

GREEN SURGE

Deliverable 7.2:

ITERATIVE PLACE-BASED KNOWLEDGE GATHERING IN URBAN LEARNING LABS

Identified research needs of, and available background information on, Urban Learning Labs

Work package 7:

Partners involved:

Researchers:

Urban Learning Labs

FCRA, UNIBA, UL, SLU, TUB, COMB, SWUP, ICLEI Europe

Alexander van der Jagt, Mike Smith, Chloe Bellamy, Darren Moseley, Duncan Ray (all FCRA); Yole Debellis, Raffaele Laforteza (all UNIBA); Alexandra Botzat, Leonie Fischer, Ingo Kowarik (all TUB), Martin Seebauer (SWUP), Tim Delshammar (SLU); Anders Mårsén (COMB); Rozalija Cvejić, Špela Železnikar, Marina Pintar (all UL); Barbara Anton, Alice Reil (all ICLEI Europe)

Description:

This report outlines how iterative place-based knowledge gathering using targeted engagement with potential end-users and research activities has prompted profiling and identification of key areas of interest in each ULL (ENV.2013.6.2-5-603567) GREEN SURGE project (2013-2017).



Primary authors: Alexander van der Jagt (FCRA), Alexandra Botzat (TUB), Yole DeBellis (UNIBA), Rozalija Cvejić (UL), Anders Mårsén (COMB)

January 2016

TABLE OF CONTENTS

1	Introduction	5
1.1	Purpose and contents of this Deliverable	5
1.2	ULLs and focal LAs: Commonalities and differences	7
1.3	Overview of GREEN SURGE Deliverables and planned activities	9
1.4	Overview of ULL syntheses	11
2	ULL updates: Bari	14
2.1	Background	14
2.1.1	Focal Learning Alliance compared to Urban Learning Lab	14
2.1.2	Key insights from other GREEN SURGE WPs	18
2.1.3	Key insights from external research	21
2.1.4	Workshop on identifying key issues	22
2.1.5	ULL synthesis	22
2.2	Research needs	23
2.2.1	Elements of key interest in future GREEN SURGE research	23
2.2.2	Opportunities for engagement with GREEN SURGE research	24
3	ULL updates: Berlin	25
3.1	Background	25
3.1.1	Focal Learning Alliance compared to Urban Learning Lab	25
3.1.2	Key insights from other GREEN SURGE WPs	27
3.1.3	Key insights from external research	32
3.1.4	Workshop on identifying key issues	36
3.1.5	ULL synthesis	38
3.2	Research needs	39
3.2.1	Elements of key interest in future GS-research	39
3.2.2	Opportunities for engagement with GS-research	40
4	ULL updates: Edinburgh	41
4.1	Background	41
4.1.1	Focal Learning Alliance compared to Urban Learning Lab	41
4.1.2	Key insights from other GREEN SURGE WPs	42
4.1.3	Key insights from external research	46

4.1.4	Workshop on identifying key issues	48
4.1.5	ULL synthesis	52
4.2	Research needs	53
4.2.1	Elements of key interest in future GS-research	53
4.2.2	Opportunities for engagement with GREEN SURGE research	55
5	ULL updates: Ljubljana	56
5.1	Background	56
5.1.1	Focal Learning Alliance compared to Urban Learning Lab	56
5.1.2	Key insights from other GREEN SURGE WPs	61
5.1.3	Key insights from external research	65
5.1.4	Workshop on identifying key issues	65
5.1.5	ULL synthesis	73
5.2	Research needs	74
5.2.1	Elements of key interest in future GS-research	74
5.2.2	Opportunities for engagement with GS-research	74
6	ULL updates: Malmö	75
6.1	Background	75
6.1.1	Focal Learning Alliance compared to Urban Learning Lab	75
6.1.2	Key insights from other GREEN SURGE WPs	76
6.1.3	Key insights from external research	76
6.1.4	Workshop on identifying key issues	76
6.1.5	ULL synthesis	78
6.2	Research needs	78
6.2.1	Elements of key interest in future GS-research	78
6.2.2	Opportunities for engagement with GS-research	79
7	Conclusion	80

SUMMARY

This Deliverable serves the purpose of facilitating knowledge exchange between Urban Learning Lab (ULL) Coordinators, who are engaging with urban green infrastructure (UGI) stakeholders in five European ULL cities, and the other researchers within GREEN SURGE. A framework to help understanding the knowledge needs in each of these cities is introduced, describing how different elements of local knowledge can be combined to make a judgement based on knowledge and experience. Given the different ways that ULLs and Focal LAs (Learning Alliances) have developed across the five cities, we then presented shared definitions of the ULL and the Focal LA, as well as the features that distinguish them. The present report also includes an overview of key findings from GREEN SURGE WPs 2-6.

Next, the supply and demand of knowledge is described for each of the five ULLs from which key interests at ULL level are synthesized. These so-called ULL syntheses are expected to aid in shaping future research and practitioner support provided by GREEN SURGE, and are therefore central to this Deliverable. The demand of knowledge by ULL stakeholders has been gleaned from the central topic of the Focal LA, as well as ULL workshops organized with this specific purpose in mind. Research already supplied by GREEN SURGE also revealed key areas of interest at ULL level, as well as specific external research carried out by researchers in these cities. The ULL synthesis is used to suggest new ideas for research within, and engagement with stakeholders by, GREEN SURGE WPs 2-6. These, combined with the ULL synthesis, are envisioned to be at the basis of discussions between all GREEN SURGE researchers around shaping activities as part of the Tier 3 stage of our research.

We conclude by reflecting on the variation between ULL-cities regarding i) the role of the Focal LA within the ULL, ii) topics of key interest, and iii) opportunities for engagement. This Deliverable demonstrates that, where opportunities have arisen, GREEN SURGE has been successful in joining existing partnership initiatives aimed at UGI improvements. It also reveals an apparent positive relationship between pre-existing empowerment of non-governmental actors in UGI decision-making and success in engaging a wide range of actors. Key topics of interest across the ULLs included: i) inspiring examples and practical tools to better integrate the concept of ecosystem services in spatial planning practice, and ii) methods and tools that empower non-governmental actors to take on aspects of green space development and maintenance, including financing. There was also widespread interest in the themes of biocultural diversity and urban agriculture. The GREEN SURGE consortium is faced with the challenge of presenting research findings in more accessible language and formats to UGI practitioners. Equally, ULL coordinators need to intensify communications with researchers in the other WPs regarding stakeholder activities. Finally, ULL coordinators highlighted the need for practitioner engagement beyond the mere sharing of ideas, in order to overcome any institutional or regulatory barriers that could stand in the way of meaningful change to the status quo regarding UGI management.

KEY CONCEPTS, ABBREVIATIONS AND DEFINITIONS

URBAN GREEN SPACE (UGS): A piece of open vegetated land in a city. Urban green space includes different components, such as parks, community or allotment gardens, urban forests, street trees, lawns, and cemeteries (Kabisch et al., 2014).

URBAN GREEN INFRASTRUCTURE (UGI): An interconnected network of green spaces, which together deliver ecosystem benefits to society [at the level of the city region] (Lafortezza et al., 2013)

BIOCULTURAL DIVERSITY (BCD): A research concept emphasizing variability among cultural groups with respect to their value system, cultural practices, mechanisms and knowledge related to different levels of biodiversity (Cocks and Wiersum, 2014)

ECOSYSTEM SERVICES (ESS): The benefits people derive from the functioning of nature or from ecosystem processes, including provisioning services, regulating services, habitat or supporting services and cultural services (TEEB, 2011)

GREEN ECONOMY: An economy that aims to improve human wellbeing and social equity while significantly reducing environmental risks and ecological scarcities. In its simplest expression, a green economy is low-carbon, resource efficient, and socially inclusive (Andersson et al., 2015)

PARTICIPATORY GOVERNANCE: Arrangements in which citizens, entrepreneurs, NGOs and other non-governmental parties develop and manage networks of urban green spaces at different levels, with or without the involvement of formal authorities (Buizer et al., 2015)

URBAN LEARNING LAB (ULL): A dynamic group of urban green space stakeholders in a given city region, comprising members affiliated with different types of organisations (e.g., NGO, local government or community group) and having varied stakes in urban green infrastructure (UGI), open to learn more about aspects of UGI development and maintenance

LEARNING ALLIANCE (LA): A clearly defined stakeholder group working together with researchers on a particular problem of high complexity by mutually exchanging knowledge and influencing practical decision-making

FOCAL LEARNING ALLIANCE: An output-oriented and formally established LA with clearly defined goal(s) and an action plan, which is facilitated and documented in line with steps outlined in process documentation

1 INTRODUCTION

1.1 Purpose and contents of this Deliverable

GREEN SURGE has introduced five Urban Learning Labs (ULLs) to aid the planning and governance of urban green infrastructure (UGI). ULLs enable end-users to learn from good practice and participate in the development of new tools and methods suited to local needs by the GREEN SURGE consortium. The GREEN SURGE consortium has delivered knowledge on the linkages between UGI and biocultural diversity, human well-being, social cohesion, climate change adaptation and the green economy. The current situation of, and trends influencing, UGI planning and participatory governance have been described as well. Considerable progress has also been made towards identifying and profiling good practice examples of UGI planning, governance, valuation and market integration. Meanwhile, ULL coordinators have begun the process of bringing together, and arousing the interests of, urban green space stakeholders that could act as potential co-developers and end-users of GREEN SURGE tools and methods. The main focus of this Deliverable is to describe the processes of convening local UGI stakeholders meetings and identifying broadly agreed UGI knowledge gaps in each of the five ULL-cities.

Deliverable 7.1 (Smith et al., 2015) served to describe the process of identifying and documenting UGI stakeholder composition and structure for the establishment of Learning Alliances (LAs) of the ULLs. The concept of LA is used in GREEN SURGE to refer to a clearly defined stakeholder group working together with researchers on a particular problem of high complexity by mutually exchanging knowledge and influencing practical decision-making (see Section 1.2).¹ A step-wise approach was taken; starting with a ULL Matrix to identify relevant UGI stakeholders associated with different UGI themes and their level of governance, through to mind maps, power-interest matrices and Venn Diagrams to capture relationships between stakeholders, as well as their strength, and importance of stakeholders in UGI decision-making processes. These stakeholder diagrams were prepared and presented for each of the ULL-cities – Bari (Italy), Berlin (Germany), Edinburgh (United Kingdom), Ljubljana (Slovenia) and Malmö (Sweden) – selected given their variability in governance culture, urban growth pattern, level of per capita urban green space provision and density of core city. One of the conclusions of Deliverable 7.1 was that the process of developing the ULLs progresses at different rates in each of the five cities, reflecting the complex nature of stakeholder engagement.

In the present Deliverable, the coordinators from the five ULLs describe the knowledge collected and fed into each of the stakeholder platforms. It covers knowledge demands by stakeholders in the focal LA and the wider ULL as well as the supply of knowledge from the GREEN SURGE Tier 1 stage of research. On the basis of an analysis of knowledge demands as expressed directly in ULL workshops, focal LA meetings, informal communications, as well as indirectly through secondary literature, interviews and surveys carried out as part of GREEN SURGE research, each ULL coordinator has reflected upon the central UGI issues for their location. Key areas of interest by local stakeholders have been described in the ULL synthesis (see Figure 1). This is used as the basis

¹ In the scientific literature, a Learning Alliance has been defined more broadly as: “grouping of constituent organisations from a given system that seeks to effect widespread impact through the adaptation and up-scaling of an innovative approach” (Butterworth and Morris, 2007).

for outlining support requirements (e.g., tools, best practice examples), targeted at each of the GREEN SURGE work packages (WPs). Doing so, this Deliverable lays the groundwork for integrating activities within the focal LAs and ULLs with those in GREEN SURGE WPs 2-6. It provides windows of opportunities for developing, testing and implementing innovative UGI planning, governance and valuation approaches to enhance the quality of UGI within the five ULLs.

Figure 1 shows the dynamic and continuous process of distilling the key areas of interest of each ULL by the ULL coordinator, as described in the ULL synthesis. The ULL synthesis was prepared on the basis of information gleaned directly from interacting with urban green space stakeholders in each ULL at workshop(s) organized to this end. In addition, it factored in the key topic of interest to the stakeholders of the focal Learning Alliance (LA). We also considered the supply of knowledge from GREEN SURGE and other research projects (top-right hand of figure). We did so because the contents of secondary literature and the views of practitioners captured in interviews and surveys carried out as part of GREEN SURGE research provide relevant information about topics of interest to ULL stakeholders. Sharing this information with ULL members can also potentially stimulate new areas of interest to emerge. We also considered external research conducted with regard to the ULL city as this may reveal something about core areas of knowledge demand locally, especially if these studies have been commissioned by UGI stakeholders operating in the ULL city. The identification of key areas of interest as specified in the ULL synthesis is expected to facilitate the process of delivering knowledge that is of practical value to the ULLs at the supply side. It will also provide a focus for selecting and moulding the information to be disseminated to stakeholders in the ULL (and LA) at the demand side. The envisioned end-result is a strengthened link between the supply and demand of knowledge (green dotted arrow).

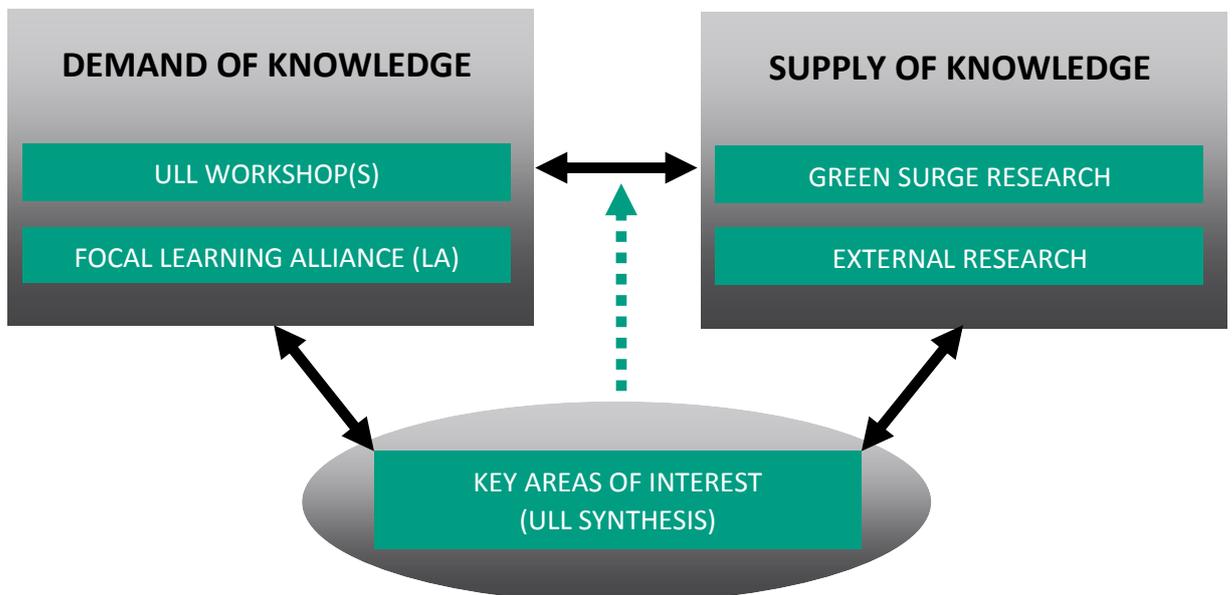


FIGURE 1. DIAGRAM SHOWING THE DYNAMIC AND CONTINUOUS PROCESS OF DISTILLING THE KEY AREAS OF INTEREST OF EACH ULL BY THE ULL COORDINATOR, AS DESCRIBED IN THE ULL SYNTHESIS.

This Deliverable contains ULL-specific chapters that will touch upon each of the components in Figure 1 for each of the ULLs. This has been done to describe the ULL syntheses as well as the information used to distil these. The ULLs are in various stages of establishing their ULLs and associated LAs, and any setbacks in this process are described, where applicable. Before presenting the ULL-specific information in Chapters 2-6, the ULL approach will be discussed. We identified a need for doing so as recent communications with co-researchers in GREEN SURGE revealed some confusion over the ULL concept, in particular with regard to the distinction between ULL and focal LA. We also present an overview of finalised GREEN SURGE deliverables and planned engagement with WPs. This was included to avoid replication of contents; frequent reference is made to these deliverables in the individual ULL chapters. The Introduction will conclude with an overview of ULL syntheses from each of the ULL-cities, providing a starting point for interpreting the research needs presented in the ULL-specific chapters.

1.2 ULLs and focal LAs: Commonalities and differences

In the GREEN SURGE Description of Work (DoW), the objective of WP7 is described in the following way: “To facilitate collaborative learning and knowledge production between practitioners, policy makers, researchers and other stakeholders who collaborate with each other under the umbrella of an LA. Through a range of different learning processes, top-down research-led knowledge comes together with, and is tested against, bottom-up stakeholder knowledge through a series of four workshops in each of the five ULLs”. With regard to the ULLs it states that: “The ULLs will individually address different levels of UGI planning and governance – city regional, city, and project level”, and: “The [LA] approach will be applied in each of the ULLs for different projects or priorities”. It can be deduced from the above that researchers in the ULL will collaborate with researchers from other GREEN SURGE WPs and multiple stakeholder groups – labelled LAs – in shaping research questions and finding local applications for research findings at different spatial levels. As stated in the DoW: “The ULLs provide a platform for an iterative implementation and testing process for UGI and promotion of BCD [biocultural diversity], using the LA approach.”

Early on in the project, the decision was made to focus the assessment and documentation of strategic approaches to UGI improvements, for which expertise is provided by ICLEI Europe, on one particular “hot topic” with relevance to UGI in each ULL-city. It was envisaged to document the process of stakeholders and researchers engaging in joint development of measures, such as new policies or an on-the-ground initiative, to address this UGI issue in this so-called *focal* LA. To this end, ICLEI Europe has taken the lead in preparing focal LA profiles, capturing participation over time and updated every three months, covering the main issues addressed, the main goal, envisaged output, identified knowledge gaps and interests in specific research by WPs 2-7 for each of the focal LAs. This information is summarized in table format and shared with other researchers in the GREEN SURGE consortium. The social network analysis performed as part of D7.1 provides a second method, tailored towards assessing impact, applied to monitor the focal LA-process. ICLEI Europe facilitates the focal LA process by providing supervision and guidance to LA facilitators by means of a focal LA process guidance document, regular Skype meetings and workshops aimed at sharing experiences and ideas around such as issues as maintaining the interest and commitment of stakeholders in a focal LA over time.

ULL coordinators and focal LA facilitators also agreed to the idea that the ULL will cover a variety of stakeholders in green infrastructure within the entire city (region). The ULL workshops written into the DoW ideally serve to learn about key issues in the city and explore a range of possible collaborations between researchers and end-users. The ULL can therefore be defined as a dynamic group of urban green space stakeholders in a given city (region), comprising members affiliated with different types of organisations (e.g., NGO, local government or community group) and having varied stakes in UGI, open to learn more about aspects of UGI development and maintenance. ULL workshops will ideally prompt new LAs – collaborations between select groups of stakeholders and researchers – meeting demand for moulding and testing research ideas by GREEN SURGE researchers to different local contexts as well as delivering UGI improvements on the ground. Learning experiences from facilitating the already established focal LA in each of the ULLs will enable ULL coordinators to more effectively facilitate partnership working in the future LAs to be established as part of Tier 3 of GREEN SURGE research. The key differences between ULLs and focal LAs have been summarized in Table 1.

TABLE 1. OVERVIEW OF THE KEY DIFFERENCES BETWEEN URBAN LEARNING LABS (ULLS) AND FOCAL LEARNING ALLIANCES (LAS).

Characteristic	ULL	Focal LA
Stakeholder composition	Dynamic	Fixed
Scale	City (region)	City (region) or local
Influence	Instrumental (leading to direct action) or Conceptual (leading to learning that could be later applied)	Instrumental (leading to direct action)
Process documentation	Workshop reports in Deliverables and on GREEN SURGE website; as part of research dissemination	Detailed and regular by means of profiling and documentation of workshops
Key topic(s)	Broad and shallow	Narrow and deep
Members	A large group of stakeholders in urban green infrastructure (UGI) affiliated with with different types of organisations (e.g., NGO, local government or community group) and having varied stakes in UGI	A small group of stakeholders in UGI affiliated with different types of organisations (e.g., NGO, local government or community group) sharing an interest in a specific key aspect of UGI implementation
LAs as sub-groups	Yes, focusing on specific aspects of UGI implementation	No
Process of platform establishment	Opportunistic	Defined

1.3 Overview of GREEN SURGE Deliverables and planned activities

To prevent repetitive descriptive coverage of (planned) Deliverables and research activities by the GREEN SURGE WPs in each of the ULL-specific chapters, this section provides an overview of key Deliverables and planned activities within WPs 2-6.

As part of *WP2 on assessment of biocultural diversity (BCD)*, GREEN SURGE is aiming at conceptualising BCD to better understand and describe the linkages between biological and cultural diversity. The current lack of an in-depth understanding of the people-biodiversity interface in cities prevents the concept from being applied in planning and policy-making. D2.1 (month 14) introduces three pillars to conceptualize BCD: 1) Manifestations of BCD, 2) Maintenance of BCD and 3) Creations of BCD. The first of these, Manifestations of BCD, is concerned with use, perception and valuation of urban biodiversity by different cultural groups. The second pillar, Maintenance of BCD, was introduced to capture the influence of cultural practices (i.e., planning and governance mechanisms) on BCD. Finally, the Creations of BCD pillar highlights the need to investigate the process of how different actors from varying cultural backgrounds ‘co-create’ BCD. The upcoming deliverable (D2.2, month 26) will provide an assessment of the interaction between urban green space components and BCD. It will cover the results of a comparative field study in the five ULLs to examine how different levels of BCD within selected green spaces (e.g., species-poor versus species-rich grassland in parks) are valued and used by residents with different cultural backgrounds and socio-economic status. This will also include the results of a field study conducted in Helsinki and Lisbon on how residents (from different cultural backgrounds) perceive and judge biological and cultural diversity, as well as use and value parks. In the final stage of the GREEN SURGE project, WP2 will focus on preparing a BCD typology, which will provide tools for identifying BCD to be applied by practitioners in the ULLs.

The focus of *WP3* is on exploring *the functional linkages between urban green spaces, BCD and ecosystem services (ESS)*. D3.1 (month 17) introduced a typology of green spaces, as well as an overview of the ESS each of these green space types provide. This acts as the basis of analysis of different types of urban green space within GREEN SURGE. In addition, the Deliverable covered the results of an analysis of spatial data from the Urban Atlas 2006 dataset regarding availability of different green space types across different cities in Europe. Finally, D3.1 also presents data on different urban (green) land uses, accessibility of green space and per capita green space for the different planning families and the ULL-cities. Other relevant findings, to be covered by D3.2, have been reported in MS25 (month 20). This provides an inventory of functional linkages. Of particular interest is the correlational analysis between urban land use and climate characteristics; a negative relationship was established between forest cover and temperatures; whilst agricultural, semi-natural areas and wetlands predicted temperatures positively. Planned activities in WP3 include, amongst other things, studying the relationship between UGI and health of first graders and studying cooling functions of different types of urban green space. Methods can be easily transferred to different city contexts depending on interests of ULL-stakeholders.

Having *contributing to the green economy* as the central topic, *WP4* is about improving methods for valuation of UGI as well as collating knowledge on successful approaches to unlocking cash flows from UGI. D4.1 (month 24) provided a first insight into financial benefits associated with different types of UGI, which is illustrated with examples showing how stormwater infrastruc-

ture is used to avoid costs, urban gardening initiatives provide profits and/or lead to cost savings and consultants gain an income from providing a broad range of services aimed at improving UGI. D4.2 (month 22) was concerned with understanding cash flows from UGI. Exploratory studies have been performed to establish whether cafés cluster around, and whether Research and Development companies prefer to locate their premises nearby urban green spaces. The findings of a survey on perceptions of café owners and staff regarding the importance of proximity to green space, also examining effect of location on the price of a coffee, were described as well. The Deliverable also included a study on hedonic pricing that served to test the assumption that people are willing to pay more for property to live close to urban green spaces. In future work, the main focus will be on further developing valuation methods, as well as developing the rights and obligations framework in more detail. WP4 is seeking to collaborate with the ULLs interested in applying methods, such as innovative and expanded hedonic pricing tool, to their own location. There is also a desire for collaboration around learning more about framing messages with regard to green economy to engage different types of actors with the topic, and experimenting with valuation tools taking into account the added financial benefits of interconnected urban green spaces.

WP5 is concerned with *green infrastructure planning and implementation*. The aims of this WP are to identify the status of UGI planning, identify good practices and share these in an accessible format. D5.1 (month 15) provided an overview of the current status of UGI planning, which was gleaned from structured interviews with UGI professionals, desk studies of secondary literature and analysis of UGI plans and strategies in the 20 Tier 1 cities. The status of UGI planning is evaluated against elements from a conceptual framework introduced for this purpose. This considers: 1) policy objectives relevant to addressing UGI challenges (e.g., BCD, green economy, climate change adaptation), 2) planning principles relevant to establishing UGI (e.g., connectivity, multifunctionality), 3) principles relevant to the UGI planning process (e.g., socially inclusive, interdisciplinary) and 4) approaches taken to implement UGI plans into actions (e.g., action planning, monitoring and evaluation). D5.2 (month 27) will build upon this work by providing in-depth case studies showcasing good practice examples of UGI planning with relevance to four planning principles and four policy objectives (14 cases). At this Tier 2 stage of research, GREEN SURGE will provide two outputs: a report providing cross-case comparisons and a practitioner's guide in accessible language acting as a living document to be tested and refined in the Tier 3 stage of research. Ideally, some of the strategies described in the practitioner's guide will be used as the basis for new strategy development in one or more of the ULL-cities. Any barriers to new strategy implementation will be identified and recorded; support and expertise will be provided to overcome these, where possible.

By exploring the potential of involving non-governmental actors in UGI development and maintenance, WP6 is capturing *innovative governance of urban green spaces and BCD* in European cities. Having used a similar method to data collection as WP5 at the Tier 1 stage of research, the current status of participatory governance of UGI was examined and reported in D6.1 (month 12). This was done on the basis of four research questions: 1) Which trends affect the participatory governance practices and policies with regard to UGI in the EU? 2) What are the different ways in which non-governmental actors contribute to UGI maintenance and improvement? 3) What actors and coalitions are involved in UGI governance and who initiates what projects? And 4) what are the intended outcomes of green space initiatives involving non-governmental ac-

tors? As part of D6.2 (month 27), researchers from WP6 have been preparing in-depth case studies of innovative approaches in five clusters of participatory governance practices of interest to local governments (18 cases): 1) participatory planning and budgeting; 2) community management of parks, woodlands, nature areas and other urban green space; 3) community supported urban agriculture; 4) involvement of business actors as partners in the co-decision process; and 5) e-governance through the use of information and communication technologies. Commonalities and differences, links with planning, perceived effects, factors explaining success and learning capacity will be extracted and described for the cases within each cluster in a report. At the Tier 3 stage of WP6 research, guidelines on appropriate and effective governance arrangements for UGI and urban green space will be developed in close collaboration with the ULLs and/or focal LAs. In addition, WP6 will offer direct support to implement participatory governance in the ULL-cities if needed. For example, by developing participatory governance tools and methods suited to local context, investigating opportunities and effects of existing initiatives involving non-governmental actors in UGI development and sharing learning about overcoming barriers to new governance approaches.

1.4 Overview of ULL syntheses

In Deliverable 7.1, an initial overview was presented of the five ULLs, their city descriptions, main issues to be addressed and local project areas. This table has been updated to reflect key points from the ULL syntheses in the current Deliverable (Table 2). As illustrated in Figure 1, the ULL synthesis is both the starting and end-point of evaluating the relevance of research and shaping future research by GREEN SURGE WPs 2-6. The contents presented in Table 2 therefore provide a framework against which to interpret the results outlined in each of the ULL-specific chapters.

TABLE 2. CHARACTERISATION OF THE FIVE ULL CITIES

City	Characteristics and issues in focus
Bari, Italy	<p>City description: The second largest city in Southern Europe (Apulia region) with a population of approximately 400,000. Bari is a major port on the Adriatic Sea and connects to other ports using railways, motorways and shipping. It has become one of the top commercial and industrial cities in Italy.</p> <p>Spatial focus and actors: City-wide, engaging the local authority (Municipality), public and private organisations and institutions (e.g., NGOs, schools), community associations, and (ideally) local residents.</p> <p>Key areas of interest: Creating innovative practices and strategies for the development and management of residual urban spaces planned to be realised as green spaces but never completed. These areas are part of complex urbanization programmes that foresee the co-participation of the public and private sectors in building new neighbourhoods. Implementing practices of community design and the management of public green space using place-making methods.</p>
Berlin, Germany	<p>City description: A large Central European city with a population of 3.5 million that has recently started growing again. There are strong differences within the</p>

city region in terms of population numbers.

Spatial focus and actors: The district of Marzahn-Hellersdorf, which is one of the main transformation areas in the eastern rim of Berlin. The ULL comprises members from local government at the Senate and district level, environmental and cultural NGOs as well as members associated with other initiatives related to the themes of interest.

Key areas of interest: The potential, transformation and protection of under-used former industrial, commercial or residential urban wastelands – a new type of urban ecosystem – into new urban spaces; the potential of urban green infrastructure for conservation and connectivity; opportunities for biodiversity-friendly management of urban green infrastructure, such as by urban agriculture or school gardens; learning more about how urban residents with different socio-cultural backgrounds perceive, value and interact with biodiversity in various types of urban green infrastructure.

Edinburgh,
United
Kingdom

City description: A growing city of around 500,000 residents in the eastern part of the Central Lowlands of Scotland in North West Europe.

Spatial focus and actors: City-wide (including the city region if relevant), engaging the municipality, environmental NGOs, community groups, government agencies and (ideally) business actors.

Key areas of interest: Engaging more people with urban green spaces, particularly in socio-economically deprived areas; supporting biodiversity by improving understanding of how the urban morphology (e.g., density of buildings, different green scape components) interacts with different species at different spatial levels; introducing new approaches to increase funding earmarked for urban green space by introducing new methods for monetary and non-monetary valuation and unlocking cash flows.

Ljubljana,
Slovenia

City description: Ljubljana is the capital of Slovenia (South East Europe) and has a population of 280,000. It is situated between the Alps and the Karst in the central area of the country. Ljubljana is Slovenia's centre of economic, educational and cultural activities.

Spatial focus and actors: City-wide, engaging different departments of the municipality and an NGO specializing in supporting young people (Focal LA also includes businesses specializing in organic urban food production systems, green infrastructure (GI) establishment and GI maintenance and a group of young people).

Key areas of interest: Increase the range of ecosystem services (ESS) considered in municipal plans and decision-making; explore and pilot various modes of participatory governance, such as involving user groups in planning and creating new green spaces.

Malmö,
Sweden

City description: A growing city of around 320,000 residents in the southern part of Sweden. Traditionally a port with strong industrial heritage but now a modern city with university. Malmö is surrounded by a plain landscape with highly productive agricultural land.

Spatial focus and actors: The whole city. The area within the administrative borders of Malmö is mostly built. The actors are city officials, developers, maintenance people, NGOs, architects and ecologists.

Key areas of interest: Introducing the ecosystem services concept in city planning and management; learning more about different aspects of urban green infrastructure (UGI) creation and maintenance, including inventory, analysis, planning and management is therefore an important area of interest. Related to that, there is also a need to find new and better ways to increase stakeholder involvement in UGI planning and management. Developing a dynamic green economy involving the private sector and non-profit organizations both working with the new concept of UGI.

2 ULL UPDATES: BARI

2.1 Background

2.1.1 Focal Learning Alliance compared to Urban Learning Lab

Past key interests of Focal Learning Alliance

Prior to the first research activities, the Bari GREEN SURGE team held a press conference on September 2014 to launch the GREEN SURGE project (Figure 2). This event paved the way for fostering the interest and participation of the Local Government (LG) and stakeholders in the Urban Learning Lab (ULL). Despite attempts to engage the LG after the event, no further action was taken due to lack of response and scarce interest in engaging in active planning with the other participants of the ULL.



FIGURE 2. PRESS CONFERENCE HELD ON SEPT. 14, 2014, PRESENTING GREEN SURGE AND THE ULL OF BARI. PARTICIPANTS ARE THE COUNCILLOR AND DIRECTORS OF THE DEPT. OF URBAN PLANNING AND PRIVATE BUILDING, A GI EXPERT, NGO, REPORTERS, AND THE UNIBA TEAM. (PHOTO: M. SPANÒ, UNIVERSITY OF BARI).

From the beginning of the project the meetings and research activities of our Focal LA have focused on three key issues, in succession; however, these did not spark the interest of the local authority. The key issues were: i) *Effective land management and planning for climate change*

adaptation, ii) *Bari centre redevelopment project – Rossani barracks*, and iii) *Building a knowledge base capable of defining ecosystem services and benefits provided by urban green infrastructure (UGI) in the future urban network as foreseen by the Masterplan.*

For the first key issue – *Effective land management and planning for climate change adaptation* – the objectives and outputs of our Focal LA were finalised based on what emerged during the initial research activities conducted in WPs 5 and 7 (see WP5 and WP7 in Section 2.2). The output was a poster presented at the PGA meeting in Edinburgh in 2014. Our LA aimed to:

- *develop an improved understanding of climate change impacts on the city of Bari in relation to urban forest availability, spatial distribution, and accessibility;*
- *demonstrate how to make cities and urban neighbourhoods fit for climate change through effective management and planning of green infrastructures (GI); and*
- *involve local and national stakeholders in impact assessment, solution testing, and dissemination of findings*

A meeting was held with our LG on February 4, 2015, to establish their interest in the key issue and to determine who would constitute the Task Force or LA. Feedback from the LG was inadequate to allow us to engage in related research activities. The opinions of both the local officials and the LA members were adamant that the topic was too general and required a narrower focus, i.e. a specific project to address. Therefore our LA decided to select a more targeted theme: *Bari centre redevelopment project – Rossani barracks.*



FIGURE 3. FIRST MEETING ON MARCH 24, 2015, OF THE UNIBA TEAM AND DIRECTORS OF THE DEPT. OF URBAN PLANNING AND PRIVATE BUILDING, MUNICIPALITY OF BARI, TO DEFINE THE KEY ISSUE AND FOCAL LA (PHOTO: M. SPANÒ, UNIVERSITY OF BARI)

The objectives and outputs of this second key issue (*Bari centre redevelopment project – Rossani barracks*) were established at a meeting with the Directors of the Department of Urban Planning and Private Building on February 4, 2015 (Figure 3). The objective was to upgrade an abandoned area, transforming it into a public park for social cohesion. The expected outputs were *i)* the elaboration of the executive project and *ii)* the start-up of the redevelopment works. After this successful meeting, further contacts were difficult to make with the LG to engage in the planning process and so no outputs were produced. The Focal LA of Bari presented this issue in a slide presentation, “The Focal LA of Bari, Italy”, at the meeting in Berlin, June 2015.

From March until September 2015, the Focal LA process had not advanced according to the GREEN SURGE work plan due to changes in leadership roles within the Department of Urban Planning. At the time, the Councillor had conflicts with the former Director and, in agreement with our ULL Coordinator, did not consider the project design and limited dimension of the brownfield military area appropriate for the scope of GREEN SURGE. Therefore, with the assistance of a new UNIBA team member, our LA convened and decided to undertake yet another key issue that focused on the interests of the Councillor of the Department of Urban Planning and how GREEN SURGE could participate in reaching their overarching goal: the revision of the Masterplan for Bari. Therefore, our third key issue involved *Building a knowledge-base with stakeholders and local institutions capable of defining ecosystem services and benefits provided by UGI in the future urban network as foreseen by the Masterplan*. Together with the LG we aimed to examine current aspects of GI planning in the revised document and to integrate new GI principles and concepts, following the double helix approach. In this perspective, we sought to introduce science from our GREEN SURGE partners (WPs) and work it into the experience of the LG and stakeholders to create a state-of-the-art Masterplan for Bari that included innovative UGI planning and governance. The first research activity envisioned by our Focal LA was a work plan outlining the steps to be taken; for this purpose a meeting with the LG was held on October 23, 2015. A second meeting was scheduled to discuss the landscape features and their design, impact and potential, but this meeting did not take place. This was most likely due to bureaucratic motives and the repercussions of the prior change in leadership roles. Therefore, no further activities were undertaken for this issue.

In the final analysis these three key issues, which were not pursued, set the Focal LA back in terms of time, research activities, and goals as set out by the GREEN SURGE project. At this point in time, ICLEI suggested that we ask the LG what they would like us to assist them with. This approach appears to have been the most successful so far; the resulting key issue is described in the next section.

Key interests of the Focal LA today

The current aim of Bari’s Focal LA is to test innovative practices and strategies for the development and management of *residual urban spaces*² (see footnote for a theoretical definition) that were planned to be realised as green spaces but never completed. These areas are part of complex urbanisation programmes that foresee the co-participation of the public and private sectors

² A residual space is a surplus area, or a “left-over land”, which is poorly defined and has scarce maintenance that functions to connect significant places providing spontaneous use (e.g., improvised picnics). It is the result of zoning and traffic planning, a waste product of urbanization processes (Wikström, 2005).

in building new neighbourhoods. An additional key interest is to implement practices of community design and the management of public green space using placemaking methods.

Based on the LG's strategic objectives for developing residual urban areas, the initiative will involve the Focal LA and stakeholders (with emphasis on bottom-up participation) in a decision-making process on the future development and management of one or more residual urban spaces (in the process of being selected). The project will also evaluate sharing the development, ownership, and management costs between the private and public sectors. This key issue, named *Operation Zero Degradation*, was requested by the Councillor of the Department of Urban Planning who finds the GREEN SURGE project a suitable framework. The Focal LA has established this initiative as its key issue.

The project phases are outlined as follows:

1) Organisation of the Task Force and defining of the objectives

2) Analysis/organisation of residual area data; this involves

- conducting an inventory of residual urban spaces in a select district of the city
- analysing the urban structure and the relationship between the urban form and residual urban spaces
- examining the municipality's data on these spaces
- organising the data collected on residual spaces to engage in the participation process

3) Organisation of the participation process

- hold a meeting of the Focal LA and stakeholders (possibly the workshop in January 2016)
- define the practices to undertake and how they can be delivered
- explore management opportunities

4) Revision and definition of results

The partners of the Focal LA are the Department of Urban Planning and Private Building of the Municipality of Bari along with its respective Councillor, Directors and surveyor/technical assistant, UNIBA, and Profin as the ULL facilitators.

Based on the project phases cited above, the upcoming activities to be undertaken are:

- **a meeting with the Councillor to establish a work programme**
- **an inventory and a mapping of residual areas plus analysis of the urban structure**
- **the ULL workshop in January 2016**
- **a presentation of initial results at the Focal LA workshop in Ljubljana in 2016**

A review of the data available on residual urban spaces at the Department of Urban Planning will be undertaken by two UNIBA members in collaboration with the surveyor. The inventory and mapping of the spaces will be conducted and collected by UNIBA in a harmonized geo-database. Taken together these data will be analysed, organised, and presented at the workshop; they will also be used to engage in the participation process. The UNIBA facilitators will be responsible for advertising and facilitating the workshop, contacting the stakeholders and preparing the materials. The successive phases of the project will be discussed as the former come to completion. The specific request made by the Councillor will likely make this LA topic successful, as will also the

fact that the inventory of residual urban spaces destined to become urban green areas (e.g., neighbourhood gardens, public parks, playgrounds, community gardens) is totally disorganised. At the moment all data on the size, property, and location of those areas have not been entered into an electronic database.

As a GREEN SURGE partner, Bari acts as both ULL and Focal LA. The ULL, however, has not been established yet because it had scarce success at the 2014 press conference in bringing stakeholders together, perhaps for lack of interest or difficulty in addressing the topic chosen for the Focal LA. Consequently, we decided to establish the Focal LA, which to date consists of the Department of Urban Planning and UNIBA team. It is precisely through this LA initiative, serving as a springboard, that we aim to set up the ULL. This will be accomplished by integrating a wider group of stakeholders in the Focal LA who would be interested in the topic as well as the GREEN SURGE findings that go beyond and which we will present. Currently, research needs for the Focal LA include biodiversity and biocultural diversity indicators to be used as tools for implementing a renewal process of residual land areas, which involves applying innovative approaches to unlock cash flows and engage bottom-up participation. In this regard, the ULL would provide an opportunity for the community and local stakeholders to share planning strategies and test bottom-up participation in developing UGI. Involving non-governmental authorities, including residents, would make UGI implementation less dependent on administrative authorities and would streamline and promote UGI development.

2.1.2 Key insights from other GREEN SURGE WPs

WP2: Assessment of biocultural diversity

Findings

Bari was included in the study conducted on biocultural diversity of urban green spaces in European cities. An investigation of the provision and distribution of urban green areas compared to population distribution has shown that Bari has rather low values of green space in its administrative boundaries. However, the green areas existing are situated in the city centre where most of the population lives. The study also shows a percentage of the urban population consisting of a mixed ethnic background. The field survey results (task 2.2, D2,2, month 26) will show how biodiversity is perceived by the inhabitants of Bari, including those of different cultural backgrounds as well as stakeholders.

Relevance

The above information stems from the land cover data of 2006 and reflects that time period. As stated in the Milestone, it does not reflect the current distribution of green spaces in comparison to the population. This information may be relevant to strategically design and plan more sustainable UGI within an urbanised context and, at the same time, integrate the green space needs of a wide range of population groups with different social and cultural backgrounds. Information on biocultural diversity will be highly useful for identifying the stakeholders who would be involved in the planning process to determine the redevelopment of green spaces. Thus, biodiversity and biocultural diversity can be seen as tools for implementing a renewal process of residual land areas.

WP3: Functional linkages

Findings

An internal project report (MS24) of urban green space demand for two scale levels, ULLs and European Urban Atlas cities, states that “southern European cities”... (including Bari) ...” have greater difficulties in maintaining green spaces under conditions of considerable summer dryness.” Additional findings show that “the share of Bari’s population with access to urban green and forest (min. 2 ha) within a distance of 500 m is less than 33%. The forest area is small, comprising only 7 ha, while urban green spaces comprise 182 ha. With around 313,000 inhabitants per capita green space is calculated to be about 6 m² and is the lowest value among the five ULL case study cities. Bari also only comprises 5 ha of water bodies within its administrative boundaries.” In summary, “Bari has below-average per capita urban green and accessibility values.” On the other hand, MS25 reports that cities of the Mediterranean planning family have on average larger shares of agricultural areas, semi-natural areas and wetlands (approx. 30%) compared to other planning families (15-20%).

Relevance

The MS studies indicate that there is a great need to increase the presence of green spaces in the city of Bari. The findings from WP3 are key to understanding the number and variety in GI types and the kind of ecosystem services that the residual areas under study could provide; for example, their functions in protecting against heat waves, the health benefits provided, and cash flows produced by GI. Maps of the residual urban spaces and the identification of their main features (e.g., property, extension) will be highly relevant to our research and assist in quantifying the demand of stakeholders on ecosystem services. Table 4 in D3.1, for example, states that for “Abandoned, ruderal and derelict areas” the “land conversion on brownfields offers great potential for food production, except on polluted sites,” providing an interesting solution to be considered by our Focal LA.

WP4: Contributing to the green economy

Findings

A method for mapping businesses and services around green spaces in the ULLs shows that Bari has the highest density directly around green spaces (-5 – 100 m buffer). According to the same deliverable, parks can have a positive influence on businesses in their surroundings if the services offered align with the needs and interests of the visitors. The literature demonstrates that greenery itself enhances sales opportunities.

Relevance

The results obtained from WP4 will offer guidance in measuring the economic effects of urban residual spaces on districts in Bari. The data will provide cues to GI planning approaches that unlock cash flows. Based on detailed data of the costs and benefits related to specific UGI components, decision-makers could take more appropriate action in managing urban ecosystems. WP4 will also provide insight into a range of monetary and non-monetary benefits to be obtained from restoring the residual urban areas, such as enhanced social cohesion and human well-being. The benefits accruing to stakeholders would provide an important impetus to gain their participation and support for the development, funding and ownership of the residual land areas.

WP5: Green infrastructure planning and implementation

Findings

The study conducted on the current state of UGI planning and implementation (D5.1) revealed that according to interviewed city officials “the quantity of urban green space is increasing for all the European cities studied, especially green space for recreational purposes.” There was also a strong positive outcome for Mediterranean cities in terms of the quality of habitat provided by green spaces. “Municipal officials in all of the case study cities (except for one) indicated strong emphasis on conservation, restoration and creation of urban green space.” The Mediterranean planning family was shown to have high familiarity with the UGI principles of *connectivity* and *multifunctionality*, but less so for *integration*. Compared to other cities, weaker results were found for Bari in improving GI planning to ensure social inclusion. Neglect of existing green spaces often occurs primarily due to lack of funds, personnel and technical resources for maintenance activities. In addition, the “Case Study Portrait” for Bari revealed that the administration faces the challenge of conserving and restoring urban green spaces and of creating new ones in abandoned areas. (An example proposed was the *Bari centre redevelopment project – Rossani barracks*. It was precisely for this reason that we had previously decided to undertake the second key issue.) Multi-scale governance is especially relevant for the case for Bari, whose urban planning system is hierarchical – from regional to provincial to municipal and local. In fact, Bari emphasises the importance of city-region-wide collaboration with regard to green area issues.

Relevance

The Tier 1 “Case study Portrait” indicates that Bari has a need to create green spaces in abandoned or residual areas. In fact, this is the goal of our current key issue, *Operation Zero Degradation*. Also, D5.1 results show that the creation of urban green space is considered and planned by the local and regional authorities of Bari. The outcomes of WP5 show that Bari and its region are looking at green space strategically.

WP6: Innovative governance of urban green spaces and biocultural diversity

Findings

For this WP our ULL did not present Bari as the case study, but rather the city of Milan. Although there are no findings to be provided for Bari from WP6, the concept of involving citizens in green space planning is considered by the Focal LA. Therefore, findings of WP6 are relevant to Bari.

Relevance

The findings will provide guidance on how to involve stakeholders with the LG in developing a shared strategy for residual spaces, emphasising bottom-up participation. Some questions to consider might be: Can bottom-up participation play a significant role in creating green spaces in the residual land areas of Bari? Can the local identity or culture of people in this community influence the green space associated with this initiative? What is the LG’s role in this process and how can it accomplish the above, since it tends to make the majority of planning decisions with associations and businesses? How will the Focal LA successfully mediate this interaction? It will be interesting to see if it is feasible and effective to involve citizens in the planning and management of residual urban spaces in Bari’s top-down planning system. Only recently has the Councilor begun to engage bottom-up initiatives in public space planning and they are still underway.

2.1.3 Key insights from external research

External sources from the literature provide insights on research conducted on the redevelopment of residual spaces (e.g., Mozingo et al., 1998; Stein and Millar, 1998; Wikström, 2005). Stein and Millar (1998) propose a new urban open space typology, a working landscape for residual spaces along the Los Angeles Freeway, in California, USA. The article specifies that residual spaces are usually eliminated from the budgets of public works departments due to the high maintenance expenses required. This information can guide the Focal LA in investigating the principles and findings provided by WP4 to assist in understanding the economies involved in this landscape type. According to the authors, the residual open spaces along transportation routes, parking areas, industrial parks and vacant lots are areas where the most needy population lives. These spaces are usually adjacent to public housing, low and moderate income apartment buildings or overcrowded single-family homes. We can consider these features and the findings from WP2 to obtain a demographic profile of the resident population of our residual urban spaces economically, ethnically and educationally. As in the California study, our residents near residual land may be a mixture of immigrants as well as working or unemployed people. This study by Stein and Millar points out that policy channels public funding away from residual spaces because planting these up and/or maintaining them are often considered decorative luxury activities. Therefore, they propose to reprogram residual urban spaces by “revealing nature through political action.” Indeed, governance approaches as proposed by WP5 and WP6 will supply best practices suited to the collaborative efforts between local authorities and stakeholders on successfully redeveloping and managing residual urban spaces in Bari.

Mozingo et al. (1998) detail a master plan for an already existing park as a large open space and urban wildland in California. The plan sought to combine intensive park use and restoration of the native landscape. It offers insights for developing parks taking into account a middle-class and multi-ethnic neighbourhood and the native vegetation growing in the area. The approach used may be of value to the residential communities found in our residual spaces, which have similar socio-demographic characteristics. The master plan was developed after an understanding of the park’s ecological and social settings, coupling technical analysis and community participation, had been derived. These are important aspects that our Focal LA must focus on together with the relevant stakeholders.

The third source by Wikström (2005) is very interesting and relevant to our key issue. It describes what residual urban spaces are, provides examples of a variety of residual spaces from a Swedish study, and explores the legal, social, physical, and functional aspects of such areas. Our LA could obtain valuable information from the proposed 3-stage method of exploration of residual spaces. The author sketches an agenda for the future of residual spaces and hints at a range of opportunities, but does not forego mentioning the challenges that exist. The agenda for residual spaces must take into account differentiation and mobilization. Measures taken without the mobilization of informal groups, associations, and institutions have limited chances of success.

2.1.4 Workshop on identifying key issues

The aim of the workshop is:

- *To present the Focal LA key issue and describe its main aspects and objectives*

Location /date / number of attendees and their backgrounds:

- *University campus / January 13, 2016 / public and private stakeholders (e.g., local authorities, companies, NGOs, neighbourhood committees, schools, associations)*

Overview of workshop activities:

- *introduction by the ULL Coordinator*
- *slide presentation of residual urban spaces*
- *administration of questionnaire/voting method to stakeholders*
- *discussion among participants*

Detailed description of workshop activities and their outcomes:

- *outcomes: sharing of best practices for reaching the key issue's objectives*

2.1.5 ULL synthesis

Bari is the second largest city of Southern Italy and the capital of the Apulia region, located on the Adriatic Sea. Named the fifth largest province in Italy, Bari carries a population of more than 400,000. The city's infrastructures, landscape and economy have been experiencing serious problems due to climate change. In addition, there are pockets of deprivation and investment challenges in improving the housing and urban infrastructures. The Focal LA will be involved in establishing innovative practices and strategies for the development and management of residual urban spaces in one or more select districts of Bari. Our intent is to meet the LG's strategic objectives for developing these spaces and securing their maintenance and management using a science-driven approach. The procedure will involve stakeholders, principally local authorities, neighbourhood committees, NGOs, schools, and associations, in a decision-making process about the future development and management of these areas. It will investigate best practices for sharing the management of the residual spaces between the private and public sectors. We foresee tapping into the material produced by all GREEN SURGE WPs, as they will provide the knowledge and tools that can be applied (e.g., D5.2 of WP5 and the Practitioner's Guide will supply best practices of UGI planning and implementation for residual urban spaces.)

2.2 Research needs

2.2.1 Elements of key interest in future GREEN SURGE research

WP2 - The future activities of this WP are to: 1) assess the UGI components and their associated ecosystem services, and state of knowledge on valuation and interactions of different resident groups towards different types of green spaces, and 2) develop a typology of UGI components as the basis for other WPs. This information will be of interest to our ULL to comprehend the ecosystem services provided by the UGI of residual spaces and how residents living near them are likely to interact with the UGI. Also, we will evaluate the information provided on the status of biocultural diversity of our city as a contextual input to our approach. These future findings will assist the Focal LA in defining what GI the residents near our residual spaces would interact best with and their needs. The final Report and Fact sheet on the typology of urban biocultural diversity and corresponding database will also be valuable resources, given the presence of different ethnic populations in Bari.

WP3 - This WP will build functional linkages and provide a web portal that will contain UGI and spatial and non-spatial data on the city of Bari. The Fact sheets made available will supply our Focal LA with data to present to local stakeholders. All this information should assist our LA in formulating the procedures outlined for the development and management of the residual urban spaces in Bari.

WP4 - It would be worthwhile for our Focal LA to review a future output of this WP, a case study of one urban green space component, such as allotment gardens, to be used as a test area for integrating monetary and non-monetary approaches to valuation. Finally, we would look at the advantages and disadvantages of using these approaches from the point of view of their integration potential. We would apply the learning module developed by this WP, including hedonic pricing and other monetary valuation and business models, to our residual urban spaces to determine what ecosystem services provided by urban green spaces translate into real economies.

WP5 - Task 5.3 will provide recommendations for innovative UGI planning and implementation in European urban areas to promote biodiversity and ecosystem services. We will analyse the recommendations, tools, and best practices that have emerged from the case studies and the literature for innovative UGI planning and implementation approaches and whether these are transferable to the city of Bari. We will also consider the barriers to effective implementation of UGI strategies. The Practitioner's Guide and D5.2 on urban green space planning will offer practical applications and insights for our Focal LA strategy.

WP6 - Our Focal LA will look at the most successful governance arrangements resulting from the cross-case analyses conducted in this WP in terms of delivering biodiversity conservation, ecosystem services, community empowerment, connecting people to urban green spaces as well as contributing to the green economy and promoting climate change adaptation. We will attempt to integrate effective participatory governance arrangements that will be provided by the final guidelines of this WP for UGI planning and management in the context of residual urban spaces. We could learn about approaches and experiences of citizen participation in green space management from elsewhere and test them out in our community in developing residual spaces.

2.2.2 Opportunities for engagement with GREEN SURGE research

Ideas for workshop activities to engage Bari's Focal LA with GREEN SURGE research carried out on the key themes might be:

- *present some of the latest GI research/projects worldwide comparing them with Bari's GI, implementation strategies and governance arrangements (involve WPs 2, 3, 4, 5 and 6)*
- *questionnaires/voting exercise: what issues do stakeholders consider important in planning GI in Bari's residual urban spaces, including BD, BCD, ESS, cost-benefit (economy planning), marketing and governance, multifunctionality, social inclusion, health and well-being? (WPs 2, 3, 4, 5 and 6)*
- *produce computer-based imagery of what developed residual areas might look like and present to LG and stakeholders (involve WPs 2, 3, 4 and 5)*

3 ULL UPDATES: BERLIN

3.1 Background

3.1.1 Focal Learning Alliance compared to Urban Learning Lab

Past key interests of Focal Learning Alliance

The topic of the Focal Learning Alliance (LA) has changed over time. One recurring theme that stakeholders from the private sector, e.g. housing associations, repeatedly brought up during our first ULL workshop in October 2014, was that it was important to make use of under-used green spaces. Since many of these are found near residential areas, unexploited opportunities exist to upgrade such spaces for benefitting adjacent neighbourhoods. Facilitating exchange between different stakeholders about varying demands and implementation approaches on how to best use the spaces independent of their ownership were addressed as an important challenge. We therefore decided to join forces with two housing associations to establish the Focal LA in order to upgrade one or more under-used informal (non-public) urban green spaces close to residential areas in the district of Marzahn-Hellersdorf (MH). The upgrade was intended in terms of attractiveness and aesthetics, biodiversity conservation and connectivity, recreation and social interaction, environmental education and awareness, wellbeing and quality of life as well as image of the district. We planned to discuss design and management activities, such as establishing wildflower meadows or interim use of the green spaces as community gardens, together with the municipal district offices for nature conservation and planning and the involved housing associations.

However, due to unforeseen circumstances we had to reconsider our idea for the LA in Berlin. Firstly, we found out that one of the housing associations that we had hoped to collaborate with and that had brought up the topic of biodiversity management in housing areas will soon no longer have access to green spaces in MH. We were informed of this at the first task force meeting in mid-June 2015 when we had aimed to select suitable green spaces for the LA process. Soon after, the other housing association disclosed that they did not have access to green spaces that would be suitable for our planned LA.

Key interests of Focal Learning Alliance today

The Focal LA in Berlin revolves around the “Edible School” project of the Caspar-David-Friedrich secondary school (CDF School) in the district of MH. The initial suggestion of the school was to both provide healthy food and expand the school garden by establishing urban agriculture on a neighbouring wasteland site. This would supply the school kitchen with local, fresh, organic food for lunches (Figure 4, left circle). For the LA, we complemented their initial ideas by developing a more comprehensive approach that takes into account (i) biodiversity is-

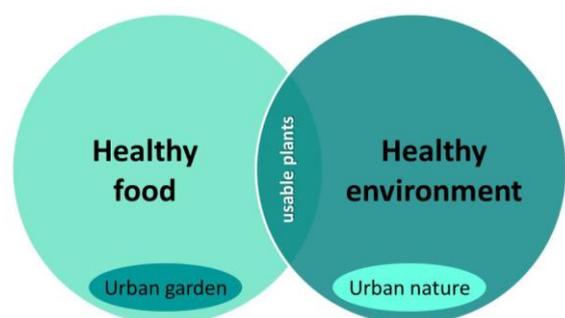


FIGURE 4. CONCEPTUAL FRAMEWORK FOR FOCAL LEARNING ALLIANCE, I.E. THE COLLABORATION WITH THE CDF SCHOOL AND GREEN SURGE.

sues within the garden project, and (ii) the biodiversity and ecosystem services of the school surroundings (Figure 4, right circle).

In addition to stakeholders related to the school itself (pupils, teachers, parents, social workers, school's principal), the main partners involved in the LA are two NGOs and registered environmental associations: NAHhaft e.V. and GRÜNE LIGA Berlin e.V. Other stakeholders (public bodies) are the MH municipal district offices for environment and nature conservation and for urban infrastructure and green space planning who own the wasteland site as well as Slow Food Berlin and the University of Applied Sciences for Sustainable Development Eberswalde.

We see a lot of potential for collaboration with the school and are excited to bring in our GREEN SURGE-specific expertise on biodiversity, and provisioning and cultural ecosystem services to add to the school's focus on food. The concept for the collaboration comprises the two key aims "healthy food" (school) and "healthy environment" (GREEN SURGE), which share an overlap that comprises those usable, wild and spontaneous plants that can be used as food, tea, herbs, medicine, etc. (Figure 4). Our aim, "healthy environment", refers, on the one hand, to the idea of enhancing the pupils' knowledge on biodiversity and a broad range of related ecosystem services as well as their environmental awareness, so that they potentially become advocates of nature when growing up. On the other hand, we actually intend to make the environment more "healthy" by increasing the local biodiversity together with the pupils. Depending on their interests and ideas this could involve planting/supporting plants that can be used in the kitchen, rare species or plant species that attract animal species like butterflies or bees.

We recently (11/11/2015) held a task force meeting with the key stakeholders involved (TUB, SWUP, teachers, social workers, NAHhaft, GRÜNE LIGA and the two municipal district offices), where this concept was received favourably. At this meeting we presented ideas on how we concretely envision collaboration from our point of view. Beforehand, TUB had already mapped and identified the plants on the neighbouring wasteland to get an overview on the most common plants available in the broader surroundings of the school. We developed fact sheets for the usable/edible plants, which summarise information on parts of the plants (leaves, stems, flowers, fruit, seeds) that can be used and how. This information can either be integrated in the curriculum for direct use in the classes or be used in the afternoon programme (clubs for cooking, environment, etc.). Another idea we presented during the task force meeting was that Master students of TUB studying urban ecology could develop teaching mod-

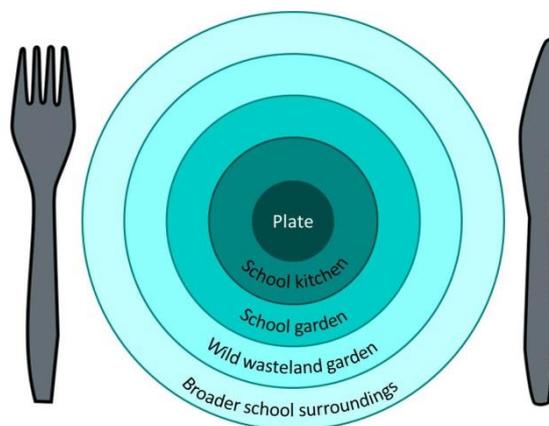


FIGURE 5. CONCEPT AND SCALE OF THE FOCAL LEARNING ALLIANCE, WHICH CONCERNS THE COLLABORATION BETWEEN THE CDF SCHOOL AND GREEN SURGE WITH ITS FOCUS ON "HEALTHY FOOD" AND A "HEALTHY ENVIRONMENT". THE SMALLEST UNIT IS REPRESENTED BY THE PLATE IN THE SCHOOL KITCHEN. WHAT IS EATEN THERE COULD EITHER STEM FROM THE SCHOOL GARDEN ON THE SCHOOL GROUNDS, BUT IT COULD ALSO COME FROM THE ADJACENT WASTELAND GARDEN OR FROM THE BROADER SCHOOL SURROUNDINGS LIKE PARK AREAS.

ules on typical plants, edible plants, soil, climate, etc., which could be applied and further advanced in the next summer semester (May to July 2016). The modules could be very practical and involve outdoor activities with the students in the broader school surroundings. These activities would increase the students' environmental awareness and enable them to make the connection between what is growing outside (in the surroundings, on the wasteland, in parks, in the school garden) and what is then prepared in the school kitchen and ends up on their plates (Figure 5). The final idea we discussed was to develop a management plan together with all stakeholders to enhance the biodiversity of the wasteland site, perhaps also in terms of usable/edible (wild) plants while incorporating the existing biological and structural diversity. All ideas were discussed and their implementation further elaborated at the meeting.

The Focal LA addresses the GREEN SURGE themes biocultural diversity, ecosystem services, urban agriculture, health and wellbeing and social cohesion. Particularly, it focuses on how a specific group of people (pupils of a secondary school in MH) interact with biodiversity (biocultural diversity) in their direct surroundings through urban agriculture and food, but also through environmental education on ecosystem services and pollution issues that can be related with food from urban settings. This concentration on biocultural diversity and ecosystem services reflects the emphasis of the ULL, which is closely connected to research in WP2 on how people perceive, value and use urban biodiversity. Unlike the ULL, operating at a more abstract and conceptual level, the Focal LA targets one specific issue (how to combine urban agriculture, biodiversity conservation and environmental education) in a local context, the CDF School in MH.

3.1.2 Key insights from other GREEN SURGE WPs

WP2: Assessment of biocultural diversity

Findings

The concept of biocultural diversity is not mentioned as such in any of Berlin's strategy and policy papers. Yet, Berlin's non-statutory Urban Landscape Strategy aims to improve the city's green spaces in a socially and environmentally conscious way; it communicates the value of urban green space through three themes: (1) Beautiful City; (2) Productive Landscape; and (3) Urban Nature. In terms of cultural diversity, this document also mentions the concept of "multicoding", referring to different users ascribing individual cultural values to urban green space: "[...] multicoding is the overlay of interests and functions; instead of a mono-functional juxtaposition it creates space that is usable in multiple dimensions". This suggests that city officials aim to promote cultural diversity and variety of lifestyles through urban green space. It could thus be argued that social functions of urban green space are considered. City officials, however, also acknowledged that not every urban green space can accommodate all needs and demands with regard to its use and the related facilities.

Of relevance to the theme of biodiversity, the city has its own *Biodiversity Strategy* that places biodiversity conservation under the responsibility of society as a whole. The strategy is related to the overall aim of promoting a high quality of life in Berlin through providing access to nature with its associated benefits, and providing opportunities for environmental education and nature experience through, for example, urban gardening. Moreover, there is an ongoing development since the 1980s of (i) acknowledging benefits of new types of urban ecosystems that evolve, with unprecedented ecological characteristics, on vacant sites, such as former industrial sites, air-

fields or railroad tracks, to urban people and (ii) integrating such systems as wilderness areas into Berlin's urban green infrastructure (Kowarik, 2015).

Relevance

Both biological and cultural diversity are important issues for the city of Berlin, but planning strategies that link the two approaches have been limited so far. There seems to be a lot of interest in doing so from the political side. If the WP2 field survey reveals a relationship between (increasing) biodiversity levels and appreciation by different groups of residents, this would show unexploited opportunities in combining approaches that address, social and conservation issues in urban development as well as in the design and management of green spaces. Ideas on approaches to integrate conservation and recreation in urban green spaces will be useful for different stakeholder groups in the ULL, e.g. by advanced management of defined sites like species-rich meadows, which could be developed on species-poor lawns and are appreciated by a variety of user groups, such as people who use the meadows for taking a walk or to relax.

WP3: Functional linkages

Findings

Berlin has a very high share of urban green spaces (46% of the total land cover; Senatsverwaltung für Stadtentwicklung und Umwelt, 2013), which is mainly due to an increased awareness of planning, protecting and investing in nature that has been developing in the last decades and the city's history (natural remnants, parks, garden heritage sites, wastelands). Also, an increase in ecological "green" lifestyles such as urban gardening activities contribute to the diverse picture of green space provision and access. There is, however, room for improvement as, e.g. green roofs cover only 12% of the total building area (Senatsverwaltung für Stadtentwicklung und Umwelt, 2013). Compared to the other ULL cities, Berlin's per capita urban green space is just under the average (16.35 m²/inh.; average: 17.45 m²/inh.), but still more than twice as much as the city of Berlin aims to provide for its residents (Senatsverwaltung für Stadtentwicklung und Umwelt, 2013); per capita green plus forest space is with more than 60 m²/inh. similarly high as in Edinburgh, ten times higher than in Bari, but only a seventh of that in Ljubljana (GREEN SURGE D3.1). Districts situated near the city border have higher shares of urban green and notably forest areas as in the southwest of the city. Accordingly, per capita values are high in these districts. By comparison, population density is highest in inner city areas. The mean patch size of green urban areas in Berlin with more than 4 ha is amongst the highest in Europe. The share of the population who has access to large green spaces (2 ha within 500 m) is with 67.7% much higher than that in Bari (21.4%), similar to that of Ljubljana (56.8%), but lower than that in Malmö (84.1%) and Edinburgh (88.3%; GREEN SURGE D3.1). Berlin's Department of Urban Development and the Environment recommends that every resident should have access to urban green of minimum 0.5 ha within a 500 m distance from home.

The resilience of cities to climate change depends, among other determinants, on the share of different land-use types. Berlin has a similarly high share of forest cover (ca. 15%) compared to the other central European countries (Austria, France, Netherlands, Belgium, Luxembourg), which is negatively correlated with a predicted rise in surface temperature (higher share, lower temperature). It has a comparatively low share of agricultural areas, semi-natural and wetlands within the city (less than 7%), which is positively correlated with a predicted surface temperature rise (higher share, higher temperature). On the basis of this data, it could be argued that the

average local temperature rise in Berlin will not be as high as predicted for entire Central and Eastern Europe. However, local temperatures are likely to be influenced by a much wider range of variables (GREEN SURGE MS25).

Relevance

Berlin already has a high share of urban green spaces, per capita green space and accessibility of green space. This might tempt policymakers and planners to use the existing green spaces, and in particular informal green spaces, for other developments. However, one important message from WP3 is that conserving urban green spaces, especially forests, is also relevant in terms of resilience to climate change; in a direct way through lowering surface temperatures and indirectly via carbon sequestration. Another valuable finding for ULL stakeholders, especially planners, is that the population density is highest and per capita green space lowest in the inner city. With this information in mind planners might want to refrain from transforming more green space to other land-use types in the city centre. Instead, ways of increasing per capita green space in the inner city could be considered, e.g. through promoting green roof installations. These issues were already discussed by stakeholders (e.g. planners from the municipalities, the senate department, NGO's, managers of housing companies, local residents) in our first ULL workshop in 2014.

WP4: Contributing to the green economy

Findings

The green economy is not mentioned in any of the strategic planning documents analysed for Berlin. Yet, the *Urban Landscape Strategy* (Senatsverwaltung für Stadtentwicklung und Umwelt, 2012b) mentions the concept of a "productive landscape" as one of its major themes. It shares similarities with the concept of green economy mainly in regard to a participatory economy:

"Green space is not only beautiful, but also socially, climatically and economically productive. The Productive Landscape combines agriculture, allotment gardens and subsistence farming with the do-it-yourself culture of intermediate users, space pioneers and start-ups. The Berlin creativity finds its way into the design of public green spaces. Citizens take responsibility, strengthen their commitment and identify more and more with the green of the city. Thus, we create new spaces in which people are active and can unfold."

Also, Berlin's green planning authorities have recently published a guideline on how companies can contribute to biodiversity issues, including existing examples (Senatsverwaltung für Stadtentwicklung, 2014).

As part of GREEN SURGE WP4 research, cafés were mapped in all of the ULL and Tier 2 cities; Berlin had the highest number of cafés of the 20 tested European cities (n = 1713). However, the density of cafés (1.9 per km²) was lower than that of other studied cities (highest density value: 3.3 per km² in Lisbon); Berlin showed a peak of café density at a distance of 200–300 m from urban green spaces (3.6 per km²; GREEN SURGE D4.2).

Moreover, a pilot study on the experiences and perceptions of café owners and staff about the importance of the proximity to green spaces for cash flow was conducted in Berlin (GREEN SURGE D 4.2). A random selection of cafés in the park's surrounding (N = 60) was visited to conduct the survey comprising six questions. The key questions were: *Did the location next to this*

park matter for the choice to establish the business here? And: Would it be different if there were no parks nearby? This showed that close proximity to green spaces was considered beneficial in terms of neighbourhood aesthetics and image. Interestingly, for two cafés near Tempelhof Field Park, established in the 70s, the proximity to the airport was more decisive for choosing the location than the nearby green space. For cafés situated in four out of six park surroundings, however, the location close to the parks was comparatively important to very important for the business. For the areas surrounding Humboldthain Park and Leise Park the proximity of the green spaces seemed to be of lower importance as stated by the café owners and staff. Cafés in the surroundings of Tempelhof Field Park, Görlitzer Park and Park at the Gleisdreieck noted seasonal differences in visitor frequency, which was higher from May to October, presumably due to the distinct open air leisure activity and sports facilities in these parks. In general, most of the café visitors were estimated to come from Berlin, but there was a higher share of locals near Trepower Park and a higher share of non-locals around Görlitzer Park and Tempelhof Field Park.

Relevance

The results of the cash flow study underline the importance of urban green spaces for the green economy as shown for the example of small businesses like cafés. This information is definitely useful for the stakeholders from the municipality and urban planners and might prompt discussing the integration of the concept of the green economy in future strategic planning documents. For the cash flow study, it would have been interesting to also consider population density as well as the proportion of other green spaces in addition to the respective parks in the surroundings of the cafés.

WP5: Green infrastructure planning and implementation

Findings

Berlin has strong linkages between different spatial levels of the planning system because the city and region are equivalent, which is unusual in Germany. Berlin has the longest-term strategic plan for green space planning, the *Urban Landscapes Strategy* (Senatsverwaltung für Stadtentwicklung und Umwelt, 2012b), a 40-year plan compared to, e.g. a 6-8-year plan in Ljubljana, out of the 32 analysed plans across Europe (GREEN SURGE D5.1). Berlin's "open space system" is described in the *Landscape Programme* (Senatsverwaltung für Stadtentwicklung und Umwelt, 1994/2004) as consisting of two "park rings" and two "green axes" in the form of a cross. Berlin has a city-wide spatial planning concept assigning priority areas for biodiversity conservation and also applies a multi-functional approach through multi-coding of green spaces to support multi-functional uses like environmental education, recreation and social interaction. Green space plans with social themes such as social justice and cohesion as important issues were only reported to exist in Berlin (Senatsverwaltung für Stadtentwicklung und Umwelt, 2012b) and Bristol. In a questionnaire Berlin's city officials expressed familiarity with the concept of urban green infrastructure. The UGI principles multifunctionality, referring to the ability of green spaces to provide multiple functions and services, and connectivity were adopted and understood to the highest degree. In general, conservation and the creation of urban green space or particular natural elements, such as urban trees for social and ecological purposes, were among the main themes in planning. Hereby, increasing and securing connectivity (UGI principle) and the protection of biodiversity (policy concept) were of particular interest. Moreover, securing the quality of green space was considered important as well. Climate change was explicitly referred to as one of the most important themes in the existing plans in Berlin, and will also

be addressed with more sector-based policies, such as water management policies. The questionnaire also revealed that the influence of policies and stakeholder groups on planning themes is strong, which is similar to the findings for Bari and Barcelona. A need for increased funding for green space in Berlin was expressed by city officials (GREEN SURGE D5.1).

Berlin city officials emphasized the socio-cultural functions of urban green space: recreation, biodiversity and habitat protection feature on a regular basis in almost all planning documents. Berlin's *Biodiversity Strategy* covers a broad range of themes, such as species and habitats, genetic diversity, nature perception and environmental education as well as the integration of different governmental and nongovernmental groups in biodiversity conservation. The strategy refers to ecosystem services to make the case for the increased conservation. The concept is, however, not elaborated to a great extent. Berlin's *Urban Development Plan Climate* (Senatsverwaltung für Stadtentwicklung und Umwelt, 2011) is the only analysed plan that considers how urban green space can mitigate the effects of climate change. The plan also describes the negative effects of climate change for human health and how these can be mitigated.

Relevance

The planning system in Berlin seems to already cover a wide range of concepts related to the social and environmental functions of UGI. Communicating this information to the ULL stakeholders as well as the general public would increase the awareness of the benefits of the urban green to urban residents. Perhaps referring to the concept of ecosystem services in a more practical way relevant to the everyday lives of people (aesthetics, recreation, green economy, tourism, health) would enhance their valuation of urban nature. This could potentially improve the funding situation by attracting private funding as it would make the multiple benefits of urban green spaces more tangible (for example, landowners may themselves want to enhance biodiversity on their privately owned green spaces).

WP6: Innovative governance of urban green spaces and biocultural diversity

Findings

The community-managed Lichtenrader Volkspark represents an interesting example of participatory governance of an urban green space. The park of approximately 5 ha was founded in the early 1980s, financed mostly by donations and park association memberships and realised by voluntary work. Every Saturday up to 25 volunteers meet for maintenance work (GREEN SURGE MS40). In general, derelict land-use for urban greening is a common practice in Berlin. The city has a fairly established culture of activist/protest groups pushing for better green space conservation – mainly on vacant land (GREEN SURGE D6.1). An example of an attempt by non-governmental actors to influence policies in Berlin is the civic movement against the development scheme of the Tempelhof Field Park. Residents voted against the development ideas of the municipality that aimed to create a housing area on one third of the former Tempelhof airport. This development project would have influenced the current use of the airport as a leisure place for residents, where different groups have created their own spaces for recreation requiring a very low level of public infrastructure. The referendum was a result of the continuous protests and campaign against the municipal plans. It is important to keep in mind Berlin's tradition of protests against development plans, in which there are several cases where organised protests by NGOs and community groups have influenced political decision-making by the municipality on green spaces. For example, the project '20 Green Main Paths' concerned a collaborative ap-

proach between two NGOs and the Senate Department for Urban Development and the Environment. They created walking paths to contribute to nature conservation and nature experiences. In total, over a hundred volunteers participated in improving the path network (GREEN SURGE D6.1).

Relevance

These findings are perhaps not that relevant to the ULL stakeholders as the successes are already widely known in Berlin and – as described above – participatory governance is largely established as a means of involving local actors and gaining public support for new developments.

3.1.3 Key insights from external research

The three studies by Fischer et al. described in the following are relevant for the ULL stakeholders because they relate to the three key themes of interest that were identified during the first ULL stakeholder workshop in October 2014: (1) the potential of under-used (wasteland) spaces for, e.g. conservation; (2) the potential of the urban green infrastructure for conservation and connectivity; and (3) the management and care of the urban green infrastructure including innovative strategies that promote biodiversity. The first study underlines the potential of the urban green infrastructure for the conservation of grassland species; the second study shows that wastelands can contribute to conserving native grassland species in cities; the third study gives very practical advice on which plant species are best suited to establish on urban wastelands because of their specific traits.

Published article: Fischer et al. (2013): Urban land use types contribute to grassland conservation. The example of Berlin

In this study the occurrence and spatial arrangement of major grassland types at the habitat level in the city of Berlin for conserving grassland biodiversity was assessed. Grassland habitats were addressed within agricultural land as well as within urban land. The study highlighted the role of urban airports and historic parks regarding the conservation of dry grassland and agricultural land with respect to wet grassland. The authors recommend involving landowners and other stakeholders while considering strategies to conserve urban grasslands as a large portion of grassland with high conservation interest is located outside protected areas. An important finding of this study is that grasslands of special conservation interest can be largely associated with the urban green infrastructure. Thus, urban regions can contribute to the conservation of grassland types which are subject to a marked decline in ex-urban cultural landscapes.

Published article: Fischer et al. (2013): Creating novel urban grasslands by reintroducing native species in wasteland vegetation

This study deals with the potential for grassland restoration in urban settings, especially on large-scale wastelands that are isolated from suitable species pools. The authors explored different restoration methods for transforming urban wastelands into low maintenance meadows. The results of the experiment indicated that urban wastelands are suitable habitats for conserving the native grassland species and their genetic diversity as all plots treated with seed mixtures showed higher species richness than the control. This underlines the potential of novel ecosystems like wastelands for the conservation of grassland species in urban settings.

Published article: Fischer et al. (2013): Urban grassland restoration: Which plant traits make desired species successful colonisers?

In this study the characteristics (traits) of different plant species and their influence on the ability to colonize urban grasslands was investigated in order to determine which species were successful in terms of urban grassland restoration. The results indicated apparent differences in the characteristics between the plant species which were successful at establishing on urban wasteland sites and those which were not. Especially high competitive ability was crucial for success.

The next three studies relate to the theme of how urban residents with different socio-cultural backgrounds perceive, value and use biodiversity in various types of urban green infrastructure, which we introduced at the second ULL workshop in November 2015 in order to facilitate exchange between researchers (WP2) and practitioners in Berlin. The theme was received favourably and with much interest by the ULL stakeholders and fuelled discussions on the potential of integrating biodiversity conservation with urban planning. The first study describes a Master's thesis about how people interact with biodiversity in urban parks. The second one illustrates the results of a student project, which deals with the valuation and interaction of biodiversity at the ecosystems level (tended vs. wild) in cemeteries—one particular type of urban green infrastructure. Similarly, the third research study investigates how people perceive and value wild-grown as opposed to cultivated roadside vegetation.

Master's thesis at the Technical University of Berlin: People interacting with biodiversity in urban parks. Examples from Berlin

A student conducted observations on how people interact with biodiversity in urban parks in Berlin as part of her Master's thesis in Urban Ecosystem Sciences (Palliwoda, 2015). The aims of the study were (1) to analyse and understand interaction patterns of urban inhabitants within urban parks; (2) to determine behaviour patterns related to biodiversity in urban parks; and (3) to observe the following interactions: gathering and collecting of herbs, nuts, plants or parts of plants, flowering species and non-timber products and taking photos of plants. Observations were conducted at Schlosspark Charlottenburg (ChB) and Treptower Park (TrP). People who were observed interacting with biodiversity were also surveyed on demographic characteristics and biodiversity-related interactions. Interactions with more than 50 plant species were recorded. More people interacted with biodiversity at ChB than at TrP. Foraging for food was the behaviour pattern related to biodiversity that most people engaged in in both parks, followed by pet food, medical herbs, photos, tea, species identification, flower bouquets, decoration, and others. More females than males were observed interacting with biodiversity in both parks, and most people were between 40 and 59 years old and lived less than 2 km away from the site.

Student research project at the Technical University of Berlin: Wilderness in cemeteries

The focus of the study was to explore: (a) people's perception of wild and tended areas within cemeteries; and (b) the influence of visitors' age (reasons for the cemetery visit and for perception and approval of wilderness). The research questions were: (1) Do visitors have a positive attitude towards wilderness areas in cemeteries? (2) Do mourning, grave tending or remembering visitors prefer well-tended cemeteries? (3) Do elderly visitors prefer well-tended cemeteries? (4) Do attitudes towards nature conservation and wilderness areas in cemeteries correlate with aesthetic valuation? Surveys (n=256) were conducted at two cemeteries in 2015. Photo series were used showing tended grave vs. wild grave; tended path vs. wild path. Cemetery visi-

tors were generally above 50 years old and there were more female than male visitors. Most visitors at ZFF valued tended graves and paths more than untended ones, but untended graves and paths were still valued by a large proportion of visitors. At GPF most people valued untended graves, and both tended and untended paths were rated highly. People stated grave tending, remembrance and mourning as traditional reasons for visiting; broader reasons were nature experience, recreation like going for a walk or relaxation and cultural experience. Broader users did not perceive wild areas at cemeteries as a sign of neglect and stated that it was important to allow wild areas within cemeteries. Traditional users preferred well-tended sites over wild ones, perceived wild areas at cemeteries as a sign of neglect and believed that cemeteries should always be well-maintained and tended. People who used cemeteries for grave tending preferred tended sites. Elderly visitors disliked wild graves and paths. People who claimed to have higher knowledge of nature were more likely to favour wild areas at cemeteries.

Published article: Weber et al. (2014). A walk on the wild side: Perceptions of roadside vegetation beyond trees

This study explores the range of roadside vegetation perceived by urban residents in densely populated city districts in Cologne and Berlin, and particularly how wild-grown roadside vegetation is valued by residents in terms of associated ecosystem services. The authors conducted semi-structured interviews and asked if participants preferred no/planted/wild-grown vegetation of the site and collected keywords for reasons and associations on the: (1) range of roadside vegetation types perceived; (2) perception of specific types of roadside vegetation; (3) meanings and values attached to roadside vegetation; and (4) suggestions for design and management. People confirmed the important role of street trees, but also perceived a variety of cultivated and wild green components. Wild roadside vegetation was highly approved of, but there were differences between “urban devotees” and “wildness enthusiasts” in Berlin. In both cities orderliness and cleanliness were of minor importance. Preferences were affected by aesthetics, nature reasons (wildness, biodiversity and protection); the group of “urban devotees” also stated orderliness, but nature to a lesser extent. Generally, the awareness of ecosystem services provided was surprisingly high and the public acknowledged that trees and other elements of roadside vegetation fulfil important ecological and economic functions; these functions were more important to a high proportion of participants than orderliness.

The next three studies are particularly relevant for those ULL stakeholders that are also involved in the LA (see Section 3.1.2). They deal with safety issues related to urban food production such as high trace metal concentrations in vegetables, fruit and mushrooms as a result of high traffic burdens.

Published article: Säumel et al. (2012). How healthy is urban horticulture in high traffic areas? Trace metal concentrations in vegetable crops from plantings within inner city neighbourhoods in Berlin, Germany

This study determines the concentration of trace metals in the biomass of different horticultural crops grown in the inner city of Berlin and analyses how this local setting shapes the concentration patterns. The authors revealed significant differences in trace metal concentrations depending on local traffic, crop species, planting style and building structures, but not on vegetable type (fruit, root and stem vegetables, leafy vegetables and herbs). Generally, a higher traffic burden

increased the trace metal concentrations in the biomass. Buildings and large masses of vegetation between roads and the cultivation site function as barriers and reduce the trace metal content in the biomass. The results suggest that urban crops are not necessarily 'healthy' or 'safe' compared to supermarket products. The authors recommend further studies to develop pollution monitoring, risk assessment and species-specific guidelines for the cultivation and consumption of crops that are grown in the inner city and exposed to high traffic burdens to enhance food safety in urban horticulture.

Published article: von Hoffen, L. P. & Säumel, I. (2014). Orchards for edible cities: Cadmium and lead content in nuts, berries, pome and stone fruits harvested within the inner city neighbourhoods in Berlin, Germany

This study deals with the potential health effects of consuming locally produced urban crops (nuts, berries, pome and stone fruit) given the high local pollution loads from cadmium and lead in inner-city neighbourhoods in Berlin. The authors analysed how local settings at the sampling sites influence the trace metal content in the biomass. The results showed significant differences in trace metal concentrations depending on species, fruit type, local traffic and parameters related to barriers between the sampling sites and roads. Higher overall traffic burden increased trace metal content in the biomass, while buildings or vegetation as barriers reduced it as shown previously (see above: Säumel et al., 2012). The authors conclude that the consumption of urban non-vegetable fruit does not pose a risk on human health as long as the fruits are washed and site pollution and impacts are considered in garden concepts and guidelines.

Published article: Schlecht, M. T. & Säumel, I. (2015). Wild growing mushrooms for the Edible City? Cadmium and lead content in edible mushrooms harvested within the urban agglomeration of Berlin, Germany

In this study, wild edible mushrooms of different habitats and commercial mushroom cultivars within Berlin were sampled. The content of cadmium and lead in the fruiting bodies was determined and the role of the local setting in shaping concentration patterns was taken into consideration. The results showed that EU standards for cultivated mushrooms were exceeded by 86% of the wild mushroom samples for lead and by 54% for cadmium but not by mushroom cultures. The authors found significant differences in trace metal content depending on species, trophic status, habitat and local traffic burden. Higher overall traffic burden increased trace metal content in the biomass of wild mushrooms, whereas cultivated mushrooms had significantly lower trace metal concentrations. The authors recommend limiting the consumption of high accumulating mushroom species such as *Agaricus ssp.*, *Macrolepiota procera*, *Russula exalbicans*, *R. vesca*, *Coprinus cornatus* and *Calvatia gigantean* when picked in urban areas.

3.1.4 Workshop on identifying key issues



FIGURE 6. STAKEHOLDERS MINGLING DURING COFFEE BREAK OF SECOND ULL WORKSHOP BERLIN.

On November 20, GREEN SURGE (TUB, SWUP) hosted their second ULL workshop at the Senatsverwaltung für Stadtentwicklung und Umwelt (Senate Department for Urban Development and the Environment). The aim of the workshop was to update the stakeholders on GREEN SURGE activities in Berlin over the past year and to get their feedback. The workshop was attended by 17 representatives from the local government, district municipalities (Neukölln, Marzahn-Hellersdorf, Tempelhof-Schöneberg), neighbourhood management offices (Moabit/Mitte), NGOs (PlayField Urban Agriculture), environmental organisations (Nature Conservation Trust, Friends of the Earth Berlin, State Committee on Nature Conservation), State Commissioner for Nature Conservation and from the CDF School (see chapter on Berlin's Focal LA) as well as 11 representatives from GREEN SURGE (Figures 6 and 7).

We intended to get the workshop participants involved in an interactive way and make them start thinking about UGI issues. Thus, when entering the workshop space they were handed four tokens, which they were asked to distribute to state their preference for one photo from each of the four series of photos – forests, parks, wastelands and roadsides with different levels of biodiversity – that had been used for the field survey on biocultural diversity in Berlin (WP2). Each photo series had the specific question as a header: *Which of these photos of a park/forest/roadside/wasteland do you prefer?*

Following this, Ingo Kowarik gave a short overview of the themes and aims of GREEN SURGE, its partners in Europe, its structure including the feedback loop between research and practice in the form of the ULLs. He paid specific attention to discussing the research topics of urban green infrastructure, biological diversity, ecosystem services and biocultural diversity.

Then Alexandra Botzat briefly provided information on the focus and ongoing activities of the LAs in the other four ULLs: Bari, Edinburgh, Ljubljana and Malmö. She continued with describing with more detail the current activities in the LA in Berlin (see Section 3.1.2).



FIGURE 7. STAKEHOLDERS LISTENING TO MARTIN SEEBAUER RUNNING THROUGH THE PROGRAM OF THE SECOND ULL WORKSHOP IN BERLIN.

Subsequently, the floor was opened for questions and comments regarding the Berlin LA, whereby the feedback was generally very positive and the stakeholders liked the multiple targets of our approach: environmental education and knowledge transfer, nature conservation and ecosystem services, urban agriculture, healthy food and inclusive planning. They also considered the project to be advantageous in terms of the image of the school because of its innovative approach to use food as a means of raising awareness for biodiversity, conservation and sustainability in an urban context.

After a coffee break, Leonie Fischer presented the first results of the field survey on biocultural diversity in Berlin and all the other ULLs. She started by explaining the concept of biocultural diversity and the study design emphasising the effort made to target groups of people that are not easy to reach in studies, such as people who have a low socio-economic status, low education level or migration background.

Next, the results of the small stakeholder survey were revealed showing that the workshop participants valued medium to high biodiversity (Figures 8 and 9). The link between beauty and diversity was discussed with the recognition that if biodiversity was appreciated for its beauty, this would create the potential to integrate strategies of biodiversity conservation with urban planning. The group was thoroughly impressed by the study and expressed much interest in being updated on the upcoming analyses. The take home message was that biodiversity seems to matter to people in Berlin.



FIGURE 8. LEONIE FISCHER REVEALING THE RESULTS ON THE SMALL SURVEY ON HOW THE STAKEHOLDERS VALUE BIODIVERSITY IN DIFFERENT URBAN GREEN INFRASTRUCTURE TYPES AT SECOND ULL WORKSHOP IN BERLIN.

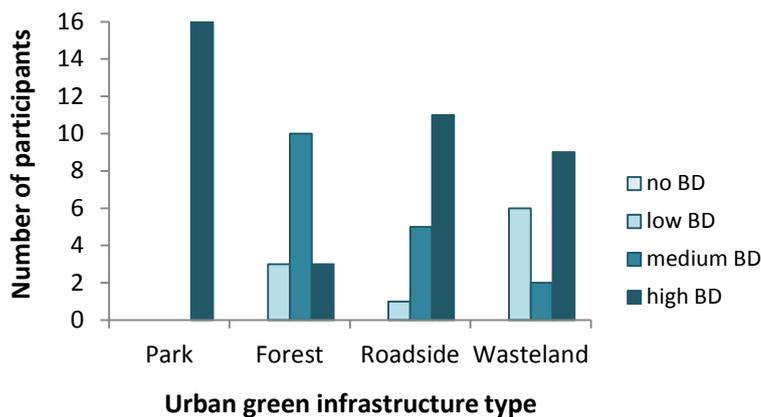


FIGURE 9. RESULTS OF SMALL STAKEHOLDER SURVEY ON THE VALUATION OF BIODIVERSITY OF DIFFERENT URBAN GREEN INFRASTRUCTURE TYPES AT SECOND URBAN LEARNING LAB WORKSHOP IN BERLIN IN NOVEMBER 2015.

3.1.5 ULL synthesis

Berlin is a large central European city with a population of 3.5 million that has recently started to grow again, but has strong differences between districts, in terms of population numbers and people moving in and out of districts. The transformation of former industrial, commercial and residential areas into new urban green spaces is a strategy that has contributed to the regeneration of the city since its reunification 25 years ago. The Berlin ULL focusses on the district of Marzahn-Hellersdorf (MH), which is one of the main transformation areas in the eastern rim of Berlin—where urban and rural landscapes come to touch. The district is characterised by large housing estates from the 1980s, made up of Plattenbau (concrete slab buildings), but also features a large amount of urban green spaces. In 2017 the district will be the main IGA (International Garden Exhibition) 2017 site and is expected to attract thousands of visitors. Besides stakeholders from MH – those who work and live there – actors representing the entire city of

Berlin are involved in the ULL as well. Some stakeholders from MH also represent Berlin as whole.

Once a year, in autumn, the ULL brings together a dynamic group of 30 to 40 urban green infrastructure stakeholders to exchange ideas on new approaches among each other as well as to be inspired by GREEN SURGE. The stakeholders predominantly represent (1) the local government at the Senate level (Senate Department for Urban Development and the Environment), (2) various offices for nature conservation, urban planning and green spaces at the district level (predominantly from Marzahn-Hellersdorf), (3) environmental and cultural NGOs, organisations and initiatives involved in, e.g. nature conservation, urban gardening, education, social cohesion and the arts, (4) urban planners and landscape architects as well as (5) the International Garden Exhibition (IGA 2017) with its environmental education programme IGA Campus.

At the first workshop in 2014 the stakeholders identified three key themes: (1) the potential of under-used spaces such as urban wastelands; (2) the potential of urban green infrastructure to connect habitat corridors in green “bands”, which contribute to conservation; and (3) management and care of the urban green infrastructure through innovative approaches that promote biodiversity. In the 2015 workshop, GREEN SURGE (TUB, SWUP) presented the progress of the Focal LA (see Section 3.1.2), which builds on the ideas collected in 2014 as well as the results of the WP2 field survey on how people perceive, value and interact with biodiversity in Berlin. In addition, the workshop participants were also given the opportunity to state their own preferences for low, medium or high urban biodiversity in a small interactive survey (see Section 3.1.5). Berlin has a long history of taking into account the green infrastructure in urban planning and using participatory approaches. This is why the overall aim of the ULL is to facilitate exchange between research, nature conservation, (inclusive) urban (green infrastructure) planning and decision making and discuss urban green infrastructure issues at an abstract and more conceptual level, while the Focal LA is fully immersed in practice and focuses on one particular issue (see Section 3.1.2).

3.2 Research needs

3.2.1 Elements of key interest in future GS-research

At the time of writing, WP2 will soon present the findings of the field survey on human perception, valuation and use of urban biodiversity in a report (D2.2, month 26). Similarly, WP3 will soon report on the functional linkages between urban green space, biocultural diversity, human health and social cohesion (D3.2, month 26 and also provide a corresponding database (D3.4, month 46).

Especially the outputs from WP2 on how people with different socio-cultural backgrounds perceive, value and use urban biodiversity will be very helpful for urban planners and decision makers in order to bridge the gap between strategies that address *either* human wellbeing *or* biodiversity conservation in the city. For example, if biodiversity-rich meadows are valued highly by certain user groups, this can inform the planning or management of defined parts of urban green spaces. Also the results from WP3 on, for example, the effects of availability of and access to urban green spaces on human health and social cohesion will help raise the stakeholders’

awareness of the cultural ecosystem services and benefits delivered by the urban green infrastructure at the city level.

Comparisons with other European cities also offer scope for inspiration for urban planners and decision makers. Especially the findings on human health and social cohesion will be very interesting in the context described above. WP5 will present the results of eight to ten case studies that represent good practices in strategic UGI planning and implementation in terms of sustainable city development (D5.2, month 27). Moreover, the newly developed innovative strategies and tools for urban green infrastructure planning (D5.3, month 44), which will have received the input from the relevant Focal LA stakeholders, are likely to provide a very valuable input to the planners of Berlin – also in terms of exchanging ideas across Europe. Similarly, WP6 will describe the success and failure of governance arrangements (D6.2, month 27) and then provide guidelines for effective participatory governance arrangements with regard to urban green infrastructure and biocultural diversity (D6.3, month 44). Berlin's city officials may benefit from the set of examples from other cities as well as from the innovative ideas for the future.

3.2.2 Opportunities for engagement with GS-research

We maintain a close and frequent exchange of ideas with WP2. The results of the field survey on how people perceive, value and use urban biodiversity were presented at the second ULL workshop on November 20, 2015. The results were discussed with the stakeholders and fuelled a debate on the cultural ecosystem services provided by (especially the species-rich) urban green infrastructure in Berlin.

Perhaps during next year's ULL workshop, representatives from WPs 3, 4, 5 or 6 could present results that are relevant for Berlin. For example, the results of a study in WP3 on the health effects of having access to green spaces for first graders would certainly be very interesting for Berlin's ULL and especially LA stakeholders. Moreover, the study on cash flow generated by urban green spaces using the example of cafés in proximity to different parks in Berlin might be suitable and interesting for ULL stakeholders. Also, the good examples for innovative strategies and tools in terms of planning and governance might be interesting to discuss within Berlin's group of practitioners.

4 ULL UPDATES: EDINBURGH

4.1 Background

4.1.1 Focal Learning Alliance compared to Urban Learning Lab

The Edinburgh Focal Learning Alliance (LA) is the Edinburgh Living Landscape (ELL) partnership. The aim of the partnership is to further the “creation and restoration of robust, resilient and connected green (and blue) infrastructure” (Scottish Wildlife Trust, 2014: 2) in and around the city of Edinburgh. The partnership was initiated by the Scottish Wildlife Trust (SWT), a charity that aims to create healthy, resilient ecosystems across Scotland. ELL was set up on 18 June 2013, and has 10 member organisations, including environmental NGOs (e.g., Scottish Wildlife Trust), government agencies (e.g., Scottish Environmental Protection Agency), research (e.g., University of Edinburgh), the City of Edinburgh Council and GREEN SURGE. The board formally meets three times a year, although meetings between subgroups may be organized more often.

GREEN SURGE has been actively involved in developing the ELL work plan before it was formally launched in November 2014. Five strategic objectives have been agreed with associated actions and indicators to measure progress. The strategic objectives are:

- *Ecosystem health of Edinburgh is improving year on year*
- *Improved ecosystem health in Edinburgh is having measurable socio-economic benefits for the city, particularly in areas of deprivation*
- *More people are engaged in caring for their local green spaces*
- *More people are making use of Edinburgh’s connected network of green and blue spaces to move around the city by walking and cycling*
- *New developments are planned and delivered in such a way as to create low carbon, walkable neighbourhoods, and workplaces containing high quality green infrastructure.*

GREEN SURGE has committed to carrying out a small number of projects as part of the LA’s Action Programme. Firstly, there is a desire to map the ecological connectivity of urban green spaces in Edinburgh in order to identify gaps in the network. To this end, GREEN SURGE is classifying domestic gardens features (i.e., trees, shrubs and grass), which will be correlated with pollinator presence data to measure how pollinator biodiversity is linked to environmental variables measured at different scales. This model will be extended with connectivity data derived from habitat suitability models in order to find gaps in the ecological network. Secondly, GREEN SURGE is working with eCountability Ltd (a UK private company) and other project partners on an Innovate-UK co-funded project, 2015-16, 'SPADES'. The aim of this project is to develop an “Urban Ecosystem Services Tool for Business and Local Authority Use”. Edinburgh is being used as one of the case studies for this feasibility project, providing mapped outputs for selected ecosystem services to Edinburgh City Council in order to inform updates to their Open Space Strategy. Finally, there is also scope to contribute to any of the other LA actions, such as creating a policy statement on the “ecosystem approach” (i.e., focusing efforts on protecting ecosystems rather than individual species), increasing the number of local communities getting involved in local park maintenance and increasing the number of people growing their own food.

The Edinburgh LA is unique in the sense that it is concerned with green infrastructure development for the whole of the city (region), focusing on different themes such as climate change adaptation, biodiversity and health and well-being. It does not have a narrow thematic or spatial focus, and in that sense is not “focal”. The LA also has a broad representation and therefore the LA and ULL will share many of the key issues. Reference will therefore occasionally be made to the ELL Action Programme when describing findings relevant to the ULL in the sections below. An important difference between the ULL and LA is, however, that the ULL comprises a much wider group of stakeholders, can be more dynamic in both make-up and topics of key interest, and is open to anyone with a stake in Edinburgh’s urban green spaces.

4.1.2 Key insights from other GREEN SURGE WPs

WP2: Assessment of biocultural diversity

Findings

Deliverable 2.1 shows that the concept of biocultural diversity is not recognized in formal planning procedures in Edinburgh. The interviewed city official responsible for green space planning indicated that input of local people on plant species choice for local green spaces could be appropriate depending on circumstances. There is also a desire to “naturalize” parks and green spaces to support biodiversity and save on maintenance cost. The field study on biocultural diversity revealed that in Edinburgh park meadows, roadside vegetation, forests and wasteland with high biodiversity are preferred over those with lower levels of biodiversity (see Milestone 21). Most interviewees used green spaces several times a week.

The spatial analysis of biocultural diversity in European core cities using the European Urban Atlas dataset revealed that the available green space per capita within Edinburgh’s administrative city boundaries is above the mean value for Europe. The share of urban green space does not vary with population density; peripheral parts of town do not have larger areas of urban green space. This is unlike cities such as Berlin, Ljubljana and Łódź, which have a skewed distribution of green space with larger areas available at the urban fringes.

Relevance

Unlike the formal CEC planning documents, the ELL Action Programme does mention the concept of biocultural diversity. “Provide accessible, multifunctional, high quality green space for all to suit the biocultural needs of residents” is one of the actions described in the programme. Accounting for the biocultural needs of local people is considered important in order to increase the number of people visiting and caring about local green spaces. Especially so in areas of socio-economic deprivation as number of green space visits and level of community green space management may be lower.

WP3: Functional linkages

Findings

Edinburgh has a relatively high level of urban green space per capita when compared to other ULL cities; 31 m² on an average of 17 m². When including urban forests, however, the total figure of green space per capita (60m²) is the lowest of all ULL-cities, with exception of Bari. It should be noted, however, that this total does not include golf courses, cemeteries, green sports areas and allotments, green space types that may be relatively prevalent in Edinburgh, although not

always easily accessible to the public. Edinburgh tops the list of ULL cities when it comes to citizen access to green urban areas (incl. forests; >2 ha) within 500 m of their homes. Over 88% of the population have such access, while this is 66% for the set of ULL cities as a whole.

Edinburgh's climate is somewhat wetter and colder than the average when compared to 295 European cities. The link between land use variables from the Urban Atlas dataset and temperature and precipitation was examined. Although correlations were not high overall, two land use variables influenced average temperatures relatively strongly; percentage of forest area (negative relationship) and percentage of agricultural, semi-natural areas and wetlands (positive relationship). The forest area and percentage of agricultural, semi-natural areas and wetlands have been reported for Ljubljana and Berlin, but not for Edinburgh. However, it can be derived from data reported in MS24 that forest area is approximately 5% in Edinburgh. This is above the British average for cities of 2% and the percentage of forest cover in the ULL cities of Malmö and Bari. It is, however, far below the averages of Berlin (15%) and Ljubljana (40%). A similar estimate cannot be provided for the share of agricultural, semi-natural areas and wetlands. The overall percentage for British cities is, however, lower than that for the Central, Mediterranean and New Member State planning families.

Relevance

Information on the share of green space and its accessibility is of high interest and therefore already available to the municipality. The comparison with other European cities may, however, be relevant in order to understand how Edinburgh fares compared to other cities. It would therefore be useful to extend this analysis on urban green areas per capita to the full set of cities in the Urban Atlas. Given high levels of precipitation already, changes in rainfall leading to higher flood risk is of concern to stakeholders in the ULL, more so than increased temperatures. As no classes of land use were predictive of precipitation levels, a convincing argument for change of land use for climate change mitigation cannot be made in Edinburgh based on this data.

WP4: Contributing to the green economy

Findings

In Deliverable 4.2, the relationship between urban green areas and the availability of cafés was studied in a range of European cities, including Edinburgh, using GIS. Green space data was derived from the Urban Atlas dataset and spatial data on cafés from the open source OpenStreetMap (OSM) platform. Cafés in OSM are defined as rather informal places with a sit-down facility where beverages and light meals and/or snacks are sold. Density of cafés was measured in "buffer rings", varying in distance (up to 500 m) from the green space. Only space falling within the administrative boundaries of the city was analysed. The findings showed that there was a peak in café density around 100-200 m (nearly 5 per km²) from urban green space in Edinburgh. The density of cafés is lower at larger distances, dropping to about two per km² in the buffer ring 400-500 meters from the urban green space. This finding matched that of most other cities; in 15 out of 17 cities the peak in café density was either at 100-200 or 200-300 m.

It was also investigated whether research and development (R&D) institutes would be more likely to locate their premises near urban green space. Given the limited number of R&D institutes in individual cities, this analysis was done for the EU as a whole using the Corine Land Cover 2006 dataset and the Amadeus database. This analysis revealed a negative correlation be-

tween percentage of green in a city and number of R&D institutes. The number of R&D institutes within 500 m of urban green spaces was also not higher than further away. Therefore, there is no evidence to suggest that creative industries reveal awareness of green space benefits on cognitive functioning in their location choices.

Relevance

The ELL (Edinburgh Living Landscape: Edinburgh's Focal LA) Action Programme reveals a key interest in quantifying socio-economic benefits of (improved) ecosystem health. This is reflected in one of the strategic objectives of the partnership: "Improved ecosystem health in Edinburgh is having measurable socio-economic benefits for the city, particularly in areas of deprivation". The list of current projects by partners does not include any projects aimed at increasing understanding of cash flow generation by urban green spaces, or any plans to unlock such cash flow potential for the benefit of urban green space. Instead, such socio-economic benefits are expected to be delivered through increasing the area of green space cover, biodiversity value of active travel routes and stimulating people to engage in food growing and/or adopting their local park. In addition, partners have agreed that there is a need to better understand nature conservation value of freshwater and coastal habitats. The ELL has not yet agreed on how best to measure socio-economic benefits for the city, and is currently considering a mental health or well-being indicator.

The findings from WP4 offer insight into cash flows generated by urban green spaces. These have not been considered by partners in the ELL and could provide an approach of financing urban green space that is likely to be of interest to ULL members. The relevance of considering these methods could be illustrated with the findings from the café research, suggesting that private actors are financially benefitting from a public good. A study such as that performed in Malmö using a method for hedonic pricing would be very interesting to replicate in Edinburgh as it shows that not only do people prefer to settle near urban green space, they are also willing to pay more. This would be especially relevant if opportunities exist to carry out such a study at smaller spatial scales in order to check if particular green space interventions changed house prices. As such, this approach could provide the sought-after indicator of economic benefits delivered by urban green spaces.

WP5: Green infrastructure planning and implementation

Findings

Planning documents in Edinburgh acknowledge the value of urban green spaces for a variety of reasons, including their economic benefits. Key documents at local level are the Open Space Strategy and the Local Development Plan, the preparation of which has been driven by policy and legislation from central government. The regional authority for South East Scotland (SESplan) also influences local planning decisions by setting a spatial strategy for the region as a whole.

Grey-green infrastructure planning is well-coordinated in the city and explicitly considered in planning documents. There is a strong focus on the role of urban green space in improving health and well-being when compared to other cities. Different planning principles (multifunctionality, integration and connectivity) have been adopted in UGI planning, although the focus is sometimes more on conservation than on enhancement of these principles. The concept of ecosystem

services (ESS) is not yet integrated in formal planning documents, although many ESS are considered without referring to them as such. Budget cuts provide a challenge so there is a strong desire to increase the involvement of community groups, NGOs and business representatives in planning. The obligation imposed upon developers to deliver green space as part of new planning proposals is unique to cities within the British planning family, and provides a real opportunity for planners to improve the city's UGI.

CEC is relatively good at consulting on their plans, and have used a variety of methods (e.g., surveys, consultation via mail and at events) to gain an understanding of the green space needs of citizens. The Planning department also has good experiences in collaborating with other departments in plan preparation.

Relevance

The city has implemented a range of plans and policies to protect and, where possible, improve the quality and accessibility of green spaces. Declining levels of core funding, however, put pressure on green space management and implementation. Therefore, there is a clear need for quantifying and mapping ecosystem services, as well as gaps in the ecological network, in order to make more funding available for green spaces, and invest that what is being made available more strategically. To illustrate, an exercise aimed at mapping of the city's green infrastructure and its quality carried out as part of the Open Space Strategy has already resulted in developers paying for green space improvements across the city's network. Moreover, it has led to better coordination of green space investments by different departments.

Examples of approaches considered to be useful are overlaying spatial data on green spaces with health statistics, linking biodiversity to garden structures or density of buildings and measuring connectivity of biodiversity hotspots. A foresight exercise to scrutinize impact of different development scenarios on urban ecosystem services could improve strategic decision-making regarding green spaces.

Finally, approaches that would aid in engaging citizens and other non-governmental actors with the concept of sustainability would be helpful to increase support for investment in UGI. In addition to developing more quantitative measures, there is thus also a need to consider how quality of information on sustainability could be improved in order to provide a "story" that non-experts can easily engage with. Inspiration could be drawn from Sustainable Seattle indicators, such as number of days you can see the top of the mountain through smog as an air quality indicator, or number of salmon in the river as indicator of river quality. Sharing examples of such approaches from other GS cities or elsewhere may facilitate the process of getting this off the ground.

WP6: Innovative governance of urban green spaces and biocultural diversity

Findings

The interviewed city official indicated the full range of non-governmental stakeholders (e.g., community groups, scientists, NGOs) to be involved with urban green space planning. There was a desire to further increase such engagement regarding community groups, neighbourhood associations, NGOs and businesses. An interview with a city official carried out as part of Task 6.2 revealed that participatory governance of urban green spaces is supported by the municipality in order to deliver green spaces that meet local needs, and sometimes to save funds as well.

This work package has identified different clusters of participatory governance practices with regard to urban green space; outsourcing, strategic involvement in decision-making, cooperative forms of management, informal attempts to influence policies and informal green space related activities. These clusters can be distinguished based on the means (varying from hands-on activities to political influence) and the mode (varying from top-down to bottom-up) of participatory governance. Examples from Edinburgh could be provided in most of these categories, suggesting that non-governmental actors are in some cases relatively powerful actors, both in influencing policy as well as in instigating on the ground action. Indeed, the interviewed city official indicated that the city relies to an extent on non-governmental actors for green space planning, design and management. Different methods or tools for participatory governance, such as e-governance or urban agriculture, were outlined as well.

Complacency of non-governmental actors was suggested to be an issue, with actors being reactive rather than proactive. The city officials also indicated that resources and skills by city officials to engage non-governmental actors were sometimes inadequate. Other challenges relevant to participatory governance mentioned were implementing the creation of temporary green-space on agricultural and brownfield sites and the over-subscription and demand for allotments.

Relevance

The findings show that national and local policy already supports participatory governance of urban green spaces in Edinburgh; a wide variety of actors are engaged in a broad range of practices. There is, however, scope for intensifying the level of engagement. This is also evidenced in the ELL Action Programme, which includes actions such as: increase the number of people growing their own food and increase the number of communities adopting local parks. As engaging non-governmental actors is sometimes an issue, and adequate skills are sometimes lacking, the municipality would benefit from learning about tools and methods that may aid in achieving such engagement. E-governance may be of particular interest here given rapid developments in this field and the relatively low resource required in orchestrating engagement. The municipality may also be interested in learning more about innovative approaches to implement urban agriculture in current and new developments in other cities, given the ever-increasing waiting list for allotment gardens and concerns regarding the lack of long-term pay-offs of any investments towards implementing temporary gardens.

4.1.3 Key insights from external research

Socio-cultural value of Edinburgh's green spaces

A student at the University of Edinburgh conducted her Master's thesis on developing a survey-based evaluation method to understand the socio-cultural value of different urban green spaces in Edinburgh (Jones, 2015). A total of 152 structured interviews were held with park users in four different parks. This showed that cultural ecosystem services such as health, recreation and the experience of nature and habitat were considered most important. Services such as mediation of pollutants, carbon storage and education were considered less important. Preferences were not influenced by the socio-economic profile of the neighbourhood in which the park was situated.

Across all different age cohorts, more than half of all respondents liked low-maintenance grass and wildflower meadows. Users showed a preference for low-maintenance natural park management styles over highly tended alternatives. The preference for park management styles varied between parks as well as age groups. Most notably, a higher percentage of older people preferred low-maintenance grass and wildflower meadows compared to younger people.

Fewer than 10% of interviewed respondents indicated to have a high interest in volunteering in their local park. Only 20% of users had no interest in volunteering in their local park at all.

Relevance

These findings are relevant to the ULL as they indicate that measures aimed at increasing biodiversity in parks, an area of interest to stakeholders, are generally supported by citizens, although there is some variation in preference for re-naturing parks depending on demographic characteristics. The study also shows that urban green spaces are not just mostly valued for their cultural ecosystem services by stakeholders participating in our workshop, mainly comprising actors from NGOs, research organisations and local government, but also by citizens using parks. It is not unlikely that views by stakeholders communicated during the workshop were informed by this work as the results had been presented on this occasion as well. The findings provide further support for the focus on engaging more citizens with their local environment within the ULL.

The value of Edinburgh's parks and trees

A study was commissioned by CEC to measure the social, economic and environmental benefits of Edinburgh's parks using a Social Return on Investment (SROI) methodology (City of Edinburgh Council, 2015). As part of this study, surveys and consultations were carried out with a representative sample of stakeholders that would be affected by a change in park services. This included visitors, volunteers, schools, community organisations and city officials.

The consultation revealed that communities value parks because they build social capital and increase sense of community, they provide health and well-being effects and opportunities for recreation, and learn more about the natural and cultural heritage. Park volunteers benefit by gaining new skills and confidence, increasing social contacts and improving physical health. Local employers benefit from having a more healthy and productive workforce as well as increased revenue from park users. Schools reported using parks for outdoor learning activities as part of the Curriculum for Excellence, providing environmental awareness, practical and social skills to pupils. Local residents benefit from increased property prices and green spaces are also used for many events by local groups and organisations that benefit from the attractive backdrop created by the local nature.

Outcomes for different groups were identified, as well as the frequency of these outcomes based on the number of park visits, and valued using financial proxies. This analysis predicts that benefits generated by the city's parks are worth over £100 million every year. This is mainly due to benefits for health and well-being (£40.5 million) and revenue by local business (£51 million). Other benefits included in the equation concerned the impact of parks on social inclusion and community capacity, environmental education and environmental awareness. The study concludes that for every £1 currently invested in park management, a £12 return is generated.

Related to this, CEC also recently commissioned an i-Tree survey to measure the value of trees in the city. This method was developed by the United States Forest Service to put a monetary valuation on ecosystem services provided by urban trees such as carbon storage. To this end, trees and shrubs were surveyed in a representative sample of 200 field plots across the city, taking into account variables such as height, girth, canopy structure and condition, in 2011. The findings, reported in Edinburgh Trees and Woodlands Action Plan (City of Edinburgh Council, 2014b), show that the city is estimated to have 638,000 trees with a canopy cover of 17%. The tree density (55.6 trees/ha) was below the UK average (58.4 trees/ha). The structural value of Edinburgh's tree stock, reflecting the cost of replacing the trees with similar exemplars, was valued at £382 million. The carbon storage value was estimated to be somewhere between £15 million and £44 million in 2011. The value of carbon sequestration by Edinburgh's trees was estimated to be £484,689 per year, the equivalent of the annual emissions of 20,801 people. Trees also improved air quality by removing pollutants such as ozone, carbon monoxide and nitrogen dioxide. This air filtering function was estimated to be worth over £2.3 million per year.

Relevance

By quantifying the monetary benefits of urban parks and trees, CEC is hoping to influence politicians and councillors to invest more in, or withhold from budget cuts of, urban green space services. They highlight that CEC is considering monetary valuation tools as important in improving urban green spaces. It is perhaps too early to judge whether these recent valuation exercises have been successful towards securing more urban green space funding. A recent workshop on monetary valuation of ecosystem services (Natural Capital(ism), 12 November 2015, Edinburgh Centre for Carbon Innovation) highlighted the issue of politicians inadequately considering (the long-term benefits of) (urban) green space quality improvements in their election promises given the importance of delivering short-term results in view of getting re-elected four years later. Therefore, there is likely to be a need for complementing existing research on monetary valuation within the Edinburgh context with alternative approaches, for example those focused on unlocking cash flows green space to private actors.

4.1.4 Workshop on identifying key issues

On 10 September, GREEN SURGE hosted their second ULL workshop at the Edinburgh Centre for Carbon Innovation in Edinburgh. It was organized together with researchers from ECom (Ecosystem Services Community) Scotland as part of their series of seminars to maximize attendance rate. ECom is a community aiming to support collaboration between science, policy and practice around issues relevant to natural resource management. This workshop brought together over 40 representatives from local government, NGOs, research organisations, businesses and community groups, to discuss ecosystem service provision in Edinburgh.



FIGURE 10. SLIDE SHOWN DURING WORKSHOP TO INTRODUCE THE GROUP EXERCISE

The workshop began with presentations on some of the latest research and collaborative projects focussing on Edinburgh's green infrastructure and ecosystem services (Figure 10 and 12). Maggie Keegan (SWT) described the work that the ELL partnership is doing to provide, restore and connect Edinburgh's green infrastructure at a range of spatial scales, from improving the design of existing and planned school grounds to making the access to high quality natural areas more equitable across the entire city. Next, Isobel Jones (University of Edinburgh) presented her Master's thesis addressing the socio-cultural value of Edinburgh's parks (see Section 4.1.3). Alexander van der Jagt and Chloe Bellamy from GREEN SURGE then provided an update on GREEN SURGE, introducing the different WPs and work being carried out by FCRA in partnership with stakeholders.

In order to find out more about key green space issues in Edinburgh, workshop attendees were asked to vote on the importance of different ecosystem services in Edinburgh, from the view point of the organisation that they were representing. Each person was given ten tokens to spend as they wanted across the suggested services to represent their organisation's concern for them. The list of services provided was based on those uncovered by the review of urban ecosystem services based on two key reviews on the topic (Gómez-Baggethun & Barton 2013; Haase *et al.* 2014). The results of this exercise show that all services identified were perceived to be important by the groups represented, but there was a preference for the cultural services, particularly biodiversity (also represented as a supporting service) and the mental and physical health benefits (see Figure 11). Discussion groups following this exercise revealed a range of issues,

concerns, and suggestions regarding the integration of urban ecosystem services into decision making in Edinburgh.

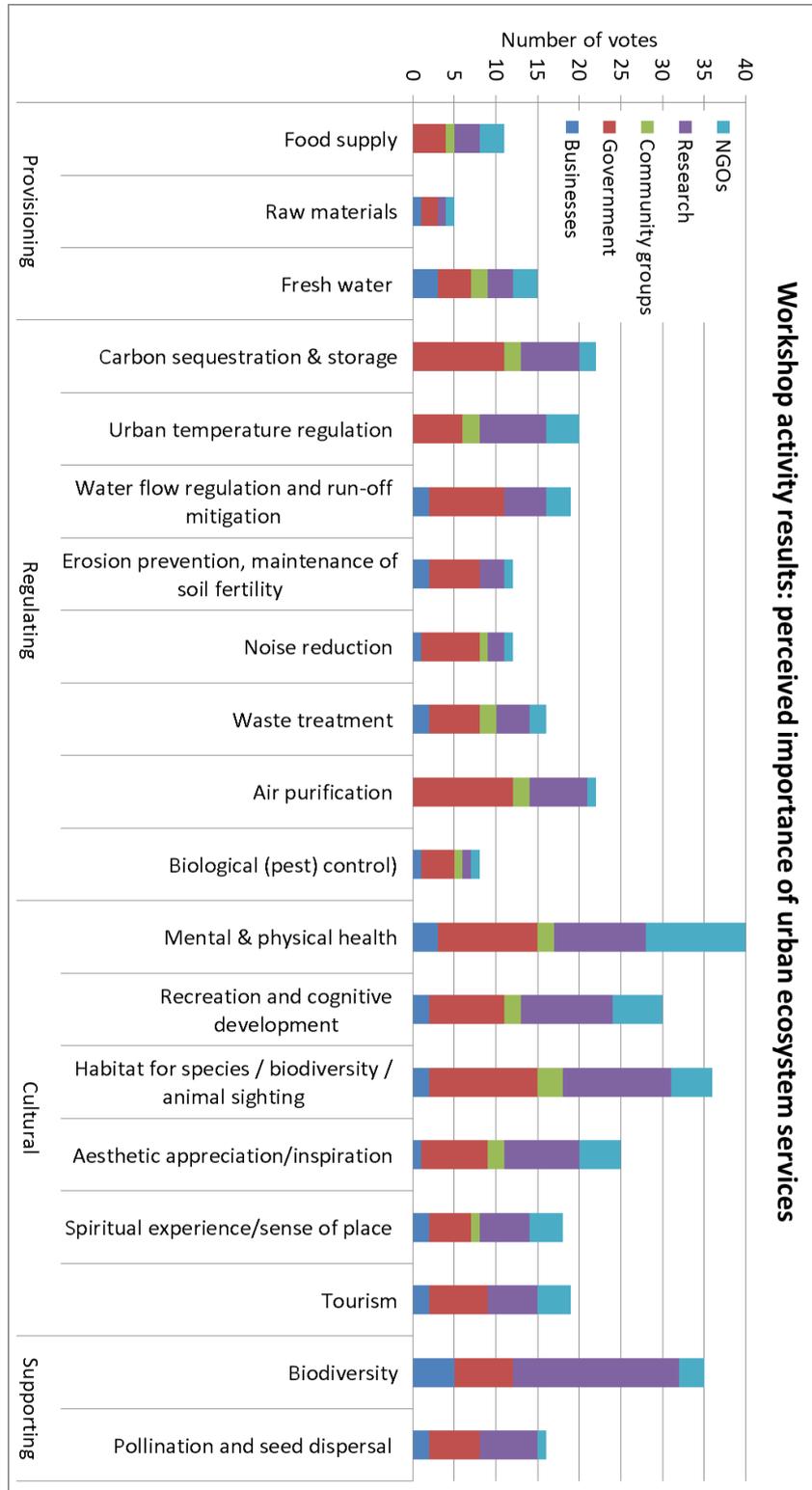


FIGURE 11. NUMBER OF TOKENS ALLOCATED TO EACH OF THE URBAN ECOSYSTEM SERVICES, SPLIT BY TYPE OF ACTOR, IN THE EDINBURGH WORKSHOP EXERCISE

Comments on exercise:

- *All services are important – we should take as many into account as possible and perhaps prioritise them locally*
- *Difficult to complete the exercise taking your organisational rather than personal perspective*
- *Issues with services vs. benefits: Some activities linked to services may provide multiple benefits and the importance of these benefits varies, e.g. people might pick berries for the social/mental benefits, not just to get the produce*
- *What about disservices, i.e. negative aspects?*
- *Need to gather information from a stakeholder group that isn't so engaged – why might they not be using local greenspace?*



FIGURE 12. WORKSHOP PARTICIPANTS ENGAGED IN SUB-GROUP DISCUSSIONS

Responses to the question: “Which, if any, ecosystem services³ have been omitted in the list to choose from?”:

- *Social cohesion/meeting places*
- *Security/climate change resilience*
- *Green travel routes/networks*
- *Crime reduction*
- *Economic value, e.g. from health*
- *Disservices, e.g. gentrification raising house prices so that it is difficult for most people to afford to buy a house in this location*
- *Education & engagement*

³ Note that the list of ecosystem services in the workshop was based upon those identified in the literature and not all responses below are actual ecosystem services

- *Intrinsic value of nature*

Responses to the question: “Which Ecosystem Services are provided well in Edinburgh and which are not?”:

- *✓ Accessible parks*
- *✓ Linear green travel routes, e.g. canals*
- *✓ Large number of community groups help to provide good access to greenspace – this might be further improved with the planned Community Empowerment Bill*
- *X Loss of community greens*
- *X Access to greenspace could be improved if tenement garden boundaries were removed and these areas were opened up*
- *X Air quality*
- *X Regulatory services*

Related comments:

- *Greenspace access/ecosystem service provision isn't equal across the city – the more deprived areas tend to have lower quality greenspace*
- *Difficult to generalise as service provision varies across the city*
- *Can be hard to tell, e.g. we have little information on how well we are providing the regulatory services*

Responses to the question “Are different Ecosystem Services important at different spatial scales (e.g., neighbourhood, city or city region)?”:

Yes, e.g. need to consider water catchment scale for flood mitigation and smaller scale for local parks.

Responses to the question: “Do you think that your priorities for ecosystem services might change 20 years from now?”:

Yes, particularly those related to mitigating for climate change (e.g. temperature regulation & flood mitigation) and because of other pressures such as population increases. There is uncertainty over what the future may bring so we need to protect core areas of urban greenspace to ensure they can continue to produce a range of ecosystem services.

4.1.5 ULL synthesis

Edinburgh is the capital of Scotland with a population of around 500,000. As well as being known for its UNESCO listed built heritage, Edinburgh has a number of open hills and wooded waterways that are prominent components of the townscape. Edinburgh is also a growing city, planning to build nearly 30,000 new houses by 2024 (City of Edinburgh Council, 2014). This, combined with municipal funding cuts, puts considerable pressure on the city's green spaces and surrounding Green Belt.

The Edinburgh ULL focuses on the city as a whole, considering interactions between the urban and peri-urban ecosystem, and comprises a dynamic group of stakeholders in Edinburgh's green infrastructure from the local government, businesses, community groups, government agencies, non-governmental as well as research organisations. A recent workshop held with the Edinburgh ULL by GREEN SURGE (September 2015) revealed that cultural ecosystem services, in particular mental and physical health, animal viewing and biodiversity, as well as recreation and cognitive development were considered to be the most important services of the city's green spaces. ULL stakeholders perceived Edinburgh to be doing well in providing accessible parks, linear travel routes and supporting community management of green spaces. At the same time, they perceived scope for improvement in delivering regulatory services such as air purification and water flow regulation. Concerns were also expressed regarding the loss of green space, the lack of accessibility of allotments and the unequal distribution of high quality green spaces across the city, with deprived areas being disadvantaged.

Given the value placed on cultural ecosystem services by the Scottish Government and other (local) stakeholders in Edinburgh's green infrastructure, *engaging more people with urban green space* came out as a key theme of interest in the Edinburgh ULL. This is particularly pertinent for deprived areas, where high impacts with regard to health and well-being could be made. Considering new tools and methods to support citizen engagement, such as e-governance, may prove useful in this regard. *Supporting biodiversity* is a second area of interest to the ULL stakeholders, with a particular demand for knowledge on how wildlife is influenced by connectivity of urban green spaces, as well as urban green infrastructure components, such as trees, shrubs and grassland. In addition, strategic conservation efforts, such as focusing on iconic species important to cultural identity or involving schools, could play an important role in improving environmental awareness and pro-environmental behaviour. Finally, the urban green space stakeholders of the Edinburgh ULL also have a broadly shared interest in *finding new methods for valuing urban green infrastructure*. There is a need to financially quantify and spatially map ecosystem services. Whereas the former may help to explain to decision-makers that investing in green space makes economic sense, the latter would allow for more strategic investment of available funds by highlighting disadvantaged areas. Exploring unused methods to that convince businesses to manage or invest in urban green infrastructure would also be of interest in this regard.

4.2 Research needs

4.2.1 Elements of key interest in future GS-research

WP2 - The results of the WP2 field study on biocultural diversity (task 2.2, D 2.2, month 26) will likely be relevant to the stakeholders in the ELL and beyond. This research will show how Edinburgh citizens' preference for different types of green spaces relates to biodiversity. In case this would show that high biodiversity urban green spaces are preferred, this provides additional justification for a number of projects written into the ELL Action Programme aimed at enhancing biodiversity. These include: increase area of wildflower meadows on Council-owned land, increase tree and woodland cover, as well as number of street trees, increase number of green roofs and walls, naturalizing urban parks and increase area of sealed soil "depaved".

In addition, this study may provide better insight into the question if and how preference for biodiversity varies between different socio-demographic or cultural groups. Improving access to green space in disadvantaged areas, both physically and psychologically, is a strategic priority given the potential of greenspace to alleviate some of the health and well-being issues associated with deprivation. Any initiatives aimed at understanding green space needs of disadvantaged people would therefore be particularly welcome. The typology of biocultural diversity to be developed as part of Task 2.3 could provide some ideas for providing new types of green spaces that better meet the needs of these people.

WP3 – It is hoped that the planned activities on showing linkages between urban green space and ecosystem services such as climate change adaptation, human health and well-being and social cohesion (Task 3.3) will deliver tools to be used, or information relevant, to quantify these benefits of urban green space. Doing so, important contributions could be made to making the case for increased investment in urban green space, which is one of the key areas of interest of the Edinburgh ULL. GIS analysis and modelling of green space benefits for vulnerable groups is relevant with regard to the aim of the ULL to engage more people in the city with green space, especially disadvantaged groups. This would be especially the case if methods allow for showing areas in town relatively deprived in provision of green space of particular interest to these groups.

WP4 – Considering the economic benefits derived from urban green infrastructure creates potential for unlocking cash flows and can therefore be considered to be an approach to increase fundraising for urban green space. Although CEC's recent report on the valuation of urban parks goes some way to achieving this (see Section 4.1.3), this does not consider the full range of green spaces. It also does not consider non-monetary valuation methods, which will be outlined as part of D4.3. Therefore, much can be gained by learning more about available methods, in particular when this could be offered to stakeholders in an easy-to-adapt learning module (Task 4.5).

WP5 – This WP will produce a practitioner's guide to urban green space planning. Although planning is relatively advanced in Edinburgh, there might be approaches from some other countries – especially around quantifying and mapping ecosystem services including biodiversity and/or planning principles and approaches that aid in strategic planning of green spaces – that could be of inspiration to the city.

WP6 – This WP will provide a report with examples of innovative practices in the participatory governance of urban green spaces. Insights will be provided about success factors and learning capacity of different examples. CEC is keen to engage communities in green space management and, although already being successful in this regard, could have something to learn about approaches and experiences from elsewhere. Information on different ways in which citizens (may) contribute to green space management, and can be encouraged to do so using deliberative tools and techniques, and how to monitor degree of citizen engagement over time, is likely to be welcomed in particular.

4.2.2 Opportunities for engagement with GREEN SURGE research

In Tier 3 of WP5, Edinburgh and other municipalities would ideally be testing some of the suggested approaches in the practitioner's guide. To this end, different approaches that could be of interest to the municipality will need to be identified by the WP leaders together with the Edinburgh ULL coordinator. These approaches could be presented to practitioners at the joint WP5, 6 and 7 workshop, to be organized together in month 27. At this workshop, participants could be invited to vote on approaches that are most interesting. A group discussion could function as a method to explore how different approaches might be complementary with the current approach to green space planning in Edinburgh, as well as touch upon potential opportunities and barriers for implementation.

There may also be scope to discuss some of the findings from WPs 2-4 at such a workshop. This would be particularly relevant if methods (e.g., typology of biocultural diversity, GIS modelling, monetary and non-monetary valuation of green spaces) offer clear potential for integration with spatial planning documents. At present, it is however not always easy to judge what kind of outputs will be provided, whether these are easy to adapt to different contexts by local researchers and/or practitioners, and when to expect these outputs. Providing this type of information would be helpful in putting together a programme of activities for workshop(s) aimed at city planners (in advance of delivered reports).

In the activities WP6 is planning around providing guidelines and problem- or project-specific advice, it plans to engage predominantly with the Focal LA. Workshops will be organized in which the LA facilitator will discuss with attendees the key barriers to involving non-governmental stakeholders in urban green space management. Once identified, the WP staff can draw upon their body of case studies and other literature to provide each LA with a set of guidelines in an attractive format (e.g., snappy factsheets) that is tailored towards their needs.

5 ULL UPDATES: LJUBLJANA

5.1 Background

5.1.1 Focal Learning Alliance compared to Urban Learning Lab

The city of Ljubljana has recently adopted important sustainable-oriented strategic documents such as the Urban Master Plan especially directed towards renewal of existing developed areas and brownfields: the Environmental Protection Program, Sustainable Mobility Plan, Sustainable Energy Action Plan and Electromobility Strategy. The city is undergoing fast changes progressively directed towards sustainable city development, involving partially shutting down the city centre for motorized traffic and greening of city centre, implementing a bike sharing scheme, developing new parks, transforming brownfield areas and an improved cross-municipality waste management system. These developments have contributed to Ljubljana winning the European Green Capital 2016 award.

Every European city has its own challenges when it comes to planning and governing urban green areas. One of the areas in which Ljubljana could improve its green planning is the field of public participation. There is evidence from GREEN SURGE showing that green areas fit more to citizens' needs if they are engaged in the process of planning the green areas. Increasing and fine-tuning the range of ecosystems services (ESS) of green spaces to the citizens' needs contributes to higher quality of urban green spaces. Despite the City of Ljubljana having large amounts of urban green spaces with various ESS and being very active in planning urban green infrastructure (UGI), the local government does not yet actively include citizens. To demonstrate that participation in planning and governance of urban green areas increases the quality and multifunctionality of urban green spaces, the Ljubljana Focal Learning Alliance (LA) focuses on engaging young people, a vulnerable group in society, in creating urban green spaces. The goal of the Focal LA is to establish a new youth park on a selected site owned by the Municipality of Ljubljana (MoL) in Ljubljana – namely LIVADA – by the year 2017 (Figures 13 and 14).



FIGURE 13: THE LOCATION OF THE LIVADA IN COMPARISON TO THE OTHER GREEN SPACES IN LJUBLJANA, SLOVENIA.



FIGURE 14: THE LIVADA SITE, LJUBLJANA, USED AS NEW PILOT GREEN OUTDOOR PLATFORM FOR ENGAGING YOUTH IN PLANNING AND MANAGING PUBLIC URBAN GREEN SPACES IN LJUBLJANA (©ŠPELA ŽELEZNIKAR, 2015).

The Focal LA partnership was initiated in August 2014 by the Biotechnical faculty of the University of Ljubljana, an educational and research organisation that aims to contribute to multi-functional landscapes across Slovenia. The LIVADA project is focused on young people as a vulnerable group in society as such, but is also sensitive to the needs of young people with learning disabilities in formal education systems. The Focal LA Ljubljana engages thirteen young people: three individuals with mild learning disabilities involved in programmes of Zavod Bob, six students (geologists, landscape architects, agronomists) and four young experts (psychologist, sociologist, architect, librarian). The group of young people engages in urban green planning with help of three facilitators, two of which are employed at the Biotechnical faculty of the University of Ljubljana and one by the NGO Zavod Bob. The group of young people was recruited based on an online application form consisting of an invitation cartoon (Figure 15) and an application form, through which they expressed their interest in participating in the project LIVADA.

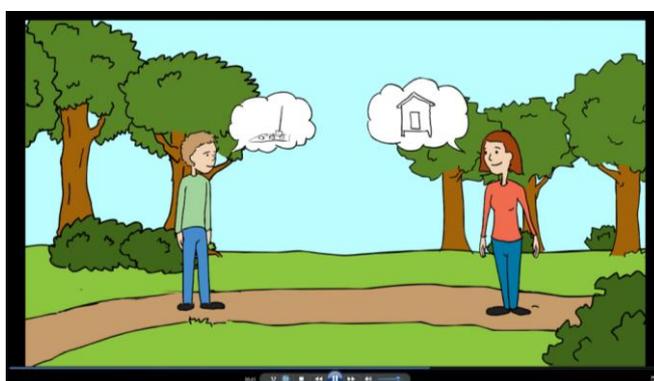


FIGURE 15: THE CARTOON FOR INVITING YOUNG PEOPLE TO PARTICIPATE IN PLANNING THE LIVADA SITE, LJUBLJANA, LAUNCHED IN APRIL, 2015. THE CARTOON IS ACCESSIBLE AT: [HTTPS://DOCS.GOOGLE.COM/FILE/D/0B77TZMB6IAYNBHF5X1BIBXYWAAE/EDIT](https://docs.google.com/file/d/0B77TZMB6IAYNBHF5X1BIBXYWAAE/edit).

The Focal LA has already started activities: During the first year (2015), the young people were actively engaged in planning of the LIVADA site (Figures 16-18Figure). The vision of the Focal LA is that LIVADA becomes a socially inclusive open space platform at a public green space that is autonomously co-managed by youth. The young people work on a weekly basis with the Focal LA team. They most closely engage with the three facilitators (two from the University of Ljubljana and one from the NGO Zavod Bob).



FIGURE 16: AN IMPORTANT ASPECT OF THE YOUTH GROUP ENGAGED IN THE LJUBLJANA FOCAL LA IS TO WORK TOGETHER AND TO EXCHANGE KNOWLEDGE AND IDEAS. THE FIGURE DEMONSTRATES GROUP PLANNING OF SITE LIVADA AT A TEAM BUILDING EVENT IN GALICIA, CELJE, SLOVENIA IN MAY, 2015(©ŠPELA ŽELEZNIKAR, 2015).

The Focal LA is hopeful that project-based learning by involving young people in the process of participatory planning and governance of urban green areas will be a suitable method to improve ESS of urban green areas as well as the socio-economic independence of the involved young people.



FIGURE 17: THE PLANNING OF THE LIVADA SITE IN LJUBLJANA INCLUDES A BROAD NUMBER OF DIFFERENT STAKEHOLDERS. THE FIGURE DEMONSTRATES HOW THE LIVADA SITE WAS PLANNED WITH THE CITIZENS OF LJUBLJANA IN THE PARK ZVEZDA IN THE CITY CENTRE OF LJUBLJANA. THIS WAS DONE USING A WAX-CLOTH FLOOR-PLAN OF LIVADA AND LEGO® BUILDING BRICKS IN JUNE, 2015. THE AUTHOR OF THE WAX-CLOTH FLOOR-PLAN APPROACH IS MS. MOJCA FAJDIGA FROM THE NGO ZAVOD BOB (©ANJA MANJA SEGULIN, 2015).



FIGURE 18: ZONING OF THE SITE LIVADA WITH THE YOUNG PEOPLE FROM THE LJUBLJANA FOCAL LA IN AUGUST, 2015 (© ROZALIJA CVEJIĆ, 2015).

During the second year (2016), the young people associated with LIVADA will engage in establishing the site. In this phase the technical and expert support for the Focal LA Ljubljana will be sourced from three GREEN SURGE SMEs, ITR, LAVACO and TISA, experts in organising organic urban food production systems, GI establishment and GI maintenance, respectively. On a more

strategic level, the Focal LA Ljubljana process will gradually intensify the involvement by the Department for Culture (the Youth sector), the Department for Environmental Protection and the Urban Planning Department of the MoL. The work of the Focal LA is for now, on a regular basis, reported to the MoL at the meetings. The municipality is consulted on certain questions that young people cannot resolve by themselves. It is envisaged that the communication between the young people and the municipality will strengthen as the project will move into the implementation phase and more and more experience will be gathered from the live public participation process at LIVADA. Occasionally the Focal LA networks with other governmental and non-governmental organizations, such as Zavod Kerniskova, Delavnica Konceptov and others interested in collaborating with the Focal LA at the LIVADA site.

It is expected that the young people will, with the help of the NGO Zavod Bob, take over the facilitated self-management of the site LIVADA in 2017. To this end, the youth group on the LIVADA site is piloting how to plan, establish and manage urban public green areas in a more socially inclusive manner. The aim of the youth group in developing the LIVADA site is to provide an urban green space that meets the needs of citizens, yet also supports biodiversity and a green economy.

The approach to planning taken by the Focal LA in Ljubljana stands out in comparison to conventional UGI planning because it is based on active participation and providing an educational aspect; young people – a vulnerable group in society – are engaged into planning, governing and managing public urban green spaces. The Ljubljana Focal LA stakeholder map, showing the different actors involved, is depicted in Figure 19.

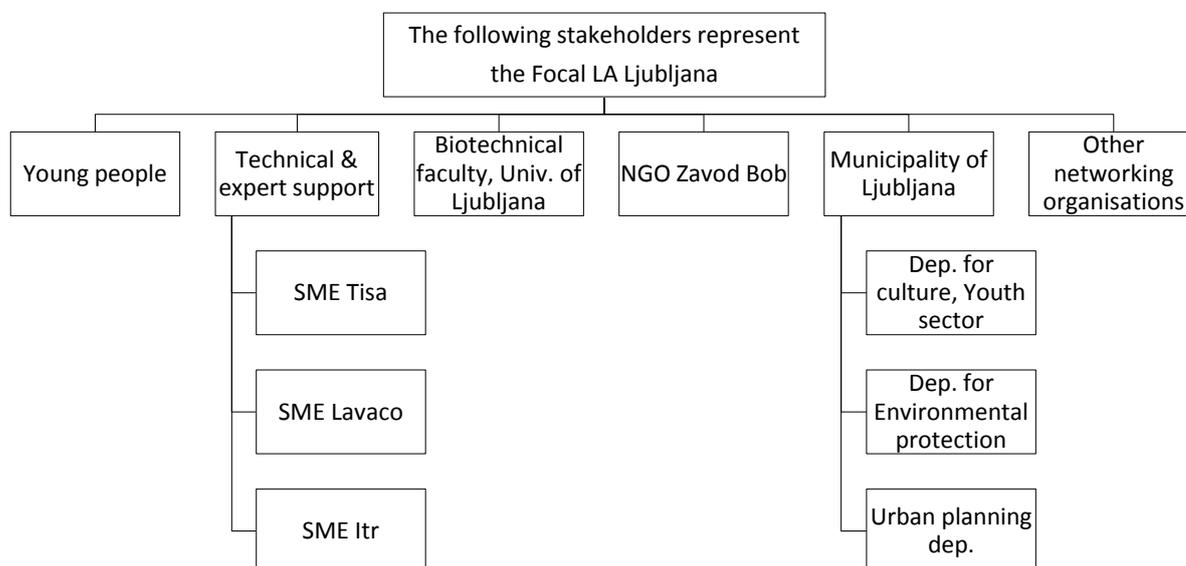


FIGURE 19: THE LJUBLJANA FOCAL LEARNING ALLIANCE STAKEHOLDER MAP IN DECEMBER, 2015.

Student responses suggest that LIVADA is much more than a park. It is regarded to be a socially inclusive project; it reflects the multi-functionality and dynamics of space. It provides a degree of self-sufficiency and nurtures a respectful attitude towards nature in the urban environment.

“When I close my eyes and visualise LIVADA, I become excited. I see it as a place of interesting things for everybody. There are workshops, sport activities and cultural events. People from different social and age backgrounds hang out there. There are local varieties of fruits and vegetables on the garden and we pick them up. The visitors respect the nature of the urban environment.”

(Landscape architecture student at the University of Ljubljana)

Therefore, the Focal LA LIVADA is set up to demonstrate a practical process of creating urban green spaces that will better integrate biodiversity, society and green economy with UGI in order to find solutions to the challenges in the development of a healthier urban living environment managed through a citizen-municipality partnership. The LIVADA LA process is unique for Ljubljana given its focus on active participation and project learning involving young people, a vulnerable group in society, with planning and governance of public urban green spaces. Due to the special focus and its applied nature the Ljubljana Focal LA currently engages a more diverse group of stakeholders than the Ljubljana Urban Learning Lab (ULL).

The following stakeholders represent the ULL Ljubljana: the Biotechnical faculty of the University of Ljubljana, educational and research organisation; the NGO Zavod Bob, an expert organisation in youth work through project-based-learning; and the MoL, responsible for planning, governing and developing the city of Ljubljana, which is engaged in the ULL with three departments (Culture, Environmental Protection, and Urban Planning; Figure 20).

The aim of the ULL Ljubljana is to scale up the experience from the Focal LA and explore various models of participatory planning and governance of public urban green areas for increasing the range of ecosystem services (ESS) of urban green spaces, as an improved approach to green city development. The concrete objectives of the Ljubljana ULL are:

- *To consider the implementation of GREEN SURGE guidelines to advance approaches in ESS development, planning and governance of urban green spaces.*
- *To consider the possibilities of transferring the principles of the advanced approaches in ESS development, planning and governance to the domestic planning environment.*
- *To apply the project-based learning approach to planning and governance of urban green spaces through a three year work project with youth at LIVADA (the Focal LA)*
- *To monitor and evaluate the project-based learning approach applied in the Focal LA as a tool to be used in the planning and governance of urban green spaces.*

The first two objectives are important for bringing in new knowledge and expertise to the ULL and for knowledge exchange with the GREEN SURGE consortium – establishing the double helix approach. Testing new concepts and ideas provided by GREEN SURGE in practice is important in getting the support needed to implement them in domestic planning and governance. The

Ljubljana ULL will test the theoretical knowledge generated by GREEN SURGE at the applied level through the Focal LA (the third and the fourth objective).

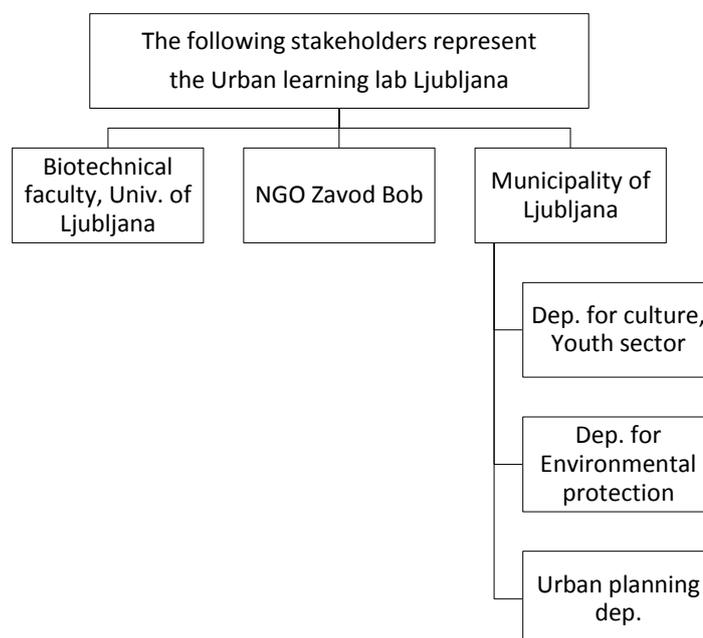


FIGURE 20: THE LJUBLJANA URBAN LEARNING LAB STAKEHOLDER MAP IN DECEMBER, 2015.

We expect that active participation by non-governmental actors, such as the young people involved in the Focal LA, will over time empower this type of actor to such an extent that they will become strategic ULL stakeholders, who are taken serious as a partner in green space decision-making by actors that are currently more powerful. The ULL is therefore envisaged to be a dynamic and open group engaging a wider diversity of actors over time.

5.1.2 Key insights from other GREEN SURGE WPs

WP2: Assessment of biocultural diversity

Findings

Deliverable 2.1 shows that the concept of biocultural diversity (BCD) is not present in analysed policy documents of the City of Ljubljana and also not recognized by the interviewed city officials. Planning documents include aspects related to BCD, such as maintaining a complete, well-structured, evenly distributed and accessible network of green spaces across the city. Cultural diversity is reflected in the intention to plan and realise urban green areas for different age and use groups as well as the intention to provide both cultural and ecological greenspace benefits (see Milestone 21). The spatial analysis of BCD across European core cities revealed that the available public recreational green space per capita within Ljubljana's administrative city boundary is one of the lowest in Europe.

Relevance

Deliverable 2.1 and Milestone 21 confirmed information already available to the public. The added value for the ULL is the comparison of Ljubljana with other European cities in order to identify the similarities and differences between the cities, posing questions such as: is there scope for including the BCD concept in the planning documents? Is there a way Ljubljana could further

improve the accessibility of its urban green areas? And how equal is the accessibility for different age and socio-economic groups of citizens? The findings are important for considering the transferability of the BCD concept for advancing cultural and ecological function of the urban green spaces through the planning process.

WP3: Functional linkages

Findings

Deliverable 3.1 confirms that Ljubljana has a relatively low area of per capita urban green spaces (excluding forests), but one of the highest shares of forest in the city. The available forest cover per capita is similar to some cities in the EU top 20 of most afforested cities – such as Koszalin, Trier, and Liberec. Forests cover approximately 40% of the city area, which approximates the sum of forest share in the ULLs Berlin, Malmö and Edinburgh. The forests of Ljubljana are a component of the city centre and are predominantly used for recreational purposes. Ljubljana therefore has a comparatively high share of available public recreational green space (which is unlike what was suggested by D2.1). A comparison between the ULLs shows that 33-66% of Ljubljana city population has access to urban green and forest of min. size of 2 ha within 500 m distance of their homes, which is a lower share of city population than in Edinburgh, Malmö and Berlin (>66%) but higher than in Bari (<33%).

Ljubljana falls within the New Member States planning family. Compared to other cities in this planning group, Ljubljana has an above average share of forest (40%) that exceeds the average share of forest in cities belonging to the Nordic planning family (>12%), which has the highest average forest share of all planning families. Ljubljana's share of agricultural and semi-natural land (approx. 27%) within city boundaries exceeds the average of the New Member States planning family (approx. 20%). The percentage is, however, lower than that of the Mediterranean planning family (approx. 30%).

The comparative analysis of the 295 European cities based on their climate characteristics showed that average temperatures and precipitation in Ljubljana resembled that of cities such as Dublin, Manchester and Edinburgh. The analysis showed that there is no relationship between the planning families and the climate characteristics of the sample cities. At the level of the sample cities, a substantial negative correlation between the percentage of forests and green urban areas and average temperature was revealed. Moreover, a relatively high positive correlation was observed between the percentage of agricultural areas and construction sites and the average temperature.

The influence of forests on reducing the surface temperature extremes that are predicted to occur in the future could compensate for the influence of agricultural areas, semi-natural areas and wetlands on increasing the surface temperature. Nevertheless, the predicted decrease in summer precipitation might influence the vitality of forests and reduce their ecosystem value. The direct economic effects of this are likely to be limited as the forests within the city area are not used as economic asset. There may, however, be an indirect economic effect by influencing recreational value and income of nearby businesses.

Relevance

Deliverable 3.1 explored the relationship between Ljubljana's land use and climatic characteristics and planning culture. The added value for the ULL is the comparison of these to other European cities within the same planning culture and to others in other planning cultures. The research confirms the need to look more closely at predicted climate change scenarios and evaluate what their impacts might be on existing urban greenspace and what could be done to mitigate possible influences of climate change, threatening to reduce the range of ESS delivered in Ljubljana, in the future.

WP4: Contributing to the green economy

Findings

Green space initiatives where food production is at least one of the main objectives are often regarded positively for providing social cohesion and urban food production, but tend to lack an economic dimension. The GREEN SURGE Deliverable 4.1 addresses the missing economic dimension of the urban food production initiatives and provides the broad economic context of urban agriculture. A study in Ljubljana explored urban gardening as a way of integrating ESS into real economies. Urban gardening is considered a marginal economy, mainly functioning as leisure and cost avoidance activity; although there are examples where urban gardening was turned into a profit making activity.

The GREEN SURGE Deliverable 4.1 offers a comparative analysis of the two economic models of urban gardening in Ljubljana – an avoided costs model (ACM) and a business model (BM). The main difference is that urban gardeners with a BM sell surplus products, which is not the case for those with an ACM. The produce in gardens of the latter type is consumed and surpluses are given to members of family and friends or exchanged for other goods, rather than sold. In some cases users thus save money because they self-supply with products from the urban gardening. This model was found to be applied by 127 garden plots from Ljubljana. An example of a private company from Ljubljana that buys products from urban gardeners in Ljubljana served to calculate estimated income by gardeners with a BM.

In the period 2014–2015, the company purchased vegetables and wild crops against an average retail price of €1.50/kg. An average producer sold 112.6 kg produced surpluses, thus earning (revenue from surplus) €160.80. The costs of production are estimated on the basis of a catalogue of calculations for planning agricultural production on a farm. The average costs for an urban garden are €54.70. Therefore the gross margin of surplus is €106.20 per gardener. BM gardeners sold on average 33.3% of their total production. Meanwhile, the ACM urban gardener produced on average 338.42 kg vegetables with a retail price €1.20/kg and saved €246.73 per year.

Relevance

The GREEN SURGE Deliverable 4.1 highlights the economic value of UGI. Companies and other economic actors benefiting from UGI have an important role in maintaining the qualities of UGI and navigating the growing economy around urban greening and the marketing of ESS. The productive ESS of urban green areas is of special importance for the ULL, as one of its objectives is to explore how this and other types of ESS can be delivered through participatory approaches and alternative financing by businesses.

WP5: Green infrastructure planning and implementation

Findings

GREEN SURGE Deliverable 5.1 revealed that the policy documents related to urban green space planning and implementation analysed for 20 European cities do not explicitly mention green economy. The documents, however, include similar concepts, such as a sustainable economy or green jobs and attribute high importance to these issues. For example, in Bristol, Amsterdam and Ljubljana most of the analysed documents made connections between green space and economic value (e.g. regarding the values of green space and ecosystem services). The assessment of the UGI planning in European cities was part of Deliverable 5.1, based on which the city portraits of 20 European cities were produced.

Relevance

The upcoming planning guide based on the Deliverable 5.2 will be an important output of GREEN SURGE as it will show advanced approaches to participatory planning of green areas in urban environments, which is of high importance for the ULL. The ULL already contributed to Deliverable 5.2 with an interesting example of socially inclusive greening in a densely populated part of Ljubljana. The Beyond construction site case study demonstrates the importance of facilitated processes in planning and implementing urban green spaces in Europe, which is exactly what ULL Ljubljana is focusing on to deliver through the Focal LA.

WP6: Innovative governance of urban green spaces and biocultural diversity

Findings

Deliverable 6.1 revealed six major trends as being relevant to participatory green space governance at the ULL level: the emergence of new instruments for co-governance, linking green space and socio-cultural objectives, participation through activism, outsourcing, using derelict land for green space development and urban agriculture and food production.

As part of Deliverable 6.2 (due in January, 2016), a detailed study was undertaken of an urban greening initiative on temporary abandoned land in Ljubljana. The governance approach from Ljubljana will be compared to six urban other agriculture initiatives involving community actors with a green space component. For Ljubljana the case study was an initiative called “Beyond the construction site”. The initiative started as a cultural intervention in a dormant construction site in the year 2010 and has later developed as an urban agriculture initiative now consisting of over 30 plots on 0,2 ha of land. Facilitators have been crucial for the success, for example by kicking off initiatives, organizing different events and taking care of founding. Beside facilitators, a range of other actors were involved in the initiative, with the municipality of Ljubljana in the main role. They acted as the provider of land (free rental agreement for the site) and as a financial supporter. Beside socio-cultural benefits, there were some green benefits evidenced too. Green benefits such as food provisioning, climate change adaptation and biodiversity effects. Moreover, “Beyond construction site” also demonstrates that urban agriculture can be seen as an integral part of the urban GI, providing multifunctional green spaces. Socio-cultural benefits – such as enhanced social cohesion, inclusion as a result of more social interaction – were the most positive outcome of the studied initiative. “Beyond the construction site” also has some cost-saving, and occasionally income generating, aspects to garden users. Finally we can state that the “Beyond the construction site” has been successful in engaging local residents and other city residents in active participation on governing green areas in the city.

Relevance

The participatory concepts and their explanations with examples are an important output of the GREEN SURGE as it provides the theoretical backbone for further analysis of real-time examples and experiences in Ljubljana. The follow-up detailed study of urban greening initiative on temporary abandoned land in Ljubljana will contribute to the work of the ULL because it provides a detailed analysis of currently used approaches to green space governance in Ljubljana, but will also advance the knowledge of the ULL regarding six other urban agriculture initiatives involving community actors with a green space component as part of Deliverable 6.2 (due in January, 2016).

5.1.3 Key insights from external research

Ecosystem services and biodiversity in selected areas of GI in Ljubljana

One of the researchers in GREEN SURGE team Ljubljana conducted her Master`s thesis on exploring and determining the relationship between biodiversity in different categories of green areas in the city and the ESS it provides (Železnikar, 2015). Plant species were recorded at a total of 108 sites. Sites were clustered in nine categories of green areas in the city. After establishing the biodiversity level in a category of a green area, a set of ESS provided by it were evaluated. One of the key findings was a positive relationship between the diversity of plant species and number of ESS provided.

Advanced research on youth specific urban green infrastructure needs

Parallel to the research to be described in Deliverable 2.2, additional field research has been carried out by the Focal LA at the end of the year 2014 and throughout the year 2015. The following methods were used: (a) focus groups, (b) workshops, (c) in-depth interviews with young people, and (d) building a physical model of an imaginary urban green site using the wax-cloth approach and building bricks. All additional field research and data analysis were carried out with youth engaged in the Ljubljana Focal LA. The analysis of the data is still underway.

5.1.4 Workshop on identifying key issues

The MoL is currently preparing its Urban Sustainability Strategy, which is a strategic policy document that is purported to horizontally connect development strategies of all MoL Departments. The ULL Ljubljana`s goal is to review the draft Urban Sustainability Strategy through the lens of GREEN SURGE findings to help and advance the strategy. The problem of such transdisciplinary documents is that they are not always easy to understand because they capture a large number of development documents from various Departments, for example youth sector, health sector, environment protection sector. The key to any comprehensive Urban Sustainability Strategy is to simplify what can be really a complex picture. For this we need a simple to understand overarching concept that systematically connects different development strategies into a meaningful story that can be easily understood both by policy makers and the general public. One such concept could be the ESS concept. To this end, experiences may be exchanged with the ULL city Malmö.

Government in Sweden made the decision that the ESS perspective needs to be included in all decision processes latest 2018. The decision is supported in the Planning and Building Act and in the governmental decision. Although currently only reflected in the guiding comprehensive plan, there is an ongoing project at the City Planning Office to explore how the concept of ESS could be

included in the detailed development plans. Although individual ESS like stormwater and recreation are already considered in these, the full ESS perspective has not yet been included.

ESS is a general expression for different functions urban green systems provide for the citizens. Public participation in urban green planning increases the range and fine-tunes the ESS to citizens' needs, while planning urban green areas without public participation risks providing a more limited set of ESS which limits the multifunctionality and the quality of the urban green systems. ESS is a buzzword in some European cities, for example Malmö. However the situation is not the same in Ljubljana. To explore what representatives of the municipality of Ljubljana and the general public think about ESS and its inclusion into the Urban Sustainability Strategy of Ljubljana, we organised a workshop. This was important as the concept of ESS is a focus theme of the Ljubljana ULL.

On 4 November 2015, team GREEN SURGE Ljubljana organised two small workshops for public sector stakeholders. The aim was to find out, how different people perceive GI and its ESS in Ljubljana. The first workshop was organised for employees of the Biotechnical faculty's Dean's office at the University of Ljubljana and the second for employees of MoL. The city officials came from different departments, a) Department of Real Estate; b) Urban Planning Department; c) Department for Pre-school learning and Education and d) Department for Environmental Protection. Employees from the Dean's office were from different departments too, a) Accounting, b) Library and c) Secretary department. The workshops brought together 14 participants, 13 female, with an average age of 47 years.

Each workshop began with a presentation on elements of UGI in Ljubljana and their role in the city. The presentation served as a baseline to implement the ESS concept and introduce the concept to the workshop participants. None of the participants was aware of the ESS concept. We selected the four largest categories of UGI in Ljubljana; park, forest, riparian zone and farmland. Participants were asked to assess the importance of different ecosystem functions in the categories mentioned above. Each person was given a scheme/diagram. The first task was to assess the importance of ecosystem functions within each chosen UGI category (ranking 1 least significant - > 5 most significant) (Figure 21).

Because of the somewhat more narrow focus of the Focal LA – food production in the urban environment – the second task was introduced to explore the theme of ESS in different areas of food production in Ljubljana. Food production areas were divided in two major groups, farmland and “hobby” land. There were different agricultural UGI categories in each group. Again, participants received a diagram with instructions. They were asked to assess the importance of different ESS for several categories of food production areas in Ljubljana (ranking 1 least significant -> 8 most significant) (Figure 22).

INSTRUCTION:
 Assess the importance of different ecosystems functions in the categories of green infrastructure from least significant (1) to most significant (5)

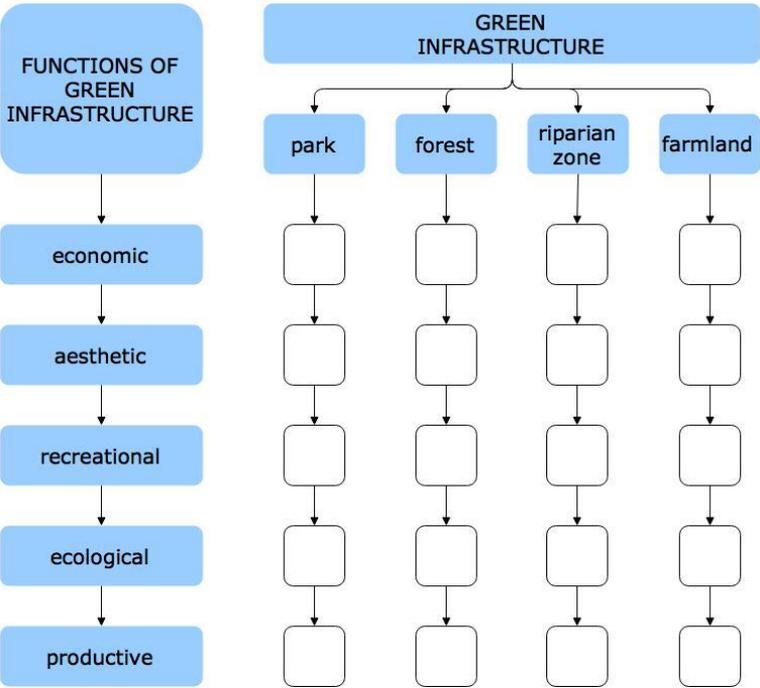


FIGURE 21: DIAGRAM SHOWING TASK 1 AT THE ULL LJUBLJANA WORKSHOP ON VALUING ECOSYSTEM SERVICES OF URBAN GREEN SPACES IN LJUBLJANA.

INSTRUCTION:
 Assess the importance of different ecosystems functions in each category of food production areas from least significant (1) to most significant (5)

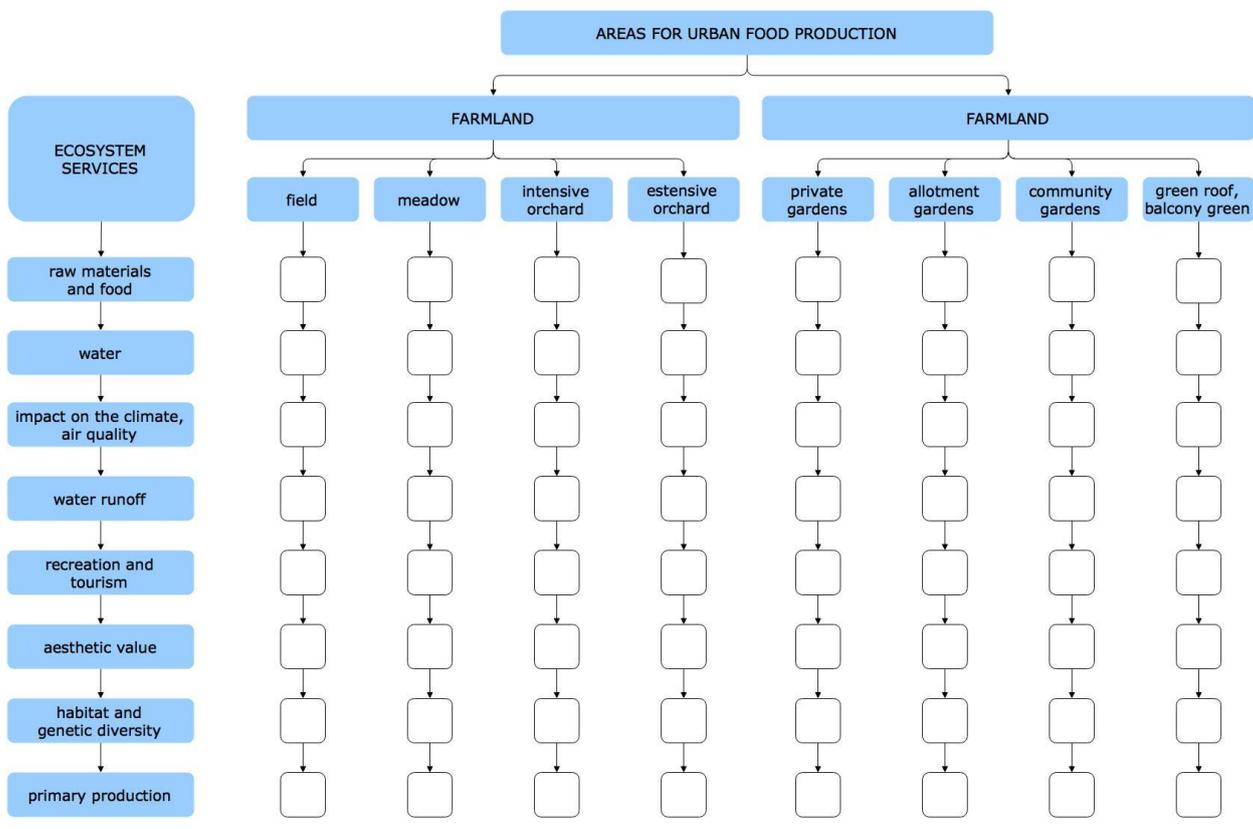


FIGURE 22: DIAGRAM SHOWING TASK 2 AT THE ULL LJUBLJANA WORKSHOP ON VALUING ECOSYSTEM SERVICES OF URBAN GREEN SPACES IN LJUBLJANA.

As shown in Figure 23, the aesthetic function of parks was considered most significant, the productive function least significant. In the category forest, recreational and ecological functions were rated most significant, while economic and productive functions scored lowest. These two functions were scored comparably low for the riparian zone category, while the ecological function had the highest score. The productive and economic functions were considered most significant in the farmland land use category while the aesthetic function in that category was scored the lowest.

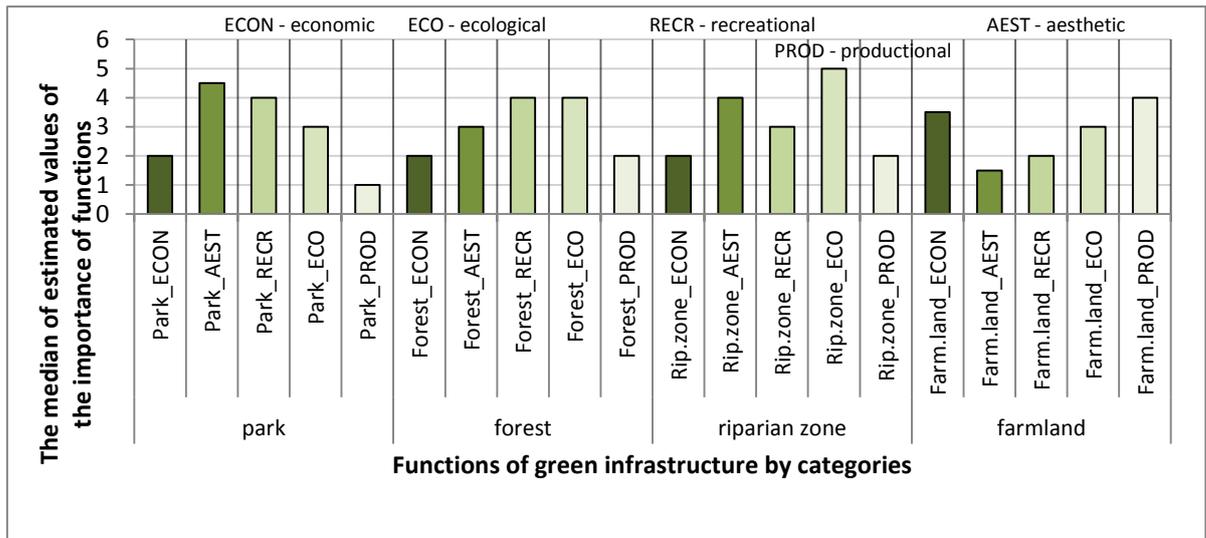


FIGURE 23: THE IMPORTANCE OF DIFFERENT FUNCTIONS OF GREEN INFRASTRUCTURE CATEGORIES AS ASSESSED BY PARTICIPANTS AT THE ULL LJUBLJANA WORKSHOP ON VALUING ECOSYSTEM SERVICES OF URBAN GREEN SPACES IN LJUBLJANA.

Figure 24 shows the estimated importance of different ESS among the UGI categories. The smallest difference in the assessment of the importance of a certain function between categories is in the *economic function* (SD = 0.8) the highest is in the *productive and ecological functions* (SD = 1.3).

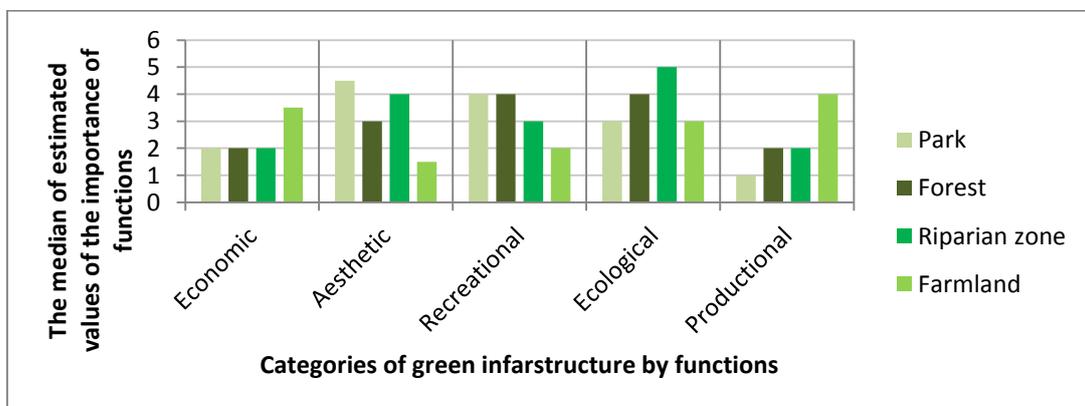


FIGURE 24: THE IMPORTANCE OF ECOSYSTEM FUNCTION BETWEEN GREEN INFRASTRUCTURE CATEGORIES AS ASSESSED BY PARTICIPANTS AT THE ULL LJUBLJANA WORKSHOP ON VALUING ECOSYSTEM SERVICES OF URBAN GREEN SPACES IN LJUBLJANA.

Figures 25 and 26 (next pages) show that the ESS *raw materials and food* received the highest score in the category farmland, orchards and private gardens. The ESS *recreation and tourism* was considered least significant in the UGI categories of farmland and orchards, probably because participants perceived these categories as work-related. Conversely, the ESS *recreation and tourism* received the highest score in the community garden category.

Figure 27 shows the estimated importance of different ESS among the UGI categories. The smallest difference in rated importance between UGI categories was found for the ESS *primary production* (SD = 0.8), followed by *water runoff* (SD = 1.0). The largest differences were found in the ESS *recreation and tourism* (SD = 2.6) and *raw materials and food* (SD = 1.9).

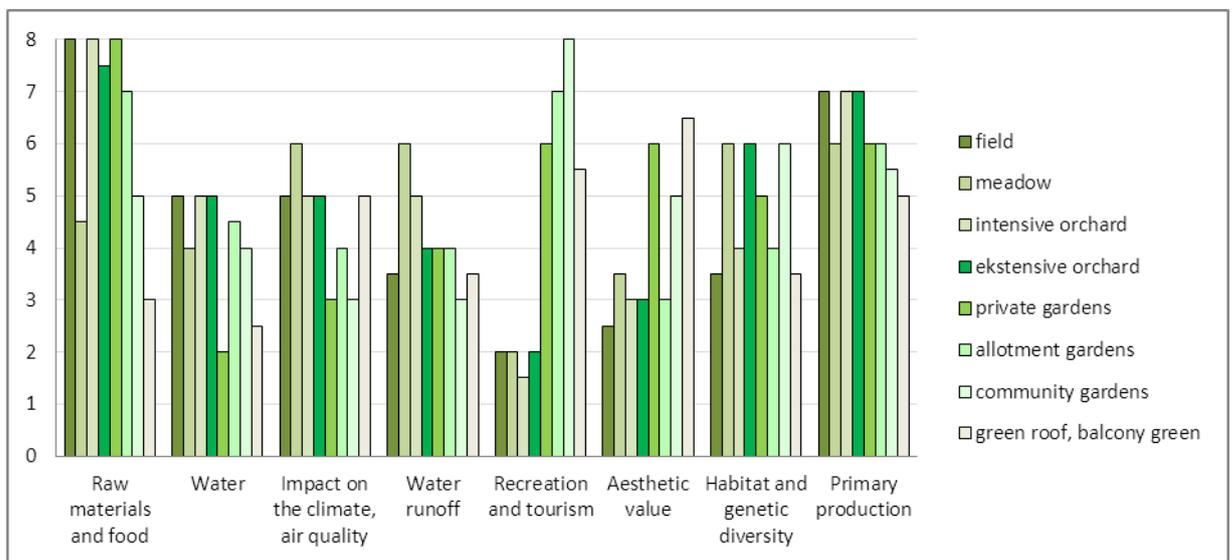


FIGURE 27: THE ESTIMATED IMPORTANCE OF DIFFERENT ESS AMONG THE GREEN INFRASTRUCTURE CATEGORIES AS ASSESSED BY PARTICIPANTS AT THE ULL LJUBLJANA WORKSHOP ON VALUING ECOSYSTEM SERVICES OF URBAN GREEN SPACES IN LJUBLJANA.

Ecosystem services in categories of farmland areas

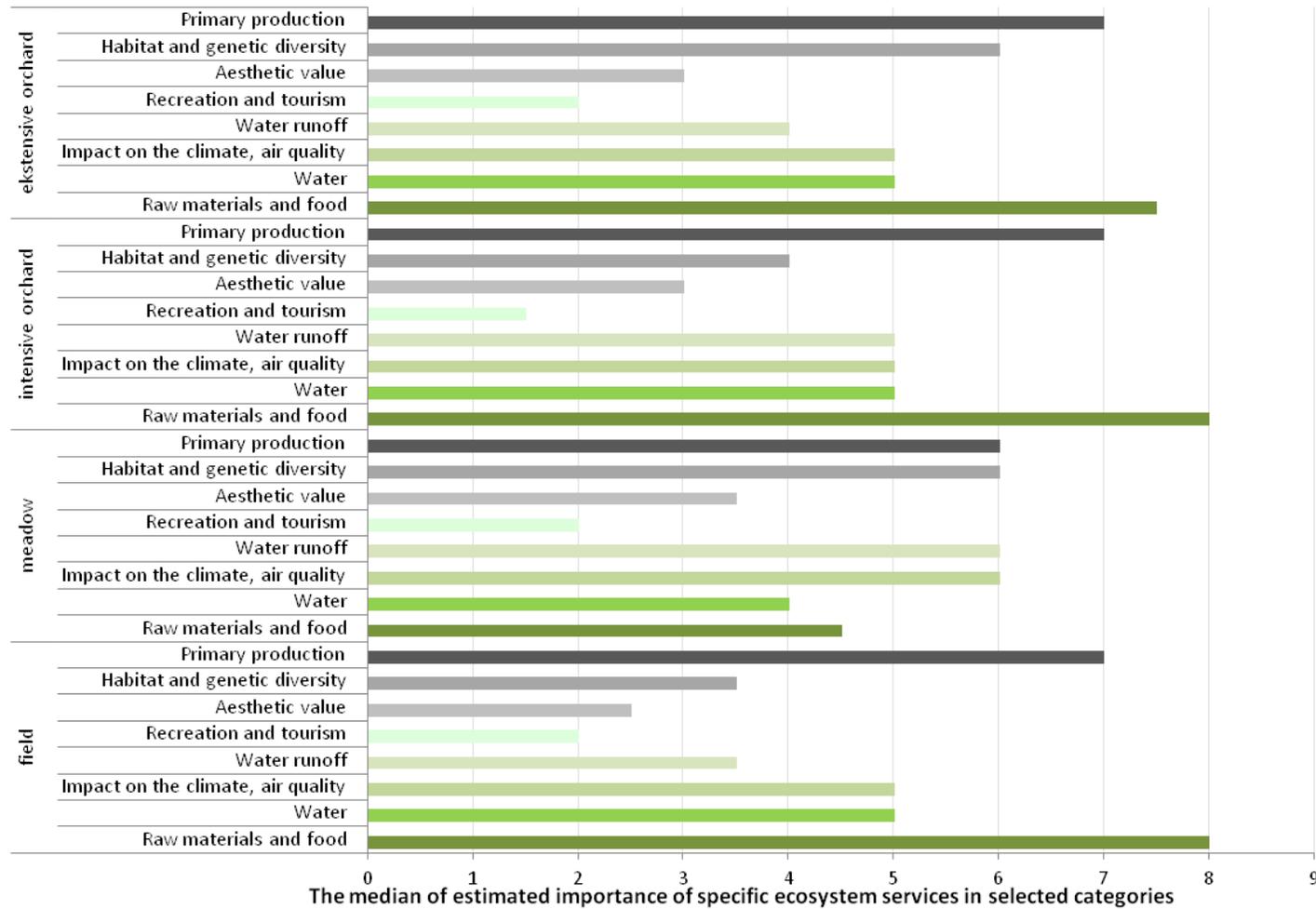


FIGURE 25: THE PERCEIVED IMPORTANCE OF SPECIFIC CATEGORIES OF ECOSYSTEMS SERVICES WITHIN THE FARMLAND AREAS AS ASSESSED BY PARTICIPANTS AT THE ULL LJUBLJANA WORKSHOP.

Ecosystem services in categories of "hobby" land areas

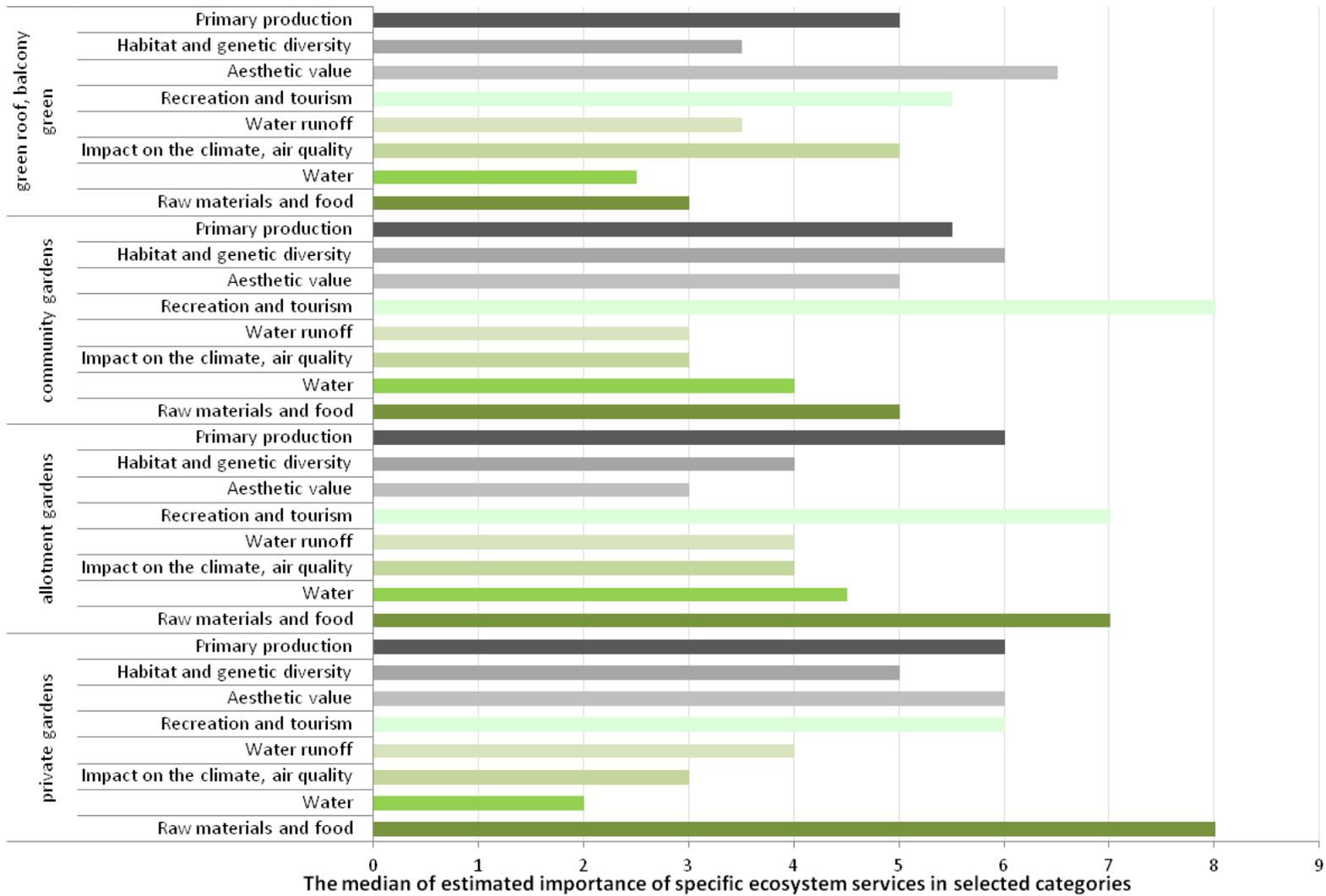


FIGURE 26: THE PERCEIVED IMPORTANCE OF SPECIFIC CATEGORIES OF ECOSYSTEMS SERVICES WITHIN THE “HOBBY LAND” AREAS AS ASSESSED BY PARTICIPANTS AT THE ULL LJUBLJANA WORKSHOP.

5.1.5 ULL synthesis

Ljubljana is one of the greenest cities in Europe. The city of Ljubljana has recently adopted important sustainable-oriented strategic documents such as the Urban Master Plan, especially directed towards renewal of existing developed areas and brownfields. The city is undergoing fast changes progressively directed towards sustainable city development, involving partially shutting down the city centre for motorized traffic, greening of the city centre, implementing a bike-sharing system, developing new parks, transforming brownfield areas and an improved cross-municipality waste management system.

Despite ambitious plans, the city of Ljubljana has room for improving its understanding of functional linkages between urban green spaces and ESS. There is also scope for improvement in implementing integrated approaches that would optimize biocultural diversity, green economy development and human well-being benefits delivered by green spaces. All these topics are important in planning and managing urban green spaces of the city and are of concern to the ULL. Research as part of the GREEN SURGE project in the years 2014 and 2015 provided several new insights regarding Ljubljana's public green areas.

The planning documents in Ljubljana do not explicitly mention green economy, but attribute high importance to the concept related to green economy, such as sustainable economy and green jobs. At the community level there are cases where people integrate benefits of green areas with economic activities and real economy. This is demonstrated with the example from Ljubljana where urban gardening was turned into a profit making activity.

The planning documents of the city of Ljubljana also do not explicitly mention the concept of ESS. Although individual ESS like stormwater runoff and recreation are already considered in the planning documents, the full ESS perspective has not yet been included. Preliminary results of the research that explores what representatives of the municipality of Ljubljana think about the ESS concept and its relation to the urban green areas in Ljubljana shows that the majority of the employees does not know the ESS concept, but feels it is useful to start thinking about which ESS are most important in Ljubljana. They also feel that the concept could be useful as a cross-departmental concept for advancing the Urban Sustainability Strategy.

Although all city development plans go through a public consultation phase, urban green spaces are developed by the city mainly through a top-down approach. Citizens are unlikely to be entirely satisfied with such approach to urban green space development. At the community level there are cases which demonstrate that more socially inclusive and participatory approaches are possible when planning and governing urban green spaces. Through GREEN SURGE we have thus far looked at identifying such approaches through the prism of stakeholders, processes, actors and outcomes. The Beyond the Construction Site initiative from Ljubljana, and five other case of community gardens from Malmö, Edinburgh, Lisbon, Szeged and Stockholm demonstrate the importance of facilitated approaches and close work with citizens through project learning that play a crucial role in engaging community in urban agriculture planning and management. Although the approaches are acknowledged by the city of Ljubljana, no real commitments for including such innovative approaches into everyday city planning have been made so far in Ljubljana. The Ljubljana Focal LA and Ljubljana ULL have so far tackled this question and are developing a model of participatory planning and governance of urban green spaces.

GREEN SURGE researchers have to some extent provided new knowledge and data about functional linkages between green spaces and ESS. However, guidance on integrated approaches that would optimize green space and biocultural diversity, ESS, green economy development and human well-being is still lacking, which will be the research focus of the project in the year 2016. In the meanwhile, the Focal LA has provided a playground for testing the Learning Alliance approach as a model to participatory planning and governance of urban green spaces in Ljubljana and has therefore included as far as possible the MoL in the process. We hope that this experience will increase openness for involving multiple green space stakeholders in green space decision-making at the municipality level in the future.

5.2 Research needs

5.2.1 Elements of key interest in future GS-research

The key future research focus for the Ljubljana ULL within GREEN SURGE will be to evaluate the Focal LA process and its contribution to maximising the ESS in relation to public participation. WP2 and WP3 will contribute to the understanding of how different levels of biodiversity within selected green spaces are valued and used by residents who vary in cultural, socio-economic and demographic status and how this is reflected in the biocultural diversity of urban green space in Ljubljana. The future work in WP4 will help find ways to integrate the ESS of urban green spaces into a real business plan realised through the Ljubljana Focal LA. Through the ULL activities the future outputs of WPs 5 and 6 will help in identifying suitable approaches to integrate advanced planning and governance approaches of urban green areas into the everyday life of citizens of Ljubljana.

5.2.2 Opportunities for engagement with GS-research

One of the most valuable features of the GREEN SURGE projects are ULLs and the Focal LA through which some of the advanced approaches to urban green planning and governance (WP5 and WP6) will be tested. Ideally the feedback on experiences in using these advanced approaches will be shared with the GREEN SURGE researchers. Additionally other WP outputs, from WP2-4, will be discussed through the ULL and Focal LA activities to explore the potential of including some of the concepts – such as ESS and green economy – into real planning documents of the MoL. Through the double helix approach there is a considerable scope to share experiences of ULL and Focal LA with the GREEN SURGE consortium, not only to theoretically empower the work of NGOs and city governments on the ground but also to advance the applicability of theoretical findings on ground. For that reason, there is a need to intensify the collaboration between the WPs, the ULL and the Focal LA in the future.

6 ULL UPDATES: MALMÖ

6.1 Background

6.1.1 Focal Learning Alliance compared to Urban Learning Lab

The key interest of the Malmö ULL is to identify tools, processes or methods that enable city officials responsible for spatial planning and urban green space management to better consider urban ecosystem services (ESS) in planning practice and formulate strategies for management enhancing ESS.

The Focal Learning Alliance (LA) process covers two linked activities; both part of the Malmö Ecosystem Services Project (MESP). One is the planning of the Green Structure Plan; the other is the project “Ecosystem Services in Municipal Spatial Planning”. To some extent the same planners are working on both of these projects. GREEN SURGE is part of both.

The project “Ecosystem Services in Municipal Spatial Planning” is financed by the National Board of Housing, Building and Planning (Boverket), Planning Legislation and Ecosystem Services. The aim of this new project is to explore the experiences of a number of Swedish municipalities with regard to planning with and for ESS, and if planners in these municipalities have experienced any limitations or obstacles that are associated with the Planning and Building Act in doing so.

The interest in Sweden to work with ESS in the planning process is developing fast with a lot of discussions and seminars. This is also reflected at the governmental level, where there is a strong and progressive ambition to include ESS in all planning decisions in 2018 at the latest. However, the situation is somewhat paradoxical, as the government has simultaneously loosened spatial planning regulations that could protect ESS with the aim to make it easier for developers to build more houses.

MESP was intentionally initiated “under the radar” to create a situation where the group could have a slow investigative approach. Workshops and meetings have provided a base for an open discussion. A system-thinking approach was applied with Donatella Meadows’ work used as background material (Meadows, 1999). The system-thinking approach aims to identify where measures or efforts will give the best result. The central question is: what can really make a difference? The MESP has involved arranging a series of system-workshops, which gave the opportunity to define topics and relationships between topics to establish the common ground between different actors.

The process of developing the Green Structure Plan and the project “Ecosystem Services in Municipal Spatial Planning” are led by the Street and Parks Department of the Malmö municipality with representatives from a number of other municipal departments. GREEN SURGE supports and participates in the City’s planning group; it is not leading the process.

The actors that have been involved in the Focal Learning Alliance (LA) up until this point are mostly the city officials. This is partly due to Sweden, in general, and Malmö, in particular, having a strong central municipal administration for both planning and management of green spaces. The strong centralized administration is also a factor contributing to a weak tradition in engaging and encouraging bottom-up urban green space initiatives in Malmö.

Given the focus on incorporating ESS in spatial planning and the lack of relevant non-governmental actors to include at present, there is currently no distinction between the Focal LA and the ULL in terms of key topics and actors involved. This may change in the future as the ULL is in the process of establishing contacts with external actors, such as developers, maintenance people, NGOs, architects and ecologists. In January 2015 a workshop is planned with early adopters of working with ESS. We will discuss how different actors within the green sector can collaborate. One important question is how to develop an economy based on new green ideas. We will also discuss how we can create a strong and interesting narrative together that will inspire the next group of adaptors, the early majority.

6.1.2 Key insights from other GREEN SURGE WPs

Due to staff changes the Malmö ULL currently has very limited insight into findings from other GREEN SURGE WPs with key relevance to the city. The ULL therefore calls upon all WPs to provide short summaries of their key findings in short presentations or fact sheets. Several GREEN SURGE researchers from WPs 2, 5 and 6, associated with foreign institutions have engaged in the stakeholder engagement process in Malmö.

6.1.3 Key insights from external research

GREEN SURGE has not yet contributed insights from external research to the ULL process. The core group consists of two landscape architects, two ecologists and an architect. In addition, the larger group consists of about 20 persons with relevant competences. Together, they have a lot of local knowledge that is continuously exchanged.

6.1.4 Workshop on identifying key issues

There have been several occasions where key issues were discussed and formulated. One situation is the municipal work with the Green Plan that is hosted by the streets and parks department. Here we present the initial process of setting up goals for the next generation of the green infrastructure plan for Malmoe, which was applied in three workshops in 2014. The first two, with representatives from the GREEN SURGE ULL, resulted in the five conclusions below:

- *Green infrastructure planning and governance need to be conducted in cooperation with the relevant municipal department from an early stage. Goals from comprehensive planning must be implemented in green space management and governance.*
- *Planning documents must be coordinated from comprehensive (i.e. with relevance to city-wide land use) to detailed, local planning. This requires that qualitative goals from comprehensive planning are put into concrete forms of guidelines or other planning tools.*
- *Green infrastructure planning and governance need to be focused not only on quantity, but also on quality and coherence. To achieve this, green space should be designed and managed to be multi-functional and to supply desired ESS.*
- *The green infrastructure is all public and private land with water and vegetation, including streets, parks, cemeteries, school yards and private gardens. Though the planning and governance tools differ in efficiency between public and private land, it is important that all relevant land is considered.*
- *Green infrastructure planning and governance need to be conducted in dialogue with citizens and using research as a resource.*

The third workshop was organized by GREEN SURGE in collaboration with the green planning group, comprising planners from the city involved in developing the Green Structure Plan. About thirty participants attended the workshop. Of those, two thirds were urban planners from Malmö municipality and one third were researchers from the GREEN SURGE project (Sweden, Denmark, Finland, Germany, the Netherlands). There were also representatives from the municipality of Helsingborg and the consultant COMBINE (also the ULL facilitator).

The workshop started with three short presentations by GREEN SURGE researchers. Marleen Buizer from Wageningen University & Research Centre suggested green space quality assessments to be conducted by means of a joint process between residents, urban planners and researchers. She also gave examples of how residents have been involved in green structure planning at a local level in Utrecht by preparing plans at different levels within a framework of one overall green structure plan. Kati Vierikko from University of Helsinki gave examples from Helsinki of how internet and soft GIS had been used to involve residents in mapping green space values. This tool has reached out to a large and broad group of residents. About 4,700 people contributed to the survey. Rieke Hansen from the Technical University of Munich highlighted with many examples the benefits provided by multifunctional green spaces.

After the presentations small group discussions were held to discuss the next steps in setting up the framework for planning the next Green Structure Plan. The key points from each of the discussions were summed up in a bulleted list by each group. Four main topics emerged from this:

- ***Develop a joint vision for Malmö's green infrastructure***
- ***Develop a set of coherent plans, strategies and planning tools***
- ***Apply assessment and feedback tools***
- ***Facilitate public participation***

The first topic with relevance to developing the next Green Structure Plan – Develop a joint vision for Malmö's green infrastructure – is to be shared by city officials at different municipal departments and residents in the city. The vision should connect green infrastructure to the most important political issues in the city, like public health and stormwater management. Although the vision needs to be short, it must also be detailed and concrete enough to guide decisions at overall political level as well as on a maintenance operational level.

With the vision of the Green Structure Plan as the starting point, the potential of developing a coherent set of legal planning documents, policies, strategies and planning tools. The Green Structure Plan as a tool could be divided into an overall comprehensive plan and local plans. Local planning would enable residents to take part in the process. Even though the legal framework differs between public and private land, the green space planning should consider private land and strive to find ways of enhancing the public benefits from private green spaces.

Another area identified as being of relevance when developing the next Green Structure Plan was the application of assessment and feedback tools, in particular maps as a method for quality assessment. There is a need to explore available options for mapping different aspects of green space quality from the viewpoints of different types of urban green space actors.

Finally, public participation was also highlighted as an area for improvement in the next Green Structure Plan. There is a need for developing methods for user involvement in assessment and decision-making processes as well as in the actual maintenance of public green space. It is important to ensure that public participation is supported in the (politically approved) vision. By now, follow-up meetings have been organized in which GREEN SURGE maintained an active role.

With regard to the MESP development, GREEN SURGE has attended reference group meetings organized around discussing different key issues.

6.1.5 ULL synthesis

There is a special focus on how to work with ESS in planning and management, which is strengthened by governmental directive. Learning more about different aspects of urban green infrastructure creation and maintenance, including inventory, analysis, planning and management is therefore an important area of interest. Related to that, there is also a need to find new and better ways to increase stakeholder involvement in, and co-creation of, urban green infrastructure planning and management. There is also an interest in how to create a narrative around the importance of integrating ESS into any plans supporting the creation of urban green infrastructure in order to get a good discussion with politician, developers etc. This would open up opportunities for developing a dynamic green economy involving the private sector and non-profit organizations both working with the new concept of urban green infrastructure.

6.2 Research needs

6.2.1 Elements of key interest in future GS-research

WP2 - Feedback from the survey on biocultural diversity (BCD); suggestions on methods for assessment of BCD in planning or management cases

WP3 - A typology of ESS outputs from different types of green spaces that can be applied and visualised on a map.

WP4 - Of interest would be empirical knowledge of the economic value of green space that can be applied in Malmö. At first there is need to establish a vision: What is a green economy? How could it be developed? What does it take for different stakeholders to collaborate and shape a new platform for green economy? This could be used in both the Green Structure Plan and the MESP (ecosystem service implementation in planning) as well as for the external actors and early adopters. WP4 research could contribute in formulating the overlapping narrative on the need for UGI and ESS that could be used to promote the concept to politicians and developers.

WP5 - Learning more about planning models from other countries that can inspire the planning for ESS in Malmö. Ideally, examples are provided that help in identifying and assessing the importance of ESS in the existing green areas as well as securing and developing ESS in the Green Structure Plan. Planning in Sweden, as in many other countries, involves different departments in the municipality, each with different expertise and interests. This division applies from the political level down to city administration level. When new complex issues and ideas are intro-

duced, such as ESS or governance, the questions overlap between the different departments. In an ideal scenario, this leads to collaboration and exchange of ideas between different departments. It needs to be avoided that this process results in a degree of misunderstanding, mistrust and conflict.

WP6 – The ULL would benefit from models from other countries that can inspire the urban green space governance in Malmö. The local municipalities (kommuner) have a plan monopoly in Sweden; the country consists of 290 municipalities. Swedish municipalities in general and Malmö in particular have a strong city official administration that takes care of planning and much of the management of green infrastructure. There is a transparent democratic planning process where the citizens can give feedback on plans but mostly citizens act as passive recipients of information.

As a result, there are not many urban green space governance initiatives involving external actors. The lack of empowerment of non-governmental actors in decision-making is acknowledged as a problem among city officials. There is, since some years, a growing interest in bottom up, governance and co-creation methods both from above (municipal), and from below (citizens) as well with consultants and academia. There is some uncertainty regarding which methods to use in relation to participatory planning and maintenance. Here the questions could be: how to increase participatory governance in a strict planning culture? What is needed, therefore, are not participatory governance methods as such, but also strategies to overcome regulatory and organizational barriers in order to implement these methods.

6.2.2 Opportunities for engagement with GS-research

Some of the key issues and questions described in the previous section could serve as the starting point of workshops to be organized within the Malmö ULL.

7 CONCLUSION

Preparing this Deliverable has provided each of the five contributing Urban Learning Lab (ULL) coordinators with an opportunity to learn more about ongoing work relevant to their ULL. We relied on a stepwise process, applied in each of the ULLs, inviting the ULL coordinators to reflect upon the nature of knowledge demand in their local urban green infrastructure (UGI) stakeholder community. We did so by considering the carefully documented knowledge needs of Focal LAs, city-specific insights from GREEN SURGE WPs and external research, and the outcome of ULL stakeholder workshops. This way, we could identify what questions important to improving the local delivery of UGI have already been addressed, and which are still open. This has paved the way for increased engagement of the ULLs in shaping the research questions of WPs 2-6 in the final two years of GREEN SURGE and possibly beyond.

By providing up-to-date information about key issues, the relevance of current findings provided by GREEN SURGE and describing relevant elements of interest as well as opportunities for interactions between the ULLs and the different GREEN SURGE WPs, we hope this Deliverable will also spark the interest of the wider GREEN SURGE consortium. Applied research is at the heart of what we aim to achieve at GREEN SURGE and everyone within the project is therefore likely to benefit from understanding how the value of their research has been interpreted locally and which of their messages resonate best with UGI practitioners at different locations. Furthermore, this Deliverable also provides a future reference document against which to check what research questions make sense given research needs at the ULL level. In the final few sections, we will provide a brief overview of the key commonalities and differences between the five ULLs. We will cover i) the role of the Focal LA within the ULL, ii) topics of key interest, and iii) opportunities for engagement.

An important step in facilitating knowledge exchange between GREEN SURGE researchers is to ensure a common understanding of the way Focal LAs and ULLs are organized and operate within each of the five ULL-cities. The city-specific chapters revealed that the process of initiating and coordinating these stakeholder groups has unfolded very differently across cities, depending on local circumstances. In Edinburgh and Malmö, the Focal LAs have been developed in an opportunistic way on the back of existing multi-stakeholder initiatives touching upon themes at the heart of GREEN SURGE. Edinburgh has additionally organized ULL-workshops engaging a wider segment of stakeholders, whilst this has proven to be much more challenging in Malmö due to a traditional top-down UGI planning system. Unlike the above cities, the Focal LAs in Bari, Berlin and Ljubljana were initiated by GREEN SURGE, and perhaps for that reason operate at a more local, site-specific level. The ULLs in these cities all focus on a wider geographical area and on a more diffuse set of topics relevant to UGI than the Focal LA. The degree to which these ULLs have become established again varies; the Bari ULL is yet to have its first meeting at the time of writing due to the great difficulty experienced in mobilizing stakeholders in what is a rather traditional non-horizontal planning system and selecting a topic for the Focal LA that matches the ambitions of both GREEN SURGE and the practitioners involved.

Two common themes can be identified when considering topics of key interest emerging across the five ULL-cities; there is a need for i) inspiring examples and practical tools to meaningfully incorporate the concept of ESS into spatial planning practice, and ii) methods and tools that facilitate participatory governance by empowering non-governmental actors to take on aspects of

green space development and maintenance, including financing. In addition, a number of cities also mention the need for creating more socially inclusive urban green space or increased understanding of how residents interact with urban green spaces and biodiversity. Transformation is a recurring topic in the Focal LAs and ULLs. The concept is used in relation to urban green space on derelict land (Bari, Berlin); increasing the provision of ESS, including biodiversity, by connecting green spaces, changing the urban morphology and/or involving non-governmental actors in design and maintenance (Edinburgh, Ljubljana, Berlin); and the degree to which ESS are consistently considered in the planning practice of multiple actors, including the municipality (Malmö; Ljubljana). Noteworthy was also the key interest in furthering participation in urban agriculture; stakeholders in all ULLs deemed it to be an excellent means to transform urban areas to deliver a wider range of ESS.

ULL coordinators would like to use future ULL workshops to share knowledge about key topics of interest mentioned above. There is, however, a need for this information to be presented in a format and language style accessible to non-researchers. Ideally, WP-leaders will therefore be involved in selecting the information to be shared and finding an appropriate method for presenting this (e.g., factsheets) for each ULL individually. ULL coordinators also highlighted that, in turn, the results of any ULL workshops need to be shared with WP-leaders in order to improve the stakeholder engagement approach, if needed. Doing so will also further improve the match between, on the one hand, the knowledge collected as well as methods and tools developed by the GREEN SURGE consortium and, on the other hand, the knowledge needs of UGI practitioners in the ULLs.

Sharing information is, however, just the first step in the envisaged stakeholder engagement by the ULLs. Ideally, this is followed up by exercises to establish which of the shared practices are applicable within the local context, the identification of potential pilot plans or sites as well as focus groups to take ideas forward, and the monitoring and evaluation of any project-based learning that is done as a result of implementing these ideas. There are likely to be many organizational and regulatory barriers on the route from idea to implementation. GREEN SURGE will have an important task in shaping strategies to successfully negotiate these hurdles. Success is required at each of these stages to ensure that GREEN SURGE is truly reimagining and transforming green space to address the UGI challenges associated with modern day urban development.

GREEN SURGE REPORTS

Deliverable 2.1 – Vierikko, K., Elands, B., Száraz, L., Niemelä, J. 2015. Biocultural diversity - Concept and assessment.

Deliverable 3.1 - Cvejić, R., Eler, K., Pintar, M., Železnikar, Š, Haase, D., Kabisch, N., Strohbach, M. 2015. A typology of urban green spaces, ecosystem services, provisioning services and demands.

Deliverable 4.1 - Andersson, E., Kronenberg, J., Cvejić, R., Adams, C. 2015. Integrating green infrastructure ecosystem services into real economies.

Deliverable 4.2 - Andersson, E., Kronenberg, J., Haase, D., Adams, C. 2015. Cash flows generated by urban green spaces.

Deliverable 5.1 - Davies, C., Hansen, R., Rall, E., Pauleit, S., Laforteza, R., DeBellis, Y., Santos, A., Tosics, I. 2015. Green infrastructure planning and implementation.

Deliverable 6.1 - Buizer, M., Elands, B., Mattijssen, T., Van der Jagt, A., Ambrose-Oji, B., Geróházi, E., Santos, A., Steen Møller, M. 2015. The governance of urban green spaces in selected EU-cities.

Deliverable 7.1 - Smith, M., Van der Jagt, A., Ambrose-Oji, B. 2015. Local Learning Alliances established in five Urban Learning Labs.

Milestone 21 - Fischer, L.K., Kowarik, I., Botzat, A., Honold, J., Haase, D., Kabisch, N. 2015. Biocultural diversity of urban green spaces in European cities. Internal project report on the assessment of BCD in European city regions.

Milestone 24 - Kabisch, N., Strohbach, M., Haase, D. 2014. Internal project report on inventory of urban green space demand for the two scale levels, ULLs and Urban Atlas cities.

Milestone 25 - Haase, D., Kabisch, N., Strohbach, M., Klemen, E., Železnikar, Š., Cvejić, R., Pintar, M. 2015. Inventory of quantitative and qualitative functional linkages between UGI components, BCD and impact.

Milestone 40 - Buijs, A., Mattijssen, T., Elands, B., Ambrose-Oji, B., Van der Jagt, A., Delshammar, T., Santos, A., Fors, H., Gerohazi, E., Tosics, I., Vierikko, K., Hansen, R., Nastran, M. 2015. Assessment framework for urban green space governance arrangements.

All reports are available from: <http://greensurge.eu/working-packages>

REFERENCES

- Andersson, E., Kronenberg, J., Cvejić, R., Adams, C. 2015. GREEN SURGE Deliverable 4.1: Integrating green infrastructure ecosystem services into real economies. Available from: http://greensurge.eu/working-packages/wp4/D4.1_Final.pdf [Accessed 6 October 2015].
- Buizer, M., Elands, B., Mattijssen, T., Van der Jagt, A., Ambrose-Oji, B., Geróházi, E., Santos, A., Steen Møller, M. 2015. GREEN SURGE Deliverable 6.1: The governance of urban green spaces in selected EU-cities. Available from: http://greensurge.eu/working-packages/wp6/files/Buizer_et_al_2015_D6.1_GREEN_SURGE_The_governance_of_urban_green_spaces_in_selected_EU_cities.pdf [Accessed 6 October 2015].
- Butterworth, J., Morris, M. 2007. Developing processes for delivering demand-led research in urban water management. SWITCH working paper. Available from: http://www.switchurbanwater.eu/outputs/pdfs/W6-2_GEN_RPT_D6.2.10a_Consolidation_report_on_learning_alliances.pdf [Accessed 27 November 2015]
- City of Edinburgh Council, 2014a. Edinburgh Local Development Plan: Second Proposed Plan. Edinburgh, United Kingdom. Available from: http://www.edinburgh.gov.uk/download/downloads/id/3839/second_proposed_local_development_plan_june_2014.pdf [Accessed 18 November 2015].
- City of Edinburgh Council, 2014b. Trees in the City: Trees and Woodlands Action Plan. Edinburgh, United Kingdom. Available from: http://www.edinburgh.gov.uk/download/downloads/id/1540/trees_in_the_city_action_plan [Accessed 18 November 2015].
- City of Edinburgh Council, 2015. The value of City of Edinburgh Council's parks. Edinburgh, United Kingdom. Available from: http://www.edinburgh.gov.uk/download/downloads/id/5625/the_value_of_city_of_edinburgh_councils_parks.pdf [Accessed 6 October 2015].
- Cocks, M. L., Wiersum, F. 2014. Reappraising the concept of biocultural diversity: A perspective from South Africa. *Human Ecology*, 42, 727–737.
- Fischer, L.K., von der Lippe, M., Rillig, M.C., Kowarik, I. 2013. Creating novel urban grasslands by reintroducing native species in wasteland vegetation. *Biological Conservation*, 159, 119-126.
- Fischer, L.K., von der Lippe, M., Kowarik, I. 2013. Urban grassland restoration: Which plant traits make desired species successful colonisers? *Applied Vegetation Science*, 16, 272-285.
- Fischer, L.K., von der Lippe, M., Kowarik, I. 2013. Urban land use types contribute to grassland conservation. The example of Berlin. *Urban Forestry and Urban Greening* 12, 3, 263-272.

Jones, I., 2015. The socio-cultural value of urban green space: a method for assessing the impact of the Edinburgh Living Landscape (Unpublished master's thesis, University of Edinburgh).

Kabisch, N., Strohbach, M., Haase, D. 2014. GREEN SURGE Milestone 24: Internal project report on inventory of urban green space demand for the two scale levels, ULLs and European Urban Atlas Cities. Available from: http://greensurge.eu/working-packages/wp3/files/MS24_13042015_nk.pdf [Accessed 6 October 2015].

Kowarik, I. 2015. Gleisdreieck: How urban wilderness became possible in the new park. In: Lichtenstein, A., Mameli, F.A. (Eds.) Gleisdreieck / Park Life Berlin, p. 216-221. Bielefeld, Germany: Transcript Verlag.

Lafortezza R., Davies C., Sanesi G., Konijnendijk C.C. 2013. Green Infrastructure as a tool to support spatial planning in European urban regions. *iForest - Biogeosciences and Forestry*, 6(3), 102-108.

Meadows, D.H. 1999. Leverage Points: Places to intervene in a system. Hartland, VT: The Sustainability Institute.

Mozingo, L., Baker, A., London, J., Ancel, N., Cheng, I., Dohi, M. 1998. The Glenn W. Daniel King Estate Park Master Plan. *Landscape Journal*, 17, 12-14.

Palliwoda, J. 2015. People interacting with biodiversity in urban parks. Examples from Berlin (unpublished Master's thesis, Technical University of Berlin).

Säumel, I., Kotsyuk, I., Hölscher, M., Lenkerei, C., Weber, F., Kowarik, I. 2012. How healthy is urban horticulture in high traffic areas? Trace metal concentrations in vegetable crops from plantings within inner city neighbourhoods in Berlin, Germany. *Environmental Pollution*, 165, 124-132.

Scottish Wildlife Trust, 2014. Edinburgh Living Landscape Programme Plan. Edinburgh, United Kingdom. Available from: http://scottishwildlifetrust.org.uk/docs/002_057_edinburghlivinglandscapeprogrammeplan_nov2014_1415022921.pdf [Accessed 6 October 2015].

Schlecht, M. T., Säumel, I. 2015. Wild growing mushrooms for the Edible City? Cadmium and lead content in edible mushrooms harvested within the urban agglomeration of Berlin, Germany. *Environmental Pollution*, 204, 298-305.

Senatsverwaltung für Stadtentwicklung und Umwelt 1994/2004. Landscape and Species Protection Program (Landschaftsprogramm/Artenschutzprogramm). Berlin, Germany. Available from: <http://www.stadtentwicklung.berlin.de/umwelt/landschaftsplanung/lapro/index.shtml> [Accessed 8 January 2016].

Senatsverwaltung für Stadtentwicklung und Umwelt 2011. Urban Development Plan Climate (Stadtentwicklungsplan Klima). Berlin, Germany. Available from:

<http://www.stadtentwicklung.berlin.de/planen/stadtentwicklungsplanung/de/klima/> [Accessed 17 December 2015].

Senatsverwaltung für Stadtentwicklung und Umwelt 2012a. Biodiversity Strategy Berlin (Berliner Strategie zur Biologischen Vielfalt). Berlin, Germany. Available from: http://www.stadtentwicklung.berlin.de/natur_gruen/biologische_vielfalt/de/berliner_strategie/index.shtml [Accessed 17 December 2015].

Senatsverwaltung für Stadtentwicklung und Umwelt 2012b. Urban Landscape Strategy Berlin (Strategie Stadtlandschaft Berlin). Berlin, Germany. Available from: http://www.stadtentwicklung.berlin.de/umwelt/landschaftsplanung/strategie_stadtlandschaft/ [Accessed 17 December 2015].

Senatsverwaltung für Stadtentwicklung und Umwelt 2013. Urban Green (Stadtgrün). Berlin, Germany. Available from: <http://www.stadtentwicklung.berlin.de/umwelt/stadtgruen/gruenanlagen/index.shtml> [Accessed 17 December 2015].

Senatsverwaltung für Stadtentwicklung und Umwelt 2014. Business in Berlin Supports Biodiversity. Recommendations for Action (Berliner Unternehmen fördern Biologische Vielfalt). Berlin, Germany. Available from: http://www.stadtentwicklung.berlin.de/natur_gruen/naturschutz/downloads/publikationen/Leitfaden_BiologischeVielfalt_BerlinUnternehmen.pdf [Accessed 17 December 2015].

Stein, A.B., Millar, N. 1998. Windows of opportunity: reprogramming residual urban space. *Landscape Journal*, 17, 8-11.

TEEB – The Economics of Ecosystems and Biodiversity 2011. TEEB Manual for Cities: Ecosystem Services in Urban Management. Available from: <http://www.teebweb.org> [Accessed 6 October 2015].

Weber, F., Kowarik, I., & Säumel, I. 2014. A walk on the wild side: Perceptions of roadside vegetation beyond trees. *Urban Forestry and Urban Greening*, 13(2), 205–212

von Hoffen, L. P., Säumel, I. 2014. Orchards for edible cities: Cadmium and lead content in nuts, berries, pome and stone fruits harvested within the inner city neighbourhoods in Berlin, Germany. *Ecotoxicology and Environmental Safety*, 101, 233–239.

Wikström, T. 2005. Residual space and transgressive spatial practices: the uses and meanings of un-formed space. *Nordisk Arkitekturforskning*, 1, 47-68.