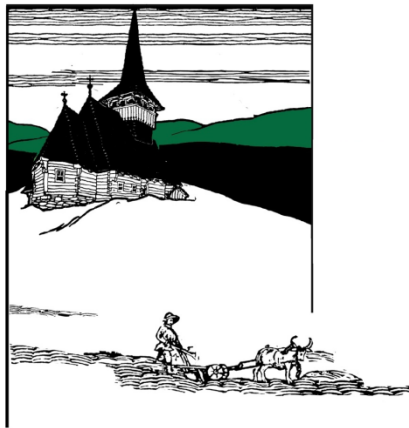


Proceedings of the 6th Conference on Horticulture and Landscape Architecture in Transylvania



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THE TOPIC OF THE CONFERENCE

The environment (built and natural) and the social context in which our settlements and the Transylvanian landscape are shaped are undergoing rapid and sudden changes. Excessive energy and raw material consumption, uncontrolled or careless urbanization, excessive, extreme globalization, or misguided rigid localization, along with its specific modes of production and consumption are some of the factors responsible for the changes in our living space, places of residence, habitats and in the life forms of our world. As long as the environmental changes are directly perceptible, understanding the connections, drawing conclusions and finding answers to the changes is a task concerning all of us, and thus the professionals as well.

THE AIMS OF THE CONFERENCE

- joint involvement of professionals, researchers, farmers, students, organizations working in the field of horticulture, landscape architecture, settlement planning, plant cultivation, plant protection or related fields in solving problems concerning the environmental changes;
- establishing and maintaining collaborative relationships between participants;
- involving young researchers in scientific life;
- encouraging research work;
- presentation and dissemination of scientific results.

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- Sustainable Territory and Environmentally Aware Settlements in a Landscape: Past, Present and Future
- Public and Private Outdoor Spaces: Garden Design as a Complex Technical and Cultural Activity
- Environmentally Friendly Farming: Crop Production Using Sustainable Technologies
- “A Small Farm with Big Ideas”: Opportunities for Small and Family Farms in the Carpathian Basin
- The Necessary Interdisciplinarity: Sciences for the Responsible Shaping of the Natural and Man-Made Environment

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Introduction

„[...] the General Urban Plan, entitled *The green city in the heart of Seklerland* was made in the spirit of sustainable urban development, which simultaneously means an economically efficient and an environmentally friendly city [...]”¹

The idea of sustainability, the ecoregional approach are not only traditional attributes of the historical Transylvanian landscape (and of one of its regions, Seklerland), but also, in a more general sense and broader local, regional and global context, generators in current development of human settlements. The (Transylvanian) landscape as a complex, built and natural, social and economic environment is undergoing a sudden and accelerated change: unmeasured energy and raw material consumption, excessive urbanisation, the out of control, extreme globalisation altogether with ill-considered and rigid localisation, with all consequent specific production and consumer characteristics, are all factors in shaping human habitat, the changing of forms of life, of living space and its territorial-spatial definition. Globalisation and localisation usually facilitated cultural- economic, social, political, scientific etc.- exchanges, the strengthening of certain administration systems, development models. Both have historical background, they are not revolutionary, only the extent of current phenomena is truly unprecedented.

Nowadays the processes of globalisation and that of an accelerated knowledge flow are interconnected. They are very much present in most domains, including agriculture, spatial and planning or life sciences, making different global professional experiences, information, scientific models available and ready to be adapted to particular local conditions.

The ecological perspective can enhance finding solutions in urgent social and environmental challenges regarding efficient management of resources, agricultural production, sustainable urban and spatial planning, public health safety etc. The ever shrinking natural environment, uneven demographic growth altogether with the excessive urbanisation, prodigal resource-energy management, multiple pollution are all results of unsustainable development models, consequences of multiple industrial revolutions. The ongoing pandemic highlighted even more the importance of sustainability in landscape architecture, urban and spatial planning, of the idea of a complex cultural-technical approach in designing public and private open space, the necessity of the ecological perspective in agricultural production through reconsidering the role of small farms, extensive use of up to date technologies, as well as the opportunity of a compulsory interdisciplinarity of social and technical sciences in rethinking human-nature relationship, in a responsible and coordinated modelling and coexistence of human and natural habitats.

Given that the metamorphosis of our environment is directly perceptible, understanding correlations, drawing conclusions and possible answers are important present challenges for all professionals, from farmers, horticultural engineers, landscape architects or urban planners to anthropologists, ecologists, economists or sociologists, worth to be part of the academic debate and thus of great interest for researchers, too.

Dr. Ványolós Endre, Sapientia Hungarian University of Transylvania, Department of Horticulture

1 About the General Urban Plan of the city of Miercurea Ciuc/CsíkSZEREDA (author: Planwerk, 2012) in Kozán, István: „A terv neve: Zöld város Székelyföld szívében” (“The title of the project: green city in the heart of Seklerland”), www.szekelyhon.ro, 2012.10.26

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CONFERENCE VOLUME

FLOWERING DYNAMICS OF *CYANUS SEGETUM* IN LIGHT OF ENVIRONMENTAL PARAMETERSKároly ECSERI^{1*}, Péter HONFI²

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Abstract: In our research we investigated the sustainability of *Cyanus segetum* in an archaeophyte seed mixture and the effect of temperature and precipitation on the generative stage of this species. We studied the phenological stages of cornflower as a part of an archaeophyte seed mixture by bonitation in an open field microplot experiment. The number of inflorescences was measured over 8 vegetation periods and compared with two environmental parameters (amount of heat and amount of precipitation). The species bloomed between the second decade of June and the second decade of July every year. The most intense ornamental value and the longest period of decoration were experienced in the year of sowing. Close fit was observed in the regression analysis between the flowering dynamics and the heat sums. In light of our results, it can be concluded, that *Cyanus segetum* is permanently present in this artificial synusium and plays a dominant role in these associations.

Keywords: cornflower, heat sum, ornamental value, archaeophytes, wildflower

Introduction

Archaeophytes are those plants that were originally not endemic to the flora of European area and were established in the study area before 1500 (1492) (Terpó et al., 1999; Pyšek et al., 2012; Maslo et Abadžić, 2015). One of these taxa is *Cyanus segetum* Hill syn. *Centaurea cyanus* L. (blue cornflower). It is an important annual ornamental plant (Bernáth, 2000; Udvardy, 2000; Szántó et al., 2003; Zsohár et Zsohárné, 2006) and plays a significant role in the ecological indication (Pinke et Pál, 2005; Fried et al., 2008). It can be used well in close-to-nature and peasant gardens (Noordhuis, 2002; Patkós et Kovács, 2018), as a space-filler (Gyórfy, 2007), or in millefleur flower beds providing a quiet view (Ormos, 1955; Throll, 2009). It is also recommended for use on green roofs, next to highways, for short decoration of freshly disturbed surfaces of landfills, gravel mines and construction sites (Kumpfmüller, 2008; Meyer et al., 2013). It plays a dominant role in commercially available wildflower seed mixtures (www.rieger-hofmann.de).

Last but not least, it is important to mention the socio-economic role of this species. Because the sight of wildflowers has a positive direct and indirect effect on humans (Alizadeh et Hitchmough, 2019). Among the close-to-nature green areas, people consider wildflower meadow to

be the most beautiful, of which the cornflower is an important component (Lindemann-Matthies et Brieger, 2016).

However, despite the significant ornamental value, the focus of western European research is primarily on perennial species. Annuals disappear after the first year as a result of competition (Vannucchi, 2014). However, the phenological, morphological and ecological parameters of this life form (and in particular of the species *Cyanus segetum*) also make it suitable for use in urban environments (Bretzel et al., 2016) and have a long-term balanced soil covering capability with annual disturbance (Ecseri et Honfi, 2021).

In its application and monitoring deserves attention that fact that cornflower is one of the archaeophyte that has been severely depressed by significant herbicide application in recent decades (Šilc et Čarni, 2005). In our study, we looked for the answer how this species behaves in a seed mixture in the medium term and how strongly changes in temperature and precipitation amount have an effect on the opening of capitulum.

Materials and Methods

The experiment took place in a house garden near Cegléd. The soil was sandy and rich in humus. The area was free of perennial weeds and was refilled with organic matter before setting of experiment. Sowing took place on 18 April 2013 in uniformly cultivated soil, shallowly rotated and then irrigated. The weight of *Cyanus segetum* seeds was 2.413 g of the sown archaeophyte seed mixture (8.329 g).

Evaluation was performed two to three times a week during the period of intensive vegetative development and flowering, and once a week otherwise. Changes in phenophases were assessed using a 5-point bonitation scale. The ornamental value was determined by counting the capitulum. The total number of inflorescences per plot was given at each measurement date. The experimental area was completely extensively maintained, with no organic matter filling or removal during the 8 years. Succession was inhibited by soil rotation, which was performed on July 29, 2014, August 30, 2016, August 7, 2017, December 9, 2018, July 27, 2019, and July 21, 2020, respectively.

By monitoring the meteorological data, we evaluated the temperature and precipitation conditions during the flowering period. From these data, the sum of precipitation and heat was calculated, in the latter the biological zero degree was considered to be 0°C.

Regression analysis using linear and nonlinear functions was used in the statistical evaluation (Sajtos et Mitev, 2007; Huzsvai et Vince, 2012). SPSS 25 software package (IBM, New York, US) was used for the analyzes.

Results and Discussions

2013: Seedlings of *Cyanus segetum* appeared as early as the decade after sowing (Fig. 2.). Flowering of the individuals began in the third decade of June at a heat sum of 1013.15°C. There was a close relationship between daily mean temperatures and flowering dynamics data that could be described by a cubic function ($R^2=0.775$, $N=77$, $SL<0.001$). Flowering peaked in mid-July, but flowering lasted a long time, with some specimens flowered until mid-October.

2014: Flowering of overwintered plants began on May 4, peaking in mid-June (at a heat sum of 1737.3°C). Then the number of opening capitulums decreased majorly. Flowering ended in late July. The fit examination of the quadratic function between the heat sums and the flowering variable showed a strong, significant relationship ($R^2=0.723$, $N=60$, $SL<0.001$). For precipitation amounts, the coefficient of determination was medium ($R^2=0.452$, $N=60$, $SL<0.005$).

2015: The flowering period lasted two and a half months, from 16 May to 1 August. The beginning of the decoration period was observed at a heat sum of 1000°C. The peak was between June 17-21, when the number of inflorescences was 43-48. The fit examination showed a close relationship between the two meteorological parameters. The R^2 values for the performed separately were 0.732 (for heat sums) and 0.633 (for precipitation sums). The N value was 55, and the significance level was less than 0.001 in both cases. The relationship is best characterized by a quadratic function.

2016: Overwintered individuals decorated the study area with their capitulums from June 3 to July 20 (Fig. 2.). Flowering was interrupted on 7 June, because at that time the stand was still at the beginning of the generative phase (only 1 capitulum opened on June 3). Most of the simultaneously opening capitulums (24) were on June 25, at a heat sum of 1840°C, following a daily mean temperature rise of 5°C.

2017: The capitulums were decorated between May 4 and August 4. The heat sum was 600°C at the beginning of flowering and 2500°C at the end. At the time of the peak (June 8), the total number of capitulums was 104. There was no precipitation in the area in the previous two weeks and the average daily temperature was between 21-22°C. The fit examination of the heat sums and the capitulum numbers showed a very strong correlation. According to the relationship described by the cubic function, heat sum played a role in the change of flowering in 83.5% ($N=26$, $SL<0.001$) (Fig. 1.). In case of precipitation amounts, the degree of fit is medium ($R^2=0.53$, $N=26$, $SL<0.001$).

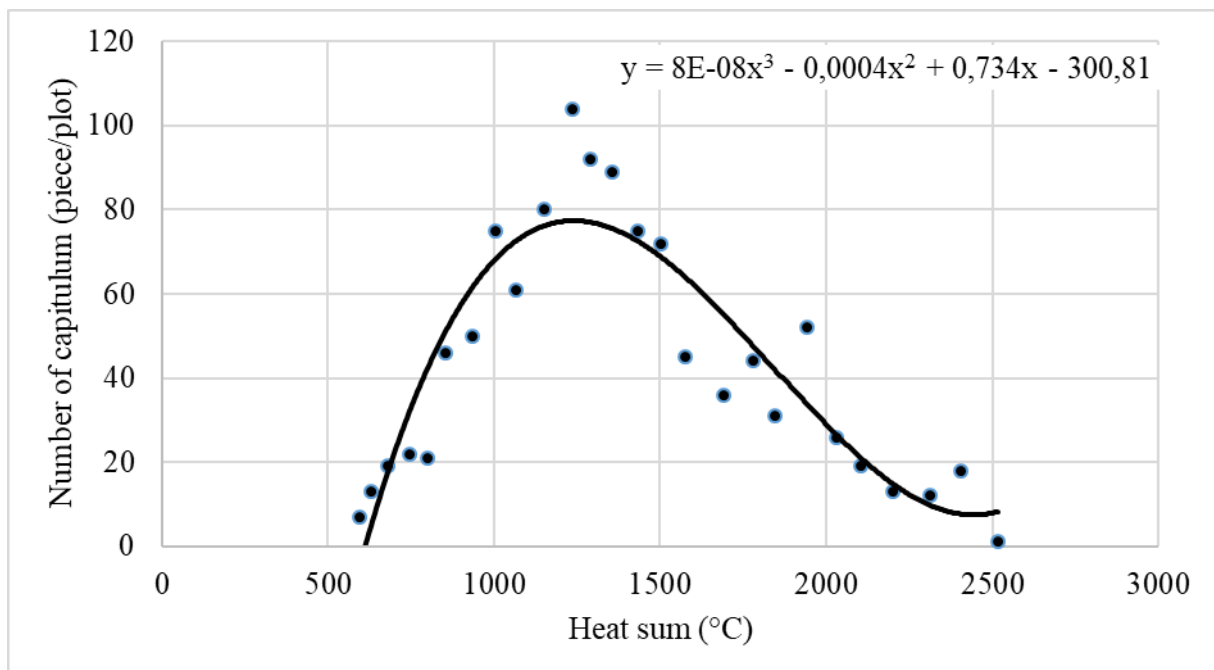


Fig. 1. Relationship between the number of *Cyanus segetum* capitulums and heat sums measured during flowering in an micro plot experiment (Cegléd, 2017)

2018: The flowering period of overwintered plants began on April 29 (at a heat sum of 740°C) and lasted until July 21 (up to a heat sum of 2470°C). Most of the capitulum that opened at the same time were observed on May 17 (20 pieces). The peak of flowering was balanced, the value between 15-20 was maintained by the stock until June 4. No precipitation fell during this period and the average daily temperature gradually increased from 16 to 23°C. The value of the determination coefficient was medium ($R^2=0.522$, $N=53$, $SL<0.005$) when examining the fit of heat sums, similarly to the result obtained when examining precipitation sums ($R^2=0.465$, $N=53$, $SL<0.005$).

2019: The opening of capitulum could be observed for two months, between 25 May and 20 July. The peak was on June 15, when 134 capitulum decorated at a same time. In the ten days before the flowering peak, the daily average temperatures showed a persistent value above 20°C. Flowering had a statistically significant relationship with the two environmental parameters. The logarithm function showed weak fit for the two meteorological parameters (34.4% for heat sum values, 35.4% for precipitation sum values). The N value was 16, and the significance level was less than 0.05 in both cases.

2020: The vegetative phase began in early March (**Fig. 2.**). Flowering lasted from May 4 to July 21. The apex in this year was June 7, when 46 capitulum were counted on the plot. Then significant amount (60 mm) precipitation fell in the area and the number of capitulum decreased significantly by the end of the second decade of June. Seedling appeared in the autumn aspect almost immediately after the soil rotation. The specimens of cornflower seedling also overwintered in the leaf rose phenophase in the winter of 2020-2021. No statistically significant relationship could be revealed for the two environmental parameters.

This species bloomed in all 8 vegetation periods studied. Observing the data, a significant decrease can be seen in the three vegetation periods following the first year (2014-2016). Then the aggregate flower number data show continuous fluctuation. The longest decoration period was also observed in the initial year. In 2014, 2017 and 2018 a significant flowering period of almost three months was also observed (**Table 1**). In addition, the average flowering period of the species is significant, approaching 80 days.

Table 1. The total flower number of *Cyanus segetum* (expressed in capitulum), in relation to the calculated average number of flowers (%), and the total length of flowering periods (expressed in days) in the studied years (2013-2020), *in situ* microplot decoration value test, Cegléd

Years	2013	2014	2015	2016	2017	2018	2019	2020	Average
Total number of capitulum	7065	1604	454	140	1123	238	753	419	1474.5
Percentage (%)	479.15	108.78	30.79	9.49	76.16	16.14	51.07	28.42	100.00
Length of flowering period	122	90	78	42	93	84	57	72	79.8
Percentage (%)	152.88	112.78	97.74	52.63	116.54	105.26	71.43	90.23	100.00

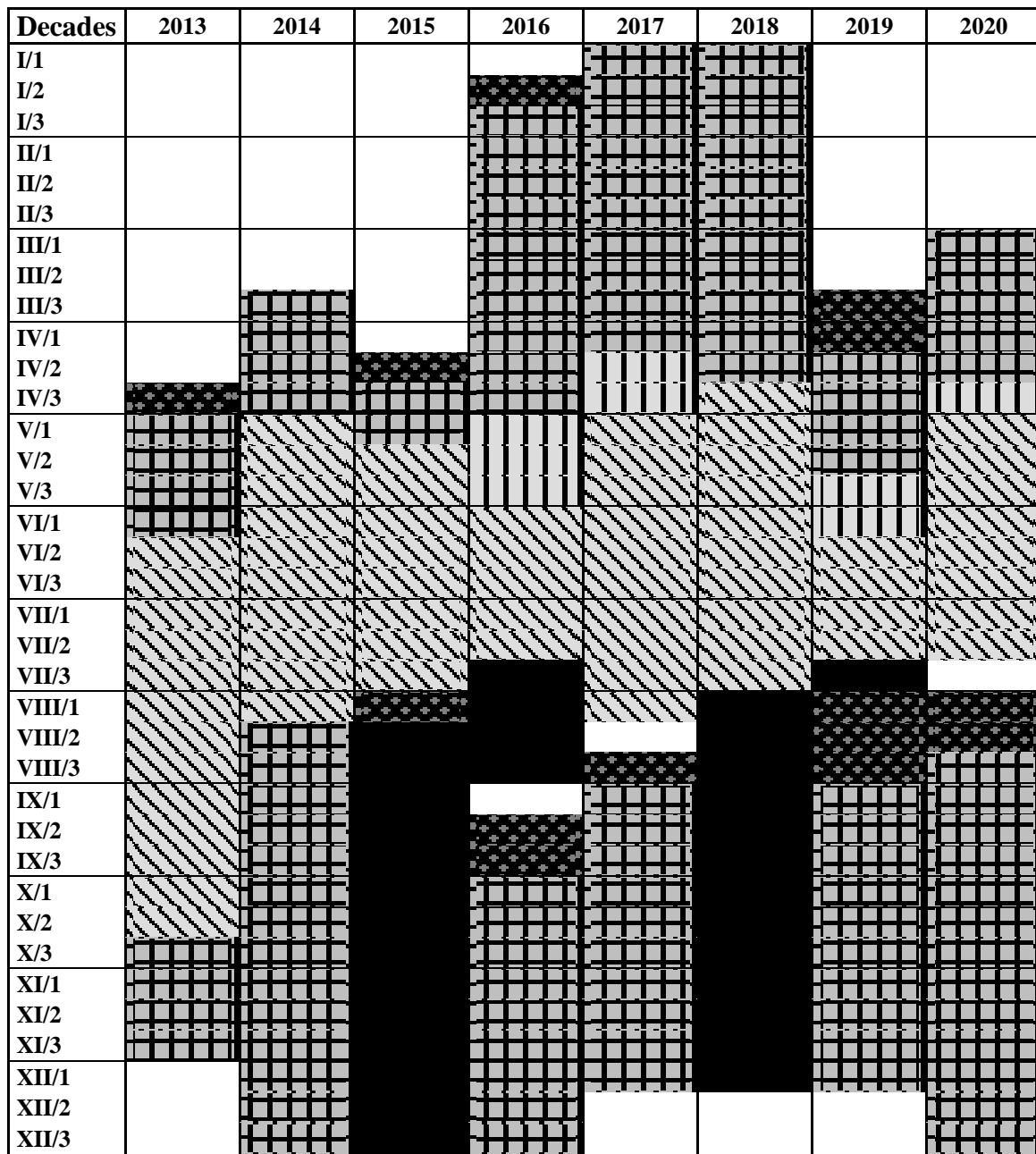
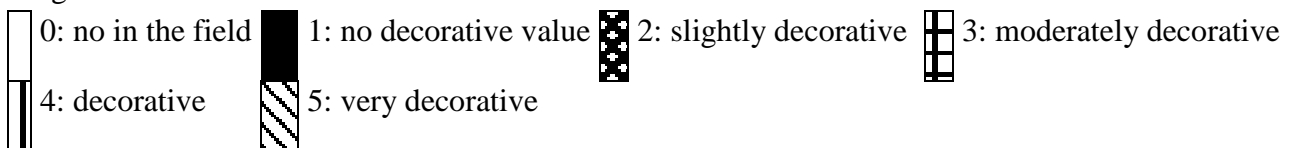


Fig. 2. Phenogram of *Cyanus segetum* in the period between 2013-2020, *in situ* microplot decoration value test (Cegléd)

Legend:



Conclusions

In the 8 winter periods studied, the seedlings of cornflower overwintered in the leaf rose phenophase 4 times. A close fit was observed between the flowering process and the heat sum values. The value of the determination coefficient (R^2) exceeded the value of 0.7 in 4 years out of the examined 8 years (six years – when a significant relationship could be detected – the average value is $R^2=0.655$). This relationship is best modeled using (quadratic and cubic) functions.

This results also shows the importance of other environmental parameters in the vegetative and generative development of archaeophyte taxa, in addition to competition for light and nutrients. Observing the two flowering dynamics parameters, the pioneer character of this taxon is clearly outlined, as it provided its maximum ornamental value in the first (and second) vegetation period after sowing.

At the same time, the species was stably present (without interruption) on the plot in the medium term and even played a prominent role in the stock most of the vegetation periods. This is one of the reasons why *Cyanus segetum* is an essential component of sustainable wildflower (archaeophyte) seed mixtures, which is not only has ornamental and ecological significance, but also plays an important role in folk culture, tourism and environmental education.

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CONFERENCE VOLUME

SUSTAINABLE COLLECTION GARDEN IN THE GREAT PLAIN – AN AGE ESTIMATION OF THE JOHN VON NEUMANN UNIVERSITY DENDROLOGICAL COLLECTIONKároly ECSERI^{1*}, Tímea KISS¹¹Department of Horticulture, Faculty of Horticulture and Rural Development, John von Neumann University, Kecskemét, Hungary

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Abstract: In our research, we surveyed the trees of the arboretum of the Faculty of Horticulture and Rural Development in Kecskemét. The aim of the study was to determine the sustainability of the stock, and in the light of the data we tried to draw conclusions about longer-term application possibilities of each taxon in the Great Plain. As the original planting documentation is also available, we also identified the surveyed specimens. In addition, we were able to determine the age using two methods: the time of planting and the trunk size. We also compare these two methods in our work. Of the 461 individuals surveyed, 171 were identified on the 40-year-old landscape desing sheets. 51 % of the originally planted trees can also be found in the area in 2020. Based on trunk diameters, 50% of the plants are 30-year-old or younger, while the range of 41-49 years contains 17 specimens. Based on our results, it can be stated that the age estimation based on the trunk diameter is inaccurate in several cases, as the trunk thickness of trees is strongly influenced by biotic and abiotic environmental factors. At the same time, the plant selection of our ancestors and their professional maintenance activities are praised by the fact that half of the trees planted in the 1970s can still be observed and serve to broaden the plant knowledge of horticultural engineering students.

Keywords: trunk diameter, green area, age of trees, stress tolerance, arboretum.

Introduction

When may it be necessary to determine the age of a tree? The answer to this question in manifold, we are primarily interested in the case of plants found in the built environment (urban green spaces) in this work. In this case, it may be interesting to estimate the age when dealing with an older park (castle park) or tree alley. In addition, the age of plant may also be important in a tree destined for felling. Based on this (because the usefulness of trees increases with age), the age of trees, on which several valuation methods are based, is also essential for determining the green value of each area (Jószainé, 2007).

Accurate age determination is often impossible. For this reason, age-based value estimations also use a 10-year scale to eliminate errors (Szaller, 2012).

There are several ways to determine the age of trees:

- It is a common practice to identify and count annual rings – the cutted stem slice is firstly cleaned and then the difference between earlywood and latewood is made visible by lignin staining. Subsequently, the calculation is performed under a stereomicroscope using an

image processing program (Silva et al. 2017). Although this method has its errors, which Duncan, 1989 also points out, it is possible that the growth seed passes through the chronological center of the tree, and in some cases some annual rings may be missing. For these reasons, there can be differences of up to 1-2 decades compared to real age. These errors can be corrected by certain correction equations (Fraver et al. 2011). In the case of living tree, a borehole sample is taken for age determination (Kern, 2014). The width of the last 10-20 years rings can be used not only in determining age but also in determining vitality (Schmidt and Varga, 2004).

- For species that do not have continuous annual rings (e.g. African baobab, *Adansonia digitata*, or for tropical forest species), carbon dating is the only accurate method (Baker, 2003; Patrut et al. 2011).
- Using trunk diameter, although this is significantly influenced by habitat and other biotic and abiotic conditions (Radó, 1999). A young tree is probably small, but a small tree can be of any age (Harper, 1977). However, a nonlinear model for oaks has already been set up between age and diameter at breast height based on the Pinheiro and Bates (2000) theory (Rohner, 2010). Or a simple formula can be used: $A = DBH / M.A.I$, where A=age of tree, DBH=diameter breast height, M.A.I=mean annual increment, which is considered to be 1.13 cm (Mat et al. 2014).
- A semi-non-destructive method of is the examination of a hole with the electric resistance drill, which allows for very precise dating if the diameter of the hole is more than 2 mm wide (Szewczyk et al. 2018).
- Of course, radiocarbon dating can also be used, for example for older olive trees (Ehrlich et al. 2017).
- Using original plant lists, historical data and maps.
- From changes in the groove of the rhytidome (bark).
- In the case of young trees, by counting the annual growth (for deciduous trees, the growth rate of the shoots can be traced back to the age of about 20 years)
- In the case of whorled branches pines based on the number of whorls (one whorl develops in 1 year). Note: this method is not applicable to scaly-leaved evergreens (*Cupressaceae* family) as these taxa have 1-2 growth cycles per year.

Materials and Methods

Horticultural education in Kecskemét now has a history of more than 120 years. The Vinegrower School, established in 1890, and the School of Agriculture, started in 1895, were the first institutions in the city in this area. The next major step was in 1950, when the Agricultural and Horticultural Technical School split in two, and the latter moved to Ceglédi Street 2. The foundation stone of the Mészöly Gyula square property, where we also continued our measurements, was laid in 1969, and college-level education began in 1971 (at the same time, the Horticultural Technical School was closed down) (Kriskó, 2019). The building has been used by students since 1972 (Szabó, 2017).

We based on these historical facts to determine the age of the plants. In addition, planting documentation (maps and taxon lists) for the area are available, each with November 1979 at the

date. From these sources, we hypothesized that the age of the taxa found and clearly identifiable on the map sheets could be between 40 and 50 years (in this work, we examine only these individuals, as the age of the plants can be determined by the two methods examined).

$$D = C \div \pi \quad (1)$$

D: trunk diameter (cm)

C: trunk circumference (cm)

$$\pi : 3.1416$$

The campus covers an area of 26 600 m², of which 11 900 m² is represented by green space. The stock survey was happened in the summer of 2020. During the data collection, in the case of trees, we also recorded the trunk size data at a height 1 m. A trunk diameter was calculated from this (1), and the help of trunk diameter the age of the remaining individuals from the original stock was estimated. For this, we used the table published by Dezső Radó at the end of the European Union alley assessment method (Radó, 1999; Józszainé, 2007) (**Table 1.**). If the species was not included in this table, another taxon of that genus was chosen for age estimation. The cross-section of the plant trunks was considered a regular circle in all cases. It was not possible to perform another – dendrochronological – age determination.

Table 1. Age of trees depending on trunk diameter (detail)

Species	Diameter (cm)	5	6-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80
	<i>Acer campestre</i>		4	8	15	25	40	45	50	57
<i>Koelreuteria paniculata</i>		4	10	20	28	38	50	62	70	77
<i>Picea pungens</i>		3	6	12	26	42	50	60	68	72

Note: All data in the table are average of at least 5 measurements. Source: Radó, 1999

Results and Discussions

Plant stock analysis

Of the 461 trees (or bush trees with trunks) surveyed, 171 could be clearly identified in the original planting documentation. We have analyzed these in our present work.

The study population consists of 71 taxa. Of these, 10 are the number of varieties and 3 are the taxonomic units under the species, and 4 are the number of hybrids. Of the 171 specimens, 28 are needles and scaly-leaved evergreens (16.37%). Of these 71 taxa, a total of 217 specimens were planted in the 1970s based on the original plant lists. Accordingly, 78.8% of the original volume has remained over the past 40-50 years. Examining all the planted dendrotaxons (707 specimens), it can be stated that 24.19% of them have remained for more than 4 decades. If only the trees are examined, the rate is 51.04% (335 trees were originally planted in the area).

In 49 of the 71 taxa, we found that 100% of the planted amount remained until the time of the study. Values of 50% or less were measured in the following species or varieties: *Populus alba* (14%), *Abies nordmanniana* (20%), *Betula pendula*; *Chamaecyparis lawsoniana*; *Malus* × *purpurea* (33%), *Pinus nigra*; *Thuja occidentalis* ‘Fastigiata’ (40%).

Of the genera, *Tilia* has the highest proportion with 20 specimens (*T. platyphyllos*). In addition, we found a significant number of *Koelreuteria paniculata* (17) and *Quercus* (mainly *Q. robur* – 10) trees (Table 2.).

Table 2. Taxa with the highest number of pieces

Taxon name	Piece (currently)	Piece (original)
<i>Cotinus coggygia</i>	6	8
<i>Crataegus laevigata</i> 'Paul's Scarlet'	4	8
<i>Koelreuteria paniculata</i>	17	18
<i>Quercus robur</i>	10	10
<i>Taxus baccata</i>	4	4
<i>Tilia platyphyllos</i>	20	23

Examining parts of the area, it can be seen that most of the trees are found in the part marked O/2 (Fig. 1., part framed in red). Here, 24 of the 60 originally planted individuals remained for the time of the study. The number of specimens in areas C, E, G and R is also significant (15 or more).

Regarding their water demand, the majority of the studied species and varieties (32 taxa) can be considered as mesophytes (Schmidt and Sipos, 1980). There are 23 trees that tolerate moderately or very dry environments, and 14 taxa are among those like more humid habitat. *Cornus sanguinea* and *Populus alba* can be considered universal species in terms of soil moisture. Based on the literature, 24 of the 71 taxa are specifically recommended or applicable to sandy soils (Schmidt, 2003).

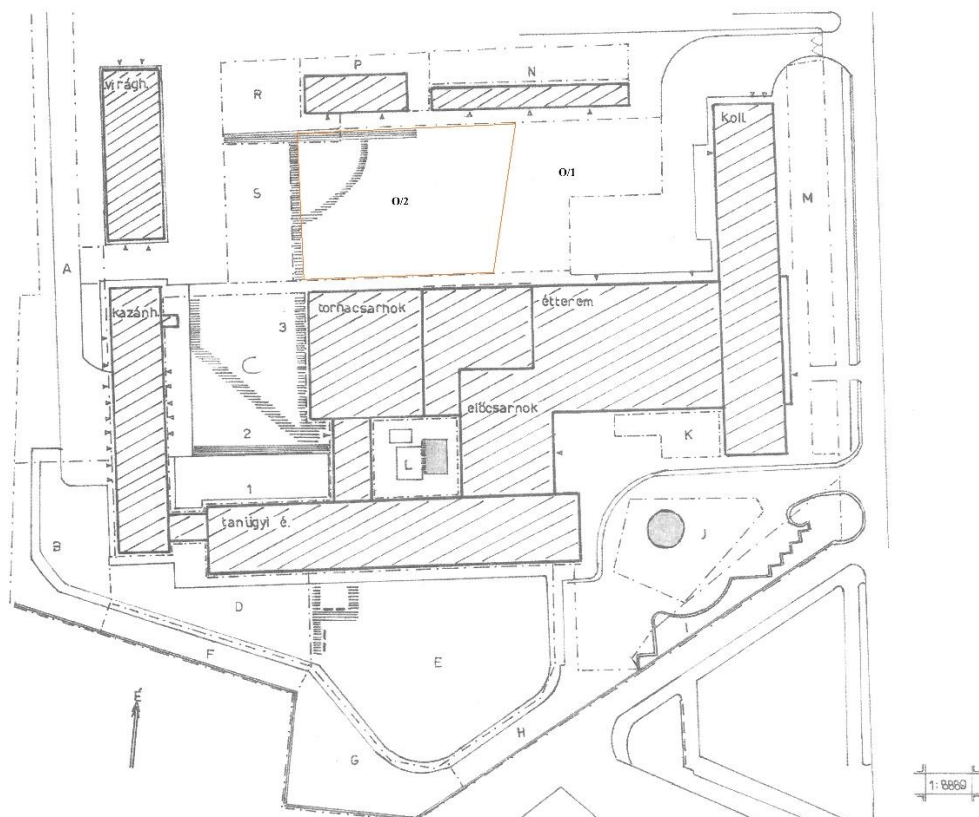


Fig. 1. Overview map of the study area

In term of urban tolerance, 22 of the 71 taxa are considered sensitive. 30 species and cultivars are listed in the literature as medium tolerant, while 19 are especially recommended for urban environments (Tóth, 2012; Schmidt, 2014).

Examination of ages

Age estimation based on trunk diameter indicate that the age of the 171 specimens is between 3 and 84 years. Ages under 10 years were observed in almost all cases in *Cornus sanguinea*, which was also indicated as a shrub spreading with root shoots, and it was also marked as a group on the original planting map. A total of 13 individuals were placed in this category (**Fig. 2.**).

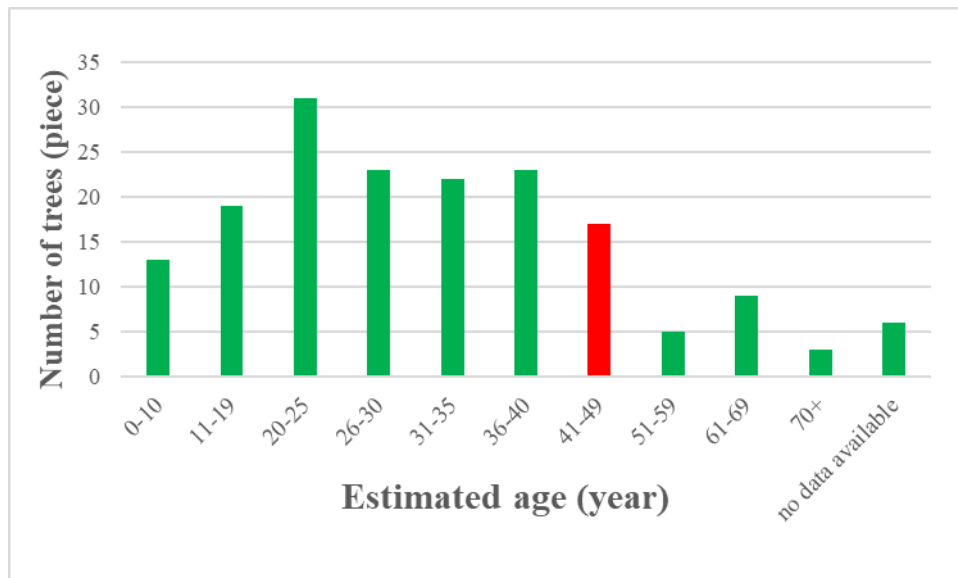


Fig. 2. Distribution of study stock based on estimated age

Plants estimated to be between 11 and 19 years of age include taxa of the genera *Crataegus*, *Malus*, *Sorbus*, *Prunus*, *Picea*, *Pseudotsuga*, and *Thuja* (19 specimens in total). In these cases, it is also possible that the original plant was died in the 1980s and 1990s and later replaced with a new plant.

The number of individuals estimated to be between 20 and 25 years old is 31 (Fig. 2.). Species and varieties of the genera *Acer*, *Fraxinus*, *Koelreuteria* and *Tilia* also appear in this category. The average age of the *Acer* genus is 25 years, while the ash is 34; and the linden are 35.34 years old on average.

The plant group between 26 and 30 years old includes 23 trees. For these specimens, the estimated age is already close to the assumed true age (40-50 years) available based on planting data. However, 50.29% of all remaining trees (86 individuals) belong to these four categories.

The vast majority of trees estimated to be 31-35 years old come from *Koelreuteria paniculata* and *Tilia platyphyllos*. This group contains 22 individuals. For the age range of 36 and 40 years, 23 specimens were determined based on trunk diameter data. Here, too, the species *Tilia platyphyllos* is mainly represented.

There are 17 trees in the category between 41 and 49 years old, but only 5 individuals are among the 51-59 year olds (**Fig. 2.**). 9 specimens between the ages 61-69 already come from the climax *Quercus* genus. The average age of oak trees is 48.71 years. Radó's table estimated 3 trees

to be even older: a *Populus alba* (70 years old), which was presumably already in the area before the 1970s (Lévai, 2021), an *Ulmus minor* (80 years old), which is also classified as a fast-growing tree (Galántai and Tóth, 2001) and a *Celtis australis* (84 years old) (Fig. 3.). For six plants (4 *Taxus baccata*, *Metasequoia glyptostroboides*, *Taxodium distichum*) no age data were found in the table.



Fig. 3. The oldest specimen based on trunk diameter data (*Celtis australis*)

Age estimation using trunk diameter can also be examined statistically for species with larger number of trees. The data set of *Tilia platyphyllos* population (20 trees) is normally distributed (Kolmogorov-Smirnov test $SL > \alpha$), with an average of 35.85 years, and does not contain any significant outstanding data. For the 17 plants of *Koelreuteria paniculata*, the normality test could not be accepted ($SL < \alpha$), because the kurtosis and skewness of the sample were also high. The mean age for this species is 31.59 years based on trunk diameter data.

Conclusions

The analysis of the data includes that the areas where the most specimens have survived compared to the original lists are the largest. For example, the area O/2 with the most taxa is 1655 m² (14% of the total green space). This was the most likely way to develop the population climate, which also provided survival opportunities for pioneer species such as *Betula pendula* or *Salix fragilis*. The higher mortality rate is also observed between the pioneer, short-lived taxa (*Betula pendula* – 1 of the 3 plants remained, *Populus alba* – 3 of the 22 plants remained), and species (mainly evergreen) that are sensitive to extreme environmental parameters (*Abies nordmanniana*,

Chamaecyparis lawsoniana). At the same time, due to the beneficial effect of the microclimate, a larger number of more demanding species such as *Tilia platyphyllos* could be preserved.

Age data show that nearly half of the remaining populations had weaker development, as their age estimate by trunk diameter is more than 10 years below their true age (the average of the stock is 31 years, while according to the planting data, the plants on the original plan sheets must be at least 40 years old). This is partly due to unfavourable environmental conditions (soil contaminated with construction waste) and root competition due to high plant density (for example, in the case of *Koelreuteria paniculata*). The average tree density in the area is 25.8 m²/piece. Long-lived, still dynamically developing *Quercus* species and *Ulmus minor*, which has a strong growth and shade tolerance at a young age, have been outstanding in terms of trunk thickening. On the other hand, *Celtis australis* showed itself to be older than its true age because of its solitary position and its position surrounded by buildings (thus better protected from frosts).

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CONFERENCE VOLUME

THE RELATIONSHIP BETWEEN THE VITALITY AND AGE OF EVERGREENS IN THE COLLECTION GARDEN OF THE JOHN VON NEUMANN UNIVERSITY IN KECSKEMÉT

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Abstract: In our research, we aimed to compare the bonitation value and the state of growth of the evergreen taxa found in the nearly 50-year-old collection garden of the John von Neumann University with the data found in the literature. During the survey, Radó's bonitation values were used to characterize the health status of the plants. Furthermore, their age was also estimated by determining the trunk diameter. The obtained values were compared with the data of the relevant source works. The results of our survey show that the values for the state of development approached the data in the literature for those taxa at which the environmental conditions are optimal and have good vitality. More than 50% of the evergreen taxa found in the collection garden lagged behind the results of previous surveys. The reason for this may be that the number of plants per unit area is high, thus the individual environmental factors (light, nutrients) are scarce for individuals

Keywords: health status, sustainability, life stages, canopy status, care of the trees

Introduction

Evergreen woody plants have been part of horticulture since Egyptian civilization. Their appearance was first observed in cemeteries, where their leaves symbolized eternal life (Rapaics, 1940). Their resinous scent evokes a pleasant “festive” atmosphere in all people and is surrounded by mysticality due to their extreme, often inaccessible habitat (Debreczy and Rácz, 2000).

It is generally known that dry periods are better tolerated by deciduous species, while in poor quality and low-nutrient soils, taxa with long-lived, evergreen foliage have some advantage (Girvish, 2002) and are also competitive in more arid habitats (Monk, 1966). Weather extremes and high air temperatures are also better tolerated by deciduous species (Bowman and Prior, 2005). However, it should not be generalized, because the species from boreal zone are particularly sensitive to dry, warm summers in Hungary, but thermophile taxa have very good heat and urban tolerance (Schmidt et al., 1988). Several of these species are pioneer and have rapid growth vigor (*Pinus nigra*, *Pinus sylvestris*) (Gencsi and Vancsura, 1992).

In terms of environmental utility, this woody plants group is also of outstanding importance: although spruce has a less photosynthetic production than beech, the latter produces 84% less biomass than spruce due to its shorter vegetation period. In addition, the CO₂ sequestration of needles is 2-3 times higher, since have a longer lifespan (on average 5 years) (Schulze et al., 1977).

In addition, their noise-protective and, for example traffic-covering (optical) effects are also important and durable (Héder and Mészöly, 1969; Bolund and Hunhammar, 1999). Individuals of the genus *Pinus* are also among the plant groups whose volatile organic compounds released by their foliage are able to reduce the harmful effects of smog (Slanina, 1997). Evergreens are more effective at removing PM10 fractions from the atmosphere than deciduous species due to their complex and durable foliage (Freer-Smith et al., 2005). This filter effect is also crucially influenced by evergreen leaves in the PM2.5 fraction (Swallowecele et al., 2019). In addition, their ability to produce bactericid and fungicides (called phytoncides) is important, for example *Pinus sylvestris*, *Picea abies*, *Taxus baccata* or *Juniperus communis* (Héder and Mészöly, 1969). The removal of pollutants is 6.5 kg/year for an evergreen tree, while the same value is 4.5 kg/year for deciduous trees (Radó, 2001). They not only reduce the effect of wind, but they also enhance nighttime cooling, which also has economic benefits (Jávor et al., 2006). From a forestry point of view, *Pinus nigra* is important for barren afforestation, but *Abies alba*, *Picea abies*, *Pinus sylvestris* and *Pseudotsuga menziesii* are also important due to their high cellulose, soft wood (Gencsi and Vancsura, 1992).

In addition, in the case of urban application, the aesthetic value should be mentioned. For this group of plants, the decorative effect is primarily in the form of evergreens (pyramid, soil covering, columnar habit) (Kiácz and Szendrői, 1980). Since there are few native evergreen species in Hungary, so their use is special, it is advisable to plant them in a prominent place in the garden (Marácz, 2014).

The aim of our survey is to determine the health status of the age groups. Furthermore, in our survey, we examined how the locally dense stand affects the condition of the canopy.

Materials and Methods

Our studies were carried out in the collection garden of the Faculty of Horticulture and Rural Development of John von Neumann University in Kecskemét in the summer of 2020 (46.9187 N latitude, 19.6902 E longitude). The faculty has been operating on this site since 1972 (Szabó, 2017).

During the examination of the dendrological stand in the area, we measured the trunk size at the height of 1 m for all trees, among others. From the resulting trunk diameter data, we estimated the age of the species using the European Union alley evaluation method published by Radó in 1999. The resulting data has been compared with the available planting documentation. If the species studied was not included in the table, another taxon of that genus was chosen for age estimation. A young tree is probably small, but a small tree can be of any age (Harper, 1977). However, a nonlinear model for oaks has already been set up between age and diameter at breast height based on the Pinheiro and Bates (2000) theory (Rohner, 2010). Or a simple formula can be used: $A = \text{DBH} / \text{M.A.I}$, where A=age of tree, DBH=diameter breast height, M.A.I=mean annual increment, which is considered to be 1.13 cm (Mat et al. 2014).

To determine the vitality of the individuals, the bonitation scale 1 to 5 reported by Radó in 1999 was used for the parameters of habitat-root system, trunk, foliage, care (maintenance) and vitality (**Table 1**). After that, the average state of health was compared to the age of evergreens. The relationship between the two parameters was also analyzed by correlation testing using the SPSS program. The significance level (α) was determined. α (significance level) is the probability of

rejecting the null hypothesis when it is true. For example, a significance level=0.05 indicates a 5% risk of concluding that a difference exists when there is no actual difference. Using literature data (Gencsi and Vancsura, 1992; Encyclopedia of Life, 2021), the life stages of trees (young, adult, old) were determined, broken down by genus, and the current life stage of the individuals in the stock.

Table 1. Bonitation categories for the viability of woody plants (Radó, 1999)

Evaluation	Rating	
	Its lifespan can be estimated up to cutting age	good
Use intervention to approach cutting age	less good	4
To be replaced within a decade	medium	3
To be replaced shortly	weak	2
To be replaced urgently (because of risk of accident or damage to buildings)	bad	1

Results and Discussions

The 5 parameters determining the vitality of 90 individuals (roots, trunk, foliage, care, viability) were examined by averaging **Fig. 1**. None of the evergreens found in the garden fell into the categories of poor health. The lowest mean value (value 3) was obtained for a 22-year-old *Chamaecyparis lawsoniana*, for whom strong crown damage (value 2) and poor viability (value 2) were found in the survey. A medium average rating was assigned to 4.4% of the individuals and a less good rating to 33.3%. The majority of the surveyed woody plants (62.2%) can be said to be in good health. A maximum value of 5 was given to a total of 17 individuals, which in our opinion have excellent vitality. The average age of these evergreens is 11 years and most of them belong to the genera *Abies* and *Taxus*.

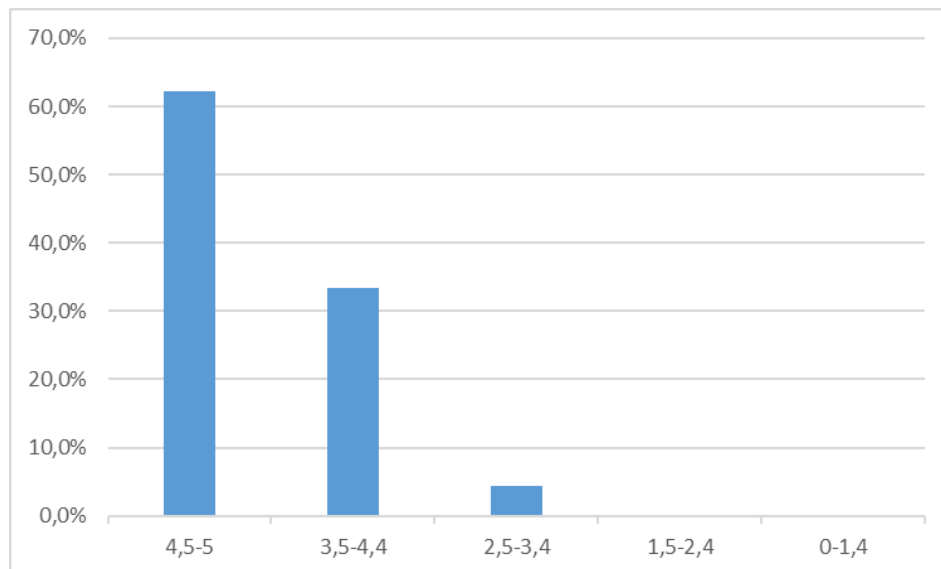


Fig. 1. Distribution of the average viability of the studied evergreens

Analyzing the average health status of each age group (**Fig. 2.**), it can be seen that the vitality of the estimated age group of 21–30 years is the weakest (value 4.27), but even so they can be classified into the less good category. The health indicators of the individuals belonging to the

oldest age group indicate an average value of 4.45, thus these evergreens gave the third best result out of the five age groups we formed. Of these, *Pinus nigra*, estimated to be 41 years old, received the highest value of 4.6. In line with our expectations, the youngest woods have the best vitality, with an average value of 4.66 in this age group. 26.3% of the individuals in the 0-10 year old category were classified in the excellent condition category.

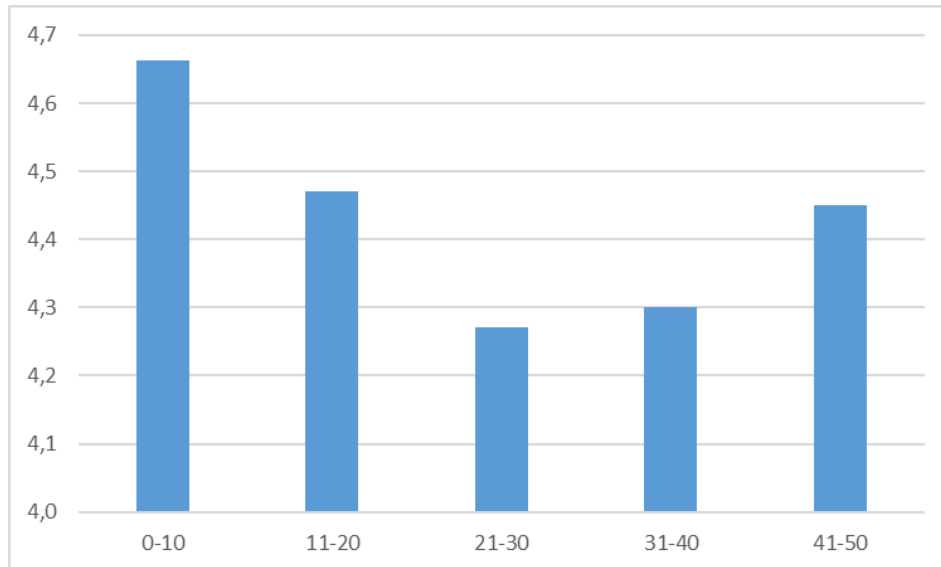


Fig. 2. Average viability of age groups of evergreens

Regarding the Radó's vitality values (**Fig. 3.**), it can be stated that the majority of the evergreens surveyed received an excellent evaluation of the condition of the root structure and the trunk. Plants belong to the excellent category (53.3%) in terms of their viability, but they are also significantly represented in the less good group (33.3%). Grading the foliage and care, it can be seen that most of the plants are in less good condition.

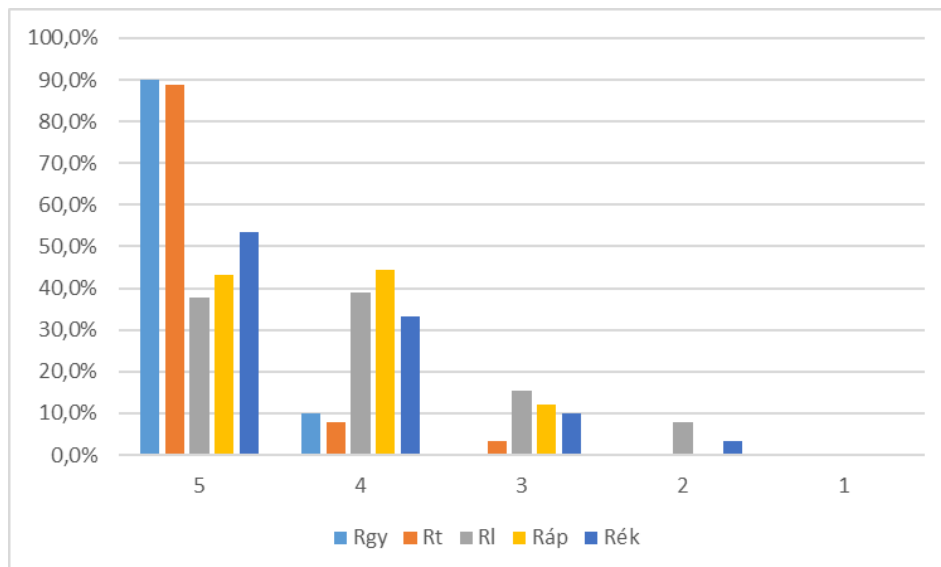


Fig. 3. Distribution of vitality values of the studied evergreen stand (90 individuals) (Rgy - root system, Rt - trunk, RI - foliage, Ráp - care of the trees, Rék - viability)

The foliage received a medium value in 15.6% of the plants and in 7 plants the foliage was strongly deficient (value 2). Based on its viability, we judged three individuals to be soon replaced: *Larix decidua* (estimated age: 37 years); *Thuja occidentalis* (estimated age: 24 years); *Chamaecyparis lawsoniana* (estimated age: 22 years). Immediate cutting is not warranted in any case.

The indicators of each age group were also evaluated separately (**Fig. 4**). Root and trunk status in all groups approached or even reached (21-30 years and over 41 years) the mean of 5. Canopy loss was most significant in the 21-30 age group, here this vitality value can be said to be moderate on average. According to our survey, there are also most individuals in this age group where a health-improving intervention is needed to approach the maximum age. However, in terms of the care of evergreens, the oldest age group has already brought the lowest average values, which shows a moderate lack of care.

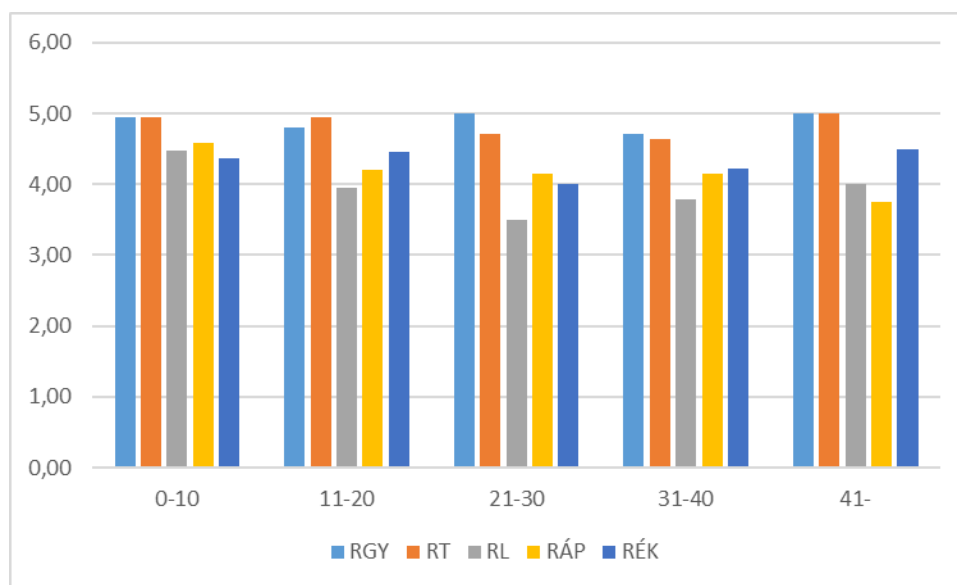


Fig. 4. Distribution of the mean of each vitality value by age group (Rgy - root system, Rt - trunk, Rl - foliage, Ráp - care of the trees, Rék - viability)

Species belonging to different genera reach adulthood at different ages and at the same time the onset of aging can be linked to other ages. The majority of the plant stock we examined, and within it the evergreens found there, can be considered juveniles and only approximately one third of them have passed into adulthood. Aging did not begin in the collection garden for even an individual with respect to evergreens (**Fig. 5**).

For those taxa (71 plants) where the determination of the estimated age based on the trunk diameter was found in the literature, we also examined whether there was a correlation between the mean of Radó's vitality values and age. The Pearson correlation showed a moderate negative relationship (-0.312). As the age progresses, the health of evergreens deteriorates. The relationship between the two parameters is strong and significant ($SL < 0.01$).

Based on leaf type, there are 57 needle, and 33 scaly and deciduous taxa in the population. In the analysis of variance, a significant difference could be detected between the two groups only in the case of viability ($F = 5.139$, $SL = 0.026 < \alpha$). Thus, scaly and deciduous plants have, on average, weaker viability (4,12) than their needles counterparts (4,51). Although there is no statistically

significant difference in age, the average data for scaled and deciduous specimens (19.13 years) are less than for conifers (20.57 years).

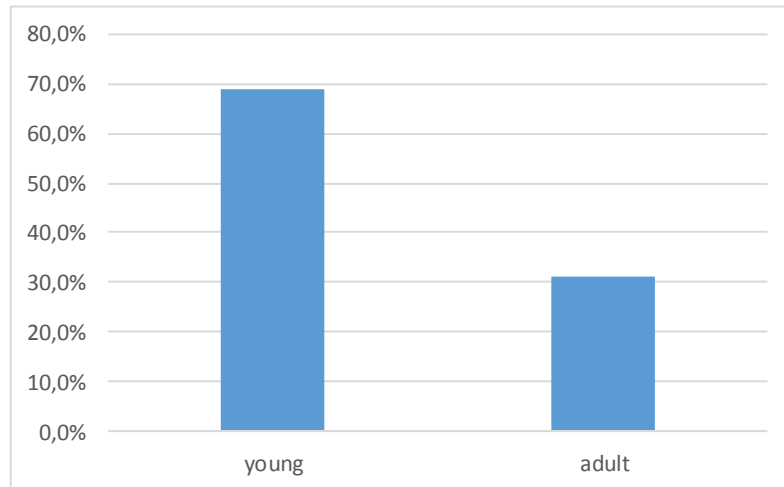


Fig. 5. Distribution of tree life stages

Conclusions

The evergreens of the surveyed plant can be said to be in good general health. The best ratings were given to members of the genera *Abies* and *Taxus*, which, thanks to the selection of the right planting site, can grow under favorable living conditions in terms of their ecological needs. Contrary to our expectations, not the oldest trees received the weakest assessment of health status in the age groups, but the 21-30 year olds. This age group includes a significant proportion of *Chamaecyparis* taxa, which can only develop in conditions that are unfavorable to them in a relatively dense population. The excellent vitality of the oldest age group is due to the fact that in the past 50 years they have developed properly - the shading effect of the dense stand is not present - and poor individuals who are less tolerant of the given environment have been removed from the garden.

Looking at the results obtained from Radó's values, it can be concluded that there are no significant damage in the condition of either the roots or the trunks. Most evergreen taxa grow in optimal production areas where there are no particular obstacles to root development, as the proportion of paved surfaces in the garden is minimal. Minor injuries on the root necks can be observed in areas where the use of the yard area is more intense, resulting in greater trampling and soil compaction. Even minor careless use of the line mower caused minor injuries. The good health of the trunks is generally typical of the evergreens, and they are less likely to be seen in decay.

The condition of the canopy has already yielded less good results in terms of stock. Crown loss is significant in most plants and there are places where it exceeds 50%. In our opinion, the reason for this is again to be found in plants that are planted too densely. In three *Thuja* taxa, we also observed that the large deciduous trees placed around them adversely affected the scaly-leaved evergreens below them in a repressed position. Also, deciduous damage was also significant in a

Larix taxon, in which a high fence transferred caused an unfavorable change in the condition of the crown.

Regarding the care of the trees, it can be said that there is only a small deficiency in this parameter. As the garden belongs to a higher education institution of horticulture, attention has been paid to the regular performance of nursing work. Currently, there is a lack of tree care interventions that require major interventions and are not feasible in practical classes.

With regard to viability, with greater or lesser interventions, the evergreens can be kept in the garden for a long time until they reach the age of cutting. In the case of the three individuals mentioned above, a decision must be made to remove them permanently, as the damage here is already such that they will be completely destroyed within 10 years.

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CONFERENCE VOLUME

THE URBAN LANDSCAPE IN TRANSYLVANIA ACCORDING TO THE BUILDING REGULATIONS AT THE END OF THE 19TH CENTURY AND THE BEGINNING OF THE 20 CENTURYKlaus BIRTHLER¹¹ Doctoral school of Architecture and Urbanism, Technical University Cluj-Napoca

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Abstract: This research is concerned to follow the attitude of the society in the town of Mediaş (Medgyes, Mediasch) according to the construction regulation at the end of the 19th century. This article is a section of the analysis of 4 Transylvanian cities located in different areas. Brasov, Mediaş from southern Transylvania, Bistrita from northern Transylvania and Gheorgheni from eastern Transylvania.

The choice to analyse these cities is mainly motivated by the availability of primary sources, namely the building regulations dating back to the end of the 19th and early 20th century.

It is also to be pursued which issues related to the built environment have been regulated on central level, considering that the European political situation is unstable and which issues have been regulated at local level. The research reveals those elements of the urban regulation written originally in German that shaped the urban landscape of Mediaş in the mentioned period.

Keywords: Construction regulation, Mediaş, Medgyes, Mediasch, urban policies

Introduction

This research may be up-to-date for contemporary generations for a number of reasons:

- The management of the new territorial expansion of the city in the last 30 years

avoids good urbanization practices probably because of lack of urban policies on local and national level. Newly built residential areas has no suitably sized street profiles or even no public streets and infrastructure. Contemporary cities in Romania in most cases may have not taken up the role of coordinator of the public interest. Even the notion of public interests is not defined by the law.

The research wants to compare why the past generations, more precisely those of the end of the 19 and the early 20 century, have managed to build in a predominantly coherent city.

- the code of urbanism and construction is under development in Romania

In the studied time segment the territory of the 4 cities successively governed at macro level as follows:

The Austrian-AUSTRIAN Empire->the Austrian-Hungarian Empire

1919-Romania Mare

1940-Hungary-Hungarian Autonomous Region (Northern Transylvania)

1944-USSR (Northern Transylvania)

1945-Hungary (Northern Transylvania)

1947-Romania

Materials and Methods

Primary sources considered on this research ist based on are:

- The proposal for the construction regulation of the free city of Brasov "Entwurf zur Bauordnung für die königliche Freistadt Brassó"¹ the year of the Regulation is uncertain but shurely after 1896 because the document refers to to some Hungarian royal provisions, one of them dated to this year;
- The Mediaş free City construction Regulation approved in 1898 in German²;
- Digital photographic archive of the chief architect of the city of Mediaş, Paul Mihaela.
- Some historic images were taken also from www.mediaslive.ro

The interpretive- historical research method⁴ was used in order to follow the end of 19th and beginning of 20th century generations attitude towards the built environment as part of the urban landscape.

Results and Discussions

The construction regulation of the free city of Mediasch

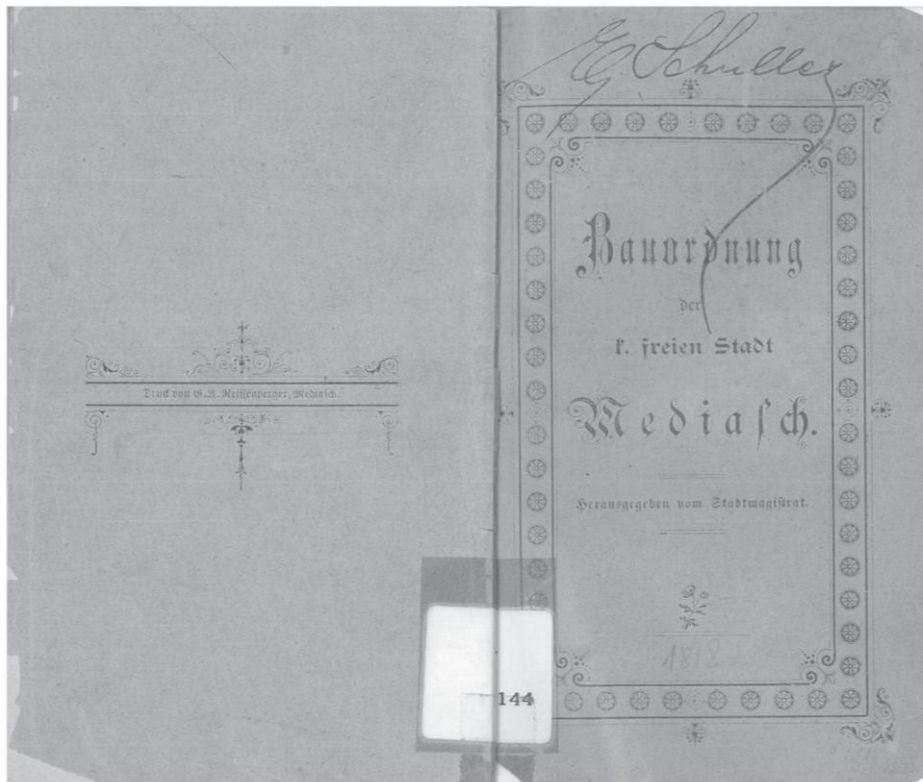


Fig. 1. Scanned image of the cover - Building regulation of Mediaş

The regulation is written in German (gothic-fraktur typography) apparently because of the ethnic majority of the German speaking citizen. The percentage structure in the year 1850 was 50-75% German, 2-10% Hungarian, 10-25% Romanian.³

Structure of the Regulation

- I. Construction approval
- II. Building regulations
- III. Construction with simplified requirements
- IV. The habitation and use approval
- V. Fines
- VI. Competences

The public spaces mentioned in the regulations are of three types: "Platz"-market or square, "Straße"- street and "Gasse"- small street.

Constructions that require a building permit

In Mediaş, the reference to the construction works does not attempt to be exhaustive but rather general in the same sense as in the case of Braşov city, the list of general cases for which the authorization of construction works is required keeps the list in the same order: " Neu- Zu- und Umbauten", i.e. new constructions, extensions and construction modifications.

the city or the outskirts.

The building authority, which is not clearly described in the light of the project, the "construction Commission" or its members apparently included in this authority, the "Baubewerber"- initiator or beneficiary, "Bauherr"- investor, "Bauführer"- project supervisor, "Bauunternehmer"- investor or contractor".

The construction Commission

The construction Commission is the forum that approves the submitted authorization projects. In Mediaş the commission is organized under the direction of a member of the city magistrate and consists of **the city engineer, the city's physician**⁶, who was assigned public health responsibilities, a representative of the police chief. The initiator and neighbours are invited to the Commission process.

In Braşov, the same composition of the commission is mentioned, apart from the magistrate's Member.

The Commission can only start the process in the presence of the representative of the magistrate and the city engineer.

Before granting the building permit, the commission meets on the ground to analyse the impact of the proposed construction in the context of building regulations and other laws and regulations in force.

The meeting of the commission is called in the German text of the regulation as "Kommissionelle Verhandlung". The meaning of this expression indicates a possible character of negotiation of the meeting. The main elements being negotiated are the street alignment and street level.

This process also checks the technical plans of fire safety, from a health and architectural point of view, and in particular that the building designed should respect the character established for that part of the city, or the street, in order to fit as harmoniously as possible in the existing environment. Any amendments or observations made by the Commission shall be noted in the plans and in the minutes (protocol).

If the neighbours comment on the attainment of rights, a negotiation shall be sought to balance any possible damage. If the negotiation is not achieved, objections that affect the private law should be discussed in court, however without, influencing the time issue of the construction permit. The magistrate decides only over other issues of competence of the building permit.

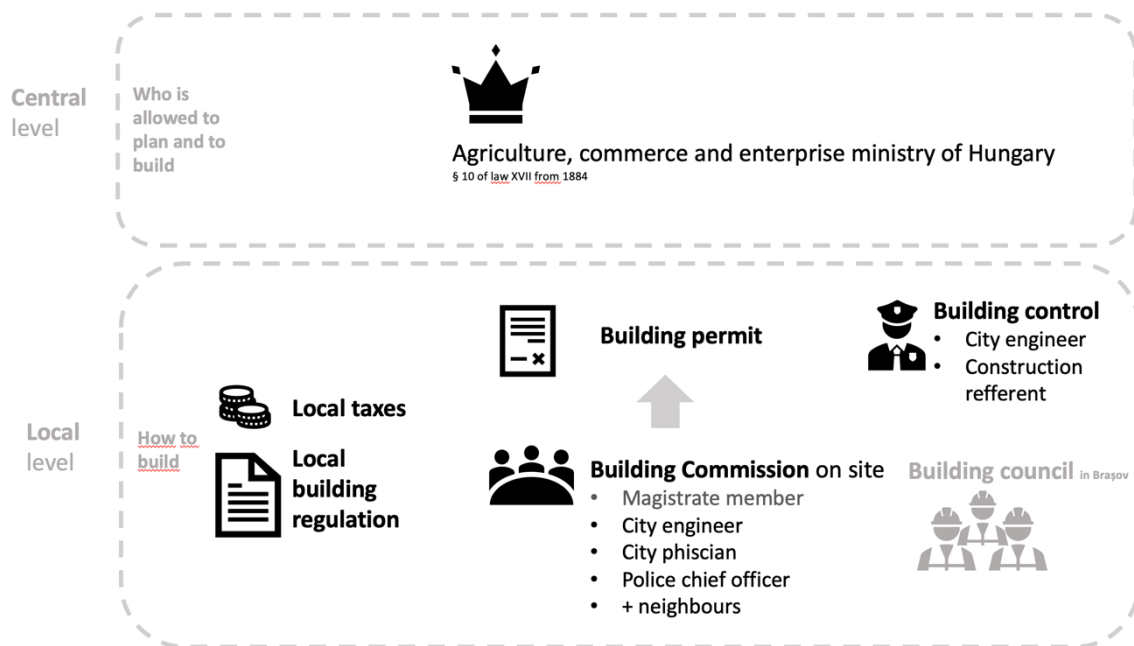


Fig. 2. The built environment regulation structure in Mediaș compared to Brașov indicates some slight differences.

Building rules

Basic regulations

As a basic rule, each construction must fully fit the purpose for which it was built, be as fire-resistant as possible, offer complete safety for persons and property and meet all health requirements.

Alignment and level

Alignment and level of the proposed buildings are determined by the "building authority"⁷ only if no plan of Regulation has been approved on a larger scale. Such arbitrary adjustments by the construction institution should be such that they do not prejudice a subsequent settlement.

For larger new buildings, the city management sets the Regulation line for the entire street or space in which it will be built.

If following the alignment, it is necessary for one of the properties to withdraw, the owner may request the redemption at fair prices of the remaining property on the street side by the city. Also if

part of the municipal land is sold to the applicant for the construction approval after the establishment of the alignment, it may be sold at a fair price.



Fig. 3. Historic postcard⁸ shows the previously urban landscape, before the hereby studied building regulation with discontinuous street alignment



Fig. 4. Historic postcard with simulated corner building dated most probably to the 20th century that follows the alignment 1.



Fig. 5. source: Google streetview image of the realized corner building, 2009

City regularization Fund

In order to regularize, create and build new streets and squares, including acquisition and sell of land for this process, a city regularization fund is created. The fees connected to the building permit and construction fines were directed into the allodial savings⁹ and shall be spent first of all on the execution of the above-mentioned process.

Independence of constructions

Each new construction must be independent from the static point of view, must have "structural strength", a construction shall not be permitted to induce loads on neighbouring buildings. Chimneys can be lifted and anchored to the neighbouring construction. The owner of the chimney can also request it's lift on cost of the constructing neighbour.

Construction materials

Each construction should normally be carried out with waist stone or burned brick and lime-based mortar. Burned bricks or broken stone with lime mortar binder shall not be used for cellars and foundations up to a height of 1 m above the ground and for the vaults.

The wood execution of construction works other than the exceptions referred to in this Regulation is prohibited.

If repairs are carried out on existing wooden buildings, then those parts must be replaced by fire-resistant materials.

Height of construction and levels

Each dwelling building that is built in a continuous front should be not lower than the neighbouring building. The usable height of building rooms in the inner city shall not, be less than 3 m and in the outskirts should not be less than 2,5m hig and at least one living room shall have a minimum area of 25 m².



Fig. 6¹⁰. The central square. The roof shape of the second building before intervention is constructed with fire wall but paradoxical it will be shaped in a way that conducts rainwater towards the neighbour.



Fig. 7¹¹. The facade and the roof are reshaped before 1912. The wall of the Trompeterthurm tower can be seen throughr the emptiness released by the new roof that apparently violates the building regulation.



Fig. 8¹². A new roof part looks to be completed with new tiles or other material, after the corner parcel is rebuilt with a 4 story high building. According to the building regulation, the building neighbor could fix the proper way rainwater flow on neighboring buildings.

The building site and its responsibilities

For the purpose of coordinating the construction of the approved building, the developer shall, within the meaning of this Regulation, have a construction site manager or supervisor who may be mentioned in the application for the construction approval or should be mentioned written or orally before construction begins. The project supervisor shall draw up the construction plans and shall forward them to the construction authority before construction begins.

Every change in person of the project supervisor shall also be transmitted to the magistrate in written or oral form. Only those persons who are competent and authorized according to § 10 of the Law XVII of 1884 (Enterprise Law) and the provisions of the Ministry of Agriculture, Trade and Enterprises of 30th October 1884, No. 46188 can be entrusted to be the building site supervisor.

In some cases according to the own assessments of the building authority, according to § 10 of the Act. XVII of 1884 of the above-mentioned Ministry, the supervision and execution of works for less important buildings are also allowed by qualified and reliable mason masters.

The construction authority is also entitled in some cases according to the provisions of the Ministry of 12 March 1885, No 10228, to allow qualified and trustworthy masons and carpenters, the supervision of renovations, in the field of their own specialisation, and for the mentioned works in the approval, as well as the construction of smaller building, if necessary under the supervision of a qualified master according to § 10 of the Law XVII of 1884 and the provisions of Minister no. 46188 84.

The site supervisor shall be fully responsibility for the use of appropriate construction materials, for the durability of the construction and for compliance with this building Regulation during the building.

Fire walls

Each roof must end towards its neighbor by a fire wall . In the fire walls, no openings are allowed, even if the neighbor agrees with it.

Where such opening exists, those must be closed with a dense wire braid and metal doors. If in such an opening in the own proprietary-oriented firewall is necessary, they may be permitted but need to be foreseen with metal shutters. If there are wooden elements in the fire wall, a minimum thickness of 15 cm of masonry must cover the wood towards the neighbor.

Wooden walls

Wooden walls are permitted only if they are not expose to the fire risk.

These walls are mainly allowed to delimit spaces of the houses. In the vicinity of fireplaces, massive masonry walls will be used anytime.

Lattice walls and plastering boards with clay are prohibited in future use. However, city representatives may allow Latin walls and boards to be used in parts of the city or on the outskirts.

The height of the floor coverings

The floor of ground floor level shops shall not be lower than 15 cm high, and for houses not lower than 32 cm from the designated level of the street.

In areas of the city, exposed to floods, the floor height is established according to highest flood level.

The cellar entrances

The provision of entrances to the cellar in front of the house or from the street, is not permitted for new buildings. Any existing access will be demolished in case of modifying construction works.

Roofs

As a general rule, roof coverings with shingles and bathroom will be changed with fire-resistant covering during major repairing work.

Gutters

The regulation determine how rainwater will drain.

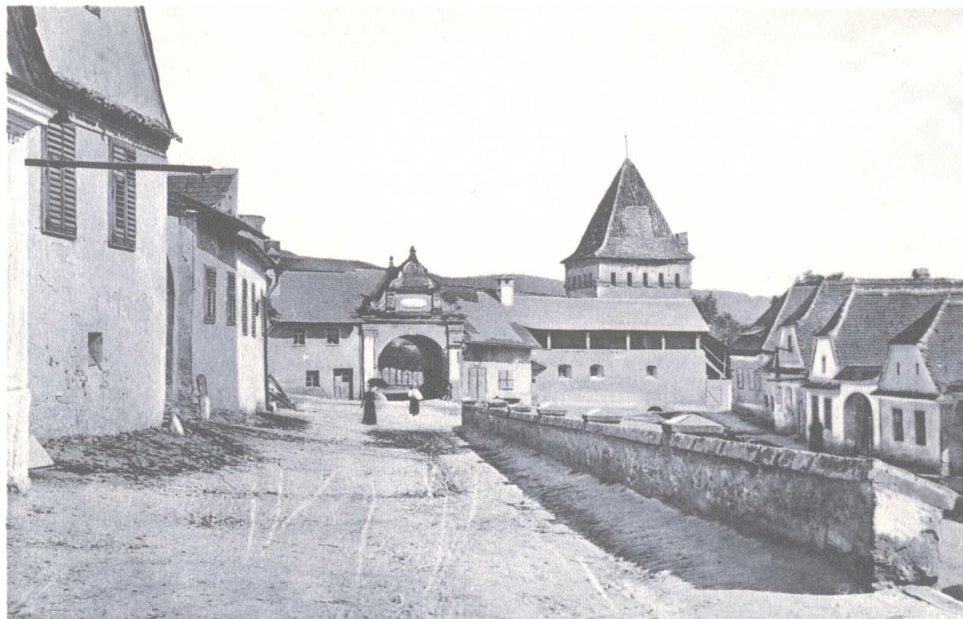
The water from the roof will be captured by suitably sized metal gutters and drained to the ground through a downpipe and ending in a stone “clam”¹³. The water is then discharged over the ground, through a stone paved ditch, to the street runoff. The costs for paving the ditch on public space is supported by the owner of the house.

Gutters towards the streets, apparently were already used. The regulation also mentions that it is not permitted for gutters to "stick out" to the street. This was probably a common practice that should be avoided according to the regulation. Those cases that are still in place have to comply within three months.

It is also mentioned here that rainwater can be drained either to the street or to its own yard.



Fig.9¹⁴. Square front with gutter but without downpipes



Mediasch — Schmiedgässer Tor: Innenansicht

Fig. 10¹⁵. Gutter without downpipe

Windows

The Regulation of windows apparently has two objectives: That of the health of the population, in order to provide sufficient light for inner spaces in which man spends the most of its time.

The lighting of living rooms is not regulated in quantitative terms but the expression "be provided with sufficiently large light openings that can be opened" is used.

The concern of safe public space introduces the regulation that windows should be opened inwards and any decorating carpentry or cases are allowed only above the height of 2,3 m above the street level.

Stables and food chambers

In paragraph § 40 the minimum height of 2,5 meters and the fire-resistant materials are regulated for their use in annexes. They have to be built separately from the main building. The construction of stables or barns towards the street is prohibited, which indicates that the society wanted to establish an attitude of honour towards the public space.



Fig. 11¹⁶. Old house of former gunsmith was probably impressive too for the generation that has taken the picture. The house reveals some elements that will be eliminated by the building regulation at the end of the 19th century.

Barns

In cities, flammable materials for barns are also prohibited. In the outskirts of the city, wooden constructions are allowed but they have to be covered with fire resistant roof tiles.

The yard of the houses

In paragraph § 45 there are mentioned urban indicators. As a general rule, it is established that at least $\frac{1}{4}$ of the land should remain free of construction.

Unbuild parcels smaller than 100 square fathom¹⁷ equivalent to 334,89 m² may not be built with a house. The courts of the inns or guest houses, as well as of the factories and productive enterprises where they usually get dirty, their paving is required. If this has not taken place, the construction authority may order the paving process within a given time limit.

Fences

In paragraph § 46 is required that all courts be firmly and properly enclosed toward the street. *The fences towards the street in the inner city are usually built from masonry and metal. Fencing from wooden rigs or boards is permitted only if they are threated with oil¹⁸.*

Braid fences are only allowed in the fields.

In this sub-chapter, concern of safe public space is revealed by the regulation of opening doors and gates, namely that they have to open inwards.

Outdoor decorations and colour.

In paragraph § 49 the painting and exterior decoration is regulated very briefly. It is established that in the exterior painting of the facades, should avoid intensive colours and especially the white colour should be avoided. The exterior decoration should be "tasteful".

Extensions that exceed the alignment

Extensions of construction beyond alignment are permitted for balconies, resalits, columns, portals, stairs, covers or other constructions with the approval of the authority. All these shall be made of fire-resistant materials with adequate rainwater leakage and shall be constructed in such a way as not to impede traffic on the street. Balconies can exit the façade up to 1,25 meters from the wall.

The windows and doors open normally inwards. An exception is granted namely where spaces are used to gather a large number of people in which case the doors must open outwards.

The corniches and decorations shall be of combustible materials and shall be firmly anchored in the masonry. Shutters shall only be permitted above the heights of 2,3 m toward the street so that in their open position should not impede the traffic.

Special regulations for windows, doors, ventilation

The minimal dimensions for buildings entrances and streets is established by the building authority. Pedestrian access will have a minimum width of 90 cm and a height of 1.85m. Carriage portals must have a minimum width of 3 m.

Sidewalks

The width of the sidewalk is regulated by the construction authority.

A new expression that was not used before in this regulation is used referring to an existing property namely "Realität". The word is similar to the English expression "real estate". The investor of a new or existing construction is obliged to build the pavement along the front of his property according to the prescription of the construction authority. The half of the costs for the sidewalk is covered by the investor.

Constructing outside the town

New buildings for housing and for businesses can only be built outside the town if there is a public interest behind it. Their courts must be enclosed with a fence of a minimum height of 1.25 m.

The reception and authorization for residence and use

The investor is obliged, after completion of the approved works, to notify the construction authority orally or in writing and to apply for authorization to reside and use. The construction authority has eight days to undertake the request and 15 days to issue the decision. After these deadlines have expired, the investor is no longer obliged to wait for the authorization.

If the investor omits the request for revision, the construction authority may decide whether after the construction season the actualization of the building permit register is needed.

Eight days after the issue of the residence and use authorization, the owner has the obligation within 8 days to apply the administrative number to the house according to the instructions of the police chief officer, on his own expense.

Conclusions

The establishment and settlement of streets was managed exclusively on the local level. Among the few issues that have been regulated centrally is the competence to plan and build. Only those who had some training in the field can take responsibility for constructions works, as attempt to ensure the quality of buildings. This Regulation is partially removed in contemporary society concerning the execution of works.

The rest of the building issues were regulated locally even the type of construction that require authorization. It is still not conclusive whether there have been directives at central level establishing a specific structure or degree of freedom of local Regulations.

In the contemporary society the types of construction works that require building permit are regulated centrally.

Through the freedom to set local taxes and relatively clear and simple land purchase procedures, the town apparently could adapt itself organically and assure the necessary infrastructure.

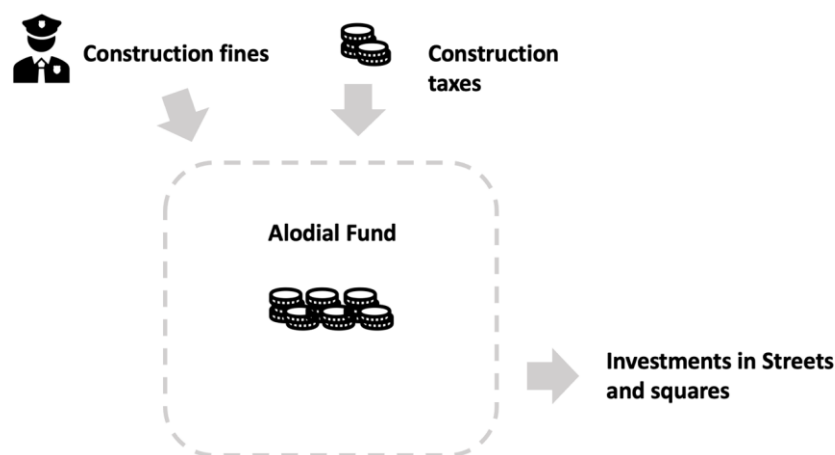


Fig. 12. Regularization fund cash flow

Regulating the fact that the use of revenues from fines and approval fees is mainly spent on the development of the town's infrastructure is a matter that is missing from the regulations of the contemporary society. Today, with taxes being set centrally, the response of the public administration can no longer organically follow the needs of expansion of the city, resulting new city parts without needed infrastructure.

The term Traufgäßchen- the space covered by the eaves of two building roofs has no equivalent correspondence in Romanian. The terms "picur", "mezunie" or "mejdă" are used to express the part of the plot, but rather in a split sense than in a spatial sense.

The term "abtretten" meaning partitioning and buying parcels for the use as public space is also a non-existent term in the Romanian vocabulary as it means in the German one. Similar alternatives to the German expression would be "expropriation" or "division", but none of the terms refer explicitly to urbanization.

The lack of some essential terms for urbanisation in the Romanian vocabulary versus their existence on the same territory about 140 years ago in German, indicates that the contemporary urban society has an approach that do not focus on the quality of urban built environment.

According to the general rules of contemporary town planning a plot is constructed if it is at least 200 m². Thus the minimum building plot for housing in the past was more generous than today's one.

The way the society was shaping the urban landscape has been probably a matter of honour that sometimes could hardly been expressed as material and quantitative prescriptions in the urban regulation. As a consequence we can find expressions like "tastefull decoration" or "enough lighting".

Acknowledgments

The series of urban landscapes according to the building regulation researches in the mentioned 4 Transylvanian is a analytical study of "Urban evolution in the city of Reghin" for the PHD Thesis at the Doctoral school of Architecture and Urbanism, Technical University Cluj-Napoca, by the author.

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9. "Allodialkasse" saving account of the common property

10. Paul Mihaela, digital photographic archive of the chief architect of the city of Mediaș
11. ibidem
12. ibidem
13. Wassermuschel
14. Paul Mihaela, digital photographic archive of the chief architect of the city of Mediaș
15. ibidem
16. ibidem
17. Quadratklafter, is the unit of measurement of the corresponding "arm" of 1,83 meters
18. Probable oil-based paint.

CONFERENCE VOLUME

THE LANDSCAPE EVOLUTION OF TRANSYLVANIAN MEDIEVAL ABBEYS

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Abstract: The purpose of this study is to explain the way in which the landscape was transformed by implementing the architectural program of Transylvanian abbeys between the 12th and 14th centuries, as well as the ways by which today the ruins of the former monasteries can be revitalized in a sustainable way. The research methods of the study put into the foreground: the archives, the chronicles descriptions, the architectural and landscape studies that talked about how medieval abbeys worked in general and those of Transylvania in particular, by comparing examples in this territory and some analogies with other examples from Western Europe. The results shows that on Transylvania, the medieval monastic orders adapted the site topology to their social, spiritual, and economical needs. These communities consolidated the lands and built irrigation channels that both altered the image of these areas and ensured a proper functioning of the monastery as physical complex and institutional part of the Catholic Church. Today, due to the disappearance of these monastic communities from the Transylvanian area, there is an increasing need for sustainable recovery and conservation for these valuable sites. This can be developed and enhanced by the rediscovering and the adaptive reuse of these assemblies.

Keywords: landscape, consolidation, sustainability, abbey, domain, transformations, constructions.

Introduction

The research shows how the architectural and urban landscape of the medieval abbeys of different monastic orders (the Benedictine, the Cistercian, and the Dominican order) evolved and developed between the 12th and 14th centuries in the sites of Transylvania. The study also aims to reconstruct the architecture and the landscape of these Eastern Europe monasteries based on archaeological, historical, and archaeological research that had started up in this area until now.

The research will nuance the urban and landscape changes through which these architectural assemblies of the medieval Transylvania have passed, which have so far caused topological changes due to successive anthropic interventions. The metamorphosis of the original functions of these architectural complexes influenced both the urban level and the relations with the natural landscape. The study will show the changes that had occurred in the monastic sites of Transylvania in the sense of the changes of the relationship between the anthropic element (the people) and the topological one (the place) despite the disappearance of the original function of the monastery or despite the functional conversion of the former medieval churches in different parish church of different confessions. A second objective of the study is to illustrate ways in which the contemporary architectural and landscape planning can restore the usefulness of these medieval assemblies and methods by which both the architecture object (the ruins of the former abbeys of Transylvania) and

their linked site (the protected area in which the medieval village was generated by the presence of the monasteries) is used both in terms of heritage and landscape protection.

The study is organized in two parts. The first part exemplifies the reconstitutions of the monastic landscape of the best-preserved ensembles in the Transylvanian area. Since the concomitant existence of several catholic medieval orders caused several distinct typologies of monasteries, we will analyse the most relevant examples on the territory of Transylvania: the ruins of the benedictine ruins of Acâș, Uileacu Simleului, Cluj-Mănăstur and Herina; the ruin of the cistercian abbey of Cârța and the ruins of the domenican abbey of Rodna. The second part of the research makes some analogies and comparisons between different examples in Transylvania and other examples of Western Europe from which will result some potential scenarios by which the ruins of the medieval abbeys in Transylvania can be put to good adaptive reuse both in architectural - landscape terms and also in economical and tourism sustainability through the restoration of the ruins and the restoration of the landscape in which these architectural assemblies have been established for about 800 years.

Materials and Methods

The study researches the way in which the built landscape of the catholic medieval monasteries in Transylvania evolved. The possible reconstitutions were based on the archaeological, historical, and architectural research of these monasteries. Before presenting the examples, their evolution over time and their reconstitutions, a clarification is needed on the way the architectural program of the benedictine, cistercian and dominican abbeys are designed and operated. For this research, the method of study involves: the analogy and the comparison between the architectural program and the typology of different medieval monastic orders (the Cistercians, the Benedictines, and the Dominicans), the comparison between some examples of medieval abbey reconstitutions in Transylvania and the analysis of some contemporary interventions of the Western Europe medieval ruins to give some principles of adaptive reuse for the abbey ruins in Transylvania.

1. The reconstitutions of the medieval fortified abbeys in Transylvania

The ideal plan of a Benedictine and Cistercian monastery (**Fig. 1.** and **Fig. 2.**) clearly shows the formal separation of the individual structures according to their intended use, but also their overall functional grouping. The architectural program of the medieval abbeys was the result of an evolving series, from which the monks of the feudal orders (the Cistercians and the Benedictines) have always filtered out the most moderate solutions in the point of view of claims for comfort. The pattern of organization of both the Benedictine and the Cistercian abbeys finds inspiration in the first monastic ensembles of the paleo christian period and the blossoming period of the Eastern Roman Empire. For them, the church is the main building as an important and architectural composition together with the cloister, delimited by annexes, as a place of meditation and meeting of the community.

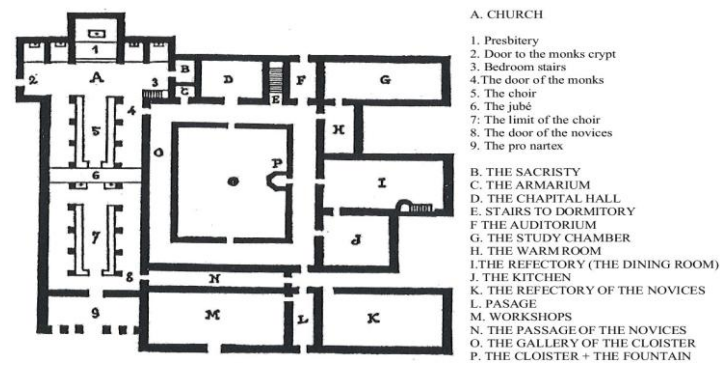


Fig. 1. Ideal Cistercian abbey plan. Source: M. Thalgott, (1990) *Die Zisterzienser von Kerz (The cistercian abbey of Cârța)*, Südostdeutsches Kulturwerk Edition, München, p. 62.

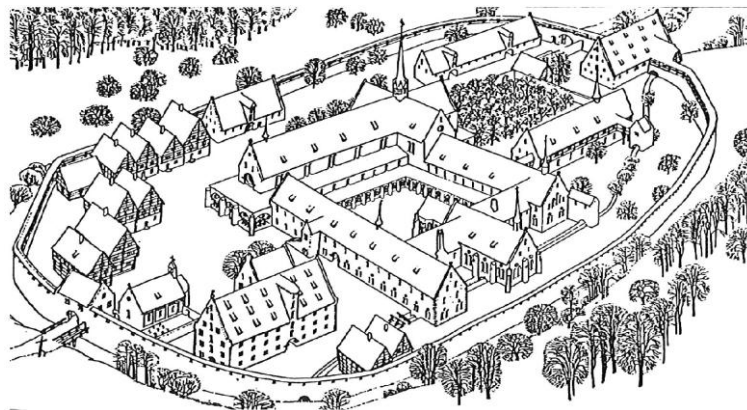


Fig. 2. The axonometry of an ideal Cistercian abbey. Source: Michael Thalgott (1990) *Die Zisterzienser von Kerz (The cistercian abbey of Cârța)*, Südostdeutsche s Kulturwerk Edition, München, p. 63.

The architectural model of the church of the catholic medieval abbey was the roman basilica, with three naves, the model of the cloister being the attraction of the roman house but also of the byzantine house, which was also tasked with connecting the rooms and being a meeting place for the inhabitants of the house. The order rule, written by Saint Benedict in the 6th century is the foundation of the Benedictine and catholic monasteries - providing for a building complex that allowed monastic life to be achieved independently of the outside world, so that any excuse for leaving the monastery can be removed. These monasteries were no longer refuges for the people of the world, but spiritual centers which have radiated from the Western Europe to the East (here Transylvania being included) in the general public life, which had an impact on buildings which gradually took on considerable proportions and which, apart from the essential facilities for hundreds of monks, there were other functions and activities that guided the life of monks such as: bakeries, breweries, shops, workshops, fruit and vegetable orchards, fish ponds, and buildings created for the material needs of the community of monks as mills and laundry rooms. The community of monks was led by an abbot that had many privileges. At the beginning the monastery of Cluny benefited from these privileges, from which later the Cistercians, dissatisfied with this evolution, moved once again in solitude according to the original laws of St. Benedict of Norcia. The return to the ascetic way of life became evident in the Cistercian monasteries. The creation of the Cistercian monastery was planned to facilitate the possibility of developing, spreading, and

multiplying the model of this type of monastic community so that in time each monastery could become an independent institution.

Michael Thalgott broadly illustrates the ideal plan of a Cistercian monastery and clearly shows the formal separation of individual structures according to their intended purpose, but also their functional group. Apart from the central ensemble of the Cistercian monks consisting of the two symbolic spaces of the ascetic life: the prayer spaces of the monk community (the church and the cloister) and the spaces of the community life (consisting of the monk's bedrooms, the refectory, the monastery's kitchen and the capitular hall organized around the inner cloister), there are a number of other annexes: craft workshops, stables, mills and other facilities needed to manage the monastery complex. All these functions are located inside a wall of protection that surrounds the entire area in a perfectly cartesian order. These austere-clustered buildings, which create the image of a small town, did not exist at the time of the first monasteries.

In the case of the Dominican and Franciscan order, the Cistercian and Benedictine monastery model were inspirations in terms of functional scheme. Since they lived in the city's *intramuros area*, they had to adapt to the limits and spatial restrictions of the available plot. Often the Franciscan and the Dominican monasteries become assemblies that recycled the existing buildings of the built-up fund or build new monachal units that adapt to spatial limits of the concentrated urban density of buildings. Although they were a result of the limitations of spatial parameters, the Dominican and Franciscan monasteries never lack the inner courtyard of meditation (the cloister) and the church as the main places of prayer and meditation.

Once the typological analysis of the abbeys was made, the study aims to illustrate the potential reconstitutions of the best-preserved remains of the medieval monasteries in Transylvania. The six examples chosen to illustrate the evolution of the universe of the fortified monasteries in Transylvania are: the ruins of the Benedictine abbeys of Acâș (the present Romanesque reformed church), Uileacu Simleului (the present reformed church in Romanesque style), Cluj-Mănăstur (the present gothic roman-catholic church of Mănăștur), Herina (the present Romanesque evangelical church), the Cistercian abbey of Cârța (currently the gothic evangelical church of Cârța together with the ruins of the former Cistercian monastery) and the ruins of the Dominican abbey of Rodna (the present Greek-catholic church together with the ruins of the former Dominican monastery).

Compared to Western Europe, where there are still medieval monasteries fully preserved, studies at the medieval monasteries in Eastern Europe focused largely on written evidence and the architectural remains of the ruins. It should be stressed that "the study of the medieval monastic landscape in this part of Europe involves a number of specific problems that are not found in Western Europe, such as the lack of written evidence containing traceable details of the landscape, such as ambulances, donations, last wills, litigation, etc.; lack of undisturbed monastic landscapes through modern control of water and landscape; extensive construction work often carelessly planned on historic sites or in their immediate vicinity. Many of these are closely related to the degree of conservation and protection of monastic sites, a problem that would require special attention from the researchers of Transylvania and inspectors in the protection of monuments. Due to the lack of sufficient written data, the image that can be restored is fragmented, so the need to complete it with additional data from different sources is a necessity. These include digging where appropriate, historical maps, field surveys, satellite or drone aerial photography, geophysical study, geological analysis of stone materials, etc. thus the researcher faces complex interdisciplinary

research, with a holistic management approach of different types and often fragmented data and sources to rebuild a landscape that existed once".

1.1 The reconstitution and evolution of the Benedictine abbey of Acâș

«The Romanesque church of Acâș, situated at the border of Sătmar County, which belonged in turn to the former Kingdom of Hungary, the Habsburg Empire and the Austro-Hungarian Empire, despite the rational restoration between 1896-1902, it is among the best-preserved abbatial churches in the territory of medieval Transylvania»¹. The church is the only building body left from the old Benedictine monastery in Acâș. According to an inscription in the church, it dates to 1175. At the beginning it was a roman catholic monastery, but after the Calvin Reform the church was transformed into a reformed one, as it remained until today. According to the writer Felician Pop, the monastery would have been built by Akos Ban, a member of the Akos nobleman family of Pannonia.

«The former Benedictine monastery and the village Acâș are stated on the left bank of the Crasna River, on a lower terrace free from floods. Along the Middle Ages, this was the place where the road following the line of Crasna, toward Tășnad and Satu Mare, touching Beltiug and Ardud»². According to the data of the first military plan (1772)³, the modern structure of the settlement can be observed, with the church located on the land between the two parallel streets of the village. The historical and archaeological research⁴ shows that the settlement of the 11th and 13th centuries was not formed around the monastery, but further away from it, further south on the left bank of Crasna, on a higher terrace.

By the 18th century the brick ex-Benedictine church of Acâș loses its old Romanesque towers and at the beginning of the 18th century gains two baroque towers that will be removed in turn following the restoration and renovation led by the architect Frigyes Schulek (1896-1902). His interventions were seen by archaeological research in 1998 that also revealed around the church the foundations of the cloister and the perimetral bodies of the former Benedictine monastery. The foundations of an older part of the monastery are dating from the 11th to 12th centuries were also found in the archaeological plan of these excavations.

The first sketches of the church were made by Franz Schulz in 1864 and did illustrate the general views of the building of that time. A second drawing of the building is the Virgil Nagy facades drawing with the church's baroque towers. «The first measurements illustrating by technical drawings the organization and structure of the building are made by István Möller in 1889»⁵.

The interventions of the rise of the neo-Romanesque towers, the interventions on the apse well as the addition of a neo-Romanesque entrance body to the main facade are illustrated by the drawings of Villos Blacho.

As for the medieval monastery landscape, **Figure 3** illustrates a potential reconstitution of the Benedictine abbey of Acâș where we can see that the monastery was surrounded by an external fortified wall of burned earth built following the Mongol Invasion of 1241. Also following the village's first military plan of Acâș village made between 1763-1778, it is noted that there were a series of artificial water channels and lakes that probably dated back to the monastery and probably they have been built by these monks themselves for: the irrigation of the agricultural field, fish farming, sailing on the Crasna river etc. These channels drained with their abandonment by the villagers who no longer offered their services to the monastery with the abolition of the abbey after

the Calvin Reform. Instead of these brooks today, a series of trees have emerged that have been going through the valleys of the former artificial channels.

It is noted that the monastery landscape has so far maintained its rural character and is a good example of preserving the mind of the place. The Church of the former Benedictine monastery remained until today the visual axis of the locality, while the village urban structure follows a parallel route with the valley of the Crasna river.

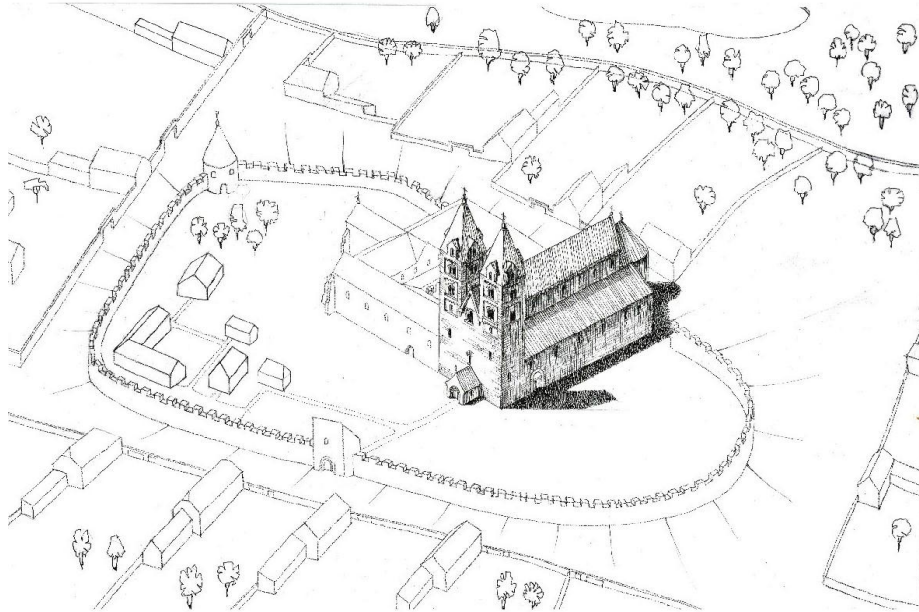


Fig. 3. Reconstitution of the Benedictine abbey of Acâș (axonometry). Source: personal archives

1.2 The reconstitution and evolution of the Benedictine abbey of Uileacu Șimleului

The Benedictine Monastery of Uileacu Șimleului, a village, located on the Crasna River Valley near Acâș abbey, was the only medieval monastery in Transylvania belonging to a community of Benedictine nuns, being founded between 1260 and 1300 in the latest Romanesque style. Following the Calvin Reform, the monastery was disbanded and took over by reformists who radically transformed the church according to the new religious doctrines by abandoning the perimetral buildings of the monastery. As a result of archaeological research, traces of foundations were found by the cloister and its perimetral buildings.

Following the Calvin Reform, the western facade of the ensemble was equipped with a bell tower of a square (at the base) and octagonal (at the top) plan. This tower was restored in the 19th century according to the original one. The old church apse was demolished at the end of the 18th century due to the advanced state of degradation. «The new polygonal apse without buttresses dates from 1800. The original interior of the church was modified during the renovations and rectifications that took place during the 18th century»⁶.

It is considered that abbey of Uileacu Șimleului had an outer wall of fortification that can be mostly reconstructed (**Fig. 4**). Because it occupies the highest point of the village today it can be seen the outline of the former fortification walls. In part this contour of the fortification wall is given by the road of the main street that revolves down in the E-V direction at the base of the hill on

which the former church of the monastery is located. As for the boundary of the northern fortification contour, it is also the curve and lies at the edge of the valley between the hill on which the church is located and the next hill situated on north of the church.

In the case of the monastery at Uileacu Șimleului, it was the monastery that generated the construction of a feudal village in which the inhabitants offered farm and manufacturing services to the female monk community in exchange for granting the physical protection (in case of siege) and the institutional protection of the Church. The structure of the village of the monastery that can also be seen in the first military plan of the Hapsburg Empire formed the basis on which today's village was built. The monastery was formed in Uileacu Șimleului along a commercial road that greased important burgs and commercial cities (at Uileacu Șimleului the monastery was placed on the road connecting Simleul Silvaniei to Satu Mare).

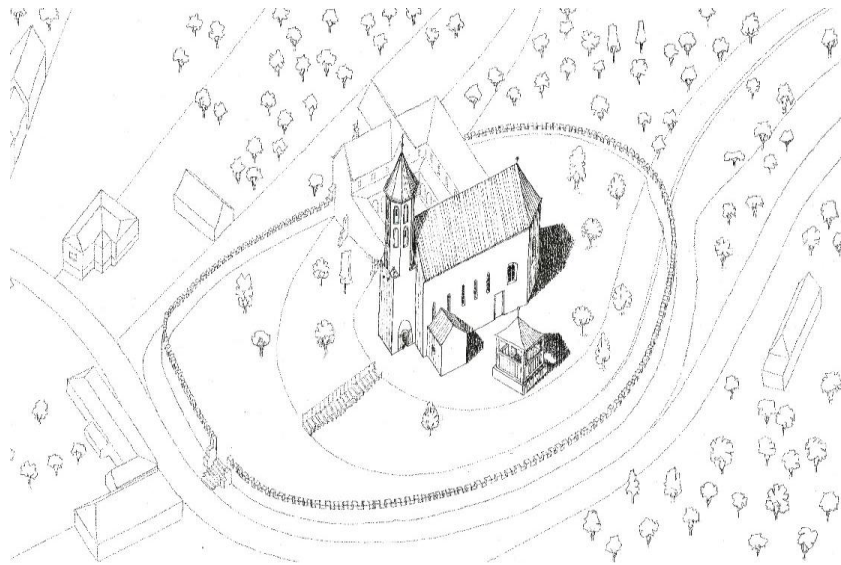


Fig. 4. Reconstitution of the Benedictine abbey of Uileacu Șimleului (axonometry). Source: personal archives

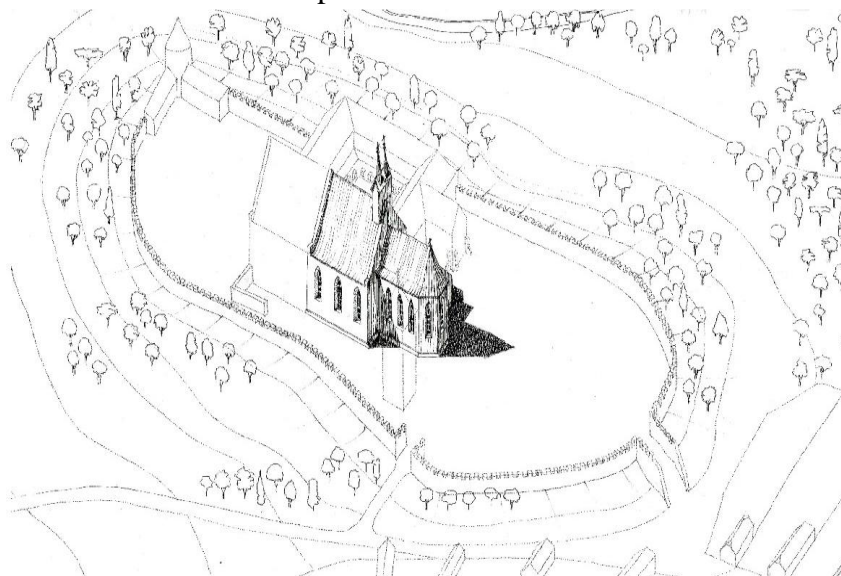


Fig. 5. The reconstitution of the Benedictine abbey of Cluj-Mănăstur (axonometry). Source: personal archives.

From the point of view of the developments of the monastery complex, it is assumed that the cloister of the monastery (the interior garden of meditation) was situated on the north of the present body of the reformed church. In addition to the enclosure walls, it is also assumed that these nuns would have financed the construction of channels directly originating from the Crasna river, which were necessary to carry out activities essential for the survival and everyday life of the nun community, such as: the milling of cereals, the irrigation of agricultural land, the washing of clothes, food, and the fountain of potable water, etc. The rural landscape of the village has been kept very well and illustrates the feudal village typology of a monastery developed on a commercial road.

1.3 The reconstitution and evolution of the benedictine abbey of Cluj-Mănăştur

Archaeological investigations suggest that the Benedictine monastery in Cluj-Mănăştur «was founded in the last third of the 11th century, at the earliest by King Bela I (1060-1063) and at the latest by King Ladislau I (1077-1095) »⁷. «Altogether the monastery worked for 500 years until the murder of George (Frater) Martinuzzi, a paulin monk and Bishop of Oradea which dispose of the income of the abbey (1551) »⁸ when Giovanbattista Castaldo, the commander of King Ferdinand I troops occupying Transylvania, it has ordered the monastery to be fortified so that it can keep the inhabitants of Cluj»⁹. «The activity of the place of truth also ceased on this occasion, until 1575, when it was reorganized as a secular institution of the principality of Transylvania»¹⁰. In 1581 Stefan Báthory, the principle of Transylvania and the king of Poland, gave the possessions of the old Benedictine monastery in Cluj-Mănăştur to the Jesuits. The place of worship was still in ruins and in 1614, when he returned to the Jesuit order. The Jesuit preacher, Stefan Millley, recorded some interesting details about the monastery in Cluj-Mănăştur in the middle of the 17th century: He tells us about an imposing church with two towers, a spacious sacristy, and a crypt in front of the main altar. We also learn that the church was surrounded by an enclosure.

Based on recent archeological research the **Figure 5** is illustrating a potential reconstruction of the fortification of the abbey. The 1658-1661 Tartar invasion destroyed the buildings of the monastery. At the end of the 17th century, with Transylvania's passage into the possession of the Habsburg Empire, the Jesuits acquired it again. In the next century, however, after the construction of the city's Jesuit church (1718-1725), the monastery reached the background level, with the edifice getting worse after the order was dismantled in 1772. From the church of the ancient monastery, only the choir was kept, in which a Roman Catholic chapel was arranged. «Between 1895-1896 the Roman Catholic Diocese built a new ship in front of the above-mentioned chapel and raised the chorus by rebuilding its domes. In 1948 the church had been seized by the Orthodox Church. The Roman Catholic Church only managed to regain the church after 1990»¹¹. In the period 1991-1994, Catholic and Orthodox believers used the building together, and it fully returned to the Roman Catholic Church only in 1994. Some restoration works were carried out between 1996-1997, preceded by archaeological investigations and parament research.

From a historical point of view, in the first military plan of Mănăştur from 1769 -1778 it can still be noticed the fortification wall of the monastery situated on the hill of the monastery as well as the village of Mănăştur has been developed on the structure of the feudal medieval village of the monastery. It is interesting that on this point we can see both the Mill Channel built since the Middle Ages by the Benedictine and other water channels that have drained today but still existed

until the 18th century. It is assumed that these channels were also built by the Benedictine monks to ensure essential needs such as laundry clothes, fish growth for trade and food and wheat milling. In the tradition of constructing water channels for irrigation we can see that the Benedictines and the Cistercians were followers of the latin motto «Ora et labora!» by transforming the site where they had settled themselves into a well-organized and closed community domain.

Because of the demographic explosion of Cluj-Napoca after World War II, Cluj-Mănăştur village becomes part of Cluj-Napoca district and therefore starts a series of works to build some massive social housing units for the population coming from the village to work in the city. These construction and excessive exploitation of the land around the former Benedictine monastery have completely transformed the aspect of the monastery and its feudal domain. The coherent image of the once-developed feudal village at the foot of the Mănăştur Hill (**Fig. 6.**) on which the Benedictine medieval abbey dominated the spiritual and physical dimension of the site of the village was replaced by the image of the neighborhood of communist social housing that suffocates the medieval church that is now lost in the existing built landscape (**Fig. 7.**).

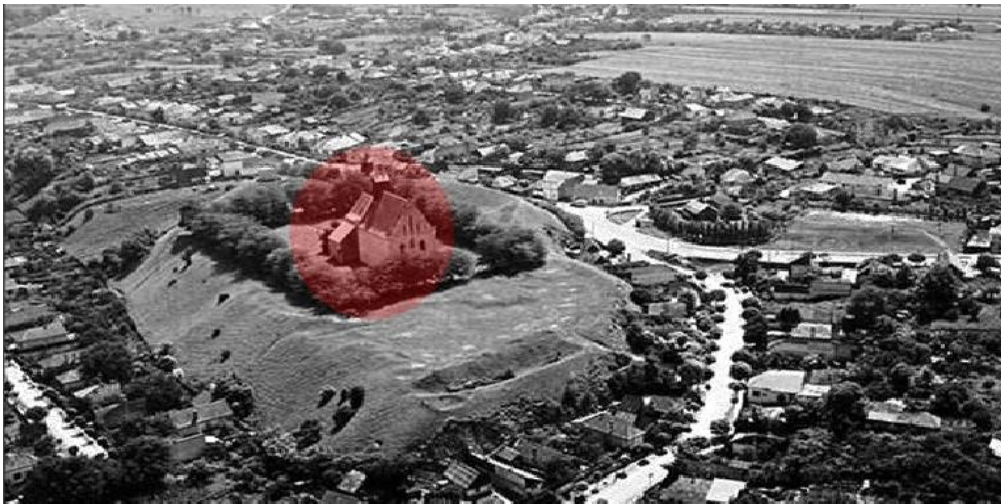


Fig. 6. Photo with the ex-Benedictine church of Cluj-Mănăştur and its surroundings (Photographer Szábo Tamás, 1974).



Fig. 7. Photo with the ex-Benedictine church of Cluj-Mănăştur and its surroundings (Source: Google Maps, 2020).

1.4 The reconstitution and evolution of the benedictine abbey of Herina

The Benedictine monastery in Herina was established at the beginning of the 13th century. «The presence of the benedictine monks in Herina is confirmed by the name of the village (*Mönchsdorf* meaning in german *the village of the monks*), but also by the preserved Romanesque church that is specific to this monastic order».¹²

As a result of the Protestant Reform, the monastery was owned by the evangelical Church that re-used only the church body of the former Benedictine monastery, leaving the rest of the buildings of the monastic assembly to ruin until their complete extinction. The exception is made by the Romanesque church with two towers that has almost been preserved completely by maintaining a relatively harmonious composition of the initial proportions despite many interventions suffered over the centuries. The Protestant Reform has led to the change of the confession of the church from Catholicism to the Lutheran faith. During an earthquake in 1834 the church was badly damaged. The drawings of Theobald Wortsch from 1885 shows that the state of the church has worsened, and the degradation has become more pronounced.¹³ The Sibiu Evangelical Church Consistorium decides in autumn 1888 the removal of the southern tower together with: the western portal, the southern side nave, the southern portal, and half of the southern apse. «The reconstruction of the demolished parts started in 1891 according to the project drawn up by the royal engineer Ignác Weisz in Bistrița, without the consent of the authorities».¹⁴ Although the elements of the western portal have already been carved, «the architect Sztehlo redesigned the western and southern portal, also based on his conception was made the tower's helmet, kept so far.»¹⁵ In 1897 the works were resumed, so «in 1898, after ten years of restoration, the church was again sanctified»¹⁶.

The church was recently restored based on the project of architect Hermann Fabini, the works being carried out during the period 1995-1999. The details of the original doors were not considered in the restoration of the western and southern gates, although they were known, so the door sheets and the forgery were achievements at the end of the 19th century the stone components of the southern tower were executed based on those existing at the northern tower, only the outer block of the circular window of the main facade and the central pillar of the twin windows of the southern tower are original (**Fig. 8A**). From the desire to give a new look, purged from the traces of age, the building was completely repainted so that the signs of aging were removed (**Fig. 8B**).

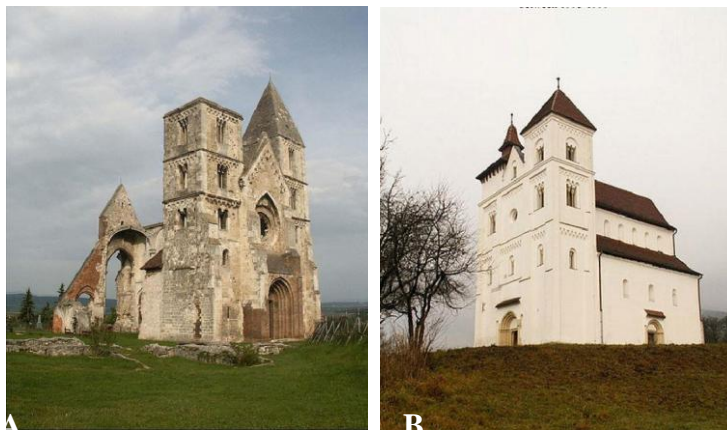


Fig. 8. Perspective with the medieval church of Herina before (**8A**) and after (**8B**) the restoration of 1995. Source:https://www.wikiwand.com/ro/Biserica_evangelic%C4%83_din_Herina.

Based on the historical plans, the reconstitution of the monastery complex of the 13th century is proposed in **Figure 9**. In the village first military plan of the Habsburg Empire there are still illustrated the routes of the irrigation channels that passed near the monastery, and which were probably the result of the interventions of the Benedictine monks. Today these routes of the irrigation channels of the monastery area have drained. Their positioning is relieved by the high density of trees that developed on the former white of these water channels. The positioning of the exterior fortification wall of the monastery can be identified on the contour of the hill on which the monastery is located. The orientation of the church in the east-west direction allows supposition of the cloister in the northern part and of the refectory on the northern edge of the outer fortified wall of the monastery. The medieval village of Herina was a feudal village, controlled and generated by the monastery of the Benedictine order that provided physical and social security.

As for the natural and architectural landscape, the former area of the monastery has maintained the rural nature of the past, except for some construction works that do not respect the heritage values of the traditional village. Except for these problems of keeping the urban texture of a coherent and traditional image of the former feudal village, Herina is a positive example of preserving the landscape image of a Benedictine medieval monastery.

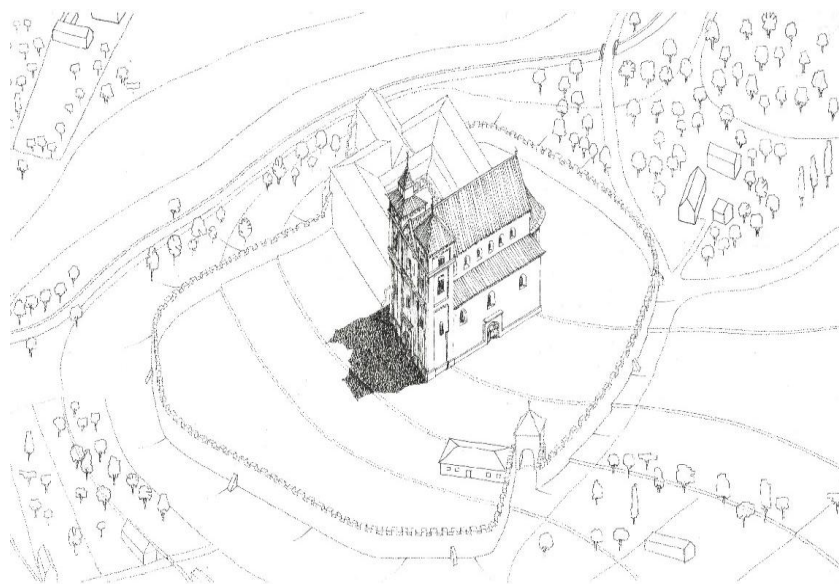


Fig. 9. The reconstitution of the Benedictine abbey of Herina (axonometry). Source: personal archives.

1.5 The reconstitution and evolution of the cistercian abbey landscape from Cârța

The Cistercian monastery of Cârța was founded at the beginning of the 13th century as a subsidiary monastery of the Cistercian monastery in Igris. «The fact that both Igris and the two subsidiary abbeys of Cârța and Verteș are the only monasteries that were part of the Pontigny line in the medieval Kingdom of Hungary makes them unique in typological and topological terms in the Transylvanian area»¹⁷. Along with the Dominican monastery in Rodna, the Cistercian abbey from Cârța is one of the most frequently discussed monasteries on the territory of Transylvania. «The first author and researcher to offer a general plan of the monastery with his environment field was Walter Horwath»¹⁸. His plan detailing the surrounding wall of the monastery was later taken over

by Gustav Treiber¹⁹ and Michael Thalgott²⁰. M. Thalgott described the monastery landscape only in a few sketches in which he spoke about the water channel system in general terms only and described the features that can be seen on the drawing of W. Horwath²¹. It cannot be known whether these elements of the landscape still existed in their time or were assumed without any field examination. There can also be mention of the wall around the abbey in Ludwig Reissenberger's work,²² but without further explanation.

«Founded at the beginning of the 13th century, the abbey from Cârța was a rural monastery situated on a lowland of the Olt river in the land of Făgăras, in the south part of the historical region of Transylvania, today in the center of Romania».²³ During its establishment, no other monasteries were in the region, so it was the only Cistercian monastic center in southern Transylvania. «The most fertile part of the Olt Valley is probably the swamp in the place where the monastery is located»²⁴. The positioning of the assembly is characteristic of the order of the Cistercians if we consider the architectural topological ideal of these monks «the positioning of the monasteries will be made in places far from the conversation with people»²⁵.

The monastery's rural site has contributed to a better preservation of the characteristics of the landscape but has also influenced the needs and opportunities of the community. The Cârța Abbey is in the vicinity of a major trade road connecting Transylvania to the south, with the Balkan Peninsula and Constantinople. Also, three major commercial cities/ burghs: Sibiu, Tâlmăciu and Sâmbăta de Sus could be found near it.

The research focused mainly on identifying and mapping the wider area used by the Cistercian community and delimiting, if possible, the outer enclosure of the monastery. «In an 1877 study, Flóris Rómer briefly mentioned that a brook passed through the monastery's territory that supplied water for the monastery's mill and the washing house. This is the first mention of these features related to the larger area of the monastery».²⁶ Later, Ludwig's Reissenberger work contained a brief presentation of ruined walls around the monastery, with the detail that «nothing special could be inferred from them»²⁷. The next researcher who obtained information about the wall around the monastery was W. Horwath²⁸, who has probably seen the ruins in person. And finally, M. Thalgott, «who took over both drawings of Horwath and G. Treiber and subsequently briefly mentioned that he had found the foundations of the oval stone wall, which surrounded the monastery»²⁹. Scenarios where the monastery was connected to the Olt River through a passage that had a docking station at the end of it were still affordable. He also noted that «the lay settlement was protected by a palisade wall surrounded by high groundwater and brooks»³⁰. It was Thalgott who described the same situation as well.

James Bond listed three main aspects of monastic households that can be applied at each monastery: «1. Bringing the water to a place where it was needed 2. Use it for a variety of purposes once it has been there 3. Taking the water out of the places where it was not wanted»³¹. Once the water was introduced into the enclosure, it had to be distributed to the different elements that require it. «Sites close to larger rivers have sought a position not to reach flood-plains if possible»³². The ideal place, as in the case of cities, was at a confluence of rivers where a fast-flow tributary joined a softer mainstream, «as in the case of Cârța, surrounded by the Olt River (on north) and the Cârțișoara River»³³. The abbey was well supplied with water, a framework which probably requires a complex water management system, both to control the flow of water and to reduce the risk of flooding.

«Even if the drawings of G. Treiber and M. Thalgott illustrates the water channels and brooks entering the cloister buildings from a slightly different angle, cannot rely on their accuracy due to lack of scale and positioning on a larger map, which would provide a wider context of identification and interpretation»³⁴. Their schematic and generalized descriptions give no details of the wider area of the monastery, such as the exact orientation of the plots, their preservation, possible modifications or use, or the existence of mills. «M. Thalgott also provides a reconstruction, which the above-mentioned defendant (identified by a mill) entered the monastic buildings in the east, right next to the cemetery and not in the south-east as identified on the field»³⁵. However, no signs of such a direction have been found, which, of course, could have been altered by land-use planning later, which nothing is currently known about. On the other hand, the second Military Plan of the Austro-Hungarian Empire it seems to justify the Thalgott`s reconstruction, because «the mill does not appear on the map, nor does the water channel that guided the water from the source; instead, it can be assumed to position a possible mill considering the great fall of the river»³⁶. In view of the insufficiency and fragmented state of the data, this interpretation should remain among the possible assumptions for the monasteries of Cârța fish reared by monks from artificial lakes, rivers, marshes, and ponds near the monastery buildings, in the main enclosure. Fishing ponds varied widely in shape and size and began to appear on monastic sites after the second half of the 12th century.

It can be stated firmly that the Cistercian landscape of Cârța was unique in the territory of medieval Transylvania since other orders were rarely involved in the landscape management (except for some Benedictine monasteries) and water management on such a scale. The reconstitution of the appearance of the monastery and its fortification wall together with the channels and the other building of the abbey is illustrated in **Figure 10**. The present study has been able to provide a much more detailed view of landscape archeology opportunities and the complex problems raised by the involvement of new techniques in the recovery of environmental data. as can be seen, an impressive water system was carried out with the involvement of a variety of sources, The importance of the Olt river as an important waterway was highlighted by the transport of resources such as: rock, salt and possibly other types of goods. Despite the great distances between the abbey of Cârța and the other Cistercian monasteries of the Kingdom of Hungary, it is confirmed that the monachal community of Cârța was part of the trans-Cistercian network and thus played an important and active role in the life of the region.

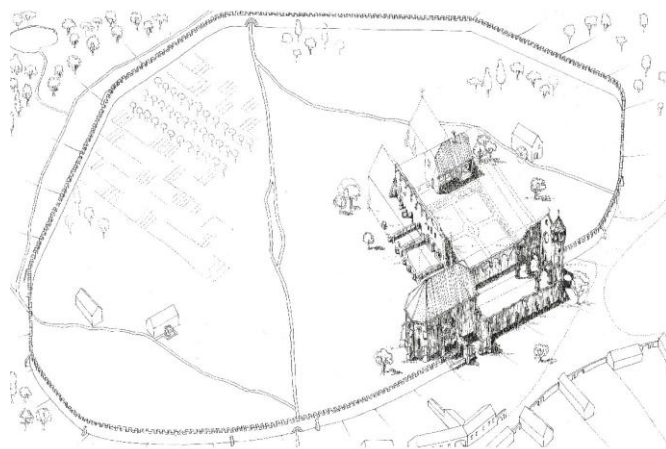


Fig. 10. The reconstitution of the Cistercian abbey of Cârța (axonometry). Source: personal archives.

1.6 The reconstitution and evolution of the Dominican abbey of Rodna

Today, near the orthodox parish church in the village of Rodna, «the ruins of a medieval edifice, consisting of a massive stone tower, connected to the north by a fragment of the wall with a portal opening in a broken arch are preserved»³⁷. To the east of the ruins and focused on the portal is the present Greek-catholic church, a hall construction with polygonal altar and walls with buttresses that incorporate in most of its structure the chorus of the church of the former Dominican medieval abbey of Rodna. «The oldest documentary mention of the monastery church in Rodna is in the code drawn up around 1270 by the local council, led by the noble Hans which governed the mining right and the civil rights of the inhabitants regardless of their social status»³⁸. This is the only mention in the spring of the presence of the Dominicans in Rodna. After the Reform, in 1580, a preacher is reported here, Nikolaus Galaczi and a vicar Michael Wagner, who was paid by local judge. At the end of the 16th century there are disagreements between the vicar and the locals who «lost their faith in God». On 26 July 1767, Franz von Gerstoff recommended the mining office in Rodna to consider allowing the giving up of the ruined protestant church to the roman-catholic community for border soldiers from the mine administration. The church was described as a modest house of prayers from the masquerade that «was nothing more than the sanctuary of the old catholic monastery ruined», and Catholics wanted to be able to use it, even if it could hardly contain 20 persons. In 1769, the maintenance of a Catholic priest and a teacher was approved, the services being held in an old wooden chapel until 1823, when the construction of the catholic church was completed.

«The images played back in ancient engravings illustrations show that until the middle of the 19th century the nave elevation was preserved along with the west façade and the ruined tower»³⁹. «The church appears as a roof-free hall, which occupies the central vessel of the -13th century basilica, with the main façade finished with an oculus pinion and a west entrance through a portal in brake spring; fragments of the walls of a room near the choir, which must have played a sacristy role outside on the northern side»⁴⁰. «The constructive relationship between the tower and the basilica naves is difficult to clarify only based on existing elevations. The restored walls at the bottom of the tower have created a situation marked by ambiguity in its relationship with the church, because they were treated as belonging to the same 13th-century building. In fact, only the tower belongs to this phase, while the wall with the portal in a broken arc dates from the restoration stage of the church after the Mongol Invasion»⁴¹.

It is believed that although this abbey belonged to the begging order of the Dominicans, it would be in possession of a feudal domain within which a large part of the houses around the monastery were located. Although it is an urban monastery, the abbey of Rodna has developed almost like a Benedictine or a Cistercian abbey in the sense that it had an outer wall of fortification where the peasants of the village were sheltered in the case of siege or invasion. It is the only example of this kind in the Dominican monastic architecture on the territory of Transylvania.

Hydrologically analyzing the plan illustrating the first military plan of the village it is noted that near the monastery there were water channels that poured directly from Someş river. It is understandable that these missing channels may have been built by the Dominican monks that have lived between the 13th and the 14th century, and because they disappeared, these channels have not been used and therefore today they no longer exist, they have drained. The plan reconstitution of the monastery landscape (**Fig. 11**) it shows the proximity relationship between the fortified monastery

and the villagers' households in Rodna. Today, the monastery landscape is no longer read due to the recent intensive overbuilding works in the historic center of the Rodna village (the recent construction of the opulent Orthodox church in the proximity of the ruins, shows an attitude of indifference to the heritage values of the 13th -century Dominican – **Fig. 12**).



Fig. 11. The reconstitution of the Dominican abbey of Rodna (axonometry). Source: personal archives.

The ruins of the Dominican abbey of Rodna represents a monument no more in the rural architecture landscape but one which have developed as if he were in a rural village. It retains the testimonies of an ecclesiastical edifice that was subjected to reconstruction and transformation until modern times. Its research involves a complex issue, which would require an integrated approach to the history of the edifice, coupled with the development of architecture-urban development in the specific context of the mining localities of the Middle Ages.



Fig. 12. Rodna. Actual aerial view of the village with the ruins of the Dominican abbey (2017). Source: <https://produsinardeal.ro/2018/03/13/primaria-rodna-din-bistra-nasaud-luat-5-mil-euro-de-la-ue-pentru-oferi-servicii-sociale-persoanelor-marginalizate-din-localitate/>

2. Possibilities of intervention in the medieval abbey sites of Transylvania

Considering the applicability of the restoration doctrines to the abbatial ruins and the way in which the monastic medieval assembles of Transylvania have evolved over time, regarding the numerous interventions that have changed the idealized image of the past through numerous restorations, volumetric consolidation additions, volumetric insertions and various functional conversions that have been carried out over time can be considered and developed a number of sustainable scenarios and options for the contemporary interventions on these ruins. Within the examples presented in the previous chapter there are two types of possible interventions: one off singular interventions (*conservation-restoration interventions* – e.g. at Cârța and Rodna abbeys; *landscape interventions*– e.g.at Cârța, Herina, Acâș or the *volumetric integration and functional conversion interventions* - in the case of the ruins of Cârța and Rodna) or the other of *composite interventions* in the rehabilitation project (interventions resulting from the combination of two or more types of singular interventions according to the degree of necessity and permissiveness of the site).

Starting with interventions in a particular area of operation, *restoration* in the direction of consolidation and protection is the first and most necessary type of intervention. In the case of the abbeys of Cârța and Rodna, in which there is a segment of the ruined assembly, the architectural and archaeological restoration of the ensemble may consist of: operations to protect walls by inserting special stone profiles fixed with lime mortar on top of the crown to protect walls from degradations caused by humidity and chemical cleaning of the facades of the assembly to avoid the processes of wetting and developing plant species (moss, lichens) and/or micro-organisms (fungi, bacteria) which contributes to the degradation of the stone structure, but also works of structural consolidation of sensitive areas by adding volumetric counterforces to support vulnerable walls (for example, the inner wall of the cloister the front of the eastern wing of the abbey of Cârța or the walls of the main facade and the tower of the abbey of Rodna).

The second type of possible intervention is the landscaping of the place where the ruin is located on the site. Depending on the urban plan of each of the 6 examples, complex landscape projects can be proposed where the ruins and the churches of the abbatial ruins are only part of the design component of the whole. For the revitalization of the historical centers of the villages of Cârța, Herina, Acâș and Mănăștur but also for the commercial, economic, and cultural revitalization of these villages, knowing the tradition of the craftsman of the Benedictine and cistercian monks of the Middle Ages, it can be proposed to set up in the vicinity of the ruins some restoration schools with stone workshops and carpentry for craftsmen or apprentices working on restoration sites throughout Transylvania. This type of architectural program is specific to the gothic cathedrals in Germany and Austria, which have in their neighborhood workshops serving both the cathedral restoration but also the other sites of restoration in the city. In this respect, a brilliant example of inspiration is the school and the restoration workshop in the vicinity of the roman catholic cathedral in Köln (the famous Dom Bauhütte). This utility function can increase the tourist prestige of these villages in Transylvania and can also bring economic benefits for the villages in the local, national context and by creating a network between the six villages that we talked about. From the point of view of the landscape, reconstituting gardens, orchards, and fisheries of the Benedictines and Cistercians can be considered to provide a promenade and recreating space in the courts and free lands of the former monastery fields of Transylvania. It is also possible to propose English gardens

of representation or plant development which would mark on the ground the hypothetical contour of the original monastic assemblies. At the same time, these landscape arrangements will constitute areas of passage between the public space and its churches and/or ruins that formed the medieval monasteries, making a fine filtration between the living space (the domestic one of the village's veto) and the uninhabited (the wild nature). These *respire* and *belvedere* spaces can positively influence both the relationship with the natural landscape and the living conditions of Cârța, Rodna, Herina, Acâș, Mănăstur and Uileacu Șimleului villages.

The museum facility represents another possibility of intervention on the existence of the sites of the former Benedictine, Cistercian, and Dominican abbeys in Transylvania. The artistic installations such as those used by the Italian artist Edoardo Tresoldi in his interventions in the Italian peninsula can be used to refer to the idea of *architectural volumetric contour* by which the visitor can imagine the possible reconstitution of the entire monument without existing a clear volumetric presence but one of maximum transparency. Depending on the architectural elements defining the ruins of the abbeys of Cârța or Rodna (the deductible presence of the cloister and the rhythm of the structural frame), modular structures of metal or wood can be proposed to suggest the continuity of the missing parts of the ruins by supporting them over the existing ruins. In the case of cloisters, through fine modular structures constituting parchment on which climbing plants can be hung, the gallery of meditation and the circular gallery of circulation around a "plant cloister" reinterpreting the medieval monastery can be suggested as a potential and creative solution.

As regards functional conversion, the Cistercian abbey from Cârța and the Dominican one from Rodna can withstand such an intervention in free wings, which are now free of construction. The volumetric insertion obtained by joining is recommended to be lower than the cornices of the preserved churches so that the volume is not too present in relation to the genuine whole which must constitute the main presence of the site. From the treatment finishing point of view, the general image of the inserted facades is recommended to be as neutral as possible in contrast to the image of the medieval ruins. In this respect it is recommended: using reflective glass panels to achieve a rendering effect of the existing image, using material plates and texture which are as neutral as possible (e.g. very light colored stone with porous textures as in the case of the Kolumba volumetric insertion of the architect Peter Zumthor or the use of metallic surfaces contrasting with the original finishing material as in the example of the volumetric insertion in the functional conversion of the ruins of the abbey of Louviers in France).

The sites of the former medieval abbeys in Transylvania allow both separate intervention operations (each of the interventions presented above applied in a single and individual way) and more complex operations of architectural, urban and landscape rehabilitation. The complex and fine interventions that can carry out within the groups of the former medieval abbeys in Transylvania can change the way the site works without distorting historical values by restoring the sense of rural community life: the communication with divinity and the work of purification, values promoted 700-800 years ago by the religious orders in Transylvania.

Conclusions

By explaining the context of appearance and evolution of the medieval abbeys in Transylvania, by studying the potential reconstitution of these assemblies, the present paper wishes to make known the possibilities of intervention by reinterpreting some missing elements such as the abbatial building, the cloister, the monastery garden, the irrigation channels or any missing element that can be brought back to life by a fine interpretation of the site where the restoration architect and the landscape architect are inspired to study and create. The purpose of the reinterpretation of the lost elements of the site is the harmonization between the architectural intervention in the monastic assemble and the natural landscape.

At the same time, the reconstitution of the monastery's past can be a source of inspiration for the functional conversion of the present. The intervention on the site has its diversity and complexity, a composite character in the sense that it is possible to combine several types of interventions into a sustainable rehabilitation project covering the following types of interventions: traditional restoration, landscape planning and functional conversion with the optional insertion of a new built volume(s). The study of the landscape and architecture of the medieval abbeys in Transylvania wants to highlight the possibility of coexistence between contemporary use and historical values.

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CONFERENCE VOLUME

SUSTAINABLE WATERFRONT LANDSCAPE PARADIGM BASED ON TRADITIONAL CHINESE PHILOSOPHICAL PERSPECTIVES – THE XIANGJIANG RIVER BASIN CASE

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Abstract: The dialectical relationship between matter and consciousness determines that different natural and human-made environments provide different paradigms, the understanding of which could help humanity transform the world. China has experienced the transformation from an agricultural society to an industrial and post-industrial society governed by the values of western modern civilization. A series of environmental problems faced by western society, especially urban diseases and other conflicts between humans and the environment in the process of urbanization, has been experienced in recent decades.

Looking back on the period of traditional agriculture in China (before 1860), there were also large-scale cities and settlements. However, according to traditional Chinese philosophy, the ancestors were full of sustainable strategies for the construction of settlements, and formed a set of paradigms regarding the location, structure, layout, orientation, and planning strategies of cities, with special regard to the city-environment relationship and responsible use of natural resources. The waterfront settlements especially, under the comprehensive influence of traditional Chinese philosophies -Confucianism, Buddhism, and Taoism have formed the ecological construction concept of unity between nature and man, the nature of Taoism, and the unity of material and self. It is specifically manifested in the landscape, ecology, and spiritual harmony of the place realized in case of waterfront heritage sites. This study will take three traditional settlements - in the upper, middle, and lower reaches of the Xiangjiang River Basin - as examples from which to analyze how traditional Chinese philosophy affects the construction and evolution of waterfront landscapes, and to explore the application of the values of ancient Chinese ecological philosophies today.

Keywords: heritage, settlement, landscape, water management, ecological civilization, Chinese philosophy

Introduction

With the continuous development of urbanization, the connection between humans and ecology became more and more distant. What followed was a series of environmental problems such as an abnormal climate. This forces us to rethink sustainability and eco-friendliness in the development process. After the completion of the industrial revolution in western society, ecological and environmental issues began to be paid more and more attention (Carson, R. 2002).

After China's reform and opening-up, China has achieved rapid economic development, and the level of urbanization has risen sharply, but environmental problems are also serious. It was in

2007, when the Chinese government first proposed the concept of ecological civilization (Hansen et al., 2018).

At the theoretical level, ecological civilization is a new stage of human civilization based on sustainable development - the post-industrial form of civilization. Specifically, it refers to a social form in which human beings and society live in harmony with nature, in a virtuous circle with all-round development and sustained prosperity.

In terms of practice, China builds eco-friendly cities, considers clean rivers and mountains as important heritage assets, and lays emphasis on urban green infrastructure. It is not the first time that similar ideas and practices have appeared in China's long history (Grumbine and Xu, 2011).

As early as the pre-Qin period (before 221 BC) Mencius said: *Jie ze er yu, ming nian ze wu yu*. (if one catches all the fish in the lake at one time, then there will be no fish in the lake next year); Lao Tzu said: *Tao fa zi ran* (truth comes from nature); and other similar environmental views were expressed. Guided by these simple philosophical views, the ancient Chinese practices of scientific and technological development were significantly different from those in the West. Western industrial civilization, beginning with Newton's physics and mathematical principles, began to question and research natural phenomena and summarize scientific laws. (Harari, 2014) The development of civilization in ancient China was based on the agricultural economy and continuously summing up life experience around agricultural production - the Chinese tradition emphasizes the inheritance of experience and value (Xu et al., 2018).

One of Needham's questions is why ancient Chinese science and technology had been leading the way, but its modern industrial civilization lagged behind that of the Western countries. One of the important answers is that Chinese people have different environmental values. From the perspective of sustainable development, traditional Chinese technology is an important resource today. Regarding ecological and environmental protection, agriculture-based countries must protect the environment to sustainably develop their agricultural economy. Therefore, in ancient China, development was achieved more through discovery than invention. It was the slow accumulation and superposition of experience rather than western-style advancement (Needham, 1976).

Taoists say: *Tian Tao yu chang , bu wei yao cun bu wei jie wang* . It means that absolute truth exists as an object and will not be changed by human society. In the course of China's history, the protection of the environment and the requirements for sustainable production are one of the important components of a social collective consciousness (Wang, 2013).

China's high-speed modernization is not a native process. It was forced to embark on a fast, catch-up industrialization process by the advance of Western industrial civilization after the Opium War. (Reinsch, 2005) Today, China is faced with similar environmental problems to those faced by developed western countries. But can we learn something about sustainable development from the form of Chinese civilization that lasted for 6000 years? (Birkin et al., 2021). This research starts with three case studies in the Xiangjiang River Basin, exploring the sustainable paradigm of traditional Chinese landscapes, and how traditional philosophy shapes Chinese waterfront landscapes, and finally discusses the value and significance of traditional philosophy for future sustainable development (**Fig. 1**).

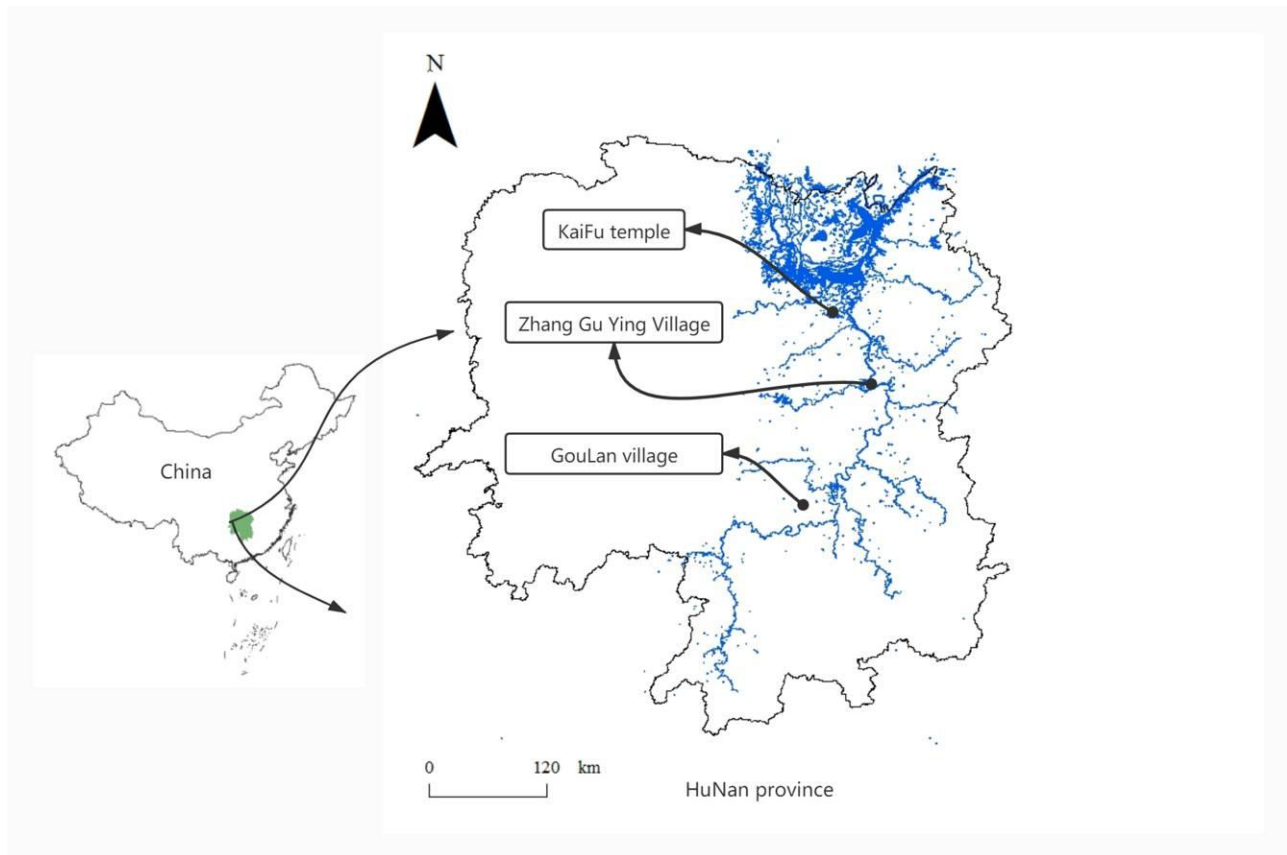


Fig. 1. Research area

Materials and Methods

The paper is aim to make a generalization of how traditional Chinese think and realize the sustainable waterfront design and management. First to collect the international literature to demonstrate that how the traditional philosophy instructs Chinese people to transform the world. Then through the field severy of three cases in the Xiangjiang River Basin. to observe and interview the waterfront cultural landscape.

Water culture and traditional philosophy

The ancient Chinese understanding of water landscapes can be traced back to the time when the oracle bones appeared(1250BC—1200BC). As a pictograph, oracle bone inscriptions can record and transmit civilization in an intuitive way, (Keightley, 1985)and through the continuous evolution of ancient characters, we can also deduce the changes in the perception of water and the evolution of social group values. The origins of the water and river characters used in China today are presented in **Figure 2**.



Fig. 2. The letter for both "Water" and "River", the evolution of Chinese Calligraphy.

An archaeological interpretation of the word "water": according to the research report on the oracle bone inscriptions in the Yin Ruins of China, the origin of the shape of the letter "water" was created by the ancients based on the water flowing down a cliff. The letter "river" combined the letter "Water" with the letter "confirmation" (**Fig. 2.**)

An alternative view of the letter "water" is that the river is in the middle with the settlement circles surrounding it, indicating that ancient residents mainly settled near the water, and the word "river" has a positive meaning. From the perspective of the evolution of the calligraphy, the shape of the letter "river" has not changed considerably. Today we it still bears a positive meaning. Therefore, the memory and association of living by the water have continued to this day.

In addition to its meaning in text, water is also an extremely important element in Chinese painting (**Fig. 3.**).



Fig. 3. The Intention of Water in Chinese Landscape Paintings and Poems

Mountains and water are the basic components of traditional Chinese painting. The mountains represent stability firm and upright, masculine qualities, while water is flexible and winding, gentle

and calm, representing feminine qualities. The combination of these two forms illustrates the harmony of the male and female elements (yin and yang).

The philosophical idea of yin-yang harmony comes from the Taoists.

In addition to the discussion of the feminine yin attributes of water, Laozi also put forward the idea that: *Shang shan ruo shui* . (in chapter eight of the *Tao Te Ching*): he believes that the highest good is like water - invisible and colorless, but can nurture and nourish all things. These philosophical ideas exhorted those in power to help the people in accordance with this belief about water - selflessly and humbly (Laozi et al., 2007).

In Chinese poems, water in the landscape features prominently. For example Li Bai's *Jiang jin jiu* (**Fig. 3**). This poem, through describing the running water is never to return, laments the passing of time and expresses the idea of cherishing the good times. The philosophical support behind it is that Confucius once said, while by the river, *Shi zhe ru si fu* : Sighing that time passes like flowing water. In addition, the philosophical enlightenment of water to Confucianism is *Zhi zhe le shui* (Hall and Ames, 1987). It means that wise people have water-like characteristics – they are intelligent, flexible, and clear. In addition to the philosophical interpretation of water by Confucianism and Taoism, many philosophical arguments related to water have emerged since Buddhism was introduced into China, such as *Shan xin ruo shui* . It means that Buddhist believers should keep their inner peace, just like a calm lake in the forest. No matter how noisy the outside world is, they should always keep their inner peace, and practice good intentions. Regardless of the form of characters, paintings, poems, and belief systems, water is a fundamental element within traditional culture; the philosophical drive behind it all comes from the three main sources of Taoism, Confucianism, and Buddhism. These ideas have been continuously exchanged and passed on through history, and gradually formed the values that influenced how the Chinese perceived and transformed their world.

Results and Discussions

The Waterfront Settlement Landscape of Goulan Village, under the Framework of Taoist Philosophy

Goulan village is a typical traditional waterfront settlement. The location of mountain and water and the vertical layout along the river realize the ideal settlement model of the mountain surrounded by water. Taoism plays a key role in the location and layout of the settlement. In the belief system of Taoism, mountain belongs to Yang, water belongs to Yin, and the environment of the mountain surrounded by water creates a harmonious landscape layout of Yin and Yang (**Fig. 4**).

The metaphor of the water from the Zhang Gu Ying village under the influence of Confucianism

One of the important thoughts of Confucius was self-restraint and courtesy, thus advocating the realization of harmonious social order both for adults and children. Under the influence of this idea, most of the traditional Chinese settlements are led by the elders, which are composed of male relatives with the same surname. The result is the distribution of settlement space based on social status and kinship. The core position of the settlement is inhabited by the highly respected patriarch, surrounded by the younger generation (**Fig. 5**).

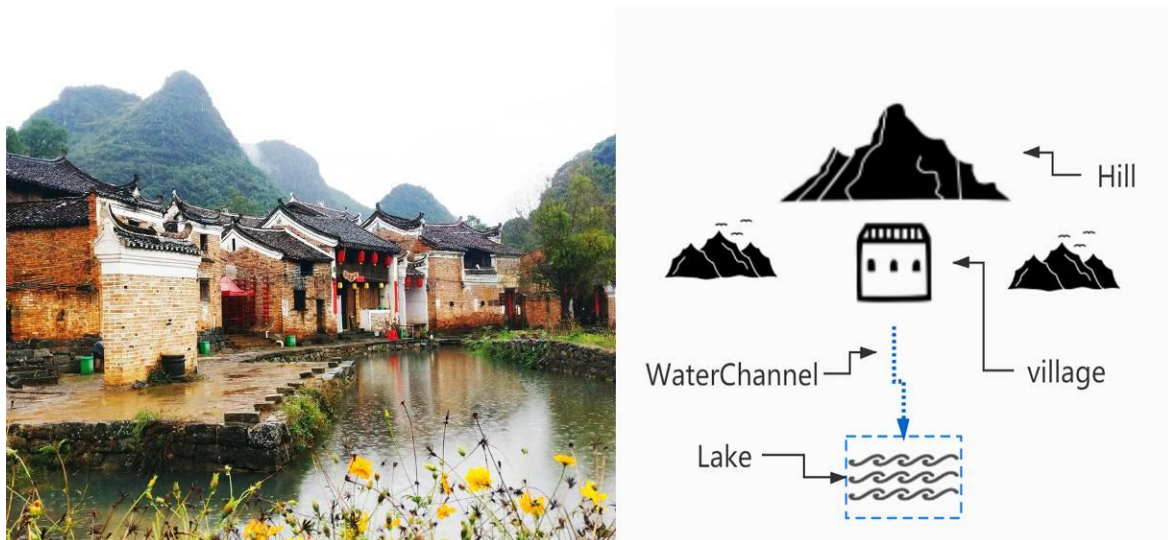


Fig. 4. The ideal location for the settlement is between mountains and water



Fig. 5. The clan settlement and water metaphor.

This also implies that the family's continuous inheritance and continuity of culture are consistent with the continuous characteristics of water. Therefore, it has a long history to advocate the same family name in ethnic culture.

In addition, Confucianism also emphasizes the unity of clans: water can support a boat, but also overturn it, just as the clan's rule depends on the clan leader, but also needs the approval and support of the clan members. Therefore, the clan leader must be an elder with a high moral standing. Such a social structure can ensure the continued prosperity of the family.

Clan cohesion is reflected not only in the living space but also in the patio structure of the building. The pitched roof around the patio is suitable to collect rainwater, symbolizing unity and cohesion. The patio owned by the patriarch is also the largest in the village.

Water and Chinese Buddhism in KaiFu temple: not just lotus pond

Traditional Chinese philosophy is not only Confucianism and Taoism - Buddhism, which originated in ancient India, also plays an important role.

After Buddhism was introduced into China by master Xuanzang, based on the original Mahayana Buddhism and combining Taoism and Confucianism, it gradually evolved into different Zen, and then had a profound impact on Chinese philosophy (Liu, 2006).

The characteristics of water have been extended by Buddhism with its cool, clean, and unsullied qualities: Xin jing ru shui .means the mind should be peaceful like calm water. Also, the description of heaven in Buddhism is of a world that is as clear as water, and illusory.

The understanding of water in Chinese Zen is diverse. By observing and contemplating water, we can understand Zen, remove the influence of the material world, and create inner peace. This is one of the ways that monks practice (**Fig. 6.**)

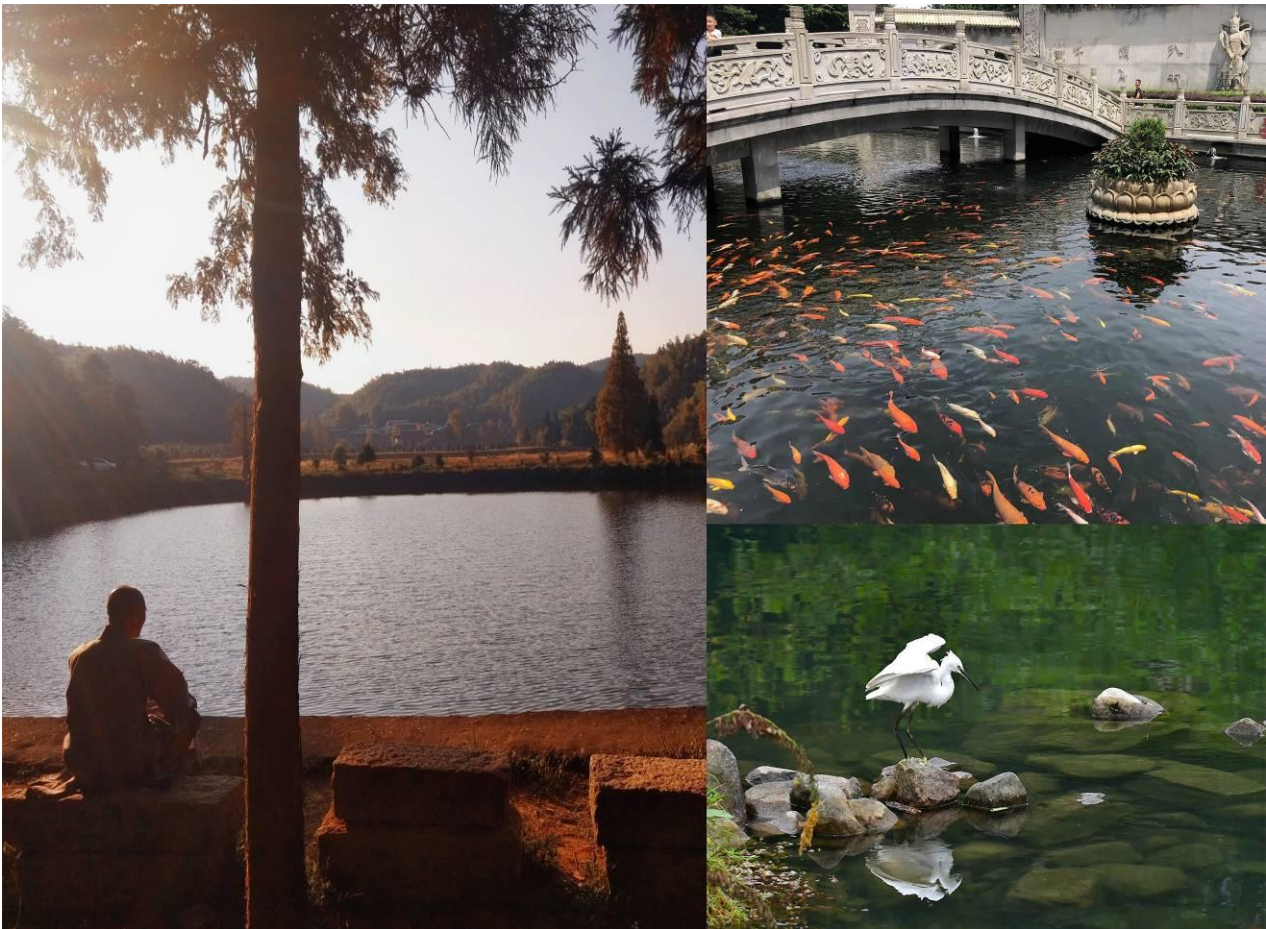


Fig. 6. Watching the water and practicing meditation. Free life pond

In addition, Buddhism contains the idea of cherishing life and admonishing people to set animals free and accumulate good karma. The KaiFu temple, as an example: the construction of the drainage pool in the temple has realized the function of ecological diversification (**Fig. 6.**).

Conclusions

China's sustainable water landscape is composed of two parts: internal drive and external landscape expression: the internal drive includes traditional values, customs, and belief systems.

External expressions include: the settlement site selected to be situated on the back of the mountain with the water lower in the front and higher in the back; settlement space allocation; building structure; and waterscape function. All the internal and external elements combined and linked as a whole stable system (Fig. 7.).

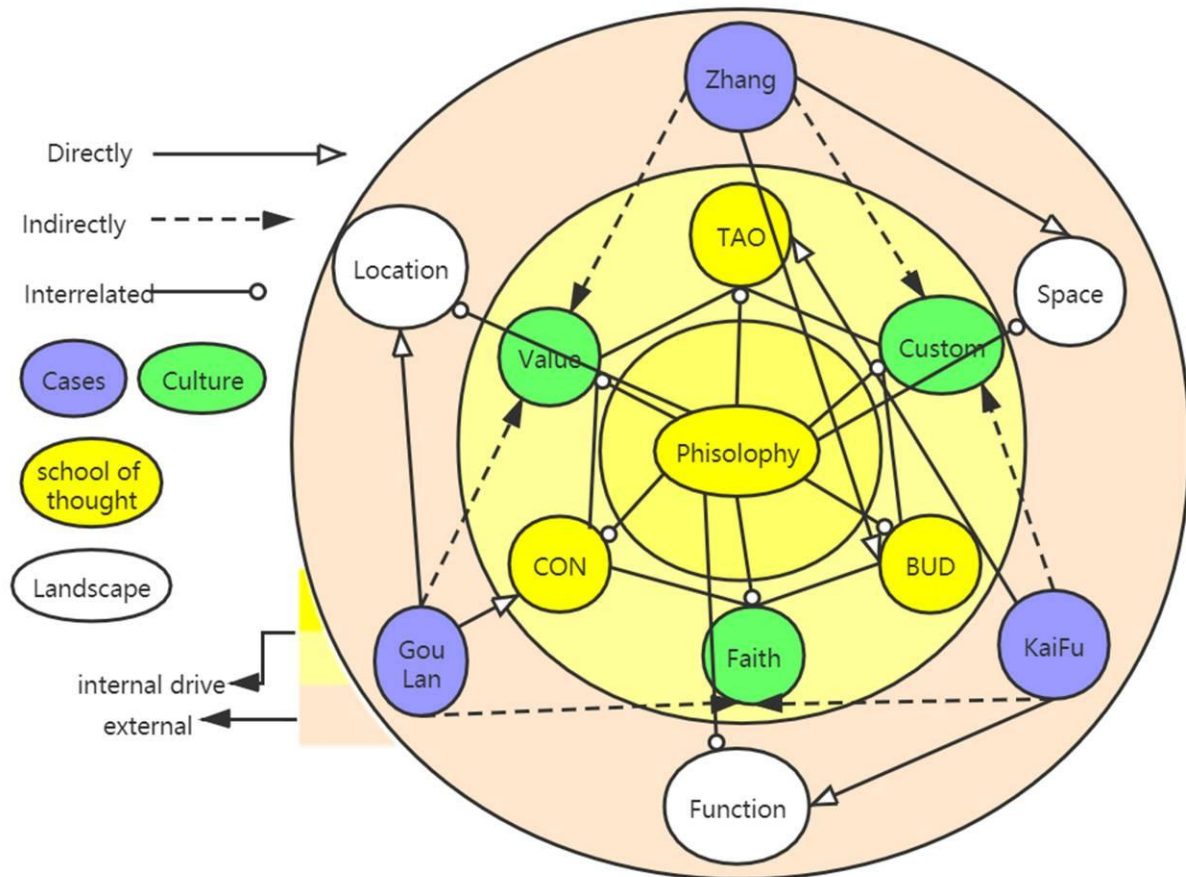


Fig. 7. Sustainable water landscape paradigm

From the analysis of the above three waterside developments it can be concluded that the traditional Chinese philosophies of Confucianism, Buddhism, and Taoism have had an important influence on the values, customs, and beliefs of the Chinese people, which in turn has helped form a solid and sustainable concept of environmental planning. This is of great value for the promotion of sustainable development.

For the construction of an ecological civilization, we must also fully explore the practical application value of traditional philosophy, and make full use of the internal drive of traditional philosophy in the process of design and application, in order to achieve an ecologically harmonious and sustainable landscape.

The landscape heritage based on traditional philosophical concepts is also necessary to fully explore and protect, utilize its educational function, and apply it innovatively for the success of sustainable development.

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CONFERENCE VOLUME

COMPARISON OF INNER CONTENTS OF FOUR PROMISING TOMATO VARIETIES

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Abstract: In Importance of small berry weight type tomato is remarkable nowadays. However, total yield can be lower than in case of normal tomato, the taste of berries represents higher quality. Many people look for and request it in marketplaces. In this study four special tomato varieties were compared in terms of berry physical parameters and instrumental attributes at the Hungarian University of Agriculture and Life Sciences. Special varieties meant some new commercial cherry tomatoes in description of higher sugar content with two shape types (plum, and normal global shape berries). Besides total soluble solids and acid content measured parameters were water-soluble antioxidant capacity (FRAP), total polyphenolic content, and lycopene-content. Cultivation techniques have a fundamental influence on antioxidant capacity of tomatoes, but variety has effect on higher sugar content and higher total soluble dry material content in our experiment. From the previous studies, tomatoes usually have 4-6 Brix° total water-soluble dry material content, but in our study all tomatoes included higher Brix° values, also acid content was higher. Antioxidant assays should be used parallel to overcome the selectiveness of certain methods. In instrumental examinations justified the positive correlation between FRAP and lycopene content. In a short conclusion, we can observe that, high quality tomato types have usually higher sugar content, but it is dependent on varieties, the dry material content can be different. Antioxidant capacity of berries are really similar, but correlation of the contents is noticeable.

Keywords: tomato variety, yield, berries, sugar content, antioxidant capacity, total polyphenolic content, lycopene content, dry material content

Introduction

Tomato (*Solanum lycopersicum* L. Mill.) belongs to *Solanaceae* family (Quient, 2019), the second most cultivated vegetable crop around the world (Queralt et al., 2011) but it considered at the top of canned vegetable (Olaniyi et al., 2010). According to FAOSTAT, 2019, the production of tomato around the world is 180 766 329 tons. It has high nutritional values such as minerals, vitamins and lycopene which can be found in ripen tomatoes, followed by β -carotene (Krumbein et al., 2006).

Due to the high consumptions of tomatoes, it deems as a main source of these nutrients (Akanbi and Oludemi, 2004) and it can be attributed as antioxidants. Antioxidant level depends on several factors for example, tomato variety and the environmental factors (Min Piao et al., 2013). In tomatoes, as in all vegetable crops, two main fractions can be distinguished, water content and dry matter content. The average water content of ripe tomato berries is 93-96%, while the dry matter content is 4-7%, the latter consists of carbohydrates (sugar, starch), organic acids, minerals, proteins, lipids, pigments, volatile flavonoids, phenols and cell walling agents (cellulose, hemicellulose, pectin) (Brandt, 2007).

The dry matter content is divided into two groups in terms of water solubility. One group of these, the water-insoluble dry matter content, and the other is particularly important in the case of tomatoes. The quantity of water - soluble solids, also known as Brix^o, as a value - measuring parameter, is 50-70% are reducing sugars. The value of Brix^o - for which the variety, the method of cultivation and the environmental factors also have an effect varies usually between 4 and 7 (Helyes, 1999).

The effect of growing conditions is shown to be generally accepted in professional circles and it is also observed that, forced tomatoes have a lower soluble dry matter content than in the open field grown tomatoes, so it is especially interesting to look at the intensive but grown outdoors tomato dry matter content. Under the same growing conditions, it was observed that the total dry matter content of continuous varieties shows better values than that of the determined varieties (Helyes, 2007). How sour the tomatoes are or sweet in nature, is determined by the relative proportions of sugar and acid content. If the sugar-acid ratio value is around 10, in general this is when we feel the tomato tastes best (Helyes, 2007).

Lycopene is a carotenoid that gives red color to tomatoes, a bioactive compound with an acyclic structure. 60-64% of the carotenoids in the berry are lycopene (Lugasi et al., 2004). The other very important antioxidant is vitamin C, of which we also find in large amounts in tomatoes, its value in freshly picked berries varies between 16-25 mg/100 g (Davey et al., 2000). Small cherry tomato varieties can be characterized with a higher specific surface area with a higher vitamin C content because vitamin C, like lycopene and polyphenols, accumulates in skin tissues (George et al., 2004). Tomatoes are also an important source of nutrients for polyphenol intake. However, there may be large differences in the polyphenol content of the berries due to genotype (variety, berry size) and place of origin (Minnoggio et al., 2003).

Materials and Methods

In this study, four varieties of ever-growing cocktail and cherry tomato (two global and two plum shape type) were evaluated according to changes of inner contents (dry matter content, polyphenol, and antioxidant capacity (Ferric Reducing Ability of Plasma = FRAP) depend on the harvest time in a small range experiment in Hungary- SÁRBOGÁRD, by SZÉRA Kft.

The measured parameters focused on tomato yield with a correlation of inner contents and dry matter. Changes of antioxidant capacity (Ferric Reducing Ability of Plasma = FR), polyphenol and dry matter contents were analyzed. The samples of tomatoes were grown in Hungary, Nagyhörcsökpuszta, 7 km from SÁRBOGÁRD, by SZÉRA Kft. The soil at the experimental place was a good quality of calcareous soil. During the experiment, four varieties of tomatoes were used (A, B,

C, D). Temperature and relative humidity were measured during the experiment by Trotec BI-30 climate data logger.

The seeds of four different cherry tomato varieties were sown on 5th of April in trays and then the seedlings were grown for 35 days in a heated foil tent. Planting was done on 8th of May. For each variety, 4 repetitions were used with 10-10 plants per repetition. In total 200 seedlings were planted with a distance 80 cm between the rows and 50 cm inside the rows.

Yield testing and berry average weight measurement (g) per repetition was performed at each harvest. In addition, plant height (cm), stem diameter (mm) and cluster number measurements were performed three times, however we only show results of berry weight measurement in this article because of limited sample size.

Lab measurements were performed later at Hungarian University of Agriculture and Life Sciences – Department of Vegetable and Mushroom Growing. Picking of tomato berries were done in (26th of July, 9th of August, 23rd of August and 12nd of September).

Antioxidant capacity (Ferric Reducing Ability of Plasma = FRAP): Antioxidant capacity was measured by spectrophotometer based on method of Csambalik et al., (2014).

Polyphenol content: The amount of polyphenol after hexane extraction was evaluated spectrophotometrically determined by (Singleton I & Rossi, 1965).

Statistical analysis: The results were analyzed according to basic statistic rules, average \pm st. deviation with significance level 5% ($\alpha=0.05$). As our data has normal distribution (checked by Shapiro-Wilk test), we basically used Microsoft 365 ProPlus Excel with XLSTAT was used for Analysis of Variances (ANOVA).

Results and Discussions

Berries weight

Defining medians with \pm st. errors and significance test with ANOVA. **Figure 1** shows the significant differences between the weight of berries within the four varieties, where the significance level was 5% ($\alpha=0.05$), $p= 2,7E-124$, $F_{krit.}= 2,63$.

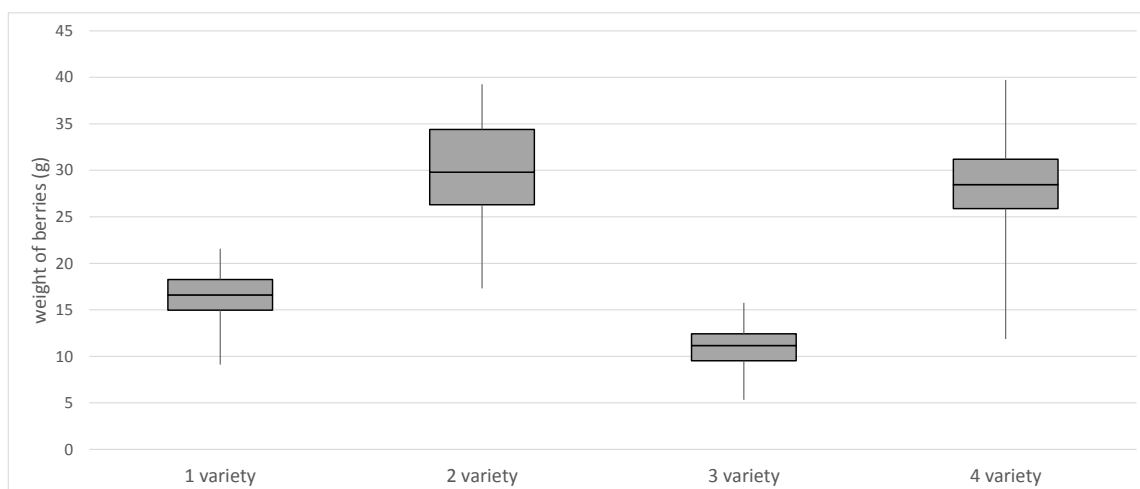


Fig. 1. Box plot analyses of weight of berries (g) within the different four varieties
(Note: 1 variety = A; 2 variety = D; 3 variety = B; 4 variety = C)

The highest mean value of the berry weight was for **D** variety, after **C** variety then **B** variety while the lowest mean of the weight was for **A** variety. At the same time significant difference was detectable between plum and global shape type varieties. Two global type (*4 variety (C)* and *2 variety (D)*), and the two plum type (*1 variety (A)* and *3 variety (B)*) were similar in berry weight values.

Polyphenol contents

From **Figure 2** it can be seen, that the highest value of polyphenol during the first harvesting time (26th of July) was in B variety then in A variety and in D and C they were the same. In the second harvesting time of the berries the highest polyphenol value was in B then in A, D and then C variety. During the third time of the harvesting the highest polyphenol was in A then B, while in D and C variety there was no significance difference. In the last time of the berries harvesting the highest polyphenol content was in B then in D, A and the lowest polyphenol content in C variety.

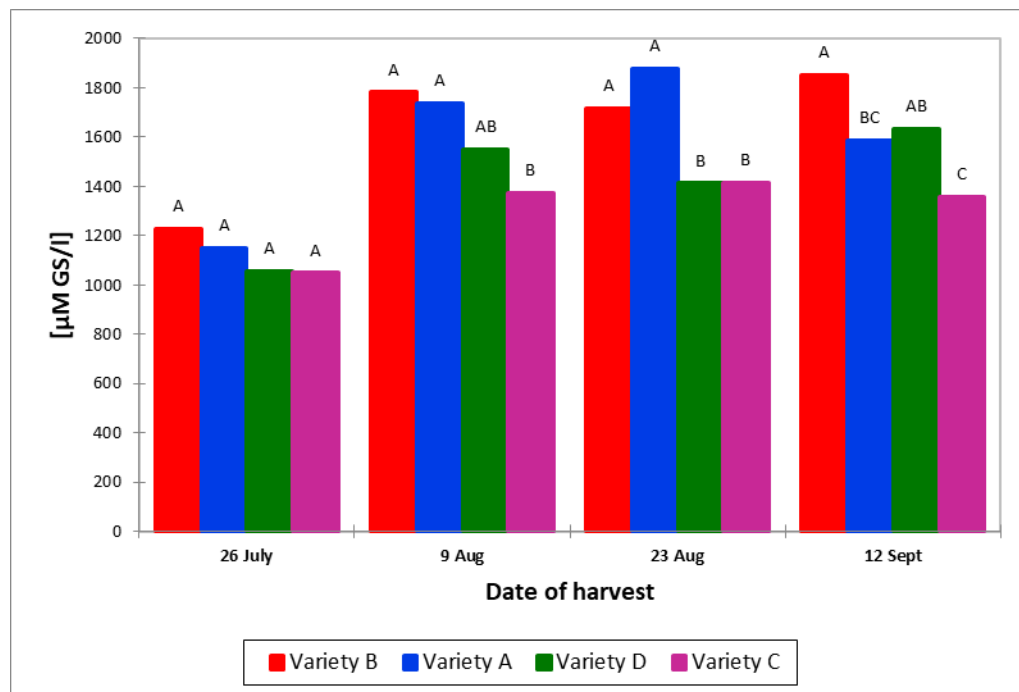


Fig. 2. Changing of polyphenol content (μ M GS/l) in four tomato varieties within different harvesting time. **Note:** different letter indicates significance difference; same letter indicates no significance difference. Average \pm st. deviation with significance level 5% ($\alpha=0.05$)

Antioxidant capacity (Ferric Reducing Ability of Plasma = FRAP)

Figure 3 defines the changing of Antioxidant capacity (FRAP) on the tomato berries within different harvesting times. During the first harvesting time (26th of July) the highest Antioxidant capacity we observed in A variety then in D, B and the lowest Antioxidant capacity (FRAP) in C variety. In the second harvesting time the highest Antioxidant capacity (FRAP) in A variety, then for the other varieties it was low especially for B variety. However, in the third harvesting time the highest Antioxidant capacity (FRAP) was in A variety while in the other varieties there was no significance difference. In the last harvesting time, there was no significance difference between the varieties.

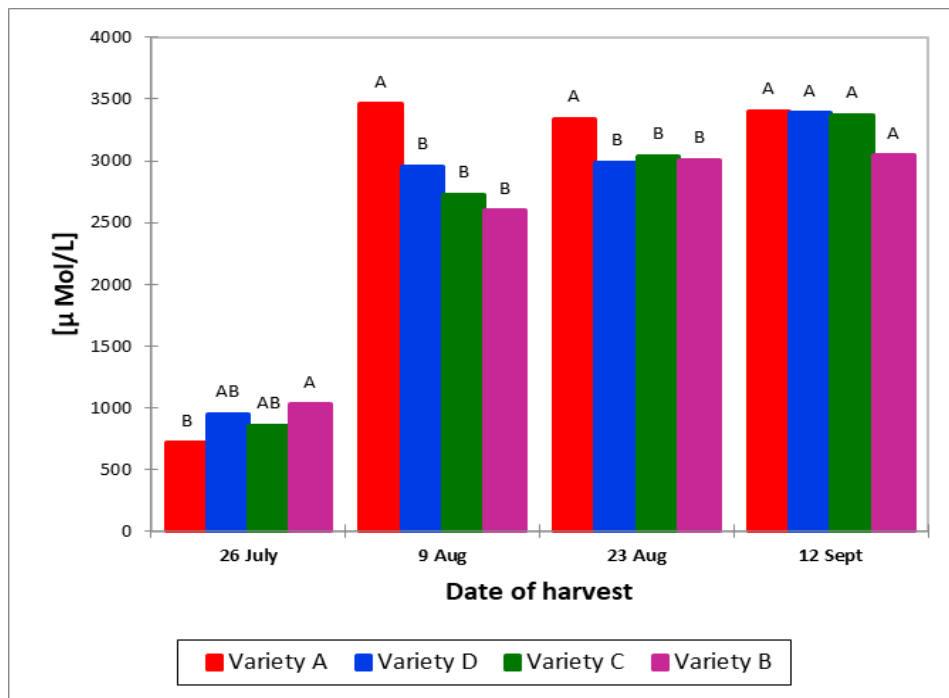


Fig. 3. Changing of water-soluble substances (FRAP) content (μ Mol/L) in four tomato varieties within different harvesting time. **Note:** different letter indicates significance difference; same letter indicates no significance difference. Average \pm st. deviation with significance level 5% ($\alpha=0.05$)

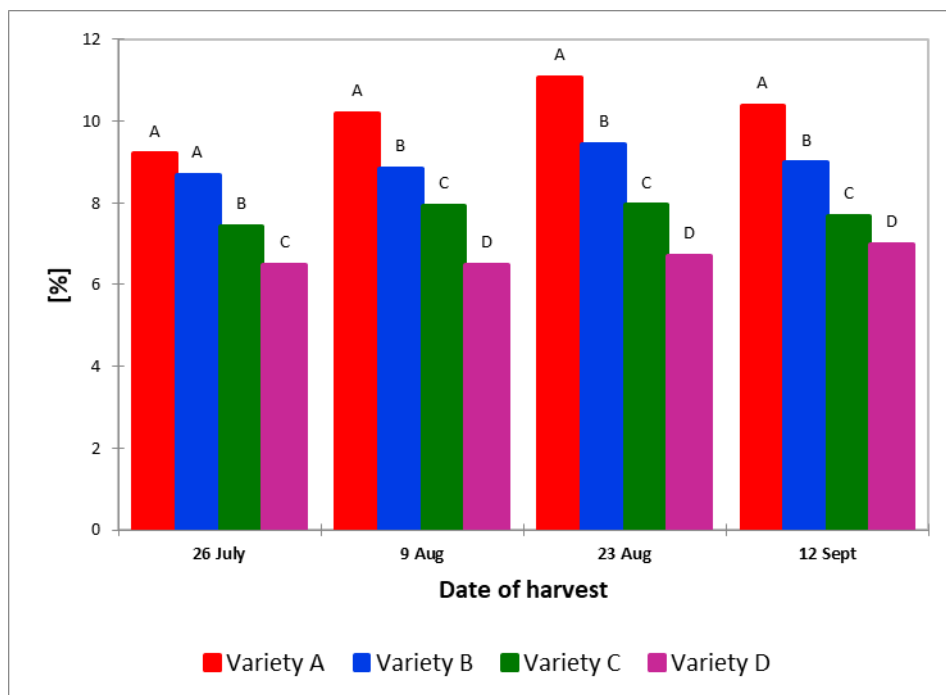


Fig. 4. Changing of dry matter content (%) in four tomato varieties within different harvesting time. **Note:** different letter indicates significance difference; same letter indicates no significance difference. Average \pm st. deviation with significance level 5% ($\alpha=0.05$)

Dry matter content

From **Figure 4**, we can observe that during the four times of harvesting of the tomato berries, the highest dry matter content was in A variety then B variety, C variety and the lowest dry matter content in D variety.

Conclusions

Tomato growing is one of the most important sectors among the horticultural crops. Countless usage patterns and increasing consumption rates all support the new cultivation technologies and research into varieties with new characteristics. The ever-expanding and due to consumption and use needs, cocktail and cherry tomatoes are gaining ground, the properties of which are worth researching from a number of perspectives.

In this experiment, different cocktail and cherry tomatoes from several perspectives were examined.

In terms of inner contents, A variety showed the highest dry matter content within different harvesting times. The dry matter content was in a range of values with the lowest performing D variety, which means a dry matter content of about 3% lower than that measured with A variety. Regarding to polyphenol content A variety showed the highest polyphenol content compare to the other three varieties within the different harvesting times. For the changing of Antioxidant capacity (Ferric Reducing Ability of Plasma = FRAP), there was a significance difference between the varieties, only during the first and second harvesting time while in the third and fourth, there was no significance difference between the varieties. There was a significant difference between the varieties in the weight of berries during the different harvesting times; the highest weight of berries was for D variety and the lowest weight of berries for A variety. We can conclude that A variety showed the best yield in a correlation with the changing of the inner contents during the harvesting times. However yield dependent on many other environmental factors, in case of inner contents we got similar results of A variety as it was mentioned by Csambalik et al., (2014). For future studies, big experiemnt with more sample size can be examined to select the best variety to be cultivated in a commercial size.

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CONFERENCE VOLUME

LANDSCAPE CHARACTER AND SETTLEMENT IDENTITY

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Abstract: The best-known public space design manuals are setting goals for big metropolises, tailored to the global needs, but their demands are usually also reflected in the manuals of smaller cities or settlements ignoring the difference in the scale. We present the settlement-forming effects of the landscape on the examples of European settlements and case studies, and we present examples for how to preserve the characteristic's of traditional public spaces through small settlements located in Kalotaszeg, in the Balaton Uplands and in the agglomeration of Budapest. Ecological sustainability and the resilience of settlements doesn't just depend on the quality of the green space elements and the complexity of their system, but also on the enforcement of the local character appears through the public space design elements.

Keywords: landscape character, public space, design manual, globalization, local identity, traditional character

Introduction

Uniqueness and the adaption to successful patterns are two drivers that have significantly shaped the character of urban landscape in the past decades (Carmona et al., 2018; Forsyth, 2019; Madanipour, 2006; Ren, 2011). Due to the dynamic urbanisation, it can best be observed in the cases of metropolises and smaller settlements how wide the range of spectrum is for interpreting uniqueness. The highest skyscrapers, historic urban districts controlled by strict policies as tourist destinations, development projects and artificial islands advertised as luxury, lookout towers with exceptional panorama, Ferris wheels, restaurants and accommodations attempting to evoke the rural lifestyle were all built with a pursuit of uniqueness regarding the image of the settlement. On the other hand, the same pursuit can be detected in the appreciation of existing local values, in the discovery of the cultural heritage of small communities that stand away the brilliance of metropolises, and in the growing awareness of natural assets. Successful patterns are related to economic expansion, with the widespread use of standards being a key factor (Easterling, 2014; Waldron, 2019). During planning, standards can shape the details of a design concept by modifying the legal circumstances of implementation and product acquisition. Enhancing the influence of a raft of global organisations, standards create a "soft law" of global exchanges. Standards also provide safeguards for international projects, therefore it is not by chance that Keller Easterling

formulates that "standards are the currency of international organizations and multinational enterprises." (Easterling, 2014 – p.11) Globalisation thus became an unavoidable process, necessary but perhaps negative from the aspects of uniqueness and the survival of traditions, nevertheless with a rate that is possible to manage.

In the development process, perspectives of various stakeholders of usually different professional backgrounds must be harmonised according to a planning hierarchy. The coordination of the work of designers, engineers and the investor is supported by not only standards, but also design codes and related plans. The latest instruments of urban governance are based on processing the big data which requires a knowledge of statistics and software. The results are then published as design manuals for practical application. Regarding the contemporary practice, the growing influence and active participation of the citizens requires that the latest design manuals are also suitable for the coordination of and the provision of information to the public. In return for an accessible language, our common knowledge assets are expanding through plenty of data and the expertise of citizens, while administrative processes may become easier through the dissemination of information.

In response to the expanding user needs and the increasing environmental impacts, more and more specialised design manuals are published for guidance. However, comprehensive studies that represent great narratives are not common even in the European Union (Carmona, 2011), and those already published – e. g. the landscape character assessments completed with regard to the European Landscape Convention – are not uniform either. In Central and Eastern European practice, it is typical to design manuals for assisting the operation of settlements that their contents and the urban design are tailored to the character of built elements (e.g. Prague Institute of Planning and Development, 2014; The Municipality of Budapest, 2017).

For all the above reasons it is important to explore what other bases the design manuals are possible to build upon apart from the patterns propagated due to the impacts of globalisation and the conformity to standards, and to establish what other points of reference could determine the identity of our settlements.

Materials and Methods

The question of identity

Nowadays there is a fierce competition in urban and spatial development in order to make settlements more attractive (Madanipour, 2006). What mostly attracts more consumers and quality workforce are "liveable" urban landscapes, and uniqueness (Yigticanlar and Velibeyoglu 2008). Defining the identity of the settlement therefore became an important task for urban management. While the design theory approach of new urbanism created an opportunity for the development of pedestrian or pedestrian-priority neighbourhoods (Tiesdell, 2002), under the influence of the design theory or movement called landscape urbanism spectacular projects were implemented in the spirit of a unified urban ecosystem (Ellis, 2002; Ruggeri, 2015). Although in most cases these projects were only partly realised, still they have set examples for successful development of a general approach. (Waldehim, 2016; Duany 2013) The adaptation and dissemination of successful patterns has not appeared only in the design theory but also in the cityscape. Creating a character that is economically beneficial established the image that we mean beyond the physical appearance, and

the illusion that we may consider the abstract interpretation of the image. However, these reproductions without any mental contents result in contentless, schematic elements which, as seen in history, are losing their character over time (Antrop, 2005). Today's individuals increasingly define themselves towards the society through image and appearance, and the same attitude appears also in the works of contemporary architects and designers. Their professional identity can be understood as the system of social relationships conveyed by images (Szabó, 2018).

The starting point to define urban design has changed considerably over the past decades. Until the beginning of the 19th century, canons of urban design derived the aesthetics of the city from its built elements, and primarily from the urban character (Sitte, 1945; Mumford, 1961). Although social needs (particularly regarding the use of space), green surface elements, and a favourable urban climate (Csepely-Knorr, 2016) were subsequently given an increasingly prominent role, it was the method of cognitive mapping of urban places that brought a breakthrough (Lynch, 1960). However, as a consequence of modernist urban renewals, it is the physical reality of space (without its abstract sense) and its material nature that have been and are still part of the architectural thinking, and we know many investments of urban planning scale which consist only of a set of buildings that correspond to these concepts. The image of the settlement however goes beyond these dimensions. As Tamás Meggyesi put it, "the image of a settlement is defined primarily by the characteristics of the built environment. Essentially the character is the unique environmental quality of the place: a combination of specific features that may, in fortunate cases, prove to be the concrete, physical manifestation of the genius loci of non-material nature." (Meggyesi, 2006 – pp.10). His definition derives the image of a settlement from the visual image, and that is how he characterises and classifies the image of various settlements (or districts and neighbourhoods). He clearly distinguishes the image from the concept of identity that can only be experienced by residents. Accordingly, the image of a settlement can be shaped as desired, and means nothing more than the sum of the dimensions of the previously discussed image, consisting of both man-made and natural elements.

In his search for the opportunities of preservation and enrichment of the values of rural settlements, Gyula Istvánfi concluded that the image of a village has three components: landscape, history, and society (Istvánfi, 2000). Even though, contrary to the approach of landscape architecture, he does not consider the representations of agriculture to be part of the landscape concept, he suggests that the image of the settlement is a more complex concept. He uses image as an abstract concept, as an idea, which is identical to the historical heritage and the content related to it, that is the tradition. He extends the image of the settlement to the landscape that provides its basis. He calls for the recognition of the elements of the image, and the identification and assessment of the characteristics, that is, the rationally measurable definition of the abstract concept. In addition, from the point of view of defining the identity of the settlement, he points out a crucial fusion: the indivisible interdependency between landscape, history, and society.

Based on the above approaches, the concept and intellectual content of the image therefore has multiple meanings. As the much quoted philosopher of the Western European design theory, Gaston Bachelard puts it: "It is not possible to synthesise the image and the concept, as it is also not possible to establish which one originates from the other." (according to Szabó, 2018)

Landscape character and settlements

Regarding the relationship of the landscape and settlements, we can observe an unanimous opinion of the planners and researchers. In addition to the Hungarian authors reviewed earlier (Istvánfi, 2000; Meggyesi, 2006), the frequently quoted international sources of our time (Gospodini, 2004; Bélanger, 2009; Gunder et al., 2018) also all agree that settlements are a subset of the landscape. Nevertheless this has not appeared so clearly in professional practice of planning. (e.g. The Line project by Neom, 2021; BudaPart Project by ADEPT, 2021; Little Island at Pier 55 by Heatherwick Studio, 2021)

Find an ecological balance between the settlement and the landscape has become one of the meaningful critique of the modernist urban design theory. In the late '70s by the examples of Dubrovnik and Chora, the fact that the settlement is an environmental entity has been proved (Anagnostopoulos, 1977). This recognitions were attend closely to the excessive tourist pressure. The phenomenon is very similar in Rio de Janeiro where the connection between the landscape and the settlement was thr drive of the settlement's image preservation programme (Iwata and del Rio, 2014)

Several historical evidences and examples suggest that exploiting the landscape potential is an essential criteria for the economic development that allows the urbanisation process to take ground. Development of the urban layout reflects the landscape context and the history of land use, the change of human needs according to the transition and development of the society. In the beginning either or both the availability of local materials and the knowldge of their use and fashioning had been criteria for economic prosperity. The architectural patterns characteristic to a specific settlement were developed on the basis of the knowledge of the building materials. While vernacular architecture is uniform in a region (Istvánfi, 2011), the differences between the regional representations are distinctive to ethnic regions.

Since 2018, a series of Regional Design Manuals have been published in Hungary, with the role of image related to the physical and visual representation, and seeking for the characteristics of the related landscape. The approach may be misleading though, on one hand due to the contentless application of patterns discussed earlier, on the other hand because a clear relationship exists between the landscape characteristics that influence the development of settlements and the ethnic regions. (Eplényi, 2012) Renaming of ethnic regions therefore can hardly be justified. "Landscape character is defined as a distinct and recognisable pattern of elements that occur consistently in a particular type of landscape". (Landscape assessment guidance, 1993) The comprehensive assessment of landscape character provides a basis for the mitigation of impacts of development, and for the appropriate land use to protect the existing character. (Kabai, 2011) The area of Hungary is divided to administrative units of municipalities, the boundaries of which however do not follow those of either the landscape character areas or the ethnic regions. It can be therefore concluded that it is no good analysing the phenomena on the basis of administrative units as it happened in the case of the Regional Design Manuals.

The number of international research publications on landscape character is significant, deriving from mainly the British and French landscape cultures. (Konkoly-Gyuró et al., 2017) In Europe, the first comprehensive landscape character assessment programme was carried out in Scotland. (Kabai, 2010) For practical application of the results, the assessments must be periodically reviewed so that the transition of the landscape is possible to monitor. Since traditional land use (as a constituting element of local identity) is diminishing, we tend to consider changes in

landscape essentially negative, although change does not necessarily mean the loss of the diversity or cohesion. (Antrop, 2005) Nevertheless this reflex is somehow correct since the preservation of local heritage is possible only if development is based on awareness about tradition.

Results

Definition of the character of public space

Zooming in to the settlement scale from the landscape scale, there is still a large demand to distinguish between the different planning sites can also be found. For the purpose of systematization, Matthew Carmona et al. identifies 12 cases based on a review of the international literature (Carmona et al., 2008). However these largely overlap: sociological perspective where society is “incessantly kept in a passive, voyeuristic, consumeristic state of mind and emotion”. (Wallin, 1998), social experience of space (Gulick, 1998), power relationships between private and public (Kilian, 1998), a journey from vision and reality (Lefebvre, 1991), means of control (Van Melik et al., 2007), terms of adaptability in use in public spaces (Franck and Stevens, 2007), exclusionary strategies (Flusty, 1997), degrees of inclusion (Malone, 2002), clientele of public spaces (Burgers, 1999), users engagement with space (Dines and Cattell, 2006), physical / morphological character (Sitte, 1889; Zucker, 1959), function (Gehl and Gemzoe, 2000; Carr et al. 1992). As can be seen from these headings, the practice of organizing the open spaces of a settlement can be based on three different methods:

- Spatial theoretical approach, the role of the given place in the urban spatial structure (Balogh, 2004).
- Social approach, the significance of the place for the community and the relationship between its members.
- The nature of the usage of the place (Balogh, 2004).

We examined two examples for the complex categorization based on several methods and related to the identity of the settlement. First: Stanley et al. Urban Open Spaces in Historical Perspective: Research of Transdisciplinary Typology and Analysis, which systematizes the open spaces in a historical context, supporting Gyula Istvánfi's statement about the significance of this. Their categorization is based on 7 forms appearing in urban spatial structure (**Fig. 1.**): (1) food production areas; (2) parks and gardens; (3) recreational space; (4) plazas; (5) streets; (6) transport facilities; and (7) incidental space, which is examined on 3 different scales: (1) city-wide, (2) intermediate, and (3) individual building. In addition to the dimensions of form and scale, the green space, gray space character was also examined in each category. The aim of their work is “a versatile framework for making broad comparisons across extremely diverse time periods, spatial scales, and human cultures” (Stanley et al., 2013).

The categorization of the Roads Task Force (working for the Transport for London government body) was created as part of the comprehensive work covering the current usage needs and keeping in mind the development opportunities of the settlement (Transport for London - RTF, 2012). Their work deals with public spaces, with the aim of creating a framework that brings those who are interested in settlement development to a common position on the following issues:

- Identify user needs in different circumstances and set priorities/make trade-offs accordingly
- Reflect changing functions and aspirations as particular streets change
- Identify the types of tools that may be appropriate locally

- Balance place-specific needs with the overall function of the network
- Understand the need for intervention at a strategic level

For the concept of their systematization, they defined the functions of the public spaces, which were found to be either place-based or network-based, so therefore the usage based on the activity can be classified into 'place' and 'movement' categories. "The figure below (**Fig. 2.**) shows two axes - 'movement' and 'place'. The movement axis involves the moving functions across different modes, while the place axis affects those functions that are specific to and happen in particular places, namely living, unlocking and functioning." (Transport for London - RTF, 2012 - p.3).

		Scale		
		City	Intermediate	Residence
Form	Transport Facilities	Harbors, Airport and Train Station Parking	Transit Stations, City Gate Areas	Driveways, Parking Areas
	Streets	Central Boulevards	Street Space	Pedestrian Alleys, Paths
	Plazas	Large Formal Plazas	Smaller Neighborhood Plazas	Interior Courtyards
	Recreational Space	Stadiums, Greenbelts, Beaches	Sports Facilities, Playgrounds	Houseyard Playspace
	Incidental Space	Natural Features and Semi-Wild Areas	Empty Lots, Transit Borders	Marginalized Space Between Buildings
	Parks and Gardens	Major Formal Park and Garden Space	Institutional Gardens, Small Parks, Cemeteries	Household Gardens
	Food Production	Orchards, Agricultural Fields	Grazing Commons, Community Gardens	Kitchen Gardens, Small Horticulture

	Grey space
	Green space
	Grey/Green space

Fig. 1. Public space categorization (Stanley et al., 2013)

We examined the real meaning of the presented typologies among different landscape characteristics, and among small settlements with and different developmental approaches. The basis of our comparison was the main square or the administrative center, the main street and the side streets of the settlement. As we were seeking the elements of the character of public space we examined only the territory of the public space and not the whole streetscape (**Fig. 3.**):

- Settlements, which are excluded from the central developments and are free from 'big city effects': Petrinzel / Kispetri
- Locations with central developments, but free from the effects of big cities and based on the protection of settlement values,: Mindszentkállya.
- Settlements developing in the agglomeration of Budapest: Törökbálint

The effects of globalization are necessarily appear through the elements related to networks and technology. But the traditional character of public space can be survive and emphasize by the following elements:

- materials: direct use or the substance of the evolution of the traditional material
- adaptation and progression of the traditional craftsmanship
- preserving the traditional proportions of different use
- preserving the characteristics of the landscape structures related to traditional use (e.g. open drain, street ditch)

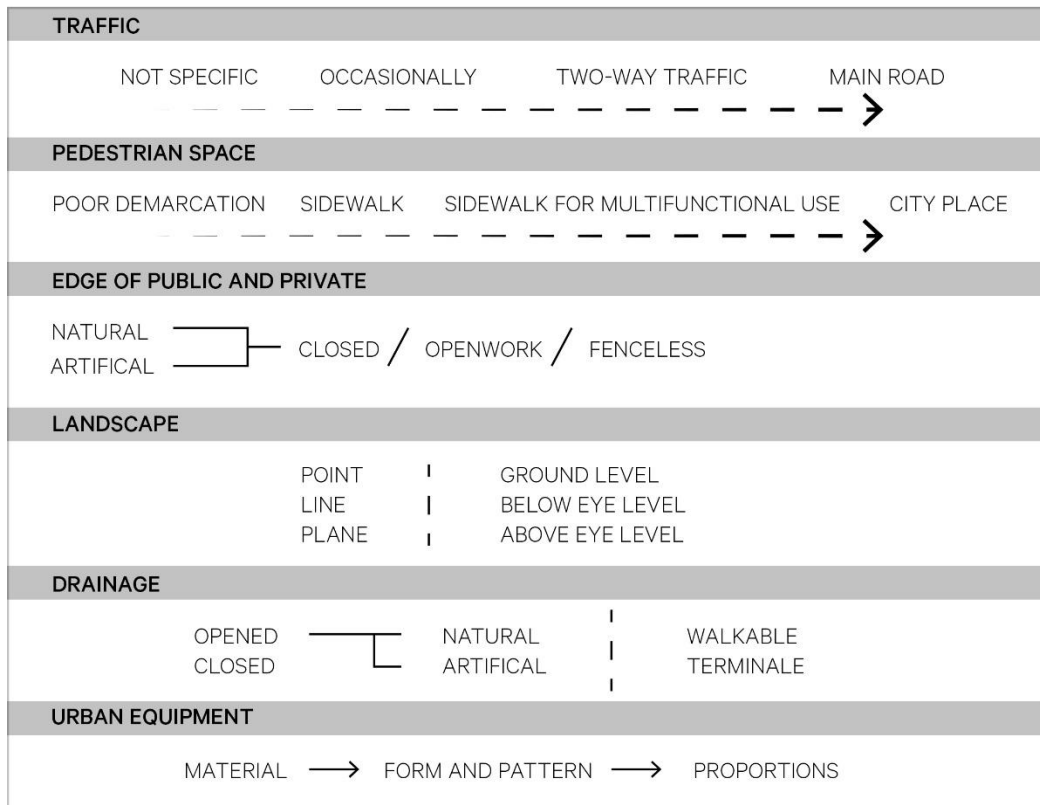


Fig. 4. Survey form of characters of public place

Conclusions

The rapidly changing needs of use have generated independent "layers" with neither context nor architectural performance in public spaces. The popular examples of diverse streetscape elements are spreading across continents in a few years, often installed upon the existing infrastructure, without a systematic approach or harmonisation with existing elements of urban equipment. Due to the impacts of globalisation, these new layers are becoming more and more common, while the traditional character of public spaces is getting less noticeable "under" them. Ad-hoc transformations influencing the proportions and usage patterns of the streets and open spaces are prevalent and only take into consideration the immediate environment of the development area. But in many cases even practical solutions that blend in effectively with the existing infrastructure result in a loss of identity of the urban landscape. These cases can be regulated by a uniform methodology of public space development tailored to the settlement (Fekete

and Szakács, 2012). The same way as the adverse effects of the car use boom can not be eliminated just moderated.

Therefore the identity of our habitat, the place of living depends on our relation to the landscape, on our contemporary culture, the visual appearance of the previous two and on the society that is behind all.

The extent of globalization in the transformation of cities can be controlled and regulated by preserving the character of public spaces. Ecological sustainability and the resilience of settlements do not only depend on the quality of green spaces and the complexity of their system, but also on the representation of the local character appearing through the design of the elements of public spaces.

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CONFERENCE VOLUME

STUDIU DE CAZ PRIVIND POTENȚIALUL DE IMPLICARE A PUBLICULUI ÎN DEZVOLTAREA SPAȚIILOR VERZI, REFLECTÂND SCARA LUI ARNSTEIN A PARTICIPĂRII CETĂȚENILOR

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Abstract: Dezvoltarea spațiilor verzi are un rol esențial în modelarea infrastructurii verzi urbane și în îmbogățirea serviciilor ecosistemice, care sunt benefice pentru sănătatea fizică și psihică a locuitorilor. Dezvoltarea spațiilor verzi este un proces complex de planificare și implementare care, în lipsa unei comunicări și cooperări adecvate, duce adesea la conflicte neașteptate și, prin urmare, la obstacole în calea realizării proiectelor. Implicarea publicului prin diferite instrumente în procesul proiectării contribuie în mod semnificativ la succesul strategiilor de dezvoltare. Experiența arată că există beneficii sociale și fizice în cazul colaborării cu comunitatea, arhitectul peisagist fiind un actor-cheie în acest proces.

Lucrarea reprezintă un studiu de caz al instrumentelor tot mai frecvente de implicare a comunității în dezvoltarea spațiilor verzi și examinarea acestora în lumina celei mai cunoscută teorie a implicării publicului, scării Arnstein și a teoriilor conexe. Ne bazăm pe materiale provenite din muncă proprie de teren, interviuri, date de baze municipale și de internet.

Cuvinte cheie: arhitectură peisagistică, infrastructură verde, instrument de planificare comunitară, faze de proiect, nivel de implicare a publicului

Introducere

Dezvoltarea infrastructurii verzi urbane este o tematica de cheie în zilele noastre, nu numai pentru profesioniști (BFVT Kft. et al. 2021), ci și pentru liderii și locuitorii orașelor. Importanța infrastructurii verzi urbane a devenit foarte apreciată, deoarece soluțiile bazate pe natură reprezintă răspunsuri eficiente și reale la amenințările schimbărilor climatice (Union 2021) și deoarece este strâns legată de conceptul de bunăstare și binefacere umană prin intermediul serviciilor ecosistemice. (Millennium Ecosystem Assessment 2007)

Pe lângă furnizarea și reglarea serviciilor ecosistemice, spațiile verzi urbane furnizează și servicii culturale, care sunt semnificative și inedite prin faptul că promovează bunele relații sociale, coeziunea socială, respectul reciproc și capacitatea de a-i ajuta pe ceilalți. (Millennium Ecosystem Assessment 2007) Aceste servicii, care sunt de o importanță capitală pentru societate, pot fi îmbunătățite considerabil prin instrumente de implicare a publicului în dezvoltarea spațiilor verzi

(Pleasant et al. 2014). Implicarea publicului poate avea adesea efectul pozitiv de a atrage liderii politici la bord (Benedict et al. 2006).

În cadrul cercetării noastre, explorăm interconectarea acestor două domenii, implementarea implicării publicului¹ în dezvoltarea infrastructurii verzi și oportunitățile pe care aceasta le oferă. Prin intermediul unui studiu de caz, dorim să arătăm instrumentele de implicare a publicului într-un proiect de dezvoltare a infrastructurii verzi, să examinăm nivelul de implicare care poate fi atins prin intermediul fiecărui instrument și să evidențiem numărul mare de experți implicați în acest proces.

Materiale și Metode

Cercetarea este împărțită în trei unități: în prima parte, examinăm teoria scării lui Arnstein și reinterpretarea acesteia; în a doua parte, prezentăm teoria fazelor și a factorilor de succes asociați proiectelor; iar în a treia parte, arătăm posibila aplicare a teoriilor prin intermediul unui studiu de caz.

Cercetarea literaturii

În iulie 1969, Sherry R. Arnstein a publicat "A Ladder of Citizen Participation" în *Journal of the American Institute of Planners*. Arnstein, care avea multă experiență atât în domeniul social, cât și în cel politic, a declarat că și-a conceput tipologia astfel încât să se concentreze pe redistribuirea puterii și să fie provocatoare. (Connor 1988) Scara participării cu opt trepte astfel construită a revoluționat abordarea implicării publicului și a rămas unul dintre cele mai importante cadre teoretice ale acestuia. Ea se bazează pe ideea că, cu cât implicarea publicului în procesul decizional este mai mare, cu atât ne aflăm mai sus pe scara imaginată. (Dömötör 2009)

Scara lui Arnstein oferă linii directoare puternice pentru implicare, care s-ar putea să nu fie aplicabile în toate domeniile și abordările, iar mulți au încercat să adapteze teoria sa la propriile experiențe. În cadrul cercetării bibliografice, prezentăm câteva dintre cele mai importante teorii care au vizat reinterpretarea scării participării.

Metodologia analitică

Esența implicării publicului este că aceasta creează un dialog între diferiți actori, iar ca urmare a acestei comunicări, se dezvoltă încrederea și este posibil să se învețe și să se înțeleagă punctele de vedere ale celorlalți. Putem identifica patru faze în cadrul implementării unui proiect din punctul de vedere al implicării publicului: nașterea proiectului, planificarea, implementarea și viața ulterioară. (Boda Zsolt et al. 2013; Horváth et al. 2018)

Posibilitățile de implicare a publicului sunt nelimitate, dar acestea pot fi grupate în funcție de natura lor. Într-un studiu anterior, când încercam să facem procesele și oportunitățile de implicare a publicului mai tangibile pentru liderii orașelor, am grupat instrumentele în cinci categorii și le-am

¹ În cercetarea noastră folosim termenul "implicare publică" pentru a ne referi la orice mijloc care oferă membrilor comunității locale posibilitatea de a avea un cuvânt de spus și de a participa la modelarea dezvoltării orașului (de exemplu, afișe, forumuri). Implicarea include și este o formă mai specifică a planificării participative, din care planificarea comunitară este un instrument mai concret. (Horváth et al. 2018)

numit factori de succes, sugerând că succesul unui proiect depinde adesea de participare. (Horváth et al. 2018)

Factorii de succes pentru implicarea publicului sunt următoarele: public (toate instrumentele de comunicare, de la informare la dialog interactiv), organizare (instrumente pentru abordarea aspectelor legate de guvernare și organizare în vederea unei colaborări eficiente), planificarea (instrumente pentru a influența planificarea proiectului), acțiune (eveniment comunitar ad-hoc pentru a crea, activa, consolida comunitatea locală) și program (acțiune pe termen lung care răspunde la problemele sociale într-un mod complex). (Horváth et al. 2018)

În cea de-a doua parte a cercetării, am investigat nivelurile de participare atinse de instrumentele grupate în funcție de cei cinci factori de succes și, prin urmare, le-am aplicat Scara lui Arnstein și Steaua Participării a lui May, precum și scara cu trei trepte creată de D. Ridder, E. Mostert și H.A. Wolters.

Studiu de caz

Ca studiu de caz, am ales revitalizarea parcului Holdudvar (23500 m²), un proiect de dezvoltare a unui spațiu verde rezidențial implementat de municipalitatea din Óbuda-Békásmegyer, Budapesta, în cadrul programului TÉR_KÖZ al municipalității din Budapesta. În timpul implementării, municipalitatea a folosit o gamă largă de instrumente de implicare publică, astfel încât a existat o comunicare în direct cu părțile interesate în toate fazele proiectului, cu excepția nașterii proiectului, unde ideea de renovare a venit de la liderii orașului.

La alegerea proiectului am ținut cont de mai multe criterii. A fost important ca acesta să facă parte din programul TÉR_KÖZ pe care îl analizăm, al cărui obiectiv principal a fost acela de a se asigura că proiectele sunt implementate la inițiativa comunităților locale sau cel puțin cu implicarea locuitorilor locali, pentru a permite o utilizare mai durabilă și un nivel mai ridicat de acceptare a spațiilor comunitare și pentru a contribui la consolidarea comunităților locale. (TÉR_KÖZ web 2021)

De asemenea a fost important, că implicarea publică bine organizată care se desfășura de ani de zile în Districtul 3 din Budapesta a fost un fel de garanție că vom găsi activități participative bine gândite și pregătite în cadrul proiectului. Implementarea Parcului Holdudvar a fost realizată de Óbuda-Békásmegyer Dezvoltare Urbană SRL, cu implicarea autorilor.

Resultate și Discuții

Cercetarea literaturii – Scara lui Arnstein

Scara lui Arnstein este asociată cu mai multe teorii diferite, pe care le-am organizat în **Tabelul 1**, pentru mai multă claritate.

Teoria lui Arnstein a fost interpretată în numeroase moduri de către cercetători și, în general, criticată diferit, dar **Tabelul 1** arată că cele două "trepte" inferioare ale scării definite de Arnstein au fost practic eliminate în mod universal, deoarece nu se referă de fapt la o implicare reală, ci doar la o aparență a acesteia. În aceste două niveluri inferioare, Arnstein a formulat o critică puternică a societății și a politicii, care era necesară în vremea sa, deoarece această viziune uimitoare a participării i-a permis să atragă atenția politicianilor asupra problemei.

Tabelul 1. Scara lui Arnstein și teoriile conexe

Nume	Anul	Formă	Număr de niveluri	Numele nivelurilor
Sherry R. Arnstein	1969	scară	8	1. Manipulare; 2. Terapie; 3. Informare; 4. Consultare; 5. Participare deplină/plasare; 6. Parteneriat; 7. Putere delegată; 8. Control cetățenesc (Arnstein 1969)
Desmond M. Connor	1988	scară	7	1. Educație; 2. Feedback de informații; 3. Consultare; 4. Planificare comună; 5. Mediere; 6. Litigiu; 7. Rezolvare/Prevenție (Connor 1988)
Jules N. Pretty	1994	scară	7	1. Participarea manipuloare; 2. Participarea pasivă; 3. Participarea prin consultare; 4. Participarea pentru stimulente materiale; 5. Participarea funcțională; 6. Participarea interactivă; 7. Automobilizarea (Pretty 1994)
David Wilcox	1994	scară	5	1. Informare; 2. Consultare; 3. Decidere colectivă; 4. Acțiune colectivă; 5. Sprijinirea inițiativelor comunitare independente (Wilcox 1994)
Nazneen Kanji și Laura Greenwood	2001	scară	5	1. Conformitate; 2. Consultare; 3. Cooperare; 4. Învățare în comun; 5. Acțiune colectivă (Kanji and Greenwood 2001)
Rosalind Eyben	2003	scară	6	1. Participarea instrumentală; 2. Libertăți civile și politice; 3. Drepturi economice; 4. Drepturi sociale; 5. Drepturi culturale; 6. Drepturi participative (Eyben 2003)
John May	2004	stea	5	1. Informare; 2. Consultare; 3. Decidere colectivă; 4. Acțiune colectivă; 5. Sprijinirea inițiativelor comunitare independente (May 2006)
D. Ridder, E. Mostert și H.A. Wolters	2005	scară	3	1. Informare; 2. Consultare; 3. Participare activă (Ridder et al. 2005)

Astăzi, unul dintre principalele obiective ale implicării publice este construirea încrederii, atât din partea cetățenilor, cât și din partea autorităților municipale, și, este necesară o comunicare de susținere și de consolidare a încrederii în timpul procesului de participare.

John May a aranjat cele cinci puncte ale lui Wilcox într-o structură diferită, în formă de stea, eliminând ierarhia dintre nivelurile de participare. Metafora scării este, de obicei, cea mai criticată, deoarece sugerează că treptele de sus ale scării sunt mai bune decât cele de jos și, prin urmare, progresul înseamnă "urcarea pe scară", cu scopul final de a ajunge la treptele de sus. (Tritter and McCallum 2006; Kiss 2015) Prin juxtapunerea nivelurilor, fiecare dintre ele este evidențiat și valorizat, astfel încât nu este nevoie să se ierarhizeze diferitele instrumente de implicare: nu este vorba despre cine folosește ce instrument, ci de a determina cât mai mulți oameni să vadă potențialul implicării publice.

D. Ridder, E. Mostert și H.A. Wolters simplifică complet teoria lui Arnstein. Importanța acestei simplificări constă în faptul că, în cadrul unui proces de dezvoltare a spațiilor verzi, cele trei concepte sunt mult mai ușor de utilizat și de interpretat decât multe alte niveluri de scări. În implementarea unui proiect de arhitectură peisagistică, transferul de informații, consultarea și angajarea în procesul de implicare a publicului și de planificare sunt sarcini la fel de importante,

<i>Înființarea unei asociații</i>	8.	V.	C.	a., b., d., g., h.
<i>Reguli comunitare</i>	8.	V.	C.	a., b., c., d., g., h.
<i>Implicarea experților externi</i>	4.	II.	B.	a., b., d.
Elaborarea planului				
<i>Utilizarea cunoștințelor existente</i>	4.	II.	B.	c., d.
<i>Evaluarea necesităților</i>	4.	II.	B.	a., c.
<i>Competiția de idei a rezidenților</i>	8.	V.	C.	a., c., d.
<i>Competiție de design</i>	8.	V.	C.	a., c., d.
<i>Oportunitate de planificare la fața locului</i>	8.	V.	C.	a., b., c.
<i>Sondaj</i>	5.	III.	C.	a., c.
<i>Implicarea comunității</i>	8.	V.	C.	a., b., c., f.
Acțiune				
<i>Testare, modelare</i>	6.	IV.	C.	a., b., c., d.
<i>Implementarea comunitară</i>	8.	V.	C.	a., b., c., d.
<i>Evenimente sportive</i>	5.	III.	C.	a., b., d.
<i>Evenimente artistice</i>	5.	III.	C.	a., b., d., i.
<i>Evenimente comunitare</i>	5.	III.	C.	a., b., d.
<i>Echipamente mobile</i>	6.	IV.	C.	a., c., d.
<i>Panouri de mesaje</i>	4.	II.	B.	a., c., d., e.
Program				
<i>Educație urbană</i>	6.	IV.	C.	a., b., c., d., i.
<i>Comunitate - programe sociale</i>	6.	IV.	C.	a., b., d., k.
<i>Programe culturale</i>	6.	IV.	C.	a., b., d., i.
<i>Programe de mediu</i>	6.	IV.	C.	a., b., d., i.
<i>Programe de istorie locală</i>	6.	IV.	C.	a., b., d., i.
<i>Programe de regenerare urbană</i>	6.	IV.	C.	a., b., c., d.

Note: ¹Scara lui Arnstein: 1. Manipulare; 2. Terapie; 3. Informare; 4. Consultare; 5. Participare deplină/plasare; 6. Parteneriat; 7. Putere delegată; 8. Control cetățenesc. (Arnstein 1969)

²Steaua de participare a lui May: I. Informare; II. Consultare; III. Decide împreună; IV. Acțiunea comună; V. Sprijinirea inițiativelor independente (May 2006)

³Scara lui D. Ridder, E. Mostert și H.A. Wolters: A. Informare; B. Consultare; C. Participare activă (Ridder et al. 2005)

⁴Experți: a. Expert în comunicare; b. Dezvoltător comunitar; c. Arhitect peisagist; d. Manager de proiect; e. Grafician; f. Antreprenor; g. Avocat; h. Politician; i. Artist; j. Realizator de filme; k. Asistent social; l. Expert în subiecte speciale.

Din punctul de vedere al arhitecturii peisagistice, este, de asemenea, interesant de observat ce instrumente de implicare necesită un arhitect peisagist: de obicei, aceștia sunt implicați la cel mai înalt nivel de implicare și în cadrul acestuia în timpul procesului de planificare.

Studiu de caz – Revitalizarea Parcului Holdudvar

Parcul Holdudvar este un spațiu verde multifuncțional situat între blocurile de pe străzile Bécsi și Vörösvári, în zona rezidențială Óbuda (**Fig. 2**). Cerințele funcționale asociate cu multiplele instituții din zonă nu au făcut decât să sporească complexitatea proiectului. Proiectarea parcului a început în 2015, cu implicarea locuitorilor din zonă într-un proces de planificare comunitară în nouă episoade. Proiectarea a fost finalizată în 2017 și adaptată la amploarea finanțării, astfel încât construcția, care a durat un an, a putut începe în primăvara anului 2019. Trei actori și-au asumat majoritatea sarcinilor legate de punerea în aplicare: Újirány Landscape Architects SRL., care a ajutat și la proiectarea comunitară, Óbuda-Békásmegyer Dezvoltare Urbană SRL., care a fost responsabilă de implementare și de implicarea publicului, și antreprenorul Pannon Park Forest SRL. (Holdudvar park blog 2019)



Fig. 2. Parcul Holdudvar situat în Districtul 3 din Budapesta (sursă: Google Maps)

Studiul de caz ilustrează bine cât de variate sunt instrumentele de implicare a publicului în cazul unei intenții bune și cât de bine pot fi aplicate în toate fazele proiectului, acoperind întreaga gamă a scării participării (cu excepția nivelurilor de neparticipare) completându-se reciproc (**Tabelul 3.**).

Tabelul 3. Instrumentele de implicare usate în realizarea parcului Holdudvar

		Nașterea proiectului	Planificare	Implementare	Viața ulterioară a proiectului
Factori de succes pentru implicarea publicului	Public				
	<i>Pliant, buletin informativ</i>		X	X	
	<i>Afișe, panouri publicitare</i>		X	X	X
	<i>Publicație</i>		X	X	X
	<i>Site web, Aplicație</i>		X	X	X
	<i>Social media</i>		X	X	X
	<i>Film</i>		X	X	
	<i>Crearea de imagine</i>		X	X	X
	<i>Forum, atelier</i>		X	X	
	Organizație				
<i>Reunirea forțelor locale</i>					

<i>Biroul de proiect local</i>				
<i>Cooperarea locală</i>				
<i>Înființarea unei asociații</i>				
<i>Reguli comunitare</i>		X	X	
<i>Implicarea experților externi</i>		X	X	
Elaborarea planului				
<i>Utilizarea cunoștințelor existente</i>		X		
<i>Evaluarea necesităților</i>		X	X	X
<i>Competiția de idei a rezidenților</i>				
<i>Competiție de design</i>				
<i>Oportunitate de planificare la fața locului</i>		X		
<i>Sondaj</i>		X	X	
<i>Implicarea comunității</i>		X	X	X
Acțiune				
<i>Testare, modelare</i>				
<i>Implementarea comunitară</i>			X	
<i>Evenimente sportive</i>				
<i>Evenimente artistice</i>			X	
<i>Evenimente comunitare</i>		X	X	X
<i>Echipamente mobile</i>				
<i>Panouri de mesaje</i>				
Program				
<i>Educație urbană</i>				
<i>Comunitate - programe sociale</i>			X	
<i>Programe culturale</i>			X	X
<i>Programe de mediu</i>			X	
<i>Programe de istorie locală</i>			X	
<i>Programe de regenerare urbană</i>				

Desigur, un proces atât de complex necesită și profesioniști, dintre care cei mai importanți sunt experții în comunicare, dezvoltatorii comunitari și arhitecții peisagiști. Arhitectul peisagist are un rol cheie în proiectarea planului, dar trebuie să joace un rol și în alți factori de succes pentru a se asigura că procesul este un succes.

Nașterea proiectului

Ideea proiectului nu a venit de la localnici, ci de la decizia consiliului municipal de a renova Parcul Holdudvar. Cu siguranță, nici locuitorii nu s-au opus, deoarece zona nu suferise o renovare majoră de la crearea sa.

Planificare

Implicarea publicului în ceea ce privește Parcul Holdudvar a fost cea mai intensă în timpul perioadei de planificare, deoarece acesta este momentul în care există o oportunitate de a cunoaște populația locală și de a face o muncă de colaborare, de planificare. Sesiunile de **planificare comunitară**, în total nouă, au inclus în sine mai multe instrumente de implicare, deoarece întregul proces a putut fi urmărit și retrăit prin intermediul înregistrărilor video ale sesiunilor de planificare

(**film**), al blogului proiectului (**site web**), al forumului "Cum ar trebui să fie Holdudvar?" pagina de Facebook (**social media**), **posterele de la fața locului și plantele** din cutiile poștale ale clădirilor învecinate. Organizatorii au invitat **experți externi** în proiectare participativă la sesiunea introductivă, localnicii au putut indica pe hărți locurile lor preferate și cele mai puțin preferate, a avut loc un sondaj la fața locului (**evaluarea nevoilor**), a avut loc o sesiune specială de planificare și comunitate cu societatea de utilitate publică EB OVO (**oportunitate de planificare la fața locului**), au fost create un logo și o imagine complet nouă pentru proiect și au fost încorporate în plan, consolidând astfel identitatea locală (**crearea de imagine**).

În timpul fazei de planificare comunitară, se elaborează de obicei un plan conceptual de arhitectură peisagistică, iar apoi, "în culise", se pregătesc documentele de proiectare, după ce au fost definite discuțiile tehnice și bugetul disponibil. Acesta este un moment important: rezidenții trebuie să fie familiarizați cu planurile, altfel pot fi foarte dezamăgiți. În cazul parcului Holdudvar, nu a existat suficient timp pentru a face acest lucru din cauza licitației și a constrângerilor financiare, iar prima ocazie de a vedea planurile de execuție a fost la ședința de organizare pre-construcție. Acest lucru a însemnat că localnicii nu au fost pregătiți pentru vestea neplăcută că planurile au fost afectate și de reducerea costurilor din cauza lipsei de finanțare.

Implementare

Perioada de construcție este o perioadă foarte sensibilă. Planurile devin, în sfârșit, realitate, iar cei implicați în procesul de planificare pot fi foarte dezamăgiți, deoarece implementarea poate fi diferită de planuri din motive tehnice sau financiare. Realitatea este întotdeauna un pic mai puțin strălucitoare și colorată decât ne-am imaginat, ceea ce s-a întâmplat și în cazul Parcului Holdudvar. Cu un astfel de context, mulți critici și "inspectori tehnici" autoprofesioniști pot apărea din echipa de proiectare inițială și este nevoie de multă răbdare și de o comunicare persistentă (**prin toate mijloacele de comunicare**) pentru a se asigura că încrederea construită în timpul procesului de proiectare nu este compromisă.

Neplăcerile cauzate de construcții (zgomot, praf, închideri etc.) pot îngreuna viața locuitorilor și, prin urmare, este important să le prevenim la un anumit nivel și să pregătim localnicii. În cazul parcului Holdudvar, acest lucru s-a realizat printr-un exercițiu de **planificare comunitară**, în cadrul căruia rezidenții locali au putut încorpora propriile opinii în planurile de organizare, de exemplu, unde să se reducă la minimum închiderile, care sunt rutele principale, la ce ore din zi să se permită lucrări mai zgomotoase. Din păcate, foarte puține persoane au venit la acest seminar, dar a fost totuși o oportunitate de a lua în considerare unele dintre cele mai importante solicitări. De asemenea, **social media** a ajutat la aducerea mult mai rapidă a oricărei chestiuni și probleme instantanee în atenția municipalității, care a putut răspunde cât de bine a putut. Au existat o mulțime de plângeri inutile, dar au existat și unele comentarii care au ajutat cu adevărat.

Începutul construcției a fost sărbătorit cu un ultim **eveniment comunitar**, un picnic de închidere a parcului, în zona care urma să fie renovată. După începerea lucrărilor, au avut loc alte activități comunitare: cu **implicarea unui expert extern** în îngrijirea arborilor, localnicii au putut să vadă și să învețe despre motivele pentru care arborii din parc trebuiau tăiați (de exemplu, bolnavi sau umbriți de alți arbori). Apoi a fost implicată și școala vecină, cu un concurs de artă pe tema 'Holdudvar Park' ('Parcul Curtea de Lună') și o plantare de copaci (**implementare comunitară**).

Pe măsură ce construcția se apropia de finalizare (**Fig. 3.**), a început un alt proces de **planificare comunitară**, în care comunitatea a trebuit să creeze un set de reguli interne (**reguli**

comunitare) pentru parc (**Fig. 4.**). Acesta este un moment important, deoarece regulile create împreună sunt respectate și aplicate cu plăcere și de bunăvoie de către participanți și, prin urmare, acest lucru servește, de asemenea, funcționalității și durabilității parcului.



Fig. 3. Parcul Holdudvar după implementare (Budapest Dialog 2020)

Viața ulterioară a proiectului

Ceremonia de inaugurare a Parcului Holdudvar din vara anului 2019 a fost însoțită de o serie de **evenimente comunitare, artistice și programe de mediu**. Cu toate acestea, continuarea a fost spulberată de Covid19.



Fig. 4. Comunitatea parcului lucrând pe regulile interne și bucurându-se de parc (sursă: ÓBDU SRL)

Concluzii

Arnstein a vrut, de asemenea, ca scara participării sale să fie o critică a politicii, motiv pentru care a atras atenția asupra manipulării care se manifestă în timpul procesului de implicare publică. De obicei, abordăm politica cu acest tip de neîncredere. În schimb, în studiul de caz, municipalitatea a folosit o varietate de mijloace pentru a implica populația locală în implementarea Parcului Holdudvar în toate fazele proiectului, cu excepția nașterii acestuia. Intenția municipalității a fost absolut pozitivă, au dorit ca locuitorii să știe despre dezvoltare și să își exprime opiniile. În timpul procesului, a fost interesant de observat că foarte puțini oameni, în comparație cu numărul de persoane implicate, s-au deranjat să participe la planificarea comunitară și la diferitele programe. Un motiv pentru acest lucru poate fi lipsa de încredere la nivelul societății și lipsa necesității de participare, care este probabil un produs al trecutului politic și istoric al Ungariei. Întrucât un alt indicator important al democrației este reducerea sentimentului de vulnerabilitate atunci când cetățenii pot influența politica, instrumentele de implicare a publicului pot juca un rol important în consolidarea încrederii și îmbunătățirea comunicării dintre administrațiile locale și locuitori (Boda Zsolt et al. 2013). Dacă încrederea crește, atunci instrumentele de implicare publică vor ajunge la mai multe persoane și vor fi mai eficiente, ceea ce va avea, de asemenea, un impact asupra calității și durabilității amenajărilor de spații verzi. (Pleasant et al. 2014; Union 2021)

Recunoștințe

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CONFERENCE VOLUME

A CASE STUDY ON THE POTENTIAL OF PUBLIC INVOLVEMENT IN GREEN SPACE DEVELOPMENT, REFLECTING TO ARNSTEIN'S LADDER OF CITIZEN PARTICIPATION

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Abstract: Green space developments have a key role to play in shaping the urban green infrastructure and enriching ecosystem services, which also benefit the physical and mental health of residents. Green space development is a complex planning and implementation process that, without proper communication and cooperation, often leads to unexpected conflicts and thus obstacles to project implementation. However, public involvement and its various tools can contribute significantly to the success of development. Experience shows that there are social and physical benefits to working with the community, with the landscape architect as a key player in this process.

In this paper we present a case study of the increasingly common tools of community engagement in green space development and their examination in the light of the best-known theory of public involvement, the Arnstein ladder and related theories. We draw on material from our own fieldwork, interviews, internet and municipal data collection.

Keywords: architecture, green infrastructure, community planning tool, project phases, level of public involvement

Introduction

The development of green infrastructure is a key issue nowadays, not only for professionals (BFVT Kft. et al. 2021), but also for city leaders and residents. The importance of urban green infrastructure has become highly valued because nature-based solutions are a real solution to the threat of climate change (Union 2021) and because it is closely linked to the concept of human welfare and well-being through ecosystem services (Millennium Ecosystem Assessment 2007).

In addition to providing and regulating ecosystem services, urban green spaces also provide cultural ecosystem services, which are significant and novel in that they promote good social relations, social cohesion, mutual respect and the ability to help others. (Millennium Ecosystem Assessment 2007) These services, which are of paramount importance to people, can be greatly enhanced by public involvement tools in green space development. (Pleasant et al. 2014) Public involvement can often have the positive effect of getting political leaders on board. (Benedict et al. 2006)

In our research, we explore the interconnection of these two areas, the implementation of public involvement¹ in green infrastructure development and the opportunities it offers. Through a case study, we want to show the tools of public involvement in a green infrastructure development project, to examine the level of involvement that can be achieved through each tool, and to highlight the large number of experts involved in the process.

Materials and Methods

The research is divided into three units: in the first part, we examine Arnstein's ladder theory and its reinterpretations; in the second part, we present the theory of phases and success factors associated with the projects; and in the third part, we show the possible application of the theories through a case study.

Literature review

In July 1969, Sherry R. Arnstein published "A Ladder of Citizen Participation" in the Journal of the American Institute of Planners. Arnstein, who had much experience in both social and political fields, stated that she designed her typology to focus on the redistribution of power and to be provocative. (Connor 1988) The eight-rung ladder of participation thus constructed revolutionized the approach to public involvement and has remained one of its most important theoretical frameworks. It is based on the idea that the greater the involvement of the public in decision-making, the higher we are on the imaginary ladder. (Dömötör 2009)

Arnstein's ladder provides strong guidelines for the involvement that may not be applicable in all areas and approaches, and many have tried to adapt his theory to their own experiences. In the literature research, we present some of the more important theories that have aimed at reinterpreting the ladder of participation.

Analysis methods

The essence of public involvement is that it creates a dialogue between different actors, and as a result of this communication, trust is developed and it is possible to learn and understand each other's points of view. We can identify four phases within the implementation of a project from a public involvement point of view: the birth of the project, planning, implementation and afterlife (Boda Zsolt et al. 2013; Horváth et al. 2018)

The possibilities for public involvement are limitless, but they can be grouped by their nature. In a previous study, when we were trying to make the processes and opportunities for public involvement more tangible for city leaders, we grouped the tools into five categories and called them success factors, suggesting that the success of a project often depends on participation. (Horváth et al. 2018)

Success factors for public involvement: public (all communication tools from information to interactive dialogue), organisation (tools to address governance and organisational issues for

¹In our research we use the term "public involvement" to refer to any means that gives members of the local community the opportunity to have a say and participate in shaping the development of the city (e.g. posters, forums). Involvement includes and is a more specific form of participatory planning, of which community planning is a concrete instrument. (Horváth et al. 2018)

effective collaboration), making plan (tools to influence the planning of the project), action (ad hoc community event to create, activate, strengthen local community) and programme (long-term action that responds to social problems in a complex way).

In the second part of our research, we investigated the levels of participation achieved by the tools grouped according to our five success factors, and therefore we applied Arnstein's ladder and May's Participation Star to them, as well as the three-rung ladder created by D. Ridder, E. Mostert and H.A. Wolters.

Case study

As a case study, we have chosen the revitalization of Holdudvar Park (23500 m²), a residential green space development project implemented by the Municipality of Óbuda-Békásmegyer, Budapest, in the framework of the TÉR_KÖZ programme of the Municipality of Budapest. During the implementation, the Municipality used a wide range of public involvement tools, so there was live communication with the stakeholders in all project phases, except for the birth of the project, where the idea for the renovation came from the city leaders.

We took several criteria into account when choosing the project. It was important that it should be part of the TÉR_KÖZ programme we were examining, which main objective was to ensure that projects are implemented on the initiative of local communities, or at least with the involvement of local residents, in order to enable more sustainable use and a higher level of acceptance of community spaces and to contribute to the strengthening of local communities. (TÉR_KÖZ web 2021)

It was also important, that the well-organised public involvement that had been going on in the 3rd District for years was a kind of guarantee that we would find well thought-out and prepared participatory activities in the background of the project. Last but not least, the fact that the entire implementation of Holdudvar Park was carried out by Óbuda-Békásmegyer Urban Development Ltd., the company I work for, gave me an insight into the processes.

Results and Discussions

Literature review – Arnstein's Ladder

Arnstein's ladder is associated with several different theories, which we have organised in **Table 1.** for more clarity.

Arnstein's theory has been interpreted in many different ways by researchers, and generally criticised in different ways, but the **Table 1.** shows that the two lower ladder 'rungs' defined by Arnstein have been virtually universally eliminated, because they do not actually refer to real involvement, but only give the appearance of it. In these two lower levels, Arnstein formulated a powerful critique of society and politics, which was necessary in his day, since it was this astonishing vision of participation that enabled him to draw the attention of politicians to the issue. Today, however, one of the main objectives of public involvement is to build trust, both on the part of citizens and city authorities, and therefore supportive, trust-building communication is needed during the participation process.

Table 1. Arnstein's Ladder and related theories

Name	Date	Shape	Number	Name of levels
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			of levels	
Sherry R. Arnstein	1969	ladder	8	1. Manipulation; 2. Therapy; 3. Information; 4. Consultation; 5. Full participation/ Placation; 6. Partnership; 7. Delegated power; 8. Citizen control (Arnstein 1969)
Desmond M. Connor	1988	ladder	7	1. Education; 2. Information feedback; 3. Consultation; 4. Joint planning; 5. Mediation; 6. Litigation; 7. Resolution/Prevention (Connor 1988)
Jules N. Pretty	1994	ladder	7	1. Manipulative participation; 2. Passive participation; 3. Participation by consultation; 4. Participation for material incentives; 5. Functional participation; 6. Interactive participation; 7. Self-mobilization (Pretty 1994)
David Wilcox	1994	ladder	5	1. Information; 2. Consultation; 3. Deciding together; 4. Acting together; 5. Supporting independent community initiatives (Wilcox 1994)
Nazneen Kanji and Laura Greenwood	2001	ladder	5	1. Compliance; 2. Consultation; 3. Cooperation; 4. Co-learning; 5. Collective action (Kanji and Greenwood 2001)
Rosalind Eyben	2003	ladder	6	1. Instrumental participation; 2. Civil and political liberties; 3. Economic rights; 4. Social rights; 5. Cultural rights; 6. Participatory rights (Eyben 2003)
John May	2004	star	5	1. Information; 2. Consultation; 3. Deciding together; 4. Acting together; 5. Supporting independent community initiatives (May 2006)
D. Ridder, E. Mostert and H.A. Wolters	2005	ladder	3	1. Information; 2. Consultation; 3. Active participation (Ridder et al. 2005)

John May arranged Wilcox's five points into a different structure, a star shape, removing the hierarchy between levels of participation. The ladder metaphor is usually the most criticised because it suggests that the top rungs of the ladder are better than the bottom rungs, and therefore progress means "climbing the ladder", with the ultimate goal of reaching the top rungs. (Tritter and McCallum 2006; Kiss 2015) By juxtaposing the levels, each one is emphasised and valued, so there is no need to rank the different tools of involvement: it is not a matter of who uses which tool, but of getting as many people as possible to see the potential of public involvement.

D. Ridder, E. Mostert and H.A. Wolters, simplifies Arnstein's theory completely, and its importance lies in the fact that in a green space development process these three concepts are much easier to use and interpret than the many more ladder levels. In the implementation of a landscape architecture project, information transfer, consultation and involvement in the public involvement and planning process are equally important, interdependent tasks that are absolutely necessary for successful implementation. This could be formally illustrated by the May theory star shape, emphasising the close interconnection of the levels (easy to remember by a well-known car brand) (Fig. 1.).

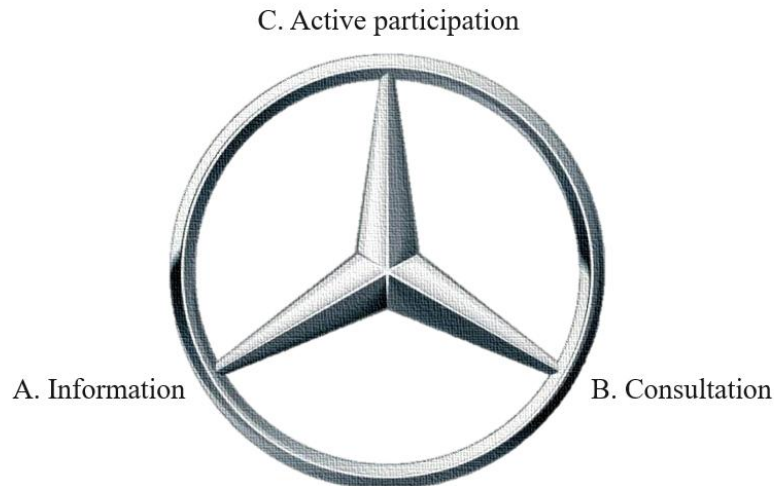


Fig. 1. Star with the three levels of D. Ridder, E. Mostert and H.A. Wolters

Analysis methods – Project phases and success factors

Finally, we have examined the tools associated with the success factors according to the three main theories, and based on our professional experience, we have identified the experts needed. The **Table 2.** clearly shows that for real involvement tools, the bottom two rungs of the Arnstein ladder are not meaningful and that the relationships between the different theories can be clearly established in a formula-like way. (A = I = 3; B = II = 4; C = III, IV, V = 5, 6, 7, 8). From a landscape architectural point of view, it is also interesting to note which involvement tools require a landscape architect: they are usually involved at the highest level of involvement and within this during the planning process.

Table 2. Tools of involvement associated with the three main theories and experts

	Arnstein ¹	May ²	D. Ridder, E. Mostert és H.A. Wolters ³	Experts ⁴	
Success factors for public involvement	Public				
	<i>Flyer, newsletter</i>	3.	I.	A.	a., e.
	<i>Posters, billboards</i>	3.	I.	A.	a., e.
	<i>Publication</i>	3.	I.	A.	a., e.
	<i>Website, Application</i>	3.	I.	A.	a., e.
	<i>Social media</i>	4.	II.	B.	a., b., e.
	<i>Film</i>	3.	I.	A.	a., j.
	<i>Image building</i>	3.	I.	A.	a., b., c., e.
	<i>Forum, workshop</i>	5.	III.	C.	a., b., c., d., e., h.
	Organisation				
	<i>Bringing local forces together</i>	6.	IV.	C.	a., b., d., g., h.
	<i>Local project office</i>	7.	IV.	C.	a., b., d., h.
	<i>Local cooperation</i>	8.	V.	C.	a., b., d., g., h.
	<i>Setting up an association</i>	8.	V.	C.	a., b., d., g., h.
	<i>Community rules</i>	8.	V.	C.	a., b., c., d., g., h.
<i>Involvement of external experts</i>	4.	II.	B.	a., b., d.	

Making plan				
<i>Use of existing knowledge</i>	4.	II.	B.	c., d.
<i>Needs assessment</i>	4.	II.	B.	a., c.
<i>Residents' ideas competition</i>	8.	V.	C.	a., c., d.
<i>Design competition</i>	8.	V.	C.	a., c., d.
<i>On-site planning opportunity</i>	8.	V.	C.	a., b., c.
<i>Poll</i>	5.	III.	C.	a., c.
<i>Community involvement</i>	8.	V.	C.	a., b., c., f.
Action				
<i>Testing, modelling</i>	6.	IV.	C.	a., b., c., d.
<i>Community implementation</i>	8.	V.	C.	a., b., c., d.
<i>Sports event</i>	5.	III.	C.	a., b., d.
<i>Art events</i>	5.	III.	C.	a., b., d., i.
<i>Community events</i>	5.	III.	C.	a., b., d.
<i>Mobile equipment</i>	6.	IV.	C.	a., c., d.
<i>Message boards</i>	4.	II.	B.	a., c., d., e.
Programme				
<i>Urban education</i>	6.	IV.	C.	a., b., c., d., i.
<i>Community - social programmes</i>	6.	IV.	C.	a., b., d., k.
<i>Cultural programmes</i>	6.	IV.	C.	a., b., d., i.
<i>Environmental programmes</i>	6.	IV.	C.	a., b., d., i.
<i>Local history programmes</i>	6.	IV.	C.	a., b., d., i.
<i>Urban regeneration programmes</i>	6.	IV.	C.	a., b., c., d.

Note: ¹Arnstein's ladder: 1. Manipulation; 2. Therapy; 3. Information; 4. Consultation; 5. Full participation/ Placation; 6. Partnership; 7. Delegated power; 8. Citizen control (Arnstein 1969)

²May's Star of participation: I. Information; II. Consultation; III. Deciding together; IV. Acting together; V. Supporting independent initiatives (May 2006)

³D. Ridder, E. Mostert and H.A. Wolters ladder: A. Information; B. Consultation; C. Active participation (Ridder et al. 2005)

⁴Experts: a. Communication expert; b. Community developer; c. Landscape architect; d. Projectmanager; e. Graphic designer; f. Contractor; g. Lawyer; h. Politician; i. Artist; j. Film maker; k. Social worker; l. Expert on the special subjects

Case study – Revitalisation of Holdudvar Park

The Holdudvar Park is a multifunctional green space located between the high rises of the Bécsi and Vörösvári streets in the Óbuda residential area (**Fig. 2.**). The functional requirements associated with the multiple institutions in the area only added to the complexity of the project. The design of the park began in 2015 with the involvement of local residents in a nine-part community planning process. The design was completed in 2017 and adapted to the scale of the funding, so that construction, which took a year, could start in spring 2019.

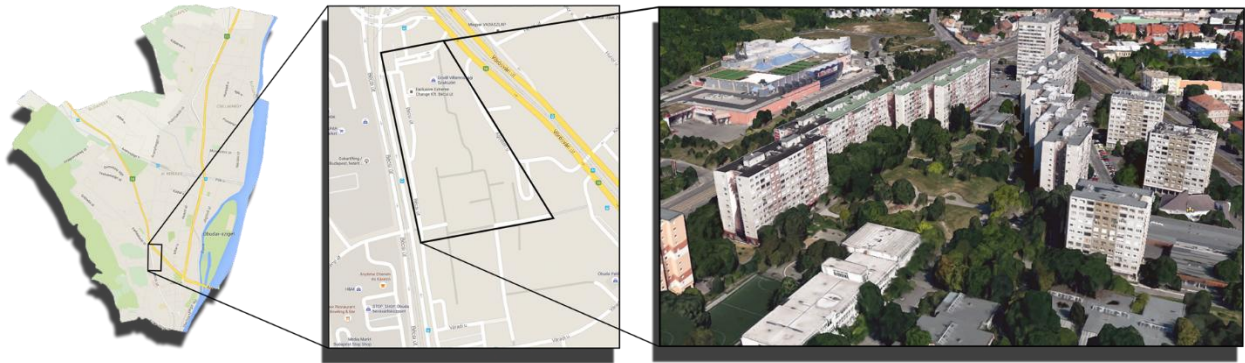


Fig. 2. Holdudvar Park situated in the 3rd district of Budapest (source: Google Maps)

Three actors took on most of the tasks in the implementation: Újirány Landscape Architects Ltd., which also helped with the community design, Óbuda-Békásmegyer Urban Development Ltd., which was responsible for the implementation and public involvement, and the contractor Pannon Park Forest Ltd. (Holdudvar park blog 2019)

The case study illustrates well how varied the public involvement tools are in case of positive intent, and how well they can be applied at all project phases, covering the whole range of the Participation Ladder (apart from the non-participation levels) while complementing each other (**Table 3**). Of course, such a complex process also requires professionals, the most important of which are communication experts, community developers and landscape architects. The landscape architect has a key role in plan design, but must also play a role in other success factors to ensure that the process is a success.

The birth of the project

The idea for the project did not come from the locals, but from the city council's decision to renovate the Holdudvar Park. Certainly, the residents were not opposed either, as the area had not undergone a major overhaul since its creation.

Planning

Public involvement regarding the Holdudvar Park was most intensive during the planning period, because this is when there is an opportunity to get to know the local people and to do some very collaborative work, the planning. The **community planning** sessions, a total of nine, in themselves included several involvement tools, as the whole process could be tracked and retraced through videos (**film**) of the planning sessions, the project blog (**website**), the "What should Holdudvar be like?" Facebook page (**social media**), **posters on site and leaflets** in the mailboxes of neighbouring buildings. The organizers invited **external experts** in participatory design to the introductory session, locals could indicate on maps their most and least favourite places, there was an on-site survey (**needs assessment**), there was a special planning and community session with the EB OVO Public Benefit Society (**on-site planning opportunity**), a logo and a whole new image were created for the project and incorporated into the plan, thus reinforcing the local identity (**image building**).

Table 3. Tools of involvement used in the realisation of Holdudvar park

	The birth of the project	Planning	Implementation	Afterlife
Success factors for public involvement	Public			
	<i>Flyer, newsletter</i>		X	X
	<i>Posters, billboards</i>		X	X
	<i>Publication</i>		X	X
	<i>Website, Application</i>		X	X
	<i>Social media</i>		X	X
	<i>Film</i>		X	X
	<i>Image building</i>		X	X
	<i>Forum, workshop</i>		X	X
	Organisation			
	<i>Bringing local forces together</i>			
	<i>Local project office</i>			
	<i>Local cooperation</i>			
	<i>Setting up an association</i>			
	<i>Community rules</i>		X	X
	<i>Involvement of external experts</i>		X	X
	Making plan			
	<i>Use of existing knowledge</i>		X	
	<i>Needs assessment</i>		X	X
	<i>Residents' ideas competition</i>			
	<i>Design competition</i>			
	<i>On-site planning opportunity</i>		X	
	<i>Poll</i>		X	X
	<i>Community involvement</i>		X	X
	Action			
	<i>Testing, modelling</i>			
	<i>Community implementation</i>			X
	<i>Sports event</i>			
	<i>Art events</i>			X
	<i>Community events</i>		X	X
	<i>Mobile equipment</i>			
	<i>Message boards</i>			
	Programme			
<i>Urban education</i>				
<i>Community - social programmes</i>			X	
<i>Cultural programmes</i>			X	
<i>Environmental programmes</i>			X	
<i>Local history programmes</i>			X	
<i>Urban regeneration programmes</i>				

During the community planning phase, a landscape architecture concept plan is usually drawn up, and then, 'behind the scenes', the design documents are prepared, after technical discussions and the available budget have been defined. This is an important moment: residents must be familiar with the plans, otherwise they can be very disappointed. In the case of the Holdudvar Park, there was not enough time to do this because of the tendering and financial constraints, and the earliest opportunity to see the implementation plans was at the pre-construction organisation meeting. This meant that locals were not prepared for the bad news that the plans also were affected by the cost-cutting due to the lack of funding.

Implementation

The construction period is a very sensitive time. Plans are finally becoming reality, and there can be a lot of disappointment for those involved in the planning process, as the implementation can differ from the plans for technical or financial reasons. Reality is always a little less shiny and colourful than we imagined which was the case with Holdudvar Park as well. With such a background, many critic and self-made 'technical inspector' can emerge from the the original design team, and it takes a lot of patience and persistent communication (**all means of publicity**) to ensure that the trust built up during the design process is not undermined.

The inconveniences caused by the construction (noise, dust, closures, etc.) can make life difficult for the residents, and it is therefore important to prevent them at some level and to prepare the locals. In the case of Holdudvar Park this was done through a **community planning** exercise where local residents were able to incorporate their own views into the organisational plans, e.g. where to keep closures to a minimum, which are the main routes, at what times of the day to allow louder works. Unfortunately, very few people came to the event, but it was still an opportunity to consider some of the more important requests. **Social media** also helped to bring any instant issue and problem to the attention of the municipality much more quickly, which was able to respond as best it could. There was also a lot of unnecessary complaining, but there were some comments that really helped.

The start of the construction was celebrated with a final **community event**, a parc closing picnic, in the area that was to be renovated. After the works had started, there were several other community activities: with the involvement of an external tree care expert (**involvement of external experts**), residents could see and learn about the reasons why the trees in the park needed to be cut down (e.g. diseased or over-shadowed by other trees). Then the neighbouring school was also involved, with an art competition on the theme of 'Holdudvar Park' (Moonyard Park) (art event) and a tree planting (**community implementation**).

As the construction was nearing completion (**Fig. 3.**), another **community planning** process began, in which the community had to create a set of house rules (**community rules**) for the park (**Fig. 4.**). This is an important moment because the rules created together are gladly and willingly followed and enforced by the participants, and therefore this also serves the functionality and sustainability of the park.

Afterlife

The inauguration ceremony of the Holdudvar Park in the summer of 2019 was accompanied by a series of **community, art events and environmental programmes**. However, the continuation was washed away by Covid19.



Fig. 3. Holdudvar park after implementation (Budapest Dialog 2020)



Fig. 4. Community of the park working on the house rules and enjoying park (source: ÓBUD Ltd.)

Conclusions

Arnstein also intended his ladder of participation as a critique of politics, which is why he drew attention to the manipulation manifesting during the process of public involvement. We usually approach politics with this kind of distrust. In contrast, in the case study, the Municipality used a variety of means to involve local people in the implementation of the Holdudvar Park in all project phases except the birth of the project. The intention of the Municipality was absolutely positive, they wanted residents to know about the development and express their views. During the process it

was interesting to see that very few people, compared to the number of people involved, bothered to participate in the community planning and the various programmes. One reason for this may be the lack of trust at a societal level and the lack of need for participation, which is probably a product of Hungary's political and historical past. Since another important indicator of democracy is the reduction of the sense of vulnerability when citizens can influence politics, public involvement tools can play an important role in building trust and improving communication between local governments and residents (Boda Zsolt et al. 2013). If trust increases, then public involvement tools will reach more people and be more effective, which will also have an impact on the quality and sustainability of green space developments (Pleasant et al. 2014; Union 2021).

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