D.T2.1.1 PILOT ACTIVITY CONCEPTS FOR THEMATIC WORKING GROUP 1- PILOT REGION ZADAR

Concepts of pilot actions on GIS-based models in the individual project regions and pilot sites

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1. Background and objectives

Regional specifications will be taken into account in terms of respecting the development goals from local strategies (see local assessment documents) as well as the distinct functions and benefits of UGS that shall be preserved as part of cultural heritage and identification space. Consequently, the clear definition of motivation for the TWG 1 partners' contributions to the smart GIS model will be supplied by defining local challenges, specific problems, and aspired results. GIS-based solutions particularly aim at the design of semi-automated processes to efficiently identify, analyze, and display phenomena on multiple scale levels. Integrative analyses will be conducted with the help of spatial indicators. In order to profit from public or expert knowledge and facilitate the usability, the tools to be designed should contain interactive elements. The choice of the right indicators, appropriate GIS methods, and application strategies is essential for elaborating durable solutions and preserving regional assets alongside a continuous exchange with the associated stakeholders.

After some theoretical foundations, the core of the model introduces a widespread compilation of indicators that are relevant for an integrative green space assessment. However, this indicator system is not supposed to be complete, but covers five analytic pillars that were identified as most important in the context of TWG 1 activities. It is still open for extensions and adaptations for other users. Furthermore, not all potential indicators will be applied in all pilot sites because an effective assessment needs to take into consideration aspects which may differ in every FUA, e.g. existence and quality of data, individual challenges, or benefits to be preserved. TWG 1 members will pick and test their most suitable indicators with appropriate implementation and communication techniques to tackle their challenges. The experiences from these pilot studies will directly be used to ameliorate the model.

Tackled challenges

The current work of public administration indicates on the great possibilities of improving, and this applies in particular to improvement of the human resources management system and increasing of the quality of services through the spread of information and communication technologies in public management. This can be achieved, among others, through the use of modern digital services such as GIS for monitoring the situation in the area. For that reason we plan to implement Green cadastre on chosen pilot location which covers 18.000 m2 of green areas with approximately 600 trees. In this way we expect to get a full overview of the terrain conditions for better management of green areas.

Motivation and aspired results

The chosen area, covering 18.000 m2, represents very significant touristic part of city of Zadar. Therefore, a proper planning and maintenance needs to be done. In the coming period there is a need for systematic inventory of public green areas in municipalities of FUA as well as for the continuous collection of data on their surface, organization and use in order to facilitate the identification of measures required for their sustainable management and increasing the quality of use. The whole process could be carried out through the introduction of a register or information system of public green areas which is planned to be, partially, solved by the Urban Green Belts project, to be precise with the implementation of the Green cadastre in pilot action in Zadar.

Starting point

While preparing UGB project there was no green areas under GIS system, but in the meantime from the preparation till implementation phase, some of the areas in the city center (City of Zadar) have been put in the Cadastre. Throughout UGB project, we will cover those significant areas, in accordance with the existing budget, which have not been covered so far. Since the chosen area is in touristic zone it is highly appreciated that it will be put in the Cadastre.

2. General implementation strategies

In this chapter, the concrete set of methods is described for each pilot region, which in this case is the set of indicators and the implementation and application process. Each TWG member is supposed to choose an appropriate indicator set from the model to face local challenges and work on one or more predefined thematic pillars. Alongside this thematic perspective, the model supplies many useful approaches for the technical side, too (cf. pursuit of logical and technical paths). In order to document the implementation steps in a harmonized way, a logical structure has been designed where every partner indicates the reference parameter and spatial dimension of each indicator in use as well as the corresponding data, metadata, calculation routines and display options. The choice and communication strategies should be motivated in terms of relevance for the stakeholders, especially regarding community involvement and capacity building directly linking to the project's other TWGs. This applies particularly to the key indicators because of their high analytic, descriptive, and integrative value.

Contribution to testing the model

By creating the Green Cadastre, we will get a platform for the intelligent management of urban green areas. In order to organize more efficient managing of urban green areas, there must be a clear and systematic overview of the green area status that will be achieved by establishing a cadastre. By generating specific indicators from the cadastre and taking special directions and indicators from the Model it will bring stakeholders to an easier decision making process. Our goal is to ensure the best quality decisions, as soon as possible, when managing green areas, taking all key criteria and parameters into account. This is exactly what we expect to get from the Smart Model that will be developed by this project. Besides the get aspect our goal is to contribute to successful implementation of Green Cadaster with experience we gained in last couple of years in the field of greenery protection and maintenance.

Chosen elements of the model

1. Basic *(basic figures mainly needed for inventory aspects or derivation of composite and key indicators)*:
   - Elements with positive influence on the sojourn quality (benches, playgrounds, sports facilities, etc.) [n]
   - Distance to public transport (efficient stops) [m]
   - Existence of water bodies within parks [y/n]

- Protection status of a single green space [y/n]

2. Maintenance *(inventory of UGS types, effort and costs for conservation)*:
   - Density of public trees per grid cell [n/ha]
   - Share of all public green areas per grid cell [%]
   - Age of objects within {plant class|species} [years/plant class | years/species]
   - Costs for cutting and watering per {plant class/ species} [€/m² | €/plant class | €/species]
   - Sustainability (supply of natural UGS functions):
   - Green space per capita [m²/person]
   - Soil conditions [categories]
3. Attractiveness *(accessibility, usage and satisfaction with UGS, contribution to liveability and quality of life)*:
   - Mean distance to the three closest public transport stops [m]
   - Number of children in walking distance of playgrounds [n/playground]
   - Share of residents within walking distance (500 m)/biking distance (2 km) of recreation grounds [%]
4. Profitability *(economic potential of agricultural, recreational, and touristic use of UGS)*:
   - Share of agricultural and forestry areas with good soil conditions [%]
   - Share of residential area within walking distance of 1 km from recreation grounds [%]

These indicators have been chosen based on the fact that Zadar County is mostly touristic and agricultural region. By setting these indicators we wanted to see what is our "status quo" regarding this two sectors and how do we stand in comparison with our partners from other Central European countries. Besides that, our goal is to determine where we are in order we could decide which way we want to take in future urban green planning. Due to tourism, people are moving out from Zadar s city centre. Hopefully we could stop this, among other things, with smart planning of content for children such as green playgrounds etc.

Input from the local assessment

The local assessment gives an overview of the initial state of green areas in the urban area and highlights the disadvantages that are planned to be affected both through this project and the continued work of the public services. All information that are indicated in this assessment clearly show the need for implementation of Green Cadastre in order to achieve more effective management and maintenance of green areas both in the city and in the entire urban area. The overall objective of Local assessment was to evaluate a FUA's potential in terms of UGS. This document provides a compilation of available UGS data in FUA Zadar and vision how public and private owned green spaces should be planned and managed. Some of the available basic data will be used such as total cover of green space in FUA as well as urban green space per capita and some others which will be set as basic indicators in the Model.

Role of stakeholder platform

By establishing Stakeholder Platform (SP) along the quadruple helix approach by engaging relevant public authorities, knowledge institutions, enterprises and civil organisations we ensured generation of project outputs. SP members function as important actors of knowledge transfer both to and from the transnational partnership due to their practical knowledge and networks. As they are familiar with the state of the art in the greenery sector then their presence at the meetings is clear. During the meeting they agreed that it is important for all key people from the sector to sit together and agree on future steps in order to achieve successful coordination and effective development of green areas. They have discussed indicators that are written above as they have found them optimal for the model.

Stakeholders are asked to give their critical opinion on local needs and accordingly to choose adequate indicators which will help give answers to aforementioned needs. By setting the appropriate indicators we will get more successful pilot concept and consequently also a Model.

Potential interconnection with other project activities

The goal is to adopt some of the community involvement techniques and tools made in TWG2 model and add them to those that have already been used in FUA Zadar. Hopefully some of those will be tested during the organization of Urban Green Fest where we expect huge involvement of local community. Participatory approach has been identified as crucial in the decision making process especially when bottom up approach is being applied. That approach in combination with multi - level approach is expected to give extraordinary results. Since it is not easy to achieve it, it will be interesting to see and to learn from what TWG3 model will bring. Municipalities in Zadar County are not harmonized in its work but they own a significant part of green area. TWG3 model could help facilitate and coordinate their decisions on all levels included.

3. Procedure and schedule

The most important information regarding upcoming reports that deal with the pilot activities is the suitability of the selected indicators for the defined tasks of the individual project partners. Therefore, within every pilot region, the indicators and their results need to be documented. Depending on the expressiveness/value of the result, the indicators should be assessed as suitable or not suitable for the overall goal. Within this context, it is necessary to document changes within the indicator set along with the reasons why these changes have been required (e.g. adding/changing of indicators if some lacks and needs within the already existing set are discovered during the pilot activities). Regarding technical issues, the derivation procedure also has to be documented in a detailed way in order to make it understandable and reproducible for the other partners in the working group. Also any collaborations with external people or institutions like universities and other research facilities plus their importance and additional value for the pilot actions and the final model need to be mentioned within the reports. As a last point, some evaluation indicators need to be defined and documented (e.g. the success of stakeholder platforms in terms of the number of people attending meetings).

The subsequent description of the pilot activity includes detailed descriptions of the following elements:

- **Description of the pilot activities:** Partners need to deliver an overview of the planned activities including their aim and a short description of the required steps
- **Overall measures planned:** Description of the planned execution of the pilot activities answering the following questions: How will the planned activities be conducted? Who will be involved?
- **Individual steps and timeline:** Tabular overview of individual steps along with a timeline, involved internal and external people, locations, necessity of the steps for the pilot action, and costs

- **Outcomes and interdependencies between the individual steps:** Description of the expected results of the individual steps and how/why they are important for the following tasks
- **Additional details:** Additional information like technical descriptions or more details regarding elements from the draft model chosen for implementation

Overall description and aim of the pilot activity

To create a Green Cadastre, administrative resources and modern geodetic equipment should be provided that will accelerate and facilitate the performance of this demanding project on the ground. The development of the Cadastre will take place in several phases: preparation, field work, data entry and analysis. Preparatory work is related to database preparation, exploration of existing documentation, definition of spatial objects, and elaboration of work plan. After carrying out inventory and assessments, it will be possible to manage all public green areas more responsible and have a continuous insight into the condition that will be available to everyone. The Green Cadastre created in the GIS will be able to overlap with other infrastructure layers, which will help in future urban development planning and all green operations.

The Green Cadastre Service will contain:

- Creating a GIS system
- Mapping green areas to at least two locations within the Zadar County area

The following locations will be mapped:

- Antun Gustav Matoš street - area of approximately 700 m² and about 110 trees
- Part of the Prince's Trpimir shore next to the Uskok Sailing Society- a surface of approximately 4,200 m² and about 170 trees
- Green triangle at the bottom of Dražanica bay - surface of approximately 500 m² and about 10 trees
- Sphinx Garden - approximately 7,100 sqm and about 170 trees
- Perivoj in Maestral bay with a surface of approximately 5.500 m² and with about 140 trees

There are, in total, about 18,000 m² of green areas with about 600 trees.

- Preparation for setting up a green cadastre
- Create an interactive web based green cadastre version fully accessible to the public

Individual steps

Activity	*Date*	*Responsible*	*Involved people*	*Place*	*Costs*	*Purpose*

1.Implementation of GIS for public green areas maintenance 1.1 Establishing IS - importing and customizing vector backgrounds, IS installation 1 GIS Implementation Total:	*15 days final deadline for the whole Cadastre is 31.12.2017.*	*External expert Nasadi d.o.o*	*UGB team/ Nasadi d.o.o*	*Zadar*	*Total 25.000,00 EUR for the whole Cadaster*	
2 Mapping of default green areas 2.1 Mapping - A.G.Matoša street, Prince Trpimir shore, Maestral bay, Perivoj Sphinx 2.2 Data entry and attribution of appropriate attributes 2 Mapping of default green areas total:	*90 days 15 days 105 days*	*External expert Nasadi d.o.o*	*UGB team/ Nasadi d.o.o*	*Zadar*	*Total 25.000,00 EUR for the whole Cadaster*	
3 Data processing and verification of all items to establish a green cadastre 3.1. Data processing and fulfillment of appropriate attributes 3.2. Checking all items to set up a green cadastre 3 Data processing and preparation for the establishment of a cadastre total:	*60 days 5 days 65 days*	*External expert Nasadi d.o.o*	*UGB team/ Nasadi d.o.o*	*Zadar*	*Total 25.000,00 EUR for the whole Cadaster*	
4 Implementing a Web GIS Application to View Data over the Internet 4.1 Setting up and configuring the application and adjusting the visual elements; Rental and maintenance on a SaaS model for 24 months Implementing the Web GIS Application for a Total Review:	*60 days*	*External expert Nasadi d.o.o*	*UGB team/ Nasadi d.o.o*	*Zadar*	*Total 25.000,00 EUR for the whole Cadaster*	

5. Performance Evaluation	*30 days*		*UGB team*	*Zadar*		
6. Adaptation of GIS Model	*10 days*			*Zadar*		
7. Android APP adoptation: Municipality/Private user			*UGB team (Zadar)*	*Zadar*		

Annex

CATEGORY		DESCRIPTION				METADATA			CALCULATION ROUTINE (if required)				Display/Implementation (Data Layer, GIS model, Web-Viewer, Script)	Stakeholder/target groups involved > link to other TWGs
Topic	Type	Name of the indicator [analytic elements; unit]	Reference parameter	Spatial dimension	Outcome/Importance for pilot region/FUA	Source	Currentness	Transferability options	Operation	Derivation procedure	WF	WF		
	Basic	**Elements with positive influence on the sojourn quality (benches, playgrounds, sports facilities, etc.) [n]**	none	Object level										
	Basic	**Distance to public transport (efficient stops) [m]**	none	Object level										
	Basic	**Existence of water bodies within parks [y/n]**	none	Object level	Indicates high landscape attractiveness and/or ecologic worthiness and thus serves as input for key analysis			transnational	not required					
	Basic	**Protection status of a single green space [y/n]**	none	Object level	Indicates high landscape attractiveness and/or ecologic worthiness and thus serves as input for key analysis			FUA level	not required					
Maintenance	Composite	**Density of public trees per grid cell [n/ha]**	extent of grid cell (500 m)	Grid cell (max. 1km)	Green network, shading effects			FUA level	Spatial join					
Maintenance	Composite	**Share of all public green areas per grid cell [%]**	extent of grid cell (500 m)	Grid cell (max. 1km)				transnational	Arithmetic operation					
Maintenance	Composite	**Age of objects within {plant class|species} [years/plant class | years/species]**			The age analysis of all objects within the plant class "trees" is useful for public maintenance reasons. Object-level studies of other plant classes may be possible, too.									
Maintenance	Composite	**Costs for cutting and watering per {plant class|species} [€/m² | €/plant class | €/species]**												
Sustainability	Composite	**Green space per capita [m²/person]**	population	Grid cell (max. 1km)	Fair supply of inhabitancy with green			FUA level	Arithmetic operation					
Sustainability	Composite	**Soil conditions [categories]**												
Attractiveness	Composite	**Mean distance to the 3 closest public transport stops [m]**	none	Object level				transnational	Network analysis & Arithmetic Overlay					
Attractiveness	Composite	**Number of children in walking distance of playgrounds [n/playground]**	playground	Object level				FUA level	Network analysis & Arithmetic overlay					

Attractiveness	Composite	**Share of residents within walking distance (500m) / biking distance (2km) of recreation grounds [%]**	population	Pilot site				FUA level	Network analysis & Arithmetic Overlay					
Profitability	Composite	**Share of agricultural and forestry areas with good soil conditions [%]**	extent of all agricultural & forestry areas	All municipalities in FUA				local level	Arithmetic operation & Spatial Join					
Profitability	Composite	**Share of residential area within walking distance of 1km from recreation grounds [%]**	extent of (all zones in) service area	Object level				transnational	Network analysis & Arithmetic overlay					
Maintenance	Key	**Effort for Maintenance**	none	FUA	Integrative analysis based on weighted overlay of specific indicators				Weighted overlay	Weighted overlay of relevant indicators with specific weighting factors (see columns at right)			GIS Model & Result Layer	
Attractiveness	Key	**Recreation value**	none	FUA	Integrative analysis based on weighted overlay of specific indicators				Weighted overlay	Weighted overlay of relevant indicators with specific weighting factors (see columns at right)	#REF!		GIS Model & Result Layer	
Profitability	Key	**Potential of touristic usage**	none	FUA	Integrative analysis based on weighted overlay of specific indicators				Weighted overlay	Weighted overlay of relevant indicators with specific weighting factors (see columns at right)			GIS Model & Result Layer	
Fair supply	Key	**Fullfilment of demand of various UGS functions**	none	FUA	Integrative analysis based on weighted overlay of specific indicators				Weighted overlay	Weighted overlay of relevant indicators with specific weighting factors (see columns at right)			GIS Model & Result Layer	