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REFERENCES
1. INTRODUCTION

1.1 URBAN GREEN SPACE AND URBAN GREEN BELTS

Urban green space (UGS) provides countless environmental, social and economic benefits to cities and their populations. It makes residential and working environments more liveable, improves environmental performance and strengthens climate resilience.

However, natural and semi-natural green spaces of all types are increasingly under threat from ongoing urbanisation and suburbanisation, resulting in fragmented ecosystems and biodiversity loss. Thoughtful development and management of green space avoids many harmful environmental impacts and climate change related risks. Public demand is also increasing for smart urban green space governance.

The Urban Green Belts (UGB) project partners’ main objective was to improve the planning, management and decision-making capacities of the public sector related to urban green spaces, thus creating integrated sustainable UGS planning and management systems.

We call this smart urban green space governance.

After a thorough investigation into the nature of the challenges facing UGS governance, the partners jointly elaborated innovative methods and tools aimed at sustainable UGS management, focusing on the following considerations:

1. Local decision makers can benefit from a greater understanding of ‘Green Infrastructure’ (GI) as a smart tool for providing ecological, economic and social benefits through natural solutions. Therefore, a Geographical Information System-based (GIS-based) spatial planning decision-support tool was elaborated to facilitate the application of the GI approach in strategic planning.

2. Community involvement in planning and implementation is crucial for ensuring the social and economic sustainability of UGS management. Smart community-engagement techniques were elaborated to raise awareness and activate civil society organisations (CSOs) and citizens.

3. Multi-stakeholder governance is an unavoidable but underexploited tool for effectively managing UGS. Smart solutions and a training curriculum for municipalities was developed to promote cooperation in planning and management between different governance levels and sectors, and internally across various local authority departments.

1.2 OBJECTIVE OF THE MANUAL

This Smart Governance Manual presents as case studies the projects realized during the Urban Green Belt project. It organises and elaborates useful and innovative smart tools and methods for UGS management in three key areas, based on the knowledge and experience gained by the project partners. The applications of these tools and methods are illustrated through the case studies. The manual is intentionally solutions-oriented; the challenges facing local and regional authorities in urban green spaces management can be read about in depth in the Baseline study on the status quo of regional UGS governance and European good practices: [https://www.interreg-central.eu/Content.Node/UGB/Baseline-Study.pdf](https://www.interreg-central.eu/Content.Node/UGB/Baseline-Study.pdf) (Figure 1).
2. TRENDS AND KEY CONCEPTS

2.1 GENERAL ASSESSMENT OF UGS IN EUROPE

Urban green space management is a cross-cutting issue addressed by a range of policy fields, most importantly; management of natural resources; sustainable urban development; spatial development. A local authority has many roles and obligations as well as opportunities in this field, which are influenced or determined by many trends:

- Application of complex approaches
- Use of green spaces as outdoor community centres
- Conversion of derelict land into green space
- Increasing uptake of approaches aiming at participatory governance
- Re-naturing cities
- Expansion of urban agriculture
- Development of green roofs and vertical gardens
- Use of digital solutions to support UGS governance
- Activism, protest groups

More can be read about these trends in the full report.
3.1 COMBINING ACTION, TOOLS AND METHODS

While implementing the Urban Green Belt project partners identified and utilized several smart tools and methods which help overcome challenges related to the three focus areas: GIS applications, community involvement and multi-stakeholder governance.

The following sections introduce 3 collections of these tools and methods. They have been illustrated with an explanatory diagram and further explored through illustrative case studies which show how these methods and tools can be used for smart urban green space management.
3.2 GIS TOOLS - MAKING THE MOST OF DATA, INDICATORS AND ANALYSIS (G)

At the beginning of the manual it was stated that “Local decision makers can benefit from a greater understanding of ‘Green Infrastructure’ (GI) as a smart tool for providing ecological, economic and social benefits through natural solutions.”

**DATA**

**G-1 Individual data collection:** In-field data collection is possible with the help of GPS-based applications, surveys, sensors etc.

**G-2 Administrative data evaluation:** Consider the potentials of open data portals or administrative data sources (cadastres, official statistics etc.).

**G-3 Remote sensing:** creating/collectiong photos, multi-spectral/thermal images, radar, laser scanning.

**INDICATORS**

**G-4 Indicators to quantify the efforts for maintenance:** area size, type/number of species (trees, meadow etc.), specific efforts for conservation.

**G-5 Indicators to detect ecological value:** tree cover density, share of protected areas/biotopes, biodiversity.

**G-6 Indicators to assess attractiveness:** users’ satisfaction, infrastructural elements, path density.

**G-7 Indicators to measure accessibility:** bus stops in walking distance, quality/safety of access routes.

**G-8 Indicators to evaluate profitability:** soil quality, productive land/forest.

**G-9 Indicators to estimate touristic potential:** visitors’ frequency, parking space, elements of cultural/natural heritage.

**ANALYSIS**

**G-10 Overlaying data:** (weighted) calculation of multiple input data on harmonized scales to perform integrative analyses (e.g. recreation index).

**G-11 Distance analyses:** calculate distances between objects (optionally based on a road network) to find the shortest path or generate service areas.

**G-12 Statistical evaluation:** summarize data/results on e.g. community or district level to characterize and compare these units.

**G-13 Image classification:** analysis and interpretation of remotely sensed data to identify specific characteristics/structures of green space (e.g. vegetation height, types of land cover) or detect their changes in time.

**G-14 GEOVISUALISATION:** Production of paper maps or webmaps to communicate results.

*Figure 2: Application of GIS tools in smart Urban Green Space management*
3.2.1 Green space monitoring system in the Upper Salzach Valley (Austria)

The local authority
The UGB partner RSA iSPACE is a research organization providing the Salzburg State administration with GIS models and documentation for innovative UGS management. It has the mandate and network to connect local stakeholders and organise public events.

The challenge
Upper River Salzach valley covers the city of Salzburg and ten rural communities. The authorities need support in establishing a sufficient supply of high quality green space for all residents within a reasonable distance. There is a need for a common green space monitoring system that can be used for planning and management purposes, an essential tool for identifying and maintaining valuable green spaces. Support is also needed in resolving land-use priorities; settlement pressure from population growth conflicts with the need to preserve and maintain particularly important green spaces.

The solution
Development of a flexible green space monitoring system that helps to assess the values of urban, suburban, and rural green areas.

During the pilot project recommendations were put forward for this system with the help of a GIS-based methodology and green space quality indicators (e.g. recreational infrastructure, presence of water, and share of protected areas). The outputs deliver green space indices showing the recreational and landscape quality of every green space in the study area. The results of the assessment were used as input for supply analyses to identify green space accessibility for residents within a short walking distance of 400m. The results show undersupply of high quality recreational green spaces in some rural regions, as well as the need to upgrade green spaces with more infrastructural or natural elements. The green space indices have also been used to develop a matrix for defining priority zones for different green space functions like recreation, economy and habitat. It also allows an implementation of scenarios, in which the green space types can be weighted specifically and combined with supply studies or settlement development forecasts.

The recommendations include the use of a wide range of community involvement methods to supplement quantitative data. Direct democracy approaches like classrooms or workshops in the park are also recommended as a way to collect community input and feedback during public events. Multi-stakeholder involvement such as round tables and local action plans might moderate any possible arising land use conflicts.

The lessons learned
For the UGB project pilot actions, a comprehensive indicator set was developed to measure, amongst others, recreational value. This can serve as a model kit for other purposes too, like the analysis of maintenance efforts, tourism potentials or ecology. The GIS methodology and the green space indicators are also easily
transferable to other regions depending on analytical goals and available data. Establishing a reliable and well-structured database is a prerequisite for data-intensive analyses. It is also important to elaborate precisely on significant indicators of different complexity levels according to a predefined local vision.

### 3.2.2 Green Cadastre Service in Zadar County (Croatia)

**The local authority**

Zadar County Council is responsible for the Zadar FUA area. In the centre is the City of Zadar, home to over 75,000 citizens. The responsibilities of the council include county assets management, spatial and economic development planning, establishment and management of local public services.

**The challenge**

Urban Green Space in the city of Zadar would benefit from better management. A popular tourist destination with 75,000 inhabitants, improvement could be made in the area of urban planning and general tracking and management of UGS.

**The solution**

In order to organize more efficient management of urban green spaces, there had to be a clear and systematic overview of the green area status. This challenge was addressed by creating a Green Cadastre Service, a platform allowing a clear and systematic overview of Urban Green Space.

The aim was for the Green Cadastre Service to contain a **GIS system** and a map of at least two green spaces within the Zadar County area, but finally a total of 5 areas were mapped. A suitable indicator system was also set up.

**The lessons learned**

Engaging local authorities in an efficient way is challenging. Although the stakeholder meetings were successful, obtaining proper data for indicator calculations was not effective. It is necessary to access other sources.

**Further information** can be obtained at zadra@zadra.hr; Phone: +385 23 492 800

### 3.3 METHODS AND TOOLS FOR COMMUNITY INVOLVEMENT

At the beginning of the manual it was stated that “Community involvement in planning and implementation is crucial for ensuring the social and economic sustainability of UGS management.”

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**Figure 3: Possibilities for involving the community in smart Urban Green Space management**

- **SWOT analysis**
- **Questionnaire**
- **Interviews**
- **Outdoor events** - classroom in the park; parliament in the park
- **Organizing workshops** - world café; problem tree; lotus blossom; moodboard; other workshop methods
- **C-1 SWOT analysis** determines the basic characteristics of a specific situation. Use it to assess the strengths (S), weaknesses (W), opportunities (O), and threats (T) of a solution to a problem (on local, FUA, national or even international levels).
- **C-2 Questionnaire** (structured or semi-structured) allows you to probe opinions and feelings of a wider sample of people. Includes; self-administered questionnaire; online survey; semi-structured/structured questionnaire.
C-3 Interview is a (semi-)formal meeting where the interviewer aims to collect information, attitudes, wishes, ideas from interviewee(s). Includes; informal; conversational interview; standardised; open-ended interview; closed; fixed-response interview; focus-group interview.

C-4 World café is a participatory method that brings all stakeholders together in one place: it is a highly structured process creating coevolving networks of conversations.

C-5 Problem tree can be used to identify causes (the roots) and effects (the branches) with potential solutions attached as fruit to the tree.

C-6 Lotus Blossom is a creativity exercise that can be used to generate ideas growing like petals from a predetermined central theme.

C-7 Moodboard is a collage of images, words and/or samples of materials that helps the community form an emotional image and overall ‘feel’ of an intended planning design.

C-8 Ethnographic workshop is an educational, social and cultural event, when participants – together with a mentor – research, perform, present, or upgrade ethnographic/vernacular tangible or intangible elements, identified as urban cultural heritage.

C-9 Future workshop helps the community design their desired future free from constraints imposed by experts, organisations or the design team.

C-10 Format, theme, setting variation: create a non-intimidating, comfortable environment for community events. This can be achieved using format, theme, and setting variation.

C-11 Problem-solving working group with a chair from underrepresented group: engaging a chair from an underrepresented group can facilitate wider social cohesion, and improve other stakeholders’/participants’ social and cultural sensibility.

C-12 Disarm the eternal opponent by tasking them with a researched and argued explanation of their view, or request that all speakers present a solution and their contribution to its realisation.

C-13 Classroom in the forest/park is about reinterpreting a park (or any other urban green infrastructure) as a classroom and the place of meeting and developing ideas.

C-14 Parliament in the park (direct democracy) encourages and empowers people to occupy the public space while offering solutions to related problems.

JOINT MANAGEMENT

C-15 Participatory budgeting is a form of direct democracy, where citizens decide how to allocate the municipality budget.

C-16 Stewardship is thoughtful management of something that cannot be owned or is even intrinsically communal.

C-17 Community consultative assembly (CCA) is a semi-formal body comprised of community representatives, who have the necessary skills and competences or motivation to enter dialogue with other stakeholders, especially decision makers, planners, etc.

RAISE AWARENESS AND MOTIVATION

C-18 Social events and competitions: attract wider population (or specifically targeted community) to a public space (for example, lectures, picnics, markets, sports events). Organise a competition (e.g. photography, painting, modelling, and essay/literature) and invite contributions related to development or maintenance of green spaces.

C-19 Creating intergenerational ties: Creating connections between young and old facilitates skill-sharing and the identification of common solutions to green space development.

C-20 Communication tools: The Communication Plan states what and how you want to communicate to whom. The Stakeholder Map will help detect and reveal the relations between stakeholders, ambitions, motives and agendas. Adapt your problem and content to: TV and radio, local newspaper, press conference, social media (Facebook, twitter, Instagram).

3.3.1 Involving the community in Maribor (Slovenia)

The local authority

The Maribor Functional Urban Area has a total population of 240,555, almost half of which resides in the Municipality of Maribor. This is the administrative, business, educational and cultural centre of the Podravje region and considered a centre of international importance. Maribor has available GIS data of adequate quality, covering green areas designated in planning documents. Maribor Development Agency (MRA) is the regional development agency.
The lessons learned

Defining different groups of stakeholders for the particular case was relatively easy, even given the absence of residents. Animating the stakeholders (or interested target groups in general), was more challenging. Managers need to personally engage and encourage participants; indirect communication is not enough of an incentive. Visible progress and tangible results are needed to maintain involvement, unless there is a direct personal interest in the issue.

Most decision makers only value such activities when they resolve issues they are responsible for: without this the process is regarded as a burden with no concrete results.

Visibility is crucial, both for the issue and the outcomes. Visualizations proved extremely useful for both presenting a synthesis of initial input and collecting feedback on these recommendations. They are especially useful in busy public spaces. Such an approach is easily transferred to other similar areas.

Further information can be obtained at info@mra.si; phone: +38623331300

3.3.2 Witkowice Green Living Lab in Krakow (Poland)

The local authority

The Municipality of Krakow governs the second largest city in Poland with a total number of inhabitants of circa 760,000. The Krakow Municipality Greenspace Authority is responsible for UGS management and development. The average estimated distance to a green area in Krakow is 418 m. Within the UGB project it implemented pilot activities in cooperation with the Malopolska Region.

The challenge

Witkowice Forest is an UGS suffering from acts of vandalism and lack of maintenance. These problems are confounded by low public interest and awareness of the opportunities and services the forest offers. To tackle this the UGB project needs to mobilize the public and the local municipality to participate in consultations on the forest’s renewal.

The solution

The municipality employed an imaginative selection of creative tools to involve a wide range of stakeholders. Local school pupils were engaged through a survey and an art competition, reaching parents and teachers too; this was followed by a...
The local authority
The 12th district is the greenest district in Hungary’s capital, Budapest. The city’s biggest forests - the “lungs of Budapest” - can be found here, as can several parks and urban woodlands, and many urban green areas enjoy a high level of protection. Besides this the district has a significant number of informal public green spaces which also need care and attention.

The challenge
Well maintained Urban Green Space improves quality of life in a myriad of beneficial ways, but its full potential would be better realized through smart cooperation between the responsible local authorities and local citizens. Traditional ‘top-down’ approaches have proved limited and new approaches are needed for UGS management.

The solution
Involving residents in the maintenance of informal public green spaces through a Stewardship Program, with the support and supervision of the 12th District Green Office.

The Municipality and the stewards sign a bilateral cooperation agreement outlining the tasks, responsibilities and reporting of their work. Applications are ongoing and so far 26 areas were included in the Stewardship program.

Further information can be obtained at sekretariat@zzm.krakow.pl; phone: +48 12 20 10 240

forest picnic with interactive visuals for gathering input on wishes and desires for the forest, and a prize-giving ceremony for the competition winners. Running events, workshops were also organized.

Through educational forest walks residents were given the opportunity not only to increase knowledge on flora and fauna, but also identify emotionally with the forest through touch and smell.

The use of participatory budgeting and practical infrastructure developments succeeded in capturing public attention and the forest has become more popular with Krakow citizens. One particularly remarkable outcome is the new playground, a 42 000€ development voted for by residents through a participatory budgeting process. This UGB project also contributed to an overall increase in awareness of the forest’s value and the Municipality has included plans to increase it from 15 to 120 hectares in the perspective of 2040.

The lessons learned
Renewal of urban green spaces by implementing small infrastructure developments and creating an educational path proved a successful approach. This was helped significantly by engaging local inhabitants in the decision and design process, increasing their attachment and securing the longer term sustainability of the UGS.

While not necessarily simple to achieve, the UGB project’s most satisfying elements were the events that enabled the authorities to reach and popularize the area among many people, even those living far from the Witkowice forest.

Managing the implementation timeline was not without its difficulties: some infrastructure developments depended on the design and construction of a footbridge over the Bibiczanka River in accordance with relevant water and construction legislation. This was the basis for almost all other activities and proved time-consuming and complicated.

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3.3.3 Stewardship programme in Budapest (Hungary)

The local authority
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Parallel with the UGB project a GIS methodology was developed through interviews with stakeholders to identify important UGS attributes and enable more areas to be included in the Stewardship Program. To measure the selected attributes, spatial indicators were generated and visualized on thematic maps applying different GIS tools available in ArcMap10 (Figure 4).
The lessons learned
The Stewardship program as well as the GIS methodology is adaptable for other local authorities. The GIS methodology can be especially useful for those which would like to start a similar program and need to identify - or help residents identify - possible stewardship areas.

Interviews revealed that stewards need greater freedom to choose their own area and also prefer direct contact with the Municipality’s professional gardener. This improves efficiency and reduces the Green Office’s workload and control, which would be beneficial for both parties. Stewards would also welcome workshops/trainings to increase their knowledge on gardening.

Further information can be obtained at zoldpont@hegyvidek.hu, katalin.bunyevacz@gmail.com

3.4 TOOLS FOR APPLYING MULTI-STAKEHOLDER GOVERNANCE APPROACHES
At the beginning of the manual it was stated that “Multi-stakeholder governance is an unavoidable but underexploited tool for effectively managing UGS.”

MULTI-STAKEHOLDER GOVERNANCE

M-1 Local strategic partnership: Local strategic partnerships (LSPs) bring together members of the community, volunteers, representatives from the public and private sectors, and local authorities to address local problems, allocate funding, and discuss strategies and initiatives.

M-2 Local action teams: LATs, created to define effective community-led projects, aim to adopt a proactive multi-agency approach.

M-3 Urban green space strategy and local action plans: The purpose of an urban green space strategy is to confront a given situation and to put forth a vision for the future based on collective goals.

M-4 Territorial pact: A territorial pact is a multi-level agreement between local, regional, and national government organisations, to coordinate and synchronise their policy agendas.
The challenge
Local authorities are not always able to dedicate generous resources to urban green issues. Generally, only a few people in a local authority investment or environmental protection department deal with urban green spaces. They often feel isolated and unsupported.

The solution
Recognising the need for a regular and shared platform for urban green municipality officers, the leader of the Green Office initiated an informal meeting to exchange experience on urban green issues. This informal meeting between peers was so successful that the Green Office initiated the KöZöld platform. ‘Közöld’ means ‘inform!’ in Hungarian, and ‘zöld’ means ‘green’.

Four KöZöld meetings were organised between November 2017 and September 2018. All districts of Budapest are invited and so far 50% of the invitees have attended this open, facilitated platform. Each meeting has a dedicated theme; so far the following topics were covered: general environmental protection, tree cadastre, climate strategy, legislation, tree maintenance, awareness-raising, funding applications, residential programs such as the compost or shredder program and waste management.

The benefits of the KöZöld platform are clear:
- it provides a platform for exchange of knowledge and learning among local authorities,
- it creates cooperation at the same governance level,
- it facilitates transfer of good practices,
- it creates synergy: thanks to KöZöld, the municipality of Budapest capital has started to create a new strategy dedicated to the management of UGSs,
- it creates impetus for wider change: local authorities are now convinced that it is time to deal with green issues besides their compulsory tasks.

The lessons learned
The local authority is very satisfied with the outcomes of the KöZöld platform as it has concrete policy impact, not only in the 12th District, but potentially paves the way for new policies in other district level municipalities too.

It seems a very innovative step, able to generate serious impact at city level. Its success gives leverage for the concept of “Urban Green Spaces as an advocate of pro-environmental thinking” concept.

Further information can be obtained at zoldpont@hegyvidek.hu; phone: +36 1 224 5900/ 590

3.4.1 Cooperation platform in Budapest (Hungary)

The local authority
The 12th District of Budapest is the greenest district of the capital, home to large public and private urban green spaces. The local authority considers its urban green spaces a special asset, providing significant effort for planning, developing and maintaining them. In order to ensure the effective management of these green spaces the local authority created a separate department dedicated to organizing maintenance and upgrading the district’s green spaces. This department is called the Green Office and was set up to tackle and coordinate general and residential green issues separately from authority-related tasks. It is widely regarded as the most ambitious local authority UGS initiative in Hungary.

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4. COMBINING TOOLS AND METHODS

ILLUSTRATIVE CASES
When local authorities are facing UGS challenges a combination of smart tools can ensure an appropriate solution to the problem. These illustrative examples are intended to give a better insight into the limitless and exciting possibilities in applying smart tools and methods.

To create a tree database a local authority should apply proper GIS tools, engage relevant stakeholders, involve citizens in data collection and validation, and for best results cooperate with other governmental bodies.

To plan new urban green spaces a local authority should involve the community, use smart tools for the planning process, and for best results cooperate widely - horizontally and vertically.

Using some of tools described in chapter 3 such process could include:
- indicator analyses to see what is needed in the city (G-5, G-8, G-9).
- analyses of the recreational value of green spaces (G-6, G-7).
- setting up a Local Action team for the planning and implementation (M-2).
- involving citizens through the Consultation assembly (C-17).

And in more detail:
- Caring for neglected or small urban green spaces is a main challenge. Community involvement (C-15, C-16, C-17) or methods for handing over responsibilities (M-5 – M-9) may be appropriate here. GIS tools can support these activities (G-4).

- In applying integrative spatial development approaches it is essential to create charts and maps (G-14) on the status of green space supply. Make use of administrative (also non-green) data (G-2) and indicators (G-4 – G-9). For reliable data sets, get in contact with decision makers, set up local action teams (M-2), develop an urban green space strategy and local action plans (M-3).

- For smart UGS governance look for synergies between participatory approaches and digital solutions. Combine community-driven (initial) data collection approaches (G-1), apps for expressions of feelings and expectations and social media data for big data analytics.

- A great opportunity (and a common trend) is to use green spaces as outdoor community “centres”. Use questionnaires (C-2), interviews (C-3) to identify expectations and wishes of residents. Apply attractiveness indicators for a proper needs-analysis. (G-6). Increase involvement with social and cultural events (C-18), classrooms in the park (C-13), ethnographic workshop (C-8), and parliament in the park (C-14). Involve local businesses through a business improvement district (M-5) or a green barter (M-6).
To use derelict land and convert it into green space first set maintenance (G-4) and ecology indicators (G-5) for long-term evaluation. Involve the community from the outset, make a SWOT analysis (C-1) and check willingness and motivation for acting. In this case direct democracy (C-14) could be expedient, combined with social events (C-18) and with offering and promoting stewardship programmes (C-16) with the possibility of expansion of urban agriculture as well.

To develop green roofs and vertical gardens it is vital to involve the community and coordinate crucial governance issues through interviews (C-3), workshops and events (C-18, C4-C-12) and by proper communication (C-20), therefore it is useful to set up a local action team (M-2). To ensure maintenance stewardship programmes (C-16), adoption schemes (M-7) or grant programmes (M-8) could be offered.

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