

DELIVERABLE D.T4.2.1 CONTENT OF THE SALUTE4CE HANDBOOK

Subtitle

Version 1
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Introduction

The urban environment is a development organism.

Due to their dynamic socio-ecological nature, we see urban areas as man-made environments. The key to their successful development is resilience and sustainability. While resilience is about coping and adapting to change, sustainability is about socio-natural relationships, the relationship between man and his environment. (Frank et. al, 2017)

Development conditions have changed over the centuries. Cities and their Functional Urban Areas have adapted to these changes and protected sustainable development.

Today's cities face a number of challenges. One of them is climate change and the need for adaptation. Climate change is a global phenomenon. Therefore, almost all cities face the challenges associated with this change. The Salute4CE project provides examples of solutions that are based on urban environmental acupuncture. Furthermore, biodiversity loss, air pollution, soil sealing and water management are environmental challenges in many cities. In addition in many cities/FUAs outdoor places for resident's recreation and for nature experiences are rare. The need for sustainable transformation is underlined by the 2030 Agenda for Sustainable Development¹, in particular Sustainable Development Goal 11, which is dedicated to making cities inclusive, safe, resilient and sustainable, the New Urban Agenda², the Paris Agreement³, the European Commission's Green Deal⁴ as well as the New Leipzig Charter⁵ - a strategy of the EU Ministers responsible for urban matters to promote integrated and sustainable urban development.

Urban environmental acupuncture is one of the urban planning approaches, which could be used for selective intervention in precisely defined urban spaces. The technique of urban environmental acupuncture draws its concept from traditional Chinese medicine. Following this concept, the urban environmental acupuncture approaches treats cities like a living organism, and provide its regeneration and urban renewal through "healing" selected weak areas. Just as the medical Chinese technique of acupuncture is aimed at relieving stress in the human body, the goal of urban environmental acupuncture is to relieve stress in the urban structure. Urban environmental acupuncture projects are usually renewal projects of small urban, neglected spaces, such as squares, yards, fragments of streets, playgrounds, etc. (e.g. Apostolou 2015, Ryan 2013) . As an approach to urban planning, acupuncture became popular in the 1970s. It was then that micro solutions appeared that improved the quality of urban space, for example Paley Park in New York. Currently, this technique is widely used in the processes of urban revitalization and renewal. The most famous designers and promoters of urban environmental acupuncture today are Jamie Lerner (Lerner 2014) and Marco Casagrande (Casagrande 2014).

The urban environmental acupuncture is perceived as an efficient alternative to the large-scale projects due to micro-targeting and low-cost intervention, which could offer an attractive and socially accepted solution. In the time of constrained budgets and limited resources, this pinpointed approach could offer not only new attractive quality of urban space but involve a large group of city stakeholders.

The handbook is divided into 7 chapters. The first three chapters introduce the reader to the issue of Urban Environmental Acupuncture. The aim is to show the reader what a positive solution the application of Urban Environmental Acupuncture to urban space brings. Furthermore chapters (specially chapters 2 and 3)

¹ <https://sustainabledevelopment.un.org/post2015/transformingourworld>

² <https://unhabitat.org/about-us/new-urban-agenda>

³ <https://www.un.org/en/climatechange/paris-agreement>

⁴ https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en

⁵ https://www.bmi.bund.de/SharedDocs/downloads/EN/themen/building-housing/city-housing/new-leipzig-charta.pdf;jsessionid=9F8415B8458096F916BED5800BAB93D6.2_cid295?__blob=publicationFile&v=3



included a description of the individual elements of Urban Environmental Acupuncture. Chapter 3 is devoted to a basic description and examples of individual Nature Based Solutions.

Chapter 4 focuses on plant species and their selection in the preparation of specific UEAs. The emphasis is mainly on native species. This chapter continues after the introductory chapters because it is closely related to a successful technical solution. Plant and native species are also closely to environmental pillars of sustainability. Chapter 4 is also the link between the technical solution and the satisfaction of future users.

Chapters 5 and 6 are closely related. They show the reader instructions on how to maximize the effect of the UEA application by creating Action Plans. Chapter 5 is mainly focused on the problem how to involve the right stakeholders in the creation Action plan. In particular, Chapter 6 describes and in what way to involve the public in the process of creating an action plan and selecting appropriate solutions.

Chapter 7 provides lessons. The UEA application process shows the examples of 4 cities and their FUA. (4 cities in the Salute4CE project). The chapter contains the transfer of knowledge and shows that despite various problems it is possible to achieve the goal.



Chapter 1 Urban environmental acupuncture

The task of the first chapter is to introduce the reader to the problem, so the first part of the chapter must explain what the main idea of the UEA is. It must contain a basic definition of green infrastructure and, above all, it must explain the basic idea of acupuncture in urban space.

To explain the environmental impact, the chapter will contain key ideas of ecosystem services. Urban environmental acupuncture touches on green and blue and gray infrastructure and provides a range of ecosystem services. Their basic explanation will be found in this chapter. Subsequently, the individual ideas will be elaborated in Chapter 2.

As this is an introductory chapter, Chapter I must include a brief introduction of the UEA to the system of strategic documents of individual countries in which the solution of the SALUTE4CE project occurs, namely Poland, Germany, Italy, Slovakia and the Czech Republic. The introductory part of the chapter will be prepared by Lead partner. The Ecosystem services are basically described by IURS. The inclusion of UEA in strategic documents of individual states will be described by authors from IETU, IOER, LINK, IURS.

The chapter will end with a list of references.



Chapter 2 Urban environmental acupuncture solution

Chapter 2 builds on Chapter 1 to deepen knowledge about individual ecosystem services, so the subchapters are divided according to individual problem areas.

NBS impact on ECOSYSTEM SERVICES



Main parts:

- Soil sealing and soil degradation reduction by application of Urban environmental acupuncture solution
- Urban environmental acupuncture for reduction of habitat loss and fragmentation
- Urban environmental acupuncture as one of the solutions for the reduction of heat stress in urban space -
- Possibilities of application of urban environmental acupuncture in reducing problems with rainwater in the urban space-
- Urban environmental acupuncture for increasing air quality
- **Improvement of social aspects**

The general definition of soil sealing in the EU used in the EC documents describes soil sealing as the covering of the ground by an impermeable material. It is one of the main causes of soil degradation in the EU. Soil sealing often affects fertile agricultural land, puts biodiversity at risk, increases the risk of flooding and water scarcity and contributes to global warming. According to the European Environment Agency, since the mid-1950s, the total surface area of cities in the EU has increased by 78 %, whereas the population has grown by only 33 %. Urban environmental acupuncture offers some soil sealing solutions. Therefore, the chapter will include a description of some solutions. (Gorgoń, 2017)



Soil sealing and soil degradation do strongly affect urban biodiversity. Therefore urban biodiversity can highly benefit from application of urban environmental acupuncture solutions, including measures for reduction of soil-sealing and greening with Nature Based Solutions (NBS).

Urban areas suffer from special climatic conditions: The phenomenon of the urban heat island (UHI) is characterized by dryness, heat, and lower wind strength compared to the rural surroundings (Arnfield 2003). Densely built-up and sealed areas are heat stores emitting heat to their surroundings, which is especially notable at night with negative influences on human health (Lehmann et al. 2014). In large cities, heat islands with “tropical nights” above 20°C make it difficult to have the necessary recovery from the heat stress of the day. Sleep can be affected negatively, which may pose health hazards (Höppe 1999). Vulnerable people like elderly people, sick persons, and young infants (toddlers) are thus exposed to higher health hazards (Scherber et al. 2013). The urban heat island and extreme heat events can increase heat-related morbidity and mortality (Endlicher et al. 2016). It is expected that climate change will exacerbate these conditions, in particular heat waves with higher frequencies and duration (Endlicher et al. 2016, Baldwin et al. 2019) intensifying heat dependant health problems (e.g. Pace et al. 2020). A sustainable urban development must deal with these foreseeable effects. Indeed, the problem of reducing heat islands is closely linked to the sustainable development of settlements. Therefore, a separate chapter will focus on a more detailed description of the problems and their possible solutions in the concept of urban environmental acupuncture.

Urban development was inextricably linked to water. Drinking water is essential for life, water as propulsion, water and watercourses as sewers, water - a river forming a transport system and water as a defensive wall. Water can be also “destroyer”. “Water is an irreplaceable helper, but a bad master”. Water in an urban environment must be taken care of. It is necessary to pay attention to water also because humans have changed the order of and natural process natural state. With the Urban green acupuncture application, we are able to improve the situation. However, it is necessary to understand how such measures work, but also what possible pitfalls can await. As storm water problems in particular are an integral part of a number of adaptation strategies, attention will be paid to the management of the hydrological cycle in urban development within the subchapter.

Air pollution represents a large problem in our cities as about 3.8 million premature deaths annually are attributed to outdoor air pollution. According to the World Health Organisation, it represents the single largest environmental health risk in Europe, while the European Environment Agency (EEA) has warned that, in our continent, air pollution causes between 400,000 and 500,000 premature deaths every year (Air quality in Europe – 2015 report). Indeed, air pollution is, currently, the most important environmental risk to human health in Europe, and it is perceived as the second biggest environmental concern for Europeans, after climate change (European Commission, 2017). In the subchapter devoted to possible solutions to air pollution, the effects of some urban environmental solutions will be described graphically and clearly.

Social aspects are a less obvious aspect. In contrast to the reduction of temperature stress, the accumulation of rainwater, the improvement of air quality or the improvement of soil conditions, social influences are rather indirect. The overall improvement brought by the application of urban environmental acupuncture leads to positive indirect effects on health, and on the overall mental condition. From the socio-economic point of view, it is necessary to deal with issues related to the evaluation of land in the vicinity. It is necessary to pay attention to these issues in the subchapter.

In this chapter will be cooperate IETU, IEOR, LINK, IURS. The chapter will end with a list of references.



Chapter 3. What are the types of interventions - description - technical solution -which impact carry - advantages - disadvantages - NBS

Chapter 3 is strongly focused on the practical information necessary for the successful application of Nature Based Solutions in Urban environmental acupuncture.

A total of thirty Nature based solutions were identified in the project. In this subchapter, they will be divided into individual types according to which solution it brings. The reader will have the opportunity to better understand which Nature based solutions are suitable for solving his problems. Furthermore, the advantages, disadvantages and basic parameters for their construction will be processed for individual types. The need for maintenance will also be recorded in the description. The chapter will also contain examples of individual solutions. Information on possible other information sources will also be an integral part. IETU, IEOR, LINK, IURS, SIBG, LAMORO will collaborate on this chapter

List of Nature Based Solutions

number	<i>NBS name</i>	number	<i>NBS name</i>	number	<i>NBS name</i>
1.	Urban meadows	11.	Road-side swales for retention and infiltration	21.	Green facades with climbing plants
2.	Verges / flower beds with native perennials	12.	Linear wetlands for stormwater filtration	22.	Wall-mounted living walls
3.	Ground cover plants	13.	Natural pollinators' modules	23.	Hydroponic mobile living walls / vertical gardens
4.	Lawn	14.	Hedge/hedgerow	24.	Vertical vegetable / herb gardens
5.	Green pavements	15.	Rockery	25.	Hanging wall planters (as green street furniture)
6.	Street trees	16.	Herb spiral	26.	Compacted pollinators' module
7.	Park trees	17.	Urban wilderness / succession area	27.	Rain gardens in planter (=self-contained)
8.	Fruit trees/ shrubs/	18.	Ground crops of vegetables / herbs	28.	Street planters (as green street furniture)
9.	Large shrubs	19.	VRSS slopes with green fences	29.	Green covering shelters
10.	Rain gardens (under-drained)	20.	Green pergolas/ green arbors	30.	Green roof /roof terrace



Chapter 4. Plants in urban environmental acupuncture

The aim of this chapter is to present the subject of the proper selection of plants, which should focus on native ones. Selection of plant species and varieties, and their combinations, must be consistent with the specifics of a given site and the specifics of the type of intervention - i.e. the type of green spot and types of NBS. The selection of plants should be limited to those species and varieties for which habitat requirements impact on other plants, humans, animals and infrastructure, as well as their growth rate, target habits, target size and required care are fully understood. In order to permanently fulfill the target functions of greenery in the selection of species and varieties, it is necessary to take into account in-depth recognition of: social needs and expected benefits for the local community, environmental conditions and biodiversity issues, already existing plant cover at the site, available space as well as current and planned infrastructure, and many others.

This chapter will provide the reader with detailed information on:

- General recommendations for limiting or excluding plant species or varieties
- Required properties of the plant material
- Matching environmental conditions
- Expected benefits in terms of regulative ecosystem services (ES)
- Compliance with the needs of protecting and strengthening biodiversity
- Promoting expected social benefits
- Conflicts / risk avoidance
- Facilitating further maintenance of the UEA site



Chapter 5 - Transnational Concept for Action Plans

The purpose of the transnational action plan concept is to develop a shared concept for action plans within the framework of SALUTE4CE project, specifically, within urban pilot project areas and their respective Functional Urban Areas (FUAs). This concept is intended to be used as a guide for local actors and should be adjusted to fit the individual needs of each pilot project. The action plan concept incorporates the methodology for selecting urban environmental acupuncture (UEA) sites and this includes the typology and selection of interventions. The transnational action plan concept is organized according to 3 main chapters, they include, general considerations, creating local action plans and plan implementation. The result of action planning is a written document that describes how a specific set of actions are to occur to bring specified goals and/or visions to fruition (i.e. implementation). The concept will contribute to continuity between action plans and thus pilot projects by bringing together visions, goals and implementation strategies for UEA sites at the local level (Hemingway et al. 2020).

In this chapter, the authors will focus on explaining the correct procedure for finding solutions to create an Action Plan. The chapter should answer the following questions:

- How to put together the right team to prepare an action plan?
- How to develop the vision of the city?
- How to acquire public and financial support?.
- Which data is needed and how should it be and collected?
- How to properly pre-select sites suitable for UEA application?
- How to select the final set of sites?

Of course, in this chapter the goals and measures of the plan will be discussed. When a maintenance & management plan is necessary and the first steps in their creation? And also emphasize the importance of monitoring & evaluation concepts based on a set indicator.

The chapter will be processed by the IOER.

The chapter will follow on from Chapter 6. The chapter will end with a list of references



CHAPTER 6 Participation and communication with stakeholders and end users of green acupuncture

Since the 80s of the 20th century, participation has won importance in democratic countries significantly. Many people are looking for new ways of participating in politics - either through direct democratic or plebiscitary channels (citizens' petitions and referenda) or through dialogue-oriented procedures for forming opinions and making decisions. Many decision-makers in politics and administration now appreciate the exchange with citizens. They see participation as the benefit of working together with an interested citizenry because it gives them an insight into people's needs and opinions. According to Kostecky (in Bernard 2011) this leads to a new relationship between traditional administrative models of decision making through representative bodies and participatory approaches.

In general, participation means forms of involvement, inclusion or integration of people. Participation can be seen as cooperation, communication and interplay in relation to public tasks and goals. It is often understood as a form of governance, involving people in public decision making. In a more normative understanding, participation can contribute to build trust and make transparent the intricate procedures of planning (Innes & Booher 2004, Jami & Walsh 2014). Regarding urban green it can help to interconnect the idea of urban acupuncture and support decision making towards urban sustainability.

Participation and communication with stakeholders is an important aspect that can mean the success or failure of a project. Therefore, a separate chapter is devoted to the problems of communication and work with stakeholders in the handbook. The chapter will deal not only with theoretical approaches, but will also contain specific aspects and approaches within the involvement in the SALUTE4CE project. A essential part will be the description "From Participatory Processes to Living Labs". The chapter starts with some general consideration on participation, but will also contain practical aspects and approaches developed within the SALUTE4CE project. Of crucial importance will be the section "From Participatory Processes to Living Labs". Finally, our chapter will also describe various participation tools. The Interactive Visualization Tool (InViTo), developed within previous European projects, will be introduced as an interactive communication tool. This chapter is a result of IETU, LINKS and IOER collaboration.



Chapter 7 Case studies -

The aim of Chapter 7 is to show that the concept of Urban Green Acupuncture behind the Nature-based solution works. The chapter will contain a description of all 16 localities on which the SALUTE4CE project is focused. In addition to the technical solution, the main part of the chapter is a description of the problems encountered by individual representatives of the Function Urban area and representatives of municipalities. How they solved these problems. The aim is to transfer knowledge to followers. The chapter should contribute to bringing the topic of urban environmental acupuncture closer to the reader and, using concrete examples, show that this is the right path. The chapter also aims to help followers to avoid mistakes that have occurred or to prevent problems that have occurred. The whole chapter will be supplemented by suitable photo documentation so that the reader gets the most complete idea of what was done. This chapter will be prepared by LAMORO, Alessandria, Erfurt, Chorzow, Liptovsky Milulas.



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