BeePathNet Guidelines – Volume 3

Biodiversity in Urban Beekeeping

Good practice from Ljubljana (SLO)

with guidance on maintenance of biodiversity in urban areas

Transfer Network BeePathNet

August 2019

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1. INTRODUCTION

1.1. Briefly about the BeePathNet project

With intense urbanization and economy growth, European cities face increased pollution, loss of natural resources and a decrease of biodiversity, while their citizens are losing high-quality living conditions and active touch with nature. Such practices, combined with heavy use of pesticides and insecticides, dramatically reduced the numbers of bees and other wild pollinators. Unfortunately, we seem to forget that they provide one of the most important ecosystem services for the food production cycle – pollination.

On the other hand, the awareness about the importance of locally and ecologically produced food is on the rise. People are increasingly following "healthy living principles" and are actively searching for better living conditions. More and more people in the cities are interested in growing their own food – either on balconies, gardens or roof-tops.

The City of Ljubljana (COL) successfully addressed all the above-stated challenges though a **BEE PATH Project**, which approached the issues of preserving urban biodiversity and urban food self-sufficiency through the "bee perspective".

In just 3 years, the City of Ljubljana created a network of 35 voluntary members from various backgrounds (e.g. beekeepers, educational, cultural and health institutions, companies, NGOs, etc.) and in close cooperation with them designed the BEE PATH to become a network of stakeholders, a touristic and educational path, an educational programme, as well as a "think-tank" and an "incubator" for development of new entrepreneurship ideas. Its' success when it was awarded the title of URBACT Good Practice.

The logic behind the BEE PATH Good Practice was very simple – bees live in a healthy environment. If Ljubljana manages to preserve the natural environment in urban areas, which allows bees and other wild pollinators to thrive, then it is on the right path to environmental protection, preservation of biodiversity, ensuring high-quality living conditions and preservation of food self-sufficiency potentials.

However, the City of Ljubljana firmly believes that BEE PATH is by no means a "finished project", but rather a "work in progress" – growing and evolving on a daily basis. Which is why it decided to take on the opportunity to transfer the good practice to other EU cities through the **BeePathNet Transfer Network Project**.

BeePathNet partnership joined 6 EU Cities – Ljubljana (SLO) as the lead partner, Cesena (ITA) and Bydgoszcz (POL) as 1st phase partner, Amarante (POR), XII. District of Budapest (HUN) and Nea Propontida (GRE) as 2nd phase partners – in an attempt to transfer the good practice from Ljubljana to other partner cities.

For more information about BEE PATH Good Practice please visit the BEE PATH website or its URBACT profile. You can follow the progress of the BeePathNet project on the BeePathNet Facebook profile.

1.2. The purpose and design of Volume 3 - Biodiversity in Urban Beekeeping

The overall aim of Volume 3 - Biodiversity in Urban Beekeeping is to present the BEE PATH good practice on the topic of Biodiversity, supplement it with good practice from Hegyvidék and transfer the knowledge gained by both project partners to those interested in its transfer.

It was developed by Maruška Markovčič (BeePathNet URBACT Local Group Coordinator and key developer of the BEE PATH Good Practice) and Nora Laki (URBACT Local Group Coordinator for Hegyvidék) and Klemen Strmšnik (BeePathNet Lead Network Expert), as well as tested and up-graded by the BeePathNet partnership.

2. BIODIVERSITY IN BEE PATH

2.1. Biodiversity in the City of Ljubljana

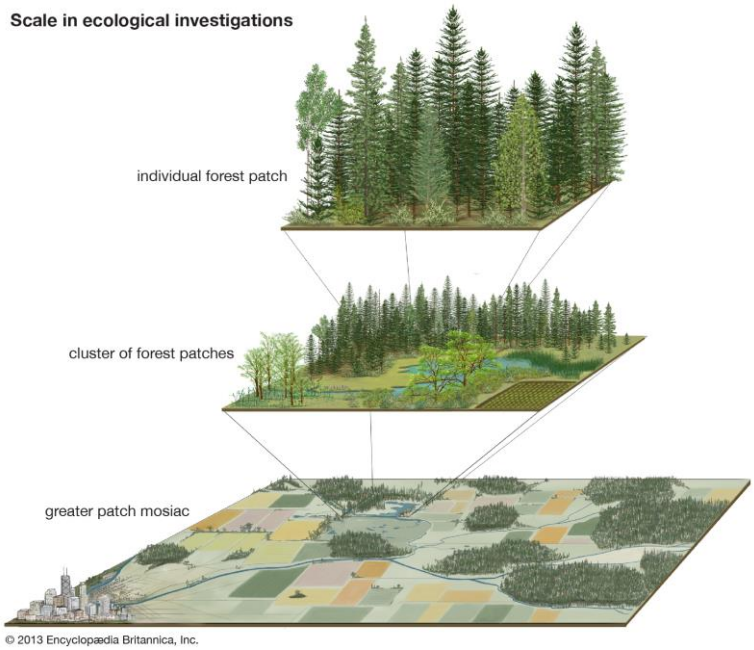
Ljubljana is the political, administrative, cultural and economic center of Slovenia. It is a medium-size, modern and vibrant Central European city, determined to implement its sustainable development vision, resolve open environmental issues, protect nature and ensure high-quality living for its citizens.

Now, a lot has already been written about the City of Ljubljana and of its success story – BEE PATH good practice – either in the BeePathNet Transfer Study, other volumes of this guidance or other project linked publications. However, it has not yet been emphasized that the current condition of the biodiversity in the City of Ljubljana is a result of several factors:

- **Mosaic landscape and its management throughout history**

It is often misunderstood that biodiversity comes only with "preservation or even conservation of nature" in its untouched form. However, practice shows that "mosaic landscapes" – so typical for geographically diverse Slovenian landscape – can also be extremely biodiversity-rich.

Mosaic landscapes are the result of man-managed landscape, where the mixture of fields, meadows, forests, water-bodies, as well as settlements, offer lots of "contact zones", which can be easily exploited by diverse flora and fauna. However, biodiversity-rich mosaic landscapes can only be kept, if humans act as responsible and sustainable managers and exploit natural resources within their limits.



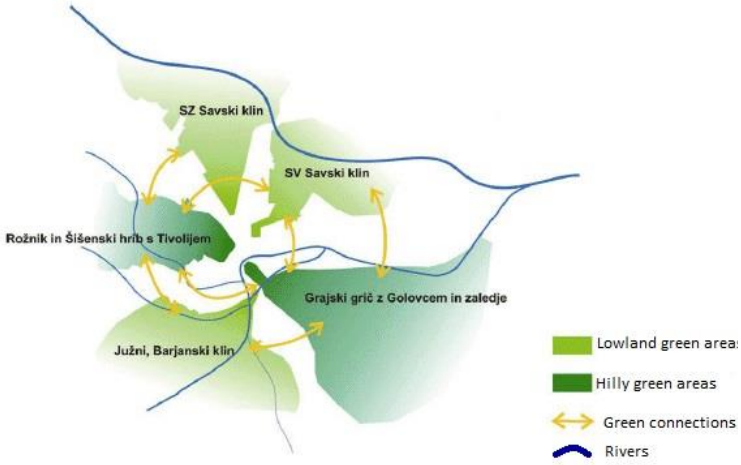
The "Green Wedges System" in the City of Ljubljana

Throughout history, Ljubljana and its surroundings were managed in this way – resulting in not only biodiversity-rich rural areas but also biodiversity-rich urban areas.

- **The initial "green character" of the city:**

Ljubljana has always been a "green city" with large areas of urban forests, parks, and gardens. Almost three-quarters of Ljubljana's territory is covered by native forests, meadows, and fields – 20% of which are protected as nature protected areas.

Due to its citizens, the "green character" was preserved throughout its rich history and today the city offers 542 m2 of public green areas per citizen. This is additionally enriched by the rural surrounding of Ljubljana – so-called "Green Doorstep of the City" – which has an important food self-sufficiency role. In Ljubljana over 800 farms and 350 beekeepers (with 4.500 beehives) operate, keeping the linkage between "urban" and "rural" very much alive.



The "Green Wedges System" in the City of Ljubljana

- **The timing was right:**

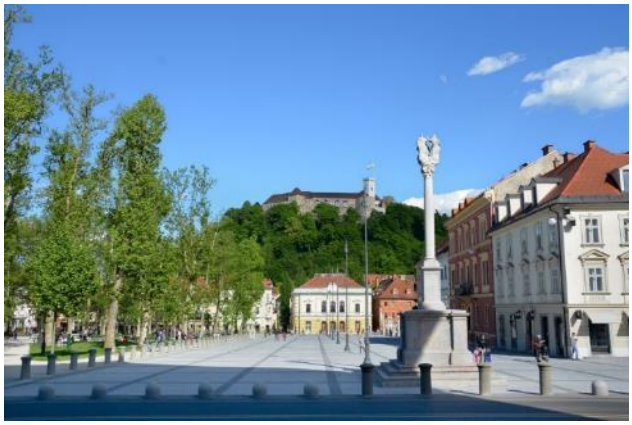
At the beginning of the 1970s, Ljubljana encountered the ever-increasing process of industrialization and urbanization. Combined with ever-increasing pollution the situation resulted in substantially reduced quality of the environment and living conditions. As a reaction, more and more young families moved to suburbs, which in turn led to inevitable "aging" of the city center and older neighborhoods, as well as their slow deterioration and in some cases even degradation in the 1980s and '90s. Subsequently, Ljubljana entered the new millennium ready for urban revival.

- **Active and continuous implementation of widely accepted "sustainable development" policy:**

In the search for new development concepts, city administration and decision-makers recognized the "green character" of Ljubljana as an advantage and opportunity. Citizens quickly responded and supported the idea and it became one of the key development policies.

Through the implementation of a new sustainable strategy *"Vision 2050"* and a new Spatial Plan, the City of Ljubljana successfully achieved a renewal of its urban, as well as rural areas.

In urban areas, Ljubljana recognized the value of its urban forests and green areas and decided to actively manage and preserve them. It also recognized the value of high-quality living conditions and addressed open environmental issues through sustainable energy, transport, waste and water policies.



An example of the "urban renewal" of the Congress square in Ljubljana city center.

At the same time, more emphasis has been given to the sustainable development of rural areas. Ljubljana implemented supporting mechanisms (e.g. co-financing, support to local products, short supply chains, etc.), which enabled farmers to continue with farming while using more ecological and sustainable farming approaches. New rural development strategies were based on the increased production of local farming and forest products. Subsequently, Ljubljana started to enlarge its own food self-sufficiency potential.

Proof of its success came in 2014 when it was declared that Ljubljana won the title of *"the Green Capital of Europe 2016"*.

- **Open communication towards citizens and active support to "bottom-up ideas":**

This was a clear signal for both, citizens and the City of Ljubljana, that they are on the right track. It also provided a supportive and nourishing environment for bolder green urban development ideas and projects. In the coming years, the City of Ljubljana encouraged and supported new urban concepts like urban gardening, urban forestry, and urban beekeeping.

However, very few of such bottom-up ideas would become reality without active support from the administration of the City of Ljubljana through the provision of:

- Leadership – the City of Ljubljana supported the BEE PATH project with its staff (1 coordinator assigned to the task with 20% working time)
- Operational support – the City of Ljubljana supported the BEE PATH project with premises and equipment for meetings.
- Funding (salary for the coordinator and a small project budget).

- **Previously on-going work of other important biodiversity-linked institutions:**

As the capital of Slovenia, Ljubljana is fortunate to host seats of many nationally important institutions dealing with the protection of biodiversity and its promotion – many of which actively cooperate with the City of Ljubljana for example:

- University of Ljubljana – Biotechnical Faculty and University Botanic Gardens Ljubljana
- National Institute of Biology
- Slovenian Museum of National History
- Institute of the Republic of Slovenia for Nature Conservation
- Slovenia Forest Service
- Slovenian Forestry Institute
- Agricultural Institute of Slovenia
- The Chamber of agriculture and Forestry of Slovenia

Their on-going theoretical and practical work, as well as guidance for citizens, play an important role in both – management of green areas and preservation of biodiversity in Ljubljana today.

2.2. Operational management of "green areas" in Ljubljana

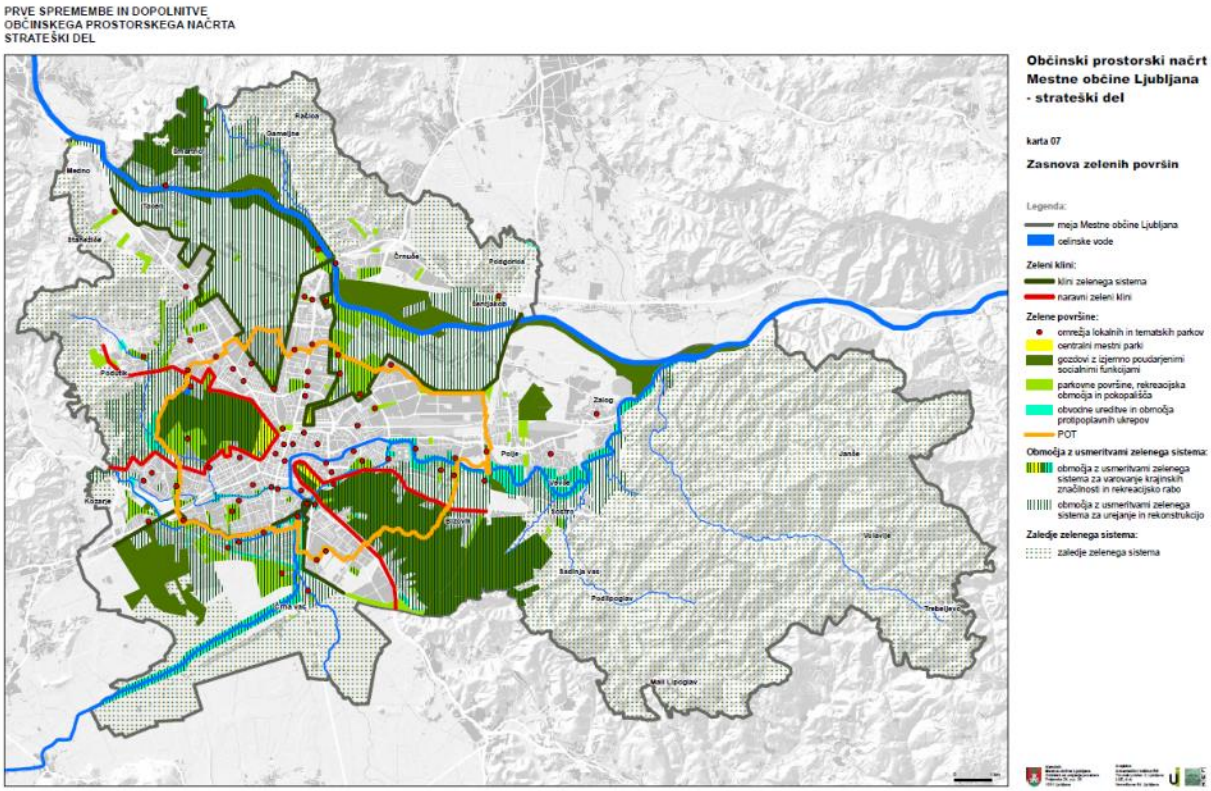
When the BEE PATH started to plan its future activities, firstly the assessment of the situation was carried out. In it we analyzed and answered the following questions:

- What is already going on in the City regarding biodiversity and green areas?
- How do already existing actions benefit bees and other pollinators?
- Do any existing actions harm bees and other pollinators? If yes, how can we prevent that?
- What can be done to further improve the current situation?
- Who are the key actors who can support our efforts?

We came to a baseline understanding that green areas are in Ljubljana understood as multi-purpose areas with many positive effects on the daily life of citizens. They don't provide only nice surroundings, recreation and relaxation areas, but also higher quality living conditions – cleaner air, reduced "heat island effects", etc.

Subsequently, the management of green areas in Ljubljana is handled from different angles. Duties regarding this task are divided among different actors like **Department for Spatial planning**, **Department for Economic Affairs and Traffic**, **Department for Environmental Protection** and its **Section for Rural Development** – which are all responsible for the development, operationalization and funding of the "green policy". On the other hand, it is the Public company VOKA SNAGA d.o.o. which is responsible for the operational management of the green areas.

The Department for Spatial Planning defined the green areas and provided the framework for the development of different activities within green areas (e.g. maintenance, development of different activities, regulations about building on green areas, etc.) through the Spatial Plan of the City of Ljubljana.



The green areas recognized by the Spatial Plan of the City of Ljubljana

The Spatial Plan is the basic spatial planning document of the City of Ljubljana and is in the process of constant improvement – its changes and adoptions are made periodically. It has two parts:

- **The Strategic part** – which defines goals and the concept of spatial development, as well as systems and networks. From the context of green areas, it deals with the Concept of the Green System, Concept and Guidelines for landscape development, as well as Landscape planning concept for Urban green areas, Forested areas, Agricultural areas, Surface water structures, etc.
- **The Implementation part** – which in more detail prescribes land use, spatial implementing conditions (regulations) and areas that require detailed plans and guidelines for their preparation. For example, it contains Regulations regarding Floor space index, Built-up index, Green surfaces factor for non-residential areas, Open living surfaces factor for residential areas, required unpaved surface, required roof and facade greening, required increased share of open and green surfaces in „the green wedges“, required number of trees planted, required public use and designing and maintaining open green areas (green surfaces, parks, individual trees, lines of trees, squares, pedestrian areas, children's playgrounds, biotopes), etc.

The Department for Economic Affairs and Traffic is responsible for the operational maintenance of public green areas and trees, as well as for the management of urban forests. The City of Ljubljana has in 2009 adopted the Decree on the maintenance of public green areas, which defines activities to be performed on public green areas by the City, such as fertilizing grass areas, moving, planting new trees, watering of new planted areas, planting and trimming bushes, planting and renewing public gardens with sessional flowers and multiannual plants, etc.

Maintaining of laws on 228 hectares is one of the important tasks. Lawns are as a rule mowed 4-7 times per year. How many times each green area is mowed predominantly depends on the classification of the area – main parks are mowed 7 times per year, while smaller parks and children playgrounds are mowed 4 times per year.

The City of Ljubljana also takes care of over 40.000 **trees on public areas, out of** which over 25.000 are melliferous and autochthonous – as presented in the table below.

Species of trees planted in Ljubljana	The total number of trees	Number of trees on paved areas
Pinus silvestris	253	100
Gleditsia triacanthos	556	258
Quercus sp.	38	30
Acer pseudoplatanus	2.145	986
Acer pseudoplatanus	21	7
Acer pseudoplatanus 'atropurpureum'	524	410
Acer campestre	691	341
Acer platanoides	9.741	5.657
Acer platanoides atropurpureum	184	116
Fraxinus ornus	173	72
Catalpa bignonioides	385	148
Aesculus hippocastanum	1.672	1.227
Aesculus hippocastanum	144	83
Tilia platyphyllos	2.610	1.499
Tilia cordata	2.197	1.282
Robinia pseudoacacia	699	253
Picea abies	3.106	680
Total sum	**25.139**	**13.149**

Allotment gardens, set-up by City of Ljubljana and let-out to its citizens, encourage citizens to grow their own food. This is one of the activities which increase the level of food self-sufficiency in the city. It enables intergenerational cooperation and raises awareness about sustainable development in the preservation of biodiversity since citizens are allowed to use only substances approved for ecological farming. Within allotment garden areas – at the moment there are 8 and they consist of 823 allotment parcels – educational programmes are provided on educational gardens, thus providing citizens free education and advice.

Ljubljana was the first City in Slovenia to **abolish the use of herbicides** with glyphosate (in August 2017) **and pesticides on public areas**. Based on expert advice the City decided to allow just the use of ecological substances for gardening on allotment gardens which are rented to citizens and supports farmers which farm based on ecological and integrated farming principles. In Ljubljana weeds are being treated with special Foamsteam approach – a Machine operating on the base of water steam and active substance (named Foamstream) composed from plant oils (palm, coconut, rapeseed oil) and glucose. It is fully biodegradable. Diesel aggregate heats water under pressure up to 106 degrees Celsius. Computer mechanism ads recommended a dose of active substance and send mixture to the hose to dispense handle. Outcomes hot foam, which is applied on weed. The foam serves as a fixator of heat on the surface of weed – that way water has longer-lasting effects. Heat makes cell walls to break and this starts the process of deterioration. After 24 hours the weed is dry.

However, such efforts are not limited only to existing green areas in Ljubljana, but are further enhanced during neighborhood renovation projects and further developed through the introduction of new approaches – both presented by the following examples.

An example linked to the **renovation of neighborhoods** is the renovation of the Slovenska street in the center of Ljubljana. Once, this was the most important traffic connection running through the city center and was heavily occupied by traffic. As such, it was noisy, polluted and heavily impacted the character of the city center. During its renovation, the Slovenska street was closed for all non-public transport and turned into a green and lively alley. Based on suggestions from

One of the city centre renovation projects in the City of Ljubljana

Botanical garden experts, the City decided to plant 63 melliferous Southern European Flowering Ash *(Fraxinus ornus)* trees and arranged the alley of Service-berries (*Sorbus domestica*) on the river banks of the Ljubljanica river.

Another example linked to the introduction of new approaches originates from an even earlier period. In 2012 Vice-mayor Koželj (responsible for spatial planning) decided to develop and issue guidelines for **sustainable management of flower beds** – they promoted measures aiming to reduce watering and other maintenance costs and introduced a more environmentally friendly mindset. This led into gradual substitution of one-year plants to multi-year plants alongside our streets, crossroads, roundabouts, children playgrounds, public lawns and parks, many of which were melliferous – for example, *Rudbeckia fulgida , Goldsturm, Sedum sp., Anemone japonica, Aster dumosus, Echinacea purpurea, Gaura lindheimeri, Hemerocallis sp., Hosta sp., Nepeta fassenii 'Six Hills Giant',* etc. This was actually the first and only attempt to promote autochthonous melliferous plants on green areas until we started to introduce them within the BEE PATH.

Department for Environmental protection developed and is implementing the **Programme for Environmental protection 2014-2020**. In it the City of Ljubljana, within the context of the strategic goal *"Ensure the protection of the natural environment in COL",* set itself the 3 very important operational goals:

1) *To maintain and improve the state of biodiversity.*
2) *To establish a comprehensive system for effective management of natural values and protected areas.*
3) *To establish a comprehensive green city system and manage it effectively.*

In order to make sure all goals are fulfilled; the City of Ljubljana implements five nature conservation measures for preservation and improvement of habitats of endangered and protected species:

- **Setting-up hotels for wild pollinators** – protection of wild pollinators became a regular task of the City of Ljubljana. With different activities (workshops, public lectures, posters, etc.) public is being informed about their importance. But by promoting and setting-up "bee hotels", people get a direct stimulation to do something good on their own.
- **Activities to protect Amphibia** – within the area of Landscape park Tivoli, Rožnik and Šišenski hrib, a strong population of Amphibia is taken care of. An important city street cut their natural migration route, so the City of Ljubljana, during their spawning season, sets-up fences alongside the street and organizes volunteers, which collects and transfers Amphibia to their spawning area safely.
- **Preservation of various habitats** – some endangered habitats in protected areas (Ljubljana has five of them) and wider were recognized as very important indicators of a healthy environment. Special attention is put on protection of nesting places and living habitats of autochthonous Box turtle, bats, nesting places of Kingfisher, the Chapman's blue (*Polyommatus other sites*) and Moor frog (*Rana arvalis*).
- **Monitoring of different plant diseases** – when diseases, especially on the trees, are detected soon enough, preventive measures can be taken, thus saving important trees in the city.
- **Removal of invasive species** – the City of Ljubljana started removing the Japanese knotweed is an invasive species on its own and reinforced its efforts through an EU funded project APPLAUSE where Ljubljana developed new ways to get rid of five invasive plants with the emphasis on Japanese knotweed and Ambrosia.

Furthermore, **the Section for Rural Development**, which is operating under the umbrella of the Department for Environmental protection developed the **Rural Development Strategy for the City of Ljubljana** for the programming period 2014-2020. In it, the City of Ljubljana set itself another ambitious operational goal – *"To ensure high-quality agriculture and forestry goods from a preserved environment, with the aim of improved food self-sufficiency of the City of Ljubljana".* This goal should be achieved by improving the supply of citizens with high-quality food, sustainable forest management, and protection, as well as by conservation and development of the functional capacity of agricultural households.

In order to implement the Rural Development Strategy, the City of Ljubljana stimulates farmers (through financial mechanisms and expert support) to farm based on organic or integrated farming principles. Through

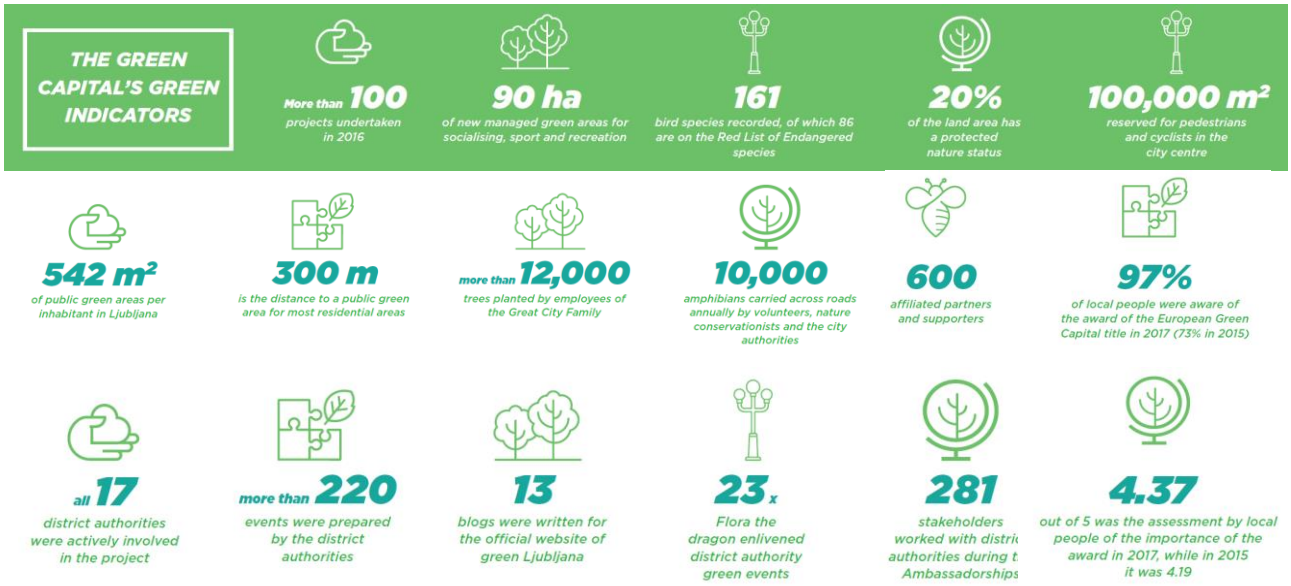
such measures, The City of Ljubljana helped to create over 32 hectares of orchards and 6 hectares of strawberry fields. It also arranged and put into operation around 900 allotment gardens – within these areas educational gardens were established in order to improve awareness about the importance of biodiversity and pollinators, as well as adequate gardening techniques. To further enhance described efforts 3 wild pollinator houses were built on public spaces and/or allotment gardens and all 3 locations were planted with fruit trees and other melliferous plants. In this way, the City of Ljubljana also creates conditions that enable pollinators to survive and develop.

Special focus within the rural development program is given to beekeeping in rural and urban areas, but also to awareness-raising, communication and active collaboration with citizens – all further described on the following pages. And it was within this context that the City of Ljubljana also developed a special program called **BEE PATH** – the good practice you are transferring today.

LJUBLJANA
European Green Capital 2016

LJUBLJANA. For you.

As you can see the City of Ljubljana integrated activities for biodiversity and pollinator's preservation into various fields of interest – from the management of green urban areas to environmental/health protection and rural development. It is this cross-sectorial approach which re-enforces its green policy and improves its presence in any mayor development discussion. And it was such approaches for which The City of Ljubljana was rewarded by the title "European Green Capital 2016". Below you can find a few indicators showing results of all stated policies and approaches – you can find more on this link.



But not everything is so great and the **BEE PATH team has already recognized several potentials for improvement** – to name just a few:

- Improved communication (formation of a special task-force within the city administration is already being discussed) and cross-sectorial actions between departments.
- More weight to wild pollinators and honeybee preservation inappropriate strategies.
- Further enhanced connections between BEE PATH members through the exploitation of newly recognized synergies, as well as the creation of a new selling point.
- Re-enforcement of educational programmes and their integration into the schooling system.
- BEE PATH is on an evolutional cross-road and a long-term vision for BEE PATH should be developed.

As the City of Ljubljana already started preparing contents for the renewal of all mentioned strategic documents for the next programming period it is the sincere wish of the BEE PATH team to use the BeePathNet project and address exposed potentials through successful implementation of the BEE PATH up-grade plan.

TIPS FOR CITIES PLANNING TO IMPLEMENT THE SAME APPROACH IN PROMOTING URBAN BIODIVERSITY AND MANAGEMENT OF GREEN URBAN AREAS	
Goals:	✓ To ensure urban revival of the City of Ljubljana. ✓ To address modern urban cross-sectorial challenges such as climate change, sustainable development, food self-sufficiency, etc. ✓ To improve the quality of living for citizens of the City of Ljubljana.
Key steps:	1) Understand your advantages and disadvantages, threats and opportunities. 2) Start with open and constructive communication with your citizens – collect their observations/complaints, understand their ambitions and identify concrete ideas for development/improvement. 3) Employ participatory approach in key policy/strategy/plan development phases. Also, make sure all city administration, as well as public services/companies understand and support the policy/strategy/plan – because they have a key role in its implementation. 4) Once adopted, start visibly and actively implementing the policy/strategy/plan. This sometimes means that you have to modify your daily work patterns and ensure cross-sectorial cooperation within the city administration. Also, make sure that every proposed activity has a clear and realistic action plan behind it – responsible person, deadline, resources, funding, etc. 5) Always monitor and publicize implementation of the policy/strategy/plan and explain how this successfully implemented step contributes to the long-term vision. If monitoring shows that some actions are not being implemented as expected or in case of unforeseen developments, revisit the action plan and look for alternative solutions.
Lessons learned:	• Communication with citizens and experts is crucial and should not be underestimated. However, once started, it is also an on-going and never-ending process. In initial phases it also demands more time and energy from the planning team. • Participation of citizens ensures wide understanding of policies and strategies, as well as their wide acceptance. On the long-run this shortens the process of final adoption of policies and strategies, as well as greatly improves and speeds-up their implementation. • Continuity of strategic decisions and implementation of vision is of great importance. Policies and strategies should be understood as roadmaps towards fulfilment of common and long-term goals and ambitions of the whole society – not as action plans for implementation short-term individual political ambitions. • Patience and persistence are needed, as results start to emerge only after a certain period of time. • New development concepts, approaches and ideas are often accepted with skepticism, fear of change and resistance. This is why it is crucial to communicate well and timely with citizens, to explain in detail what and how it is going to happen, thus reducing resistance. Small-scale pilot cases proved to be another useful toll, showing new concepts, proving that they work and subsequently reducing resistance.

2.3. Cooperation with University Botanic Gardens Ljubljana

University Botanic Gardens Ljubljana

University Botanic Gardens Ljubljana is the oldest Slovene cultural, scientific and educational institution, which holds a wide plant selection – more than 5000 species from Slovenia and abroad.

It was founded in 1810, at the time when Slovenia was a part of the Illyrian Provinces (created during Napoleonic wars), as a garden of native flora and a section of the Central School (École Centrale). The Garden grounds originally covered 33 acres. In 1822 it was further enlarged by 16 acres and surrounded with a wall.

A renaissance of the Garden began under the management of Alfonz Paulin. In 1889, he began to issue a yearly seed index (*Index Seminum*), which he distributed to similar institutions all over the world. Since 1920, the Garden has been a part of the University of Ljubljana (founded in 1919).

After World War II (in 1946), the garden was enlarged to 2.35 ha and got also a greenhouse, only to be reduced in size to the final 2 ha due to the widening of a nearby road and railway. Since 1991 the Botanical Garden, as a valuable example of our cultural heritage, enjoys the protection status of a monument of landscape gardening. In 2010 it received its final up-grade when a new tropical green-house was built.

The seed bank contains 20% of all Slovenian flora

VARIOUS ROLES OF THE BOTANICAL GARDEN IN THE BEE PATH

University Botanic Gardens Ljubljana was **one of the first stakeholders of BEE PATH** and the Botanical Garden is also **its original entry point.** Its main role is to support different activities from education to awareness-raising with **proper guidance regarding autochthonic melliferous plants**.

The main content focus, in the context of the BEE PATH, is on melliferous plants and their importance for bees in the city. Visitors are guided through the garden and they get to know all important information about melliferous plants, as well as the bees.

Green-house in the Botanical Garden

Visit the garden starts with introduction of the plant system – garden plants are planted on flowerbeds where every flower bed presents one plant family. Every single plant offers pasture for bees during the whole year. Bees especially appreciate lavender, savoury, thyme, mint, sage as well as peony, calf and many other plant communities. Undergrowth arboretum is also very interesting for bees, as bees find food in the undergrowth of the common snowdrop, saffron, as well as trees and shrubs and many willows next to the pond. Later in the season they are replaced by flowering corneas (pears, quince).

A special part of the collection is represented by Mediterranean plants in containers that are characterized by their essential oils and are resistant to strong solar radiation. Many of them have fragrant flowers and are attractive to bees due to the large quantity of pollen.

The botanical garden is **one of the main consultants and interlocutors for the City of Ljubljana** regarding planting new plants in the city. It works closely with vice mayor responsible for urban planning. They recommended the plants for new alleys in the center – for example:

- Melliferous autochthonous European flowering ash (*Fraxinus ornus*) on the Slovenska street,
- Service-berries (*Sorbus area* and *Sorbus domestica*) on the river banks of the Ljubljanica river.

Melliferous plants in the Botanical Garden

They also guide services responsible for the maintenance of green areas in the City of Ljubljana – for example:

- They provide guidance on mowing public areas – mowing should not be done during the bloom season of grass and flowers, in order to reinforce allow the biodiversity of the green areas.
- They provide guidance on planting autochthonous perennial plants in public areas.

But it also plays an important role as an **advisory point for all stakeholders within the BEE PATH and wider**, promoting the planting of melliferous plants and prioritizing autochthonous species.

The City of Ljubljana, build the **City apiary on public space that is managed by the Botanical Garden**. In this process, they planted the area around the apiary with different wetland habitats – thus mimicking the autochthonous flora of the marsh area stretching from the location of the Botanical Garden to the outskirts of the city – the so-called Ljubljana Marsh. They represent an important educational area, as well as the nearest pasture for the bees.

University Botanic Gardens Ljubljana also play an important **awareness-raising role**, as they:

- Organize different lectures about melliferous plants and biodiversity;
- Publish publications about flora in Ljubljana;
- Grow and sell melliferous plants for customers;
- Maintain a seed bank of Slovenian autochthonous plants;
- Take care of dry rough grasslands outside the Botanical Garden, where they use late mowing (they mow it once a year in late August) to preserve and increase biodiversity – so-far they counted more than 120 species. This is also an educational polygon for citizens, where the species are presented in nature.

Meadows in surroundings of Ljubljana

University Botanic Gardens Ljubljana also works on international level, as they are an important partner in the Life project Life Naturaviva – Biodiversity – Ort of Life, where they prepared the guidelines for farmers, explaining why biodiversity is important for successful agriculture. For further reading please look at following links to e-books:

- TRADITIONAL MOWING PRESERVES PLANT BIODIVERSITY
- MEADOWS – GREEN SURFACES OR COLORFUL GARDENS

TIPS FOR CITIES PLANNING TO INVOLVE EXPERT INSTITUTIONS	
Goals:	✓ To attract and involve institutions and experts with specific knowledge and skills in order to create internal knowledge base within your ULG.
Key steps:	1) Identify existing and adequate institutions or individuals. 2) Meet with them and try to understand their ambitions, capacities and compatibility with you and your ULG network. 3) Select most adequate ones and identify key interest/"attraction factors" for them. 4) Present them the opportunity for cooperation (based on attraction factors) with clearly established role they would play in your ULG network, extent of required involvement and benefits you see in their cooperation. 5) If you are rejected by the first contact, go to the next one and repeat the steps. 6) Treat them as any other ULG member. You can involve as many as you need/want, but make sure their roles do not overlap and that they are cooperating and not competing against each other.
Lessons learned:	• As all other ULG members, expert institutions or/and their employees must also show clear interest and recognize benefits in your cooperation and must willingly and voluntarily support your "bee path". • It is vital to clearly divide their voluntary role in the ULG (voluntary work) from the "consultant" role for the city administration (potentially paid services). It is best to do it through clear division of tasks.

2.4. Organization of the awareness-raising campaign: *"Help the Bee in the City: Plant the City with Flowers"*

This is an excellent example of corporate responsibility driven initiative, based on cooperation between the BTC d.d. and the City of Ljubljana. BTC d.d. was one of the first stakeholders that joined the BEE PATH and has certainly become one of the most important ones. As the biggest shopping and commerce centre in Slovenia and Sout-East Europe, they have an important impact on regional traffic patterns and represent, due to high percentage of built-up areas, one of the biggest heat islands in the city. Subsequently, they became increasingly aware of the importance of sustainable development and environmental protection.

This awareness reflected in their corporate responsibility agenda, as they developed a programme called "Mission: Green", through which they promote "the green" way of living and carry out many activities. It is based on four pillars and here is how BTC understands them:

- **Environmental protection -** *"Caring for the environment and climate change is part of our DNA. Our efforts towards a cleaner environment, air and water are strategic and goal-oriented. With care, persistence, and consistency we fulfill our mission that brings a profound positive influence on our future. We take the care for our planet very seriously."*
- **Green energy -** "*We strive towards success in business while maintaining strict environmental and social responsibility, constantly searching for potential energy improvements, savings, and further development. In 2017 we completed 21 energy-related projects and reduced our carbon dioxide footprint by a total of 5,449,637 kilograms. We promote alternative forms of transport and expand the reach of our Mission: Green through innovative approaches."*
- **Energy efficiency -** *"BTC has approached energy efficiency with our characteristic spirit of innovation. Responsible energy management, work process optimization and the use of advanced technologies focused on conservation are part of the way we work. Energy always manifests new energy."*
- **Social responsibility -** *"We are aware of our role in the social and natural environment and are dedicated to doing our part in spearheading the development of our communal, social, sports, cultural and economic environment. We believe in collaboration and synergy, in balanced and sustainable development and in a bright future full of opportunity. Together hand in hand for a better tomorrow."*

HOW IT ALL STARTED?

In 2013, Maja Oven and Zvone Rijavec had the first idea about setting up a beehive in BTC City Ljubljana – based on best practices from other European capitals. They invited the beekeeper Franc Petrovčič, who already placed a beehive on the top of Cankarjev dom, and the Slovenian Beekeepers Association to **create a story about *"A bee going to the city"***.

All key actors in front of the BTC d.d. beehive

In 2014 they **placed their own beehive next to the Water park Atlantis**. It almost immediately became one of "the top stories" in Slovenian media and kicked-off a public debate about beekeeping in an urban environment. With words „beekeeping" and „urban" next to each other, there was a lot of skepticism and concerns, for example – bees will not survive in urban environment due to the lack of food; there will be conflicts between residents and bees; honey will be full of „heavy metals" due to traffic air pollution, etc.

However, such discussions did not hamper their efforts or belief in the final success. Instead, they took the next bold step and focused their communication (alongside communication with mass media and the general public) also on elementary schools in the Ljubljana Urban Region. To strengthen their message, **they helped to build an apiary in an elementary school in Medvode** (a town near Ljubljana).

In the meantime, the beekeeping season finished and they were able to collect first honey from their beehives. In the first year, their bees collected 76 kg of honey in 4 beehives, despite bad weather conditions during the season. In light of expressed skepticism, but also due to their own curiosity, they **decided to have their honey tested by an independent and certified institution**.

When the results came in, it was all good news. **Not only was their honey impeccable, but also showed surprisingly high biodiversity** – the honey was in parts forest honey, wild-flower honey, linden honey, etc. This was a result of a very diverse pasture their bees used during the season. Based on positive results and high biodiversity they decided that to brand their honey as Urban honey.

PREJETO
DATUM 21-08-2014
Evid. št.: 415/011

ERICO

POROČILO O PRESKUSU

Št. poročila: 01-1022/14
Stranc: 1 / 1
Datum: 19. avgust 2014

Izvajalec: ERICo Velenje, Inštitut za ekološke raziskave d.o.o.,
Koroška 58, 3320 Velenje
tel.: +386 3 898 1930, fax.: +386 3 898 1942

Naročnik: BTC d.d.
Delovni nalog: DN 865a
Interno naročilo: NA-0573/2014

Vrsta vzorcev: med
Laboratorijska oznaka vzorca: 01-1022/14
Oznaka vzorca: GLAZER - BTC

Kraj vzorčenja: BTC d.d.
Vzorčevalec: lastnik
Datum vzorčenja: 2014-07-31
Datum prejema vzorcev: 2014-07-31

REZULTATI:

PARAMETER	METODA	REZULTAT	ENOTA	MER. NEG. (%)	DATUM PREDSUŠANJA
svinec - Pb	SIST EN ISO 17294-2: 2005 modif.	<2.0	mg/kg	/	18.08.2014
kadmij - Cd	SIST EN ISO 17294-2: 2005 modif.	<0.3	mg/kg	/	18.08.2014
cink - Zn	SIST EN ISO 17294-2: 2005 modif.	<7.0	mg/kg	/	18.08.2014
nikelj - Ni	SIST EN ISO 17294-2: 2005 modif.	<3.0	mg/kg	/	18.08.2014
železo - Fe	SIST EN ISO 17294-2: 2005 modif.	<0.5	mg/kg	/	18.08.2014
kobalt - Co	SIST EN ISO 17294-2: 2005 modif.	<1.0	mg/kg	/	18.08.2014
baker - Cu	SIST EN ISO 17294-2: 2005 modif.	<3.0	mg/kg	/	18.08.2014
aluminij - Al	SIST EN ISO 17294-2: 2005 modif.	<0.5	mg/kg	/	18.08.2014
policiklični aromatski CH - PAH	ISO 13877:1999 mod.	<0.05	mg/kg	/	11.08.2014

Opombe:
PAH-i predstavljajo vsoto fluorantena, benzo(a)pirena, benzo(b)fluorantena, benzo(k)fluorantena, benzo(g,h,i)perilena in indeno(1,2,3-c)pirena.

Vodja laboratorija:
Andrej Glinšek, univ.dipl.kem.

Testing results

BTC d.d. WITHIN THE BEE PATH

Encouraged by test results BTC d.d. quickly became one of the strategic partners of the City of Ljubljana. They helped in **spreading of the BEE PATH network** by attracting their business partners like Minicity, Merkur, Hofer, Semenarna/Kalia, SiTi Teater BTC, Medex, etc. Furthermore, they increased their activities within the BEE PATH and started actively cooperating with the University of Ljubljana, especially with the Biotechnical Faculty and Faculty of Architecture.

But one of the most important tasks of the BEE PATH is to get key messages to target groups. This is why BTC d.d. initiated the **awareness-raising campaign *"Help the Bee in the City: Plant the City with Flowers"***, within the BEE PATH and became the messenger of the importance of biodiversity in the city.

The campaign was kicked-off as one of the key messages during the celebration of *"Ljubljana - the Green Capital of Europe 2016"*. At that time, it was important to let people know that there are plants that help bees outside the period of the nectar flow. As the main target group was citizens of Ljubljana, they decide to

focus on the message that everyone can make a difference, even with the smallest contribution – like planting melliferous plants on their windows, balconies, roofs, and gardens. At that time no special concern was raised about allochthonous and/or potentially invasive plants).

However, next year this disadvantage was already recognized and the campaign emphasized the importance of the autochthonous melliferous plants. To re-enforce the message University Botanical Gardens Ljubljana was drawn to the campaign in order to provide lectures for the general public about the difference between both categories of the plants, as well as to **promote planting of autochthonous melliferous plants**.

In 2019 such efforts were further increased when University Botanical Gardens Ljubljana created a **selection of autochthonous melliferous plants**. In line with this recommendation, BTC d.d. created a brand, prepared seed packages and distributed them for free to citizens on one of the public events in the center of the city.

»Let's join the city buzzing!« - examples of used promotional materials

INTEGRATION OF THE *"Help the Bee in the City: Plant the City with Flowers"* MESSAGES INTO OTHER BEE PATH ACTIVITIES

As the original campaign evolved into a regular awareness-raising campaign of the BEE PATH, it was quite logical to integrate it into other BEE PATH regular activities.

The urban beekeeping season is kicked-off by a yearly event sometime before Easter. It is organized as a one-day fair where all BEE PATH members present themselves in the city center. Each member gets a free stand, but they contribute funds for the realization of the awareness-raising campaign and they give away free seeds of autochthonous melliferous plants. From the beginning the event has a common visual identity, which is upgraded every year.

To further increase the campaign, many activities take place within the partner's shops and premises during the week before Easter. For example, within the Mini City (BTC playground and educational center for kids) workshops for children are organized, with contents always connected to bees and autochthonous melliferous plants. For the great finale, a big flower fair is organized by the BTC.

The second important awareness rising period takes place in **the period around the 20th of May** when partners plant autochthonous melliferous plants on the flower beds located in the BTC. At first there were just green areas with grass, but in 2018 BTC decided to transform them into the flower beds. In the first year they planted the combination of parental plants and sunflowers. In 2019, autochthonous melliferous plants were planted. It is a great event because all elementary schools included in the "Eco-schools" programme are invited to cooperate and plat the plants. However, the BTC gardener takes care of the plants during the year. BTC also plants melliferous trees and so decreases the impact of the heat island as well.

Planting autochthonous melliferous plants in BTC.

Awareness-raising is an important part of BEE PATH events.

But there is also **other awareness-raising events supported by the BTC**. For example, an exhibition is placed within the shopping area, presenting new architectural solutions for urban beehives. It is the result of students of Faculty of Architecture, which in 2016 created eight models of urban bee stands and apiaries (three of them were already built and set-up). In 2018 the exhibition of beekeeping cultural heritage was also presented as a prelude to the great exhibition in Slovenian Ethnographical Museum titled *"Where bees are at home".*

The yearly symposium on urban beekeeping

BTC and the City of Ljubljana, with the cooperation of Urban beekeepers Association, also organize the yearly **Symposium on urban beekeeping** where contents regarding the importance of biodiversity are presented and discussed by the experts.

TIPS FOR CITIES PLANNING TO ATTRACT COMPANIES WITH "ENVIRONEMNTAL AND SOCIAL CORPORATE RESPONSIBILITY DESIRES" AND INVOLVE THEM IN AWARENESS RISING	
Goals:	✓ To attract and involve companies with "environmental and social corporate responsibility desires" in your own awareness rising activities.
Key steps:	1) Identify interested companies or their employees. But don't chase them too hard – let them come to you. 2) Meet with them and try to understand their ambitions, capacities and compatibility with your ULG network. Make sure they know who you are and what you stand for. 3) Encourage them to develop their own "environmental and social corporate responsibility vision/strategy" and only later look for compatible activities – this will ensure that their needs and interests are heard and met, thus they will be motivated to cooperate and establish long-term relationship with you. 4) Start slow – with small and straightforward actions, so that you can test your cooperation and compatibility. Treat them as any other ULG member, but make sure they have a clear role and that other ULG members understand what they can expect from them. You can involve as many as you need/want, but make sure their roles do not overlap and that they are cooperating and not competing against each other.
Lessons learned:	• Such ULG members usually join only after your "bee path" has established itself as a "platform with a vision and a mission", after you have shown some real progress and after you have gained some visibility in general population and media. • As all other ULG members, such companies must also show clear interest and recognize benefits in your cooperation and must willingly and voluntarily support your "bee path". They can become "internal donors" but don't force this – it has to be offered on their own terms and based on their own interests.

2.5. Establishment of the "Public Orchard and Honey Garden Grba"

In 2015 the City of Ljubljana decided to open a "Public Orchard" on publicly owned land, as a special type of green area. Its main purpose – at that time – was to introduce a different type of green area that would not only serve as a green area for relaxation and high-quality space for citizens but also as a polygon for the presentation of best gardening and orchard practices and education.

However, just as many other great ideas, the "Public Orchard" quickly overgrew its original purpose and started evolving. We can distinguish the following 3 development phases until today:

PHASE 1 – ESTABLISHMENT OF THE PUBLIC ORCHARD GRBA

The Public Orchard Grba was officially opened on 11th November 2015 by the ceremony in which our mayor Zoran Janković planted one of the last fruit trees. The orchard was designed in cooperation with the Agricultural Institute of Slovenia and in the end, 108 fruit trees were planted in 2 separated areas.

The layout of the Public Orchard Grba.

Species planted in the northern part – 36 various fruit trees:

- Mulberry tree *(Morus)*
- Medlar *(Mespilus germanica)*
- Sorb tree (*Sorbus domestica*)
- Rowan tree *(Sorbus aucuparia)*
- Quince *(Cydonia oblonga)*
- Persimmon *(Diospyros lotus)*
- Papaw *(Asimina triloba)*
- Walnut *(Juglans regia)*
- Chestnut *(Castanea sativa)*
- Elder tree *(Scambucus)*
- Juneberry *(Amelanchier lamarckii)*
- Euodia *(Tetradium daniellii)*

Species planted in the northern part – 72 fruit trees:

- 48 apple trees;
- 18 pear trees;
- 6 plum trees.

Autochthonous fruit trees were selected for the orchard in order to promote biodiversity and promote high-quality autochthonous fruit tree species – especially the "old fruit tree species" which are not so popular today. Additionally, the selected mixture of fruit trees enables visitors to be exposed to fruits from mid-summer to late autumn. This was done not only to improve its appeal to the public but also to show that a smart orchard owner can have a diverse array of fresh fruits through longer periods of time.

Visitors are also invited to pick and eat fruits from the public orchard – thus, the principle of *"Pick only a little to leave enough for others!"* was introduced and is widely promoted.

The overall investment cost for the Public Orchard Grba was 5.000 EUR. Since then four other orchards were established around Ljubljana:

- In 2016 two more orchards were planted within the allotment gardens area – Rakova jelša (190 trees) and Savsko naselje (20 trees).
- In 2017 a new orchard was planted alongside Vojkova street (68 trees).
- In 2018 a new orchard was planted in Park Muste (88 trees), while 36 additional fruit trees were planted within the allotment garden area on Grba).

Yearly operational costs linked to the maintenance of all public orchards are 6.000 to 7.000 EUR. The orchard is operationally managed by the Agricultural Institute of Slovenia, using only nature-friendly methods, and is fully open to the general public. Local inhabitants, families with children, elderly, but also groups of

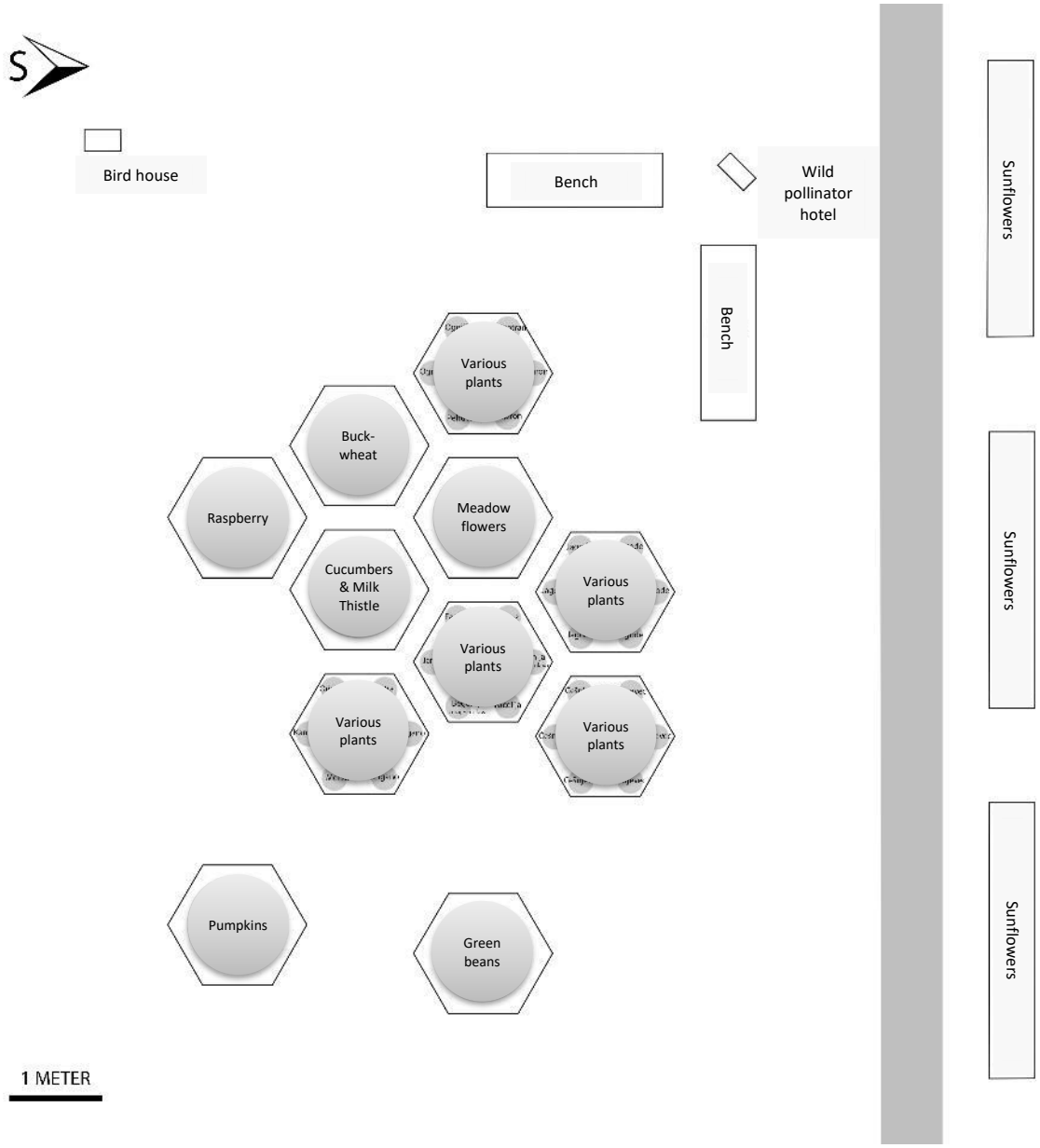
kindergarten and school children visit it on a daily basis. Unfortunately, the open concept also brings some downsides. Since it opened, the orchard was on 2 occasions the victim of vandalism. Due to this reason, the City of Ljubljana decided to increase its awareness-raising efforts.

PHASE 2 – INTRODUCTION OF THE HONEY GARDEN

The Honey Garden being built

Soon after the opening of the Public Orchard, various ideas for its improvement or up-grade were presented to the City of Ljubljana. One of them was presented by the Social Enterprise ENEJA, which at the same time started actively cooperating within the BEE PATH framework.

The idea was to upgrade the Public Orchard Grba by the introduction of the "Honey Garden" with 4 distinct uses by citizens of Ljubljana – awareness-raising, education, co-existence, and solidarity. ENEJA also designed the set-up of the honey garden, as presented on the design sketch bellow.



The Honey Garden design concept

The central part of the honey garden is occupied by 11 hexagons – resembling the honey-comb and expressing the clear linkage to BEE PATH. In hexagons over 100 species of garden plants, meadow flowers and herbs are planted to form an extremely biodiverse and melliferous garden.

As such, they also provide pasture and living habitat for pollinators, as:

- 33 species are pollinated by honey-bees,
- 24 species are pollinated by bumble-bees,
- 28 species are eatable by humans,
- 33 species can be used in apitherapy.

The Honey Garden in operation

To further promote biodiversity and co-existence, a wild pollinator hotel was set-up in the NE corner of the honey garden, alongside with 2 benches for relaxation and rest, while a bird-house was also set-up in the NW corner.

As you can see, the honey garden was designed not only as a relaxing green area promoting co-existence and educational location for the promotion of melliferous garden plants and biodiverse gardens but also as an apitherapy and inter-generational learning polygon.

The honey garden was built through an open and voluntary action – organized and supervised by ENEJA. Plants, tools, and materials were paid by the City of Ljubljana, but all the work was done on a voluntary basis and was promoted as “horticultural practical therapy”. All interested citizens were invited to participate in the way they see fit – for example, kindergarten children planted sunflowers, learned about pollinators and were rewarded by “the honey-treat” by one of local honey producers.

To further strengthen the bond with citizens and users a special wooden “mail-box” was set-up in the honey garden in order to collect any responses and suggestions for improvement. All comments and ideas are publicly announced on the ENEJA web-page.

DEVELOPMENT OF CONTENTS AND PROGRAMMES

The Honey Garden – as an up-grade of the Public Orchard – was well accepted by the general public and it was this fact that led to further development of new content.

It all started with the development of educational programmes for kindergarten and school children. A special educational programme linking all types of locally produced food (fruits, vegetables, honey, and bee-products, etc.) is implemented 2 times per month during the school year in line with monthly topics – for example: In this way, children learn about:

- Potential and importance of locally produced food,
- Biodiversity and importance of pollinators,
- The yearly cycle in gardening,
- Recycling of water and resources in the garden,
- Noise pollution,
- Importance of urban green areas,
- Energy efficiency,
- Sustainable tourism,
- Sustainable mobility,
- Importance of wood as a natural resource, etc.

From this educational programme a more general one was created for all other interested target groups – e.g. citizens, families with children and tourists. This programme is also implemented 1 time per month during the school year in line with the above stated monthly topics.

As urban orchard, gardening and beekeeping are all joined under the same umbrella, synergies started to emerge and were quickly recognized – for example:

- An additional educational programme for urban gardening beginners was created. In it, ordinary citizens can learn all important information about urban gardening and gardening techniques.
- The Public Orchard and the Honey Garden were interconnected with few other interesting nearby locations and turned into a "nature exploration trail" nick-named the "Adventure Track.

In the end, the whole Grba complex with all its programmes functions as a local food production learning polygon and an important part of the BEE PATH.

Regarding operational management of the Honey Garden – an agreement was reached between the City of Ljubljana and the Social Enterprise ENEJA according to which ENEJA is funded by the City of Ljubljana to conduct educational programmes and is in turn responsible for the operational management of the Honey Garden.

TIPS FOR CITIES PLANNING TO SET-UP AND PROMOTE PUBLIC GARDENS, ORCHARDS, BEEHIVES OR OTHER SIMMILAR INITIATIVES	
Goals:	✓ To test and promote "new urban-green initiatives and approaches" on selected locations before full-scale implementation. ✓ To evaluate and learn from testing period and up-scale to full-scale implementation.
Key steps:	1) Identify the idea and test its feasibility – e.g. location, design, investment & maintenance costs, timeline, willingness of local stakeholders, etc. 2) Promote the idea with local stakeholders and try to get them involved in its design, implementation and management. You can try with several locations and in the end select the most favorable one. 3) Implement the idea and ensure regular performance/satisfaction monitoring. 4) Make sure you have assigned a person responsible to oversee and manage the location, as well as that they have sufficient knowledge, time, tools and funding available for its proper maintenance. 5) Draw lessons learned from the monitoring and plan its up-scale accordingly.

Lessons learned:	• Devote enough time to selection of the location of your idea – it should be easily accessible *(but in some cases maybe a little bit hidden – not to attract unwanted attention)* and open to the public, easily manageable *(not to large to be maintained, not to small to allow testing)*, with connection to needed communal infrastructure *(e.g. water access)*, preferably with constant presence of local stakeholders, etc.
	• Make sure you have assigned a person responsible to oversee and manage the location, as well as that they have sufficient knowledge, time, tools and funding available for its proper maintenance.
	• Even though you might be interested in establishing only a "pilot location", plan to keep it in function on the long-run, in case it proves to be successful and well-accepted by local stakeholders. If something works and is well accepted, citizens resent if you decide to reallocate or take it away.
	• Skepticism and resistance can escalate into vandalism. The best way to tackle such issues are:
	  ○ To actively communicate and raise the awareness of local stakeholders.
	  ○ To explain what you are doing and for which reasons.
	  ○ To involve local stakeholders in the design and development – if you can "fix a problem/concern or two" that are important to local stakeholders, you will for sure win them over and gain their trust and support.
	  ○ To involve them in the management of the location – they are constantly present in the area, so this gives you free "surveillance and control" over the location.
	  ○ To allow free access and use to local stakeholders and the general population.

2.6. So, how should transfer cities approach the transfer of the "Biodiversity maintenance" module?

We believe that it is unlikely that all 5 transfer cities will be able to transfer all the above-stated BEE PATH good practice elements and examples within the framework of the BeePathNet project. Not only due to its time restrictions but also due to political decisions, operational modifications and secured funding which need to be put in place before the overall situation changes. And we must not forget the legislative, cultural and natural differences between the City of Ljubljana and 5 transfer cities, as well as their actual needs and priorities.

For all stated reasons, the "Biodiversity maintenance" module was, during development of the Transferability Study and all 5 Transfer Plans, divided into 5 good practice development (transfer) steps, which could be transferred within the BeePathNet project framework. Both, good practice development (transfer) steps and predictions linked to how far are transfer cities willing to go within the BeePathNet project framework are presented in the following table.

GOOD PRACTICE MODULES		GOOD PRACTICE TOPIC DEVELOPMENT STEPS		GOOD PRACTICE DEVELOPMENT STEP					
				LJ	CES	BYD	HEG	NPR	AMA
VOLUNTARY	Biodiversity maintenance	1) Awareness-raising campaign linked to promotion of planting of autochthonous melliferous plants in green areas / 2) Distribution of seeds and seedlings to citizens and planting of autochthonous melliferous plants with key target groups / 3) Awareness raising campaign linked to importance of wild pollinators / 4) Set-up of wild pollinator hotels / 5) Organization of biodiversity conferences	1	✓	✓	✓	✓	✓	✓
			2	✓	✓	✓	✓	✓	✓
			3	✓	✓	✓	✓	✓	✓
			4	✓	✓	✓	✓	✓	✓
			5	✓	?	?	?	?	?

It is the task of transfer cites to think and decide how they plan to achieve above-stated steps (this was on operational level already considered in Transfer plans), while the City of Ljubljana and the Lead Expert will provide them with support and advice. This is why it is important that transfer cities come to the "Biodiversity maintenance" topic devoted 2-day city visit in Hegyvidék (Hungary) well prepared and already equipped with concrete implementation vision of the transfer process.

However, the BeePathNet project is not only devoted to the transfer of knowledge only between the City of Ljubljana and 5 transfer cities. On the contrary, both the City of Ljubljana and the Lead Expert fully support and encourage direct transfer of best practices and innovative ideas between all partners.

In order to support this approach in practice, re-enforce knowledge transfer, as well as to further inspire transfer cities for successful transfer, we decided to include into this guidance also a case study on the topic of Maintenance of Urban Biodiversity in Hegyvidék – BeePathNet transfer partner from Hungary. This case study also presents a "theoretical introduction" to the 2-day city visit to Hegyvidék, where BeePathNet partners will be able to experience presented best practices, as well as further discuss the transfer process.

3. MAINTENANCE OF URBAN BIODIVERSITY IN HEGYVIDÉK – CASE STUDY

3.1. Briefly about the Municipality of 12th District of Budapest (Hegyvidék) and the Green Office

The 12th District of Budapest, also called Hegyvidék (meaning "the mountainous area"), is located on the hilly Buda side of the capital of Hungary. Municipality of the 12th District of Budapest has its own local government, which is working under the city level government – partly autonomically. The 12th District is responsible for the administration of Budapest's greenest district, where 44% of the territory represents green areas – mainly private gardens (40%) and forest (60%). Normafa (963,8 ha) represents the most significant green area of Budapest and Natura 2000 site and is, with all its biodiversity richness, also located in Hegyvidék.

In 2016 a Green Office has been established under the 12th District Municipality's administration. The Green Office is more than just an official environmental back-office, as its main function is closer to an NGO type of organization. Its main tasks are not only related to coordinating and implementing environmentally-focused EU and National projects, but also to the organization of programs and events for citizens. In this way the Green office team gets closer to residents of the district, as well as citizens of Budapest. Due to significant size of the green area, the Municipality and the Green Office also have an important responsibility to maintain and develop the greenery and its biodiversity, thus, it is crucial to involve multiple stakeholders like companies, residents and other key stakeholders into this equation.

All the below stated and described activities are implemented or coordinated by the Green Office and represent its active contribution to the maintenance of biodiversity in urban areas.

3.2. The Stewardship Programme

THE REASONING BEHIND THE STEWARDSHIP PROGRAMME

The 12th District of Budapest manages several public urban green areas, such as parks and urban forests. The most important green area of the district is the Normafa forest park located on the ridge of the Széchenyi and János Hill. Besides forests and parks, the District also manages a significant amount of "informal urban green spaces" – they are smaller in size and are usually represented by formally unmanaged green squares, single trees or scrubs between buildings, street greenery, green tram tracks, road medians, public backyards and front yards, which also need attention and care.

Small green areas on the google map

Well-maintained urban green space improves quality of life in a myriad of beneficial ways (not only it provides leisure or sports facilities, but improves the quality of the air, reduces urban noise and even improves the urban climate), but its full potentials can be better exploited only through smart cooperation between the responsible local authorities and citizens. Traditional top-down approaches have proved to be rather limited in their attempts, and subsequently, new approaches were needed for more effective urban green space management.

One solution investigated by the Green Office was based on mobilization and involvement of residents of Hegyvidék in the maintenance of informal public green spaces through a Stewardship Program, with the support and supervision of the Municipality.

IMPLEMENTATION OF THE INITIAL STEWARDSHIP PROGRAM WITH LESSONS LEARNED

As a pilot activity of the Urban Green Belts project (Interreg Central Europe project) the Municipality of Hegyvidék started the Stewardship Program in the spring of 2017. As already explained, the main goal of the Program was to involve residents in the maintenance of informal public green spaces of the district.

As a first step, implantation plans were prepared for nearly thirty areas (with the help of a landscape architect), paying special attention to the unified appearance and the installation of indigenous native plant species. In addition, it was a fundamental goal to design green surfaces in a harmonized way which provides an attractive sight in every season.

About two-thirds of these green spaces were suitable to be tended by individuals, residential communities, work communities, schools, and kindergartens. Such green areas have been advertised through several communication channels, such as awareness rising boards, leaflets, as well as their active advertisement on our events. We have created a google map on the official Municipality's website and we made sure that the local press was actively advertising the Stewardship program as well.

A promotion sign for the Stewardship Program – it reads: "This area can be adopted"

When we started the program, we were very flexible with the conditions of participation and we allowed everyone to join the program with a very diverse set of commitments.

For example, there were people who only wanted to plat seedlings and nothing more, as they couldn't manage the watering and all year management.

At the start, such flexibility seemed reasonable, as we wanted to successfully kick-off the programme. But looking back, we must point out the following problems we encountered:

- Since adopted areas were managed by stewards based on a solely oral agreement, it was difficult to keep track or account of effective and efficient actual management performed by stewards. It was also difficult to handle a diverse set of commitments and to maintain motivation, as in areas where stewards couldn't complete the work, the remaining tasks had to be managed by a third party. All this resulted in significant and unplanned extra costs.

- Upholding motivation, in the long run, was also difficult, as the areas designated by the Municipality were in many cases far from the home/workplace of stewards. In addition, the stewards were not involved in the planning process, so the stewards had no say in how the areas should be managed. For this reason, the stewards couldn't reach the expected level of ownership or bond with the area emotionally.
- Also, there were constantly present external problems like the constant problem of water supply, stealing plants, illegal parking, littering and careless pet owners.

TACKLING IDENTIFIED CHALLENGES AND IMPROVEMENTS OF THE STEWARDSHIP PROGRAMME

During the implementation of the programme, apart from gaining experience, we also gained continuous requests from applicants who wanted to include their own areas in the program instead of the ones designated by the municipality.

Based on our experience, as well as based on the good practices of the Munich GreenCity Programme, we have redesigned the Stewardship Program.

Two most important changes in the conditions of application are:

1) Today stewards can only apply with their own areas (meaning areas they suggest),
2) The Municipality and the stewards sign a bilateral cooperation agreement.

With these modifications, commitment has improved, motivation can be sustained for a longer period, the program has fewer extra costs and past problems (for example parking, theft) are easier to handle.

Involving own areas creates immediate commitment and provides bottom-up initiatives. Areas are easier to maintain because they are close to the home or workplace of stewards. Stewards are involved in the planning process, so they can also shape the area for their own needs – creating so important ownership.

Areas chosen by stewards are prepared, planted and maintained under the following conditions:

- Residents can apply by providing information/data about the area they select (remember, at first the Municipality offered the spots).
- Only areas located inside the border of the 12th District, which are owned by the Municipality and represent public green spaces can be involved in the program.
- The Municipality provides preparation of the area, creates a planting concept, provides plants for planting, as well as a package of tools for maintenance.
- Under the continuous professional support and supervision of the Municipality, stewards take care of their area on their own.
- The Municipality and stewards sign a bilateral cooperation agreement which must be prolonged after one year – of course only if both sides agree. The agreement defines the tasks, responsibilities, and communication related to the area selected. Of course, this legal file does not contain penalties but gives clear rights to the Municipality to stop cooperation with a volunteer who neglects the area.
- It is possible to join the Program at any time, as the Municipality accepts the applications continuously; the areas are planted in spring and autumn every year.
- At the time of the application, the size, place, the condition of the area and the number of already existing stewards determine when the resident can join the program – ant this is clearly stated in the agreement.
- If residents would like to apply, they have to send the following information to the Municipality by email or phone:
    - the address and/or land registry number of the selected area,
    - 3-4 pictures about the area, which show the condition, size, and location of the area,
    - number of residents intending to take care of the area,
    - contact details of the applicant,
    - any other relevant information about the area.

After it reviews the application, the Municipality representative contacts the applicant and they visit the location together – in the frame of a field visit they discuss all necessary details. Stewards, the Municipality, and the landscape architect design the green area together.

Below you can see an example of a typical Stewardship Programme area transformation:

The area before the adoption

Planting by students of a primary and high school

Planting by students of a primary and high school

The adopted area after a few months of maintenance

Area marking ceremony – management of the area was officially taken over by the primary and high school.
The sign says: *"This area is maintained by Testnevelési Egyetem Gyakorló Sportiskolai Általános Iskola és Gimnázium"*

FOLLOW-UP OF THE STEWARDSHIP PROGRAMME

So far 22 areas have been included in the Stewardship Program. However, the application process is still open and it is expected that there are more small green areas that will be involved.

Within the framework of the Programme any active community, institution or organization receives an information board on its own site, which clearly promotes the steward of the area.

To further support stewards, guidelines were produced to support their activities.

In 2019 the Municipality joined the BeePathNet project so we try to connect these two programs by providing melliferous plants for planting. We suggest our stewards use the following plants:

- *Nepeta x faasenii,*
- *Buddleia x davidii,*
- *Geranium macrorrhizum,*
- *Anemone hupehensis,*
- *Lavandula angustifolia,*
- *Perovskia artiplicifolia,*
- *Salvia officinalis,*
- *Aster,*
- *Stachys byzantina,*
- *Verbena bonariensis,*
- *Petunia grandiflora.*

By planting autochthonous and bee-friendly (of course also wild pollinator-friendly) species we further contribute to biodiversity.

Wild pollinator is working as a Steward ☺

Even more wild pollinators are working as Stewards ☺

3.3. The Urban Meadow Programme

THE REASONING BEHIND THE URBAN MEADOW PROGRAMME

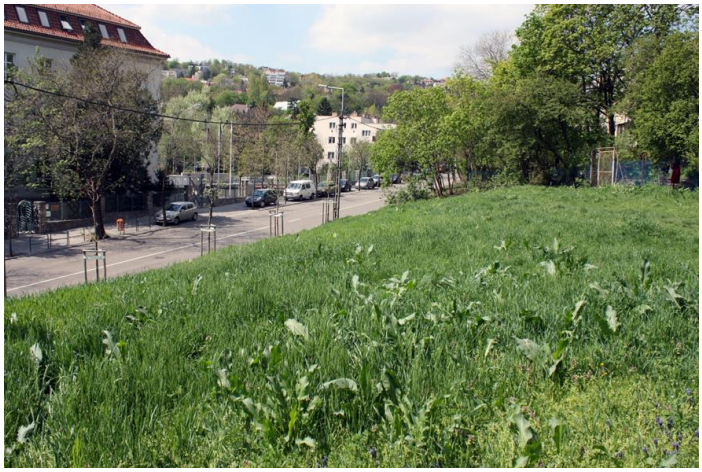
In the spring of 2018, external experts of the Danube-Ipoly National Park Directorate, the Botanical Section of the Hungarian Biological Society, and the Municipality of the 12th District started an experiment. Its primary goal was to restore the original natural form of the pilot site – a meadow encircled by urbanized areas – by ensuring favorable habitat conditions in order to achieve an increased number of endemic plant and animal species. Due to significant global population decrease, specific attention was put on creation of optimal conditions for all types of pollinators.

This experiment was an attempt to test if the biodiversity of urban green areas can be enriched and if urban green areas can be used and maintained as biodiversity "hot-spots" or "stepping-stones" in the long-run.

IMPLEMENTATION OF THE URBAN MEADOW PROGRAM

In order to carry out the experiment, external experts volunteered to create and maintain an urban meadow on one of the available public green spaces in the 12th District – more precisely on the slope of the Istenhegyi street.

This type of land management can contribute to the stability of the habitats, green surfaces of the built-up area, preservation of the nutrient content of the soil and keeping the area free of weeds. The result of the experiment will also be a benefit for nearby gardens by reducing pests more easily and making it more difficult for allergenic plants to settle in the area.



The location of the pilot site – the urban meadow on the the slope of the Istenhegyi street in 12th District

As a first step, the Municipality consulted with the previous manager (Budapest Horticultural Private Limited Company) of the area and they agreed that the Municipality takes over the maintenance of the area for the purpose of the experiment. Until then the site was mowed several times per year, mechanical mowing was used instead of manual mowing and the grass was cut short.

The external experts and the Municipality agreed that volunteers will adapt the management of the pilot area to the needs of biodiversity increase – for example, they will mow the grass two times a year, they will continuously monitor plants, as well as collect and sow seeds.

Mowing is carried out twice a year, with the so-called high meadow grass (about 10 cm high grass) to help species regeneration and ensure seed production of all native species. This is a prerequisite for the development of high diversity vegetation. As a result of the experiment, a beautiful flowering meadow will emerge in the long run.

This experiment has been communicated toward the residents through different communication platforms (information tables, flyers, newsletters). It was also the intent of the programme to raise the awareness of the neighborhood residents, in order to present them a clearer picture of the reasons behind the programme as well as about the benefits of high level of biodiversity on the urban meadow.

EVALUATION AND FOLLOW-UP OF THE URBAN MEADOW PROGRAMME

Experts are constantly monitoring and analyzing the pilot area, especially the composition of the plant population. To further enhance biodiversity the pilot area was enriched with seeds of native plant species.

The botanical monitoring is being carried out in two steps. Firstly, the experts examined in detail the mass relationships of the species forming the lawn by identifying three permanent quadrates. Secondly, they listed additional plant species occurring anywhere in the area.

Experts are working on the botanical measurement

Consultation time on the urban meadow

For the permanent quadratic botanical measurement, 4m x 4m test areas were designated. They were monitored three times during the year of 2018 (April, May, August).

As a result of botanical monitoring (2018), a total of 59 plant species were detected in the 4m x 4m quadrates, with 44 species per quadrates in average. To put this result into perspective – this number is higher than the number of plant species of grasslands habitats regularly found in parks and other public areas of the inner city of Budapest.

Urban meadow after one and half year of implementation

Further 46 species were detected from the grasslands outside the quadrates, so the total flora of the area is 105 species. This number confirms the experts' belief that the area is well worth the effort to maintain it as an urban meadow.

The botanical monitoring was followed by the mowing of the lawn. In order to further increase the grassland species stock and make the species composition more natural during the 2018 vegetation season, volunteers collected seeds in well-kept grasslands near Budapest. Dry grass species were prioritized for collection. Seeds of about 21 species (which include species already present in the lawn) were seeded partly in the quadrats and partly outside the quadrats in November 2018.

External experts and the Municipality constantly consult, evaluate and plan together. Once a year a written report on implementation is prepared. The results for the year 2019 will be evaluated at the end of the year, but the following results are already worth to be mentioned:

- New dicot species have appeared;
- The number of ragweed specimens has halved;
- There is increasing acceptance of the experiment among residents;
- The urban meadow could be a great habitat for wild pollinators.

MAIN EXPERIENCES

The manual mowing of the urban meadow generates appreciation from residents. Manual mowing takes longer, but additional volunteers joined (even from the BeePathNet ULG) and we happily accepted their help.

Due to the fact that residents around the area are accustomed to seeing short-cut lawns, we are aware that **there are periods of the year when the area appears to be abandoned and disorganized**. The grass patches left for seed maturation had some negative feedback from the general public that needed to be treated – for example:

- We decided that a small section of the urban meadow should be cut regularly to signal to residents that we have not forgotten about the area.
- Both, the Municipality and experts, have to communicate with residents continuously and give them constant information about the implementation, challenges, and results.
- Both, the Municipality and experts, have to regularly and efficiently manage all the complaints which have appeared regarding the experiment.

Constant monitoring of invasive species is required.

Only a part of the hay can be composted locally. The compost placed in the public area should be properly handled and continuously checked.

The regular presence of our volunteers in the area is very useful, it creates trust among the residents of the area, and many issues can be clarified personally through joint discussion. In addition, it becomes evident that the area is owned (maintained), which complements the general communication about the program.

The urban meadow proved to be an important habitat for wild pollinators. Based on current experience, we can help wild pollinators by promoting autochthonous species and by finding the best time for mowing.

At a later stage with the **active involvement of the people living in the district**, we will also encourage the planting of native plants in the surrounding gardens on the Kis-Sváb-hegy nature protected area to create a population connection between the urban meadow and the Kis-Sváb-hegy.

3.4. Conservation of water-tank linked natural habitats

In the summer of 2019, under the umbrella of the BeePathNet project, the Municipality of the 12th District of Budapest and Budapest Waterworks started to cooperate on the topic of management of water-tank areas within the 12th District of Budapest and near the border with the 11th District of Budapest.

Within the framework of cooperation, a specific management action for increasing biodiversity and for environmental sustainability was introduced. With alternative land management and conservation of natural wildlife, we want to increase biodiversity and promote environmental sustainability.

The main aim of the action was to ensure proper management of the undisturbed operating areas of Budapest Waterworks – for example, mowing of sufficient intensity and timing (reducing the number of mowing and proper timing of mowing), leaving natural habitat spots, etc.

One of the first steps was to experimentally reduce the number of mowing from five times a year to two/three times a year. Subsequently, we provide a living space for wild pollinators and other native species. We promote the cultivation of seeds of all autochthonous plant species and increase the species variety of these areas. All this is an essential condition for the enhancement of biodiversity.

This type of management also contributes to the long-term stability of the habitats, the "greening" of built-up areas with autochthonous species, preservation of the nutrient content of the soil and to a reduction of unwanted presence of weeds and invasive species. The cooperation also supports the efforts of the Municipality of Hegyvidék to make the district a bee-friendly, pollinator-friendly area.

Some melliferous plants on the areas

Sign on the fence of the area of the water tank. It says: "The bees are important for us, flowers are important for the bees, we protect the plants. Budapest Waterworks has joined the BeePathNet program. We mow the grass two times per year and that supports the melliferous flowers to grow further and gives shelter to the bees. Thank you for supporting us and the bees."

This project has been communicated also towards the residents through different communication platforms (information tables, flyers, newsletters). Subsequently, we also expect that the selected management approach will bring may indirect beneficial impacts – for example, reduced use of pesticides and herbicides on nearby gardens, reduced potential for growth of allergenic plants, etc.

The Municipality of the 12th District also informed the Municipality of 11th District about this initiative because a quite big area that has involved in the action is in that district – until now around 20.600 m^2 area has been involved into this action. However, the initiative has just been started, so we will need to wait another year or two to be able to report on lessons learned and consider its full potentials.

3.5. The Sapling Programme

THE REASONING BEHIND THE SAPLING PROGRAMME

Under the Urban Green Belts project, the Municipality launched a novel „street trees from saplings" program by planting 16 locally-native Turkey oak saplings along part of Nárcisz Street. This is a cooperative initiative between the Zöld Iroda/Green Office of 12th District of Budapest (Hegyvidék) and the Nemzetközi Dendrológiai Alapítvány/International Dendrological Foundation (NDA/IDF), Budapest/Budakeszi. The project intends to accelerate a scheme to plant saplings instead of the more customary and much larger (3–4 m) „street trees" grown in horticultural nurseries.

Planting the Turkey oak saplings along part of Nárcisz street

According to the experts at IDF, planting saplings might be the most efficient and cost-effective way to produce and install street trees. In addition to the sapling program's cost savings (purchase price and planting and maintenance costs are much lower), it opens the door for using a range of species that typically do not exist in the street tree nursery market and business (in necessary/desireable number and for acceptable price) i.e. locally-native oak species. Partial independence from the nursery market may significantly increase the species diversity of the street plantings and may also encourage residents' ongoing participation in their local treeline project (in their residence area).

Saplings adjust to their street-side environment better than large, nursery-grown trees and so have a higher survival rate. IDF observations on experimental plantings show that saplings catch up to the commonly used larger nursery stock within just a few years. They may need more attention than the larger trees initially, but there is an advantage in this since it gives locals an opportunity to participate in the work of tending to the trees, which may further enhance their engagement in the project as a whole.

By piloting this novel method within the Urban Green Belts project, Hegyvidék hopes to pave the way for its sapling-planting practices to be used more broadly in Budapest or even throughout Hungary.

KEY ADVANTAGES OF THE SAPLING PROGRAMME

Easier to plant and with better survival rates: Current common practice is to purchase 3–4 m high trees for street plantings. These trees may have rootballs weighing 40–50 kg and their proper planting require professional and technical expertise. There is little opportunity for public participation. The mortality rate of larger trees might be high because they were dug from their original, ideal growing conditions, had their roots pruned and balled, and then were replanted in "alien" soil. On the other hand, saplings' roots develop in small, narrow „tube" containers (typically 5 lit.), and they are easy to plant, even with volunteers' assistance. Their roots remain intact when transplanted, so they develop quickly and adapt well to a specific local environment and variable street conditions. Therefore, the saplings' mortality rate, as experienced in our experiments is low – and this is expected to hold true for large-scale plantings as well.

Fast growth at a far lower cost: Our observations show that three to five years after planting along a street, inexpensive saplings and expensive root-ball trees had reached approximately the same size. However, the estimated cost of each root-ball tree, including transportation, planting, and maintenance (watering through installed pipes) is about a total of 100,000 Ft (310 €). Thus, the Green Office has calculated to have spent 10 million Ft (30,900 €) this year on such trees. In contrast, the cost per tree in a sapling program, including transportation, planting, and maintenance, would be approximately 3000 Ft (9 €) including transportation and actual planting.

A better and wider selection of species: The nursery business concentrates on fast-growing, usually non-native species and/or cultivars and the market controls both availability and pricing. In addition, most of the

native tree species, particularly locally native oaks, are simply not available in the necessary size and quantity. The sapling program will produce an assortment of tree taxa that are highly desirable but typically absent in routine street tree production. IDF has selected 19 species, 13 of which are native in Hungary and neighboring areas, to propagate for saplings. Displaying the native flora, enhance some particularly beautiful and rarely seen flowering trees, is one of the project's objectives.

Faster, easier and less disruptive planting: Unlike larger trees, saplings can be planted by hand or (if circumstances require) by a hand-operated borer or drilling machine. The supports for saplings are also smaller and easy to install. In our experimental plantation in Nárcisz street, it included a placard as well, with information to the public about the saplings that will soon become their street trees.

Simplified maintenance: Because the saplings are planted with intact roots, little care is required beyond watering twice a week in hot periods, in the first year. After that, these carefully selected native species grow naturally and „organically" in what is, actually, their „original" home soil. Some branch pruning is eventually necessary to clear the lower part of the trunk, but this can be done quickly and easily.

IMPLEMENTATION AND FOLLOW-UP OF THE SAPLING PROGRAMME

The Municipality decided to initiate and support the planting of 5,000 trees in total in the next five years, including both saplings and older trees, on both public and private properties.

The following actions are envisioned with respect to the Hegyvidék sapling and public tree planting programme:

- Young and well-developed autochthonous seed-grown saplings will be planted.
- Maps of underground infrastructure-systems will be studied carefully prior to planting.
- Sites are to be surveyed in detail to determine which trees are ecologically best suited to the environment and will blend into the areas' specific ecology and aesthetic aspects. Often handled primarily in „linear plantation" without contexts with its immediate environment, street trees can also be considered as a continuation of local garden systems or the immediate natural environment such as either existing or hypothesized natural forest communities.
- Autumn tree-planting activities on public property as well as other public areas managed by the municipality can include planting and/or replacing trees and renewing tree-lined streets, with special emphasis on autochthonous and/or other species that are suited to the climate or other practical aspects (e.g. honey production), if they do not contradict primary goals.

Planting saplings

The information placard around the saplings

These activities call for a greater degree of citizen engagement than it is currently common, including the need for enhanced communication, resulting in increased involvement and "buy-in" among local residents, schools and other organizations. „Infield" education is also a very important part of our tree line and green belt development project.

4. FINAL TIPS AND TRICKS

All involved in the production of this guideline feel that "tips and tricks" are actually all we talked about on previous pages. However, there are still a few very important things we need to take into account, if we want to achieve successful transfer of all steps linked to the "Biodiversity maintenance" module – here are a few:

1) THE STARTING LEVEL OF AWARENESS ABOUT IMPORTANCE OF POLLINATORS AND THEIR STATUS IN SOCIETY

One of the most important challenges all BeePathNet partners must overcome is "the traditional identity" or "the cultural context" of bees and other pollinators. It is often this "image" which shapes the "collective perception" of any animal and potentially drives "the fear factor".

For example, in Slovenian culture the honey bee plays an extremely positive role – it is hard-working, active, smart, always prepared for the "hard times", protective of its home and family, etc. This is why honey bees, but also other pollinators, are widely accepted in the Slovenian society and the "fear factor" is very low. In such a cultural and local context, it is quite easy to carry out awareness-raising campaigns and attract citizens to join and support the cause. On the contrary – in some other countries the honey bee's role is quite different, as it is perceived as a wild and potentially dangerous animal, which poses a threat to citizens.

In order to be fair, we have to point out that there are more aggressive and less aggressive types of honey bees spread around Europe. It was this character of the autochthonous type of honey bee – for example, in Slovenia *Melifera Carnica (*which is known for its mild character), while in Portugal *Melifera Iberica* (which is known for its aggressive character) are 2 representatives with quite diverse characters – which helped to shape the "collective perception" of bees.

On the other hand, citizens – especially in urban and suburban areas – have lost connection with nature and often overreact to quite natural phenomena and regular behavior of animals. Here are a few examples:

- Bees, like all animals, react to colors and smells around them, which is why they change their behavior according to their instincts – and if they feel threatened, they will attack. But they are only defending themselves.
- Bees also react to quick movements, which is why they are more likely to feel threatened and start attacking people if a person starts swinging at them. But again, they are only defending themselves.
- Bees are always on the look-out for water, especially in hot and dry summer periods, which is why they are often attracted to swimming pools. But they only want to drink.

It is this low understanding of bees and their behavior which also contributed to shaping the "collective perception" of bees.

We could list more examples, but there are numerous reasons why our "collective perception" of bees is what it is. The important thing is, that we are aware of it, that we take it into account and adapt our approaches, actions, and tools to any awareness rising attempts involving our citizens. Or in other words:

- Start as low and soft as you need to start and leave enough time for your citizens to "digest" your key messages.
- Do not underestimate the "fear factor" – you can use pilot examples (carried out in "safe environments") which will support your key messages and prove in practice that things can be done differently and perceptions can change.
- Use "specific" communication channels and modify key messages for "specific" audiences or target groups.
- Give yourself enough time (don't get discouraged after 1 or 2 "strikes") and target people who share your views and supplement your capacities in order to build-up a ULG.
- Check the BeePathNet Guidelines – Volume 5, which will be devoted to awareness rising for more tips and tricks.

2) THE "LOCAL CONTEXT"

People are often skeptical about "copy-paste" transfers of even proven good practices from other countries and cultural/legislative/operational environments. And they are absolutely right because even the best solutions don't work if they are not modified or tailored to the environment and the society where they are being transferred to.

This is why it is extremely important to identify the "local context" and to start thinking about how good practice could be modified as early on as possible. Don't argue the transfer just by saying: "This worked well over there!", but explain to people how "the good practice from over there" was transformed to fit their environment, improved their life and met their needs.

3) AWARENESS RAISING

As already stated, this is probably one of the most important aspects of biodiversity preservation. People must first understand the importance and benefits of biodiversity for mankind in order to be willing to "put it on the agenda", take it seriously and act on it.

Unfortunately, this is heavily interlinked with the development index of individual society and average household incomes. To put it I more blunt words – it is hard to convince any person trying to feed his or her family to worry about biodiversity when he or she needs the fertile soil to grow crops so the family will not starve. Citizens of more developed societies also have better access to education and information, while also consume more natural resources per person and leave a bigger ecological footprint on the planet. It is exactly for stated reasons that more developed societies have a responsibility to go beyond current efforts and actively search for new solutions – as the project BeePathNet is trying to do.

All presented ideas and concepts are based on intensive communication with citizens and well taught through an active awareness rising, which is especially aimed at children and young population. Not because they are more easily convinced, but because they are the voices of the future within their families and neighborhoods and have the capacity to change the mind-set of the whole society.

As awareness rising was an important and integral part of the BEE PATH good practice, we devoted a special module to awareness rising, which is why it will be discussed in more detail in BeePathNet Guidelines – Volume 5 – Awareness Rising.

It is for the same reason that we decided to attach a PDF version of the Leaflet "Help the bee in the city: Plant the city with flowers". Unfortunately, it is only available in the Slovenian language, but we believe it will still prove helpful and provide additional ideas for transfer partners.

But don't forget that there is no need to just copy-paste all presented ideas…

Modify them to your needs and implement them in the best way you see fit.

Or even better, come up with your own ideas and allow us to learn from you!