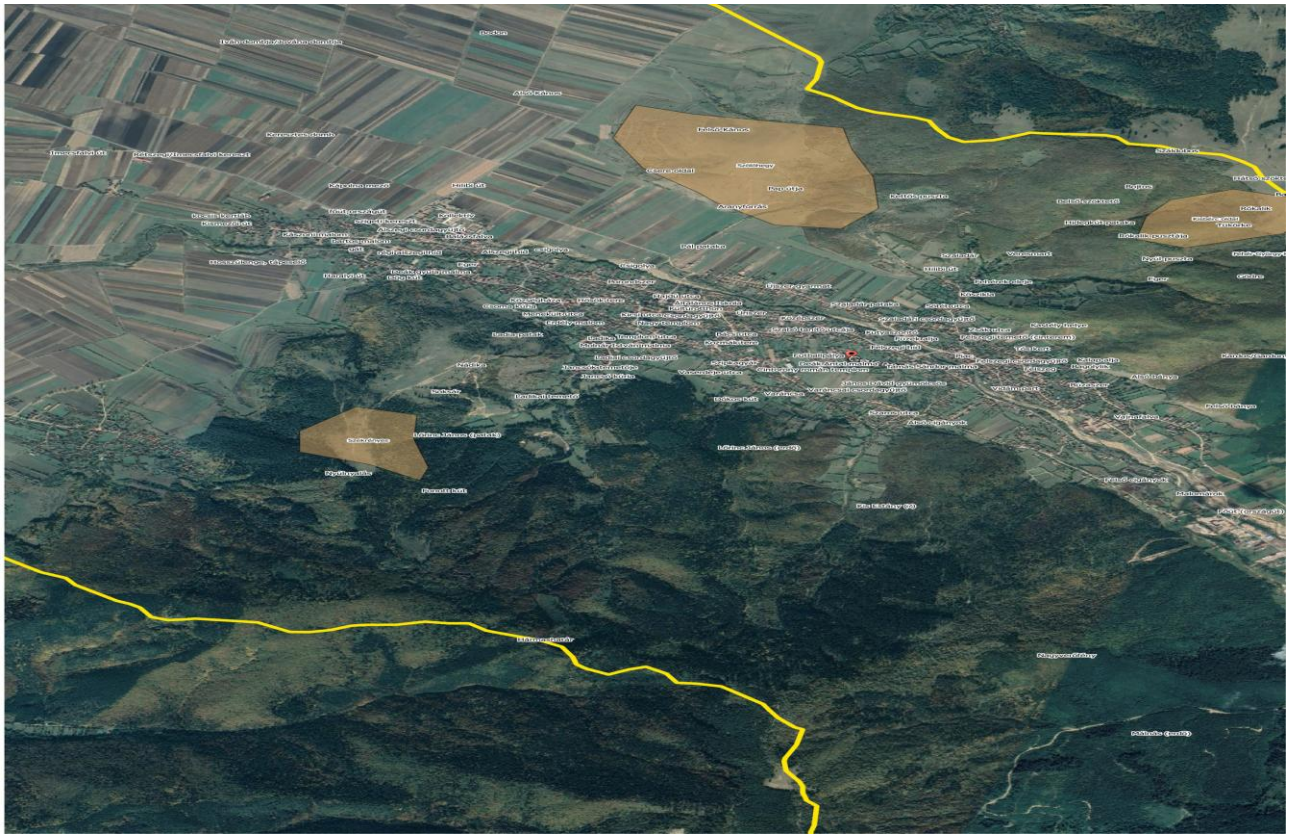


Fig.23. Displaying the off-field/ plot names on the map (designed by Brigitta Telek) Source: Aerial photo Google earth, http://lpis.apia.org.ro/

Conclusions

The survey results obtained so far show that a segmented set of information has been found in Gelence. Data and processes related to development, economics, management and culture are not presented in sufficient detail in the development strategy, which hinders the process of a sustainable and valuable settlement development. PUG Gelinta (2023)

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