Integrated NBS-based Urban Planning Methodology for Enhancing the Health and Well-being of Citizens

D3.2

Baseline status and indicators identification

WP3 – Gap analysis, Requirements and Solutions identification for cities

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Table of Contents

Executive Summary

This document presents Deliverable D3.2 "Baseline Status and Indicators Identification" corresponding to Task 3.2 (T3.2) of Work Package 3 (WP3) (Gap analysis, requirements, and solutions identification for cities). The overall WP3 objective is to propose processes and methods required for planning and detailed design of the euPOLIS NBS interventions. More specifically, the objective of T3.2 includes the qualitative evaluation of the baseline status and definition of Contextual Indicators (CI) (related to urban, social, environmental, economic and PH&WB categories), for the four euPOLIS demo sites located in the four Front-Runner (FR) cities of Belgrade (Serbia), Gladsaxe (Denmark), Lodz (Poland) and Piraeus (Greece), as well as the development of the advanced planning and design matrix. To achieve the above objectives, the three following steps within the planning process have been completed:

1. Definition of demo sites baseline status, in order to assess the current condition of the sites in all urban planning categories relevant to Physical Health and Well-Being (PH&WB). The aim is to reach a comprehensive understanding of the baseline status and related challenges of the demonstration sites in the context of social and urban design, environmental and economic conditions, as well as the main stakeholders' concerns/problems. The assessment of baseline status related directly to PH&WB was not possible at this project stage, without site testing results. The identification of the baseline status at the demo sites related to PH&WB is deemed to be a prerequisite for the introduction of the innovative euPolis planning process, based on the systematic implementation of the NBSs. To complete the baseline status assessment of demo sites, the WP3 team has used the information included in questionnaires Q1 and Q2, earlier obtained from each city's stakeholders, as well as information from the Gap analysis previously completed by each city and reported in the deliverable D3.1. The baseline status will be used for later comparisons of improvements after the NBS deployment.

2. Contextual Indicators identification, in order to achieve the highest quality set of indicators relating to defined challenges for identification of actual demo sites requirements in urban, social, environmental, economic and PH&WB urban planning categories. To define the CIs, the WP3, WP4 and WP8 teams formed specialized groups to provide information on each site's diagnosis with respect to urban components affecting PH&WB.

3. Construction of the urban planning matrix, in order to create the system revealing the means for meeting stakeholders' requirements at the demo sites. For this purpose, Task 3.2 utilized the advanced euPOLIS urban planning methodology, the Goal Driven Planning Matrix (GDPM). The provisional GDPM has been delivered by WP3.

The GDPM is a unique holistic planning tool used as a main tool for the planning and detailed design of project interventions tailored to improve PH&WB at selected demonstration locations. This system ensures urban regeneration by exploiting synergy of resources, producing prerequisite for high quality of life and city efficiency, and ensuring a comprehensive list of functional synergies, thus achieving the lowest life cycle cost of planned interventions. Additionally, GDPM integrates all stakeholder concerns, data from the baseline status, challenges, and CIs for all demo sites so as to produce specific concept proposals for the future euPOLIS interventions, and monitoring requirements. The identification of appropriate Evaluation Indicators (EI) for the proposed euPOLIS interventions will quantify the euPOLIS intervention

impact on PH&WB as the ultimate goal of the project. The GDPM's main products are the lists of potential demo site interventions, as well as the identification of appropriate NBS impact monitoring setups at each site.

Following the implementation of NBS interventions at demo sites, the effect of the implemented interventions on citizens' PH&WB is to be assessed.

The developed urban planning methodology is providing a starting point for implementation of the euPOLIS planning, construction, monitoring and validation process. The insights provided by the Baseline Assessment will be further refined and quantified in Task 3.3 (Set-up Project Requirements) and used in evaluating CIs and setting up project requirements. The overall D3.3 results will supply necessary information to WP4 (PH & WB with related Social and Behavioural Aspects), WP5 (Technologies to support the development of NBS in the cities) and WP6 (Design and Development of the euPOLIS solutions and implementation plan).

List of Figures

List of Tables

List of Acronyms / Abbreviations

Table 1: List of Acronyms / Abbreviations

Abbreviation	Explanation
BG	Blue Green
BVOC	Biogenic volatile organic compounds
CI	Contextual Indicators
EC	Ecosystem
ESS	Ecosystem Services
EI	Evaluation Indicators
ENPL	EnPlus SME
FR	Front Runner
GA	Grant Agreement
GDPM	Goal Driven Planning Matrix
KPI	Key Performance Indicators
NB	Nature Based
NBS	Nature-Based Solutions
PH	Public Health
PH & WB	Public Health and Well-Being
POI	Place of Interest
SMEs	Small Medium Enterprises
Q1	Questionnaire 1
Q2	Questionnaire 2
Q3	Questionnaire 3
(U)HI	Urban Heat Island
VOC	Volatile Organic Compound
WB	Well-being
WP	Work package

Glossary of Terms

Covered in D3.1

1. Introduction

This deliverable (D3.2) reports the activities undertaken under Task T3.2, which aims at joint identification of demo site challenges and a representative high-quality set of baseline status and CIs at the FR cities demo sites, using the newly developed euPOLIS' urban planning methodology. The activities of Task T3.2 are running in parallel with those of Task 3.1, and both are aimed at analyzing the existing demo-site conditions. Task 3.2 goes further ahead to establish the sites baseline status identification system and develop the planning matrix system.

This report consists of seven (7) chapters, starting from the current one that is the introductory section including the introduction and overall description of the Task. Chapter 2 consists of the summary of the task 3.2 approach. It also explains the connections of this task with other WPs. Chapter 3 defines the concept of demo sites status assessment, while Chapter 4 describes the structure of the euPOLIS project indicators. Chapter 5 explains the euPOLIS project Goal Driven Planning Matrix as the NBS planning tool. Chapter 6 includes project's main conclusions. The supporting documents are provided in the Annexes.

The Task 3.2 comprises the following activities:

- Understanding of baseline status/challenges of the demonstration cities in five living categories: urban, social, environmental, economic and PH & WB ;
- Identification of the main stakeholders' concerns/problems (as specified in D2.2) to be entered into the euPOLIS' planning system as site requirements for meeting PH and WB related goals and targets;
- Identification of each baseline status of city functions related to PH & WB.
- Identification of constraints in identification of indicators and quantification of the baseline.
- Use of T3.2 demo sites' baselines for the impact assessment of the deployed NBS.
- Based on the results from completed Task 2.2 (Stakeholders and wide public participatory planning education), Task 3.1 and related Task 3.2, construction of the provisional GDPM is completed for the demonstration sites, in order to create the bases for specifying the demo sites euPOLIS interventions, and for identifying the corresponding EIs.

The Deliverable 3.2 consists of two distinctive parts. The first part is the demo sites baseline status assessment and the identification of relevant indicators. In order to fulfil this goal, we used the data from the questionnaires Q1, Q2 and the corresponding NBS Gap Analysis. The site challenges identified through this process, along with the data and information obtained from Task 2.2 (Stakeholders and wide public participatory planning education), 2.3 (Stakeholders benchmarking against already taken urban regeneration endeavors) and 3.1 (Local conditions, features, gaps in existing NBS and optimization metrics) were analyzed and organized so as to establish the advanced (common for all demo sites) baseline status. This was achieved by defining site Contextual Challenges, and, from these, identifying of the site CIs.

The second part of D 3.2 defines the construction and use of Goal Driven Planning Matrix (GDPM), the advanced euPOLIS urban planning system.

2. Process summary for the demos' baseline status, indicators identification and GDPM construction

Task 3.2 is focused on the development of euPOLIS methodology for introducing a novel Goal Driven Planning Matrix (GDPM) process. The novel GDPM is based on a previously developed methodology as proposed by Bozovic et al. (2017). In Task 3.2, the GDPM process was further expanded and refined to explicitly account for a set of CIs which were designed in order to provide an overview of the baseline status across the demo sites.

The process of baseline assessment and consequent implementation of GDPM is fully interactive and consists of the following steps (see Fig. 1):

(a) Initially the data collected from the Q1, Q2 and the Gap analysis (for more information see D3.1) are utilised to produce the "Demo Sites Baseline status" (Tables 2 to 7). This information summarizes the data received from FR cities, which cover four main categories: urban, social, environmental and economy & business. The process outlines the initial euPOLIS-related challenges which were recognized at demo sites.

(b) Information from "Demo sites Baseline status" [see item (a)], and the data collected from demo sites (e.g., from questionnaires, stakeholders' workshops, existing deliverables, etc.) are then used to formulate demo sites Challenges and Themes. The Challenges and Themes define the site-status diagnosis templates, applicable to all sites, which were produced in order to create the basis for identification of CIs and the GDPM targets (Challenges, Themes and CIs are presented in Annex 1).

(c) Parallel to the activity described in (b), a provisional GDPM is constructed (see Annex 3). This process initially involves the extraction of Project Goals from the original project KPI's, and consequently their further expansion into a set of Project Targets. Hence, each set of Project Targets is associated with a particular Project Goal.

Following the identification of Project Targets, a set of potential demo site NBS conceptual interventions is defined for each site.

(d) Evaluation of CIs represents the second-level assessment which takes place at each demo site. The CIs are identified in this task and will be quantified during the Task 3.3. These will define the demo sites' requirements considering five urban living categories (urban, environmental, social, economic and PH&WB) likely to be affected by the foreseen euPOLIS interventions.

2.1 Integration of the baseline status and CIs into GDPM process

Subsequent to above steps, the euPOLIS has developed a novel approach by integrating information from above into GDPM. Due to the fact that Challenges and Themes essentially reflect issues at euPOLIS level, but also include identified challenges at demo sites, they have been utilized as input data for GDPM to further refine the potential NBS site interventions. The information was used to proof-check and expand the GDPM targets defined in step (c).

2.2 Link between the GDPM process and indicators identification

Identification of Challenges and Themes, as well as definition of CIs was a joint work of the teams of Task 3.2 and Task 8.1, and the working groups of WP4. In addition to defining the process for identification of Challenges, Themes, CIs as well as preliminary GDPM development, Task 3.2 has developed a process for identification of indicators to be applied and further developed throughout the euPOLIS project. The identification of euPOLIS project indicators entails the definition of CIs and EIs through the following steps:

(1) By further refinement of Challenges and Themes that are accomplished by means of identifying a set of parameters, the CIs were identified. The purpose of CIs is to assist in the process of understanding the broader environment of demo sites, as well as establishing if, and to what extent, the implemented euPOLIS interventions have an effect on addressing the challenges.

(2) The identification of EIs will be done accounting for the GDPM proposed interventions and hence will be accomplished at a later stage (as part of WP4).

(3) The identified CIs will then be converted into demo site "concerns" so as to incorporate them into GDPM, for further analysis that is likely to initiate potential interventions (Annex 2).

D3.2 mainly reports the findings of the baseline status assessment of demo sites, the identification of CIs (but not yet their evaluation) and the formulation of the provisional GDPM.

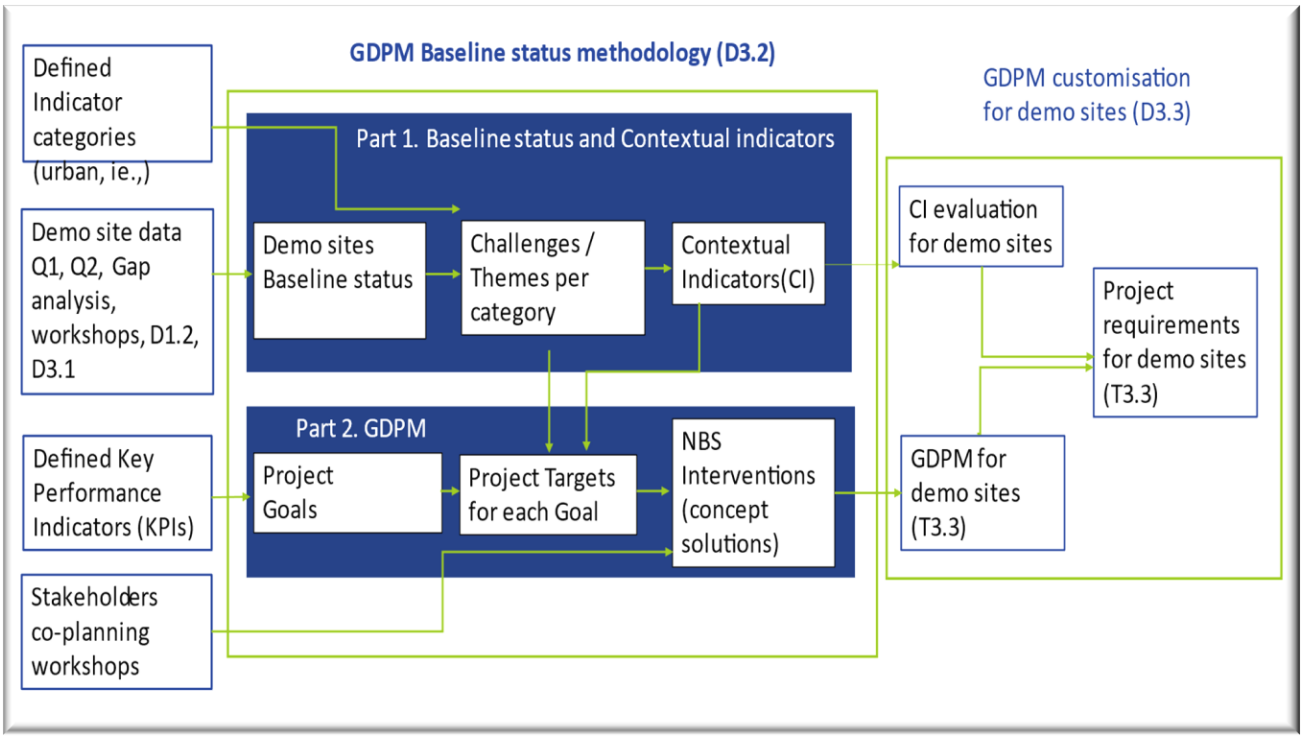

Figure 1: The Task 3.2 approach

2.3 Relation and interactions with other euPOLIS WPs

The framework for evaluation of indicators for urban, social, economic, environmental and PH & WB categories is defined within T3.2 (Baseline status and indicators identification), quantified in T3.3 (Set-up Project Requirements) and fine-tuned in WP8 (Evaluation of euPOLIS solutions, Training and Capacity Building).

The provisional list of CIs presented in this deliverable was developed by several expert working groups composed of WP3 (Gap analysis, Requirements and Solutions identification for cities), WP4 (Public Health and Well-Being with related Social and Behavioral aspects) and WP8 (Evaluation of euPOLIS solutions, Training and Capacity Building) teams.

The preliminary identification of EIs (from GDPM produced in Task 3.2) will be accomplished in WP4 in conjunction with WP8. The consolidation of all indicators, to support the quantification of main project results, will be completed within the WP4 (Public Health and Well-Being with related Social and Behavioral aspects), WP5 (Technologies to support development of NBS in the cities), WP6 (Design and Development of euPOLIS solutions and implementation plan), WP7 (Deployment of the NBS and Monitoring Solutions in the cities), for all five categories (urban, social, environmental, economy & business and PH & WB) and in WP8 following the completion of PH&WB site testing.

3. Concept of demo sites status assessment

3.1 Baseline status assessment process

The main objective of the baseline assessment, at this stage of the project, is to carry out comprehensive site-screening at demo sites. By using this process, we identify relevant stressors and trends, as well as the issues and needs for each site. Collected information would eventually contribute towards a more informed identification of appropriate NBS interventions at each site.

3.2 Site status assessment general principles

The euPOLIS approach for evaluating baseline status at a site of interest is a two-step process explained in 3.2.1 and 3.2.2.

3.2.1 The Demo sites Baseline status

The first step involves initial site-screening to produce the baseline status at the demo site (part of this deliverable). Input from answers to the questionnaires (Q1, Q2 and Q3) was used to identify major site characteristics in four of the considered categories, i.e., urban, social, environmental and economy & business. At this stage, the impact of identified demo sites challenges on fifth category, PH & WB could not yet be accurately determined, hence this category was not included. Answers to Q1, Q2 and Q3 were obtained from the four Front Runner (FR) cities, and they essentially represent the basic information relevant to euPOLIS project. The demo sites characteristics / challenges constitute the demo sites baseline status and were identified for each euPOLIS demo site in each of the above four categories. The results of this phase are summarized in demo sites baseline status report presented in Tables 2 to 7 of this document.

Table 2: City of Lodz demo site baseline status

URBAN
The site is under conservation protection (registry of monuments).
Regulation 1: a) building surface ratio for temporary buildings: maximum 4%, b) building intensity for temporary buildings: minimum 0.00, maximum 0.04, c) rate of biologically active surface - minimum 60%;
Regulation 2: The construction of temporary service and commercial buildings is allowed only with a footprint of up to 12 m^2, a height of up to 4 m and a flat roof,
Total site area is 8226 m^2, of which permeable surfaces are 5645 m^2, and impermeable surfaces are 2581 m^2
The terrain has a slight slope between 0.8% and 1%
There are no permanent structural assets on the site
There is no interaction between the site greenery and surrounding buildings i.e., there is no “blend-in”.
Site is surrounded by large, bare, not aesthetically pleasing concrete walls.
There are no multifunctional areas; the planning process is driven by a single-target approach.

The site planning did not include insurance against future operational and/or climate challenges.
The demo site has an abundant resource of public transportation in close range (i.e., buses, night buses and trams).
Pedestrian transport is compromised as there is a lack of pedestrian crosswalks to surrounding areas, and the pavement is uneven. There is also a lack of cycling paths close to the site, however, there is a small bike stand.
The area is not covered by security cameras.
Accessibility to people with wheelchairs and parents with strollers is not sufficient.

ENVIRONMENTAL
The inventory of greenery has not yet done but is planned to be completed in spring/summer 2021 – It is yet to be determined the availability and accessibility of green spaces.
Only 24% of the area is covered by trees. Considerable continuous areas are without trees.
The standard for the maintenance of greenery is not in line with the quality required to enhance PH&WB.
There are no BG hot spots that have been identified with clear protection / management targets towards climate adaptation, sustaining ecosystem services and biodiversity protection.
There are no water bodies on the site.
No groundwater analysis has yet been performed on the site.
There are no NBSs focused on rainwater retention on the demo site.
The site is exposed to an indirect UHI effect from the surrounding densely urbanized neighbourhood and direct UHI effect from the buildings and surface materials in the immediate vicinity (on the site).
The summer shading is not systematically distributed by adequate planning of greenery – there is considerable space for improvements of the direct shading for visitors and reductions in building radiation.
The site is exposed to dominant winter winds.
There are no recycling activities on the site.
Urban agriculture does not exist on the site. There is a serious potential for it.
There is no record of wastewater reuse in the immediate neighbourhood.
There are no public toilets on the site

SOCIAL
The site contains a small playground for kids.
There is a small, poorly equipped outdoor gym on the site.
There are a few benches, which are not adequate to the number of current and potential users and are not shaded in summer.
The categories of visitors are limited – they are mostly people who walk their dogs in the park, use the small outdoor gym, and are accompanying children to the playground.
There are people interested and practically daily involved in taking care of the demo sites nature (and are a potential resource for urban gardening, urban agriculture, etc.).

There is an active group of citizens in the neighbourhood who have been jointly implementing social activities for several years. The topic of social activities include development, education, culture, neighbourhood help, building a civil society, ecology, intersectoral cooperation, etc. This group implement these topics through workshops and trainings, meetings and discussions, cultural and social events, individual and group activities.
The site is not covered by info-tech facilities.
The City progressed on development of NBS related participatory programmes, tools, promotion, some of them supporting not only communication among stakeholders but also their engagement in the city-nature stewardship. These engagement practices consist of organization of Citizens' Panel on City Greenery, co-designing workshops on streets revitalization, e.g., "Streets of Old Polesie. There is also ongoing participatory development of the City Green Deal that is to stimulate filling the NBS gaps through multi-stakeholder and multi-sectoral collaboration.
BUSSINESS
There is a number of small restaurants at short walking distance from the site.
The location has a particularly good connection with important city points, making it with a great potential for business instigation.
There is a big office block and a hotel close by, which could be considered good for new business generation.
There is number of small businesses that might be interested in gaining from NBS improvements on the site.
There is a potential for co-planning activities with developers, with expected high benefits from an increase in site attractiveness to all stakeholders.
There is a good potential for developing retail related activities.
There are currently no established PPP models to involve the private sector in NBS implementation across the city, neither good local business models facilitating the use of NBS.

Table 3: City of Gladsaxe demo site baseline status

URBAN
There are large non-permeable areas at the site: Impermeable surfaces are approx. 5200 m^2, permeable surfaces are approx. 7100 m^2. Area covered by trees only approx. 1900 m^2
Kids sport playgrounds are made on hard, non-permeable material.
The areas are not planned to serve as multifunctional. There are not many areas on site that can serve as places for outdoor physical activity.
The area is accessible via pedestrian and cycling routes, and it does not have any obstacles. However, the demo site itself does not have proper walking lanes (although there is a possibility of connecting it to the several surrounding areas for that purpose). The area of the site does not have cycling lanes.
The safety of the area is good during the day, but it is compromised during the night-time due to poor lighting.
The area is private residential, and accessible to residents of surrounding buildings and their guests. It has no environmental interactions with the immediate neighbourhood.

The outdoor facilities are designed in a way to keep maintenance simple and fast. This makes it possible for one person to keep and service the 117 departments and outdoor space. Facilities on site are worn-out, but well maintained.
There are no enclosed areas for pets on the site.
There are no plans for additional construction as the area is fully developed. However, there is a recreative potential (not adequately utilized) of green corridors close to the site.

ENVIRONMENTAL
According to the Danish Metrological Institute Denmark climate changes will include more precipitation mostly in the winter half-year, longer periods with the same weather type. The traditional changing Danish weather will likely be less changing. It is expected that periods with draft will be occurring, especially in the spring and the summer. Additionally, higher temperatures are expected all year round.
The area is probably not affected by the UHI effect, although it has not previously been investigated. However, as climate changes are expected to affect the area, new planning will require resilience to climate change from all new interventions and NBSs.
There are large areas without greenery on the site (euPOLIS plans for the site include many different functions). The trees and other greenery species are not yet identified and assessed.
There is no adequate NBS shading for buildings or pedestrians present on the site.
Surface water is managed in only a few spots on the site; however, it is not sufficient. There have been multiple events with pluvial flooding of hallways and basements in the western block due to heavy rainfall (and low permeable soil – heavy clay-soil).
The ongoing DAMP project introduces a new approach to handle rainwater local in urban context. The facility store and expose water at the terrain.
In general, the soil in the area consists of healthy heavy clay-soil, which on are affecting the secondary groundwater levels, thus creating risk of localized flooding.
The biodiversity enhancement activities have started but are not yet sufficient. At this stage there is no comprehensive monitoring of the biodiversity on the project site.
There are increased risks of animal collision if e.g., amphibians coming from neighbouring area cross the road to colonise the new NBS in the project sites.
The plants present on the site are mostly ornamental plants. Only a few of them are local plant species. The overall biodiversity present in Pileparken is poor, and the area is professionally managed, thus not allowing wild plants to colonise and attract more insects.
The air quality of the area is good (i.e., gasses, particulate matter, allergens).
The renewable energy is presently not used on the site.
Gladsaxe Municipality is at present working on a fully updated status on achieving the set recycling targets within the different categories of solid waste, that is sorted and collected in the municipality.
A new wastewater plan for the municipality of Gladsaxe is in a public hearing. If the plan gets adopted, there will be new demands that all rainwater must be separated from the grey wastewater.
There is no urban gardening with food production in Gladsaxe. The Municipality has established five demonstration gardens in the neighbourhood of this residential district.

SOCIAL
The area is characterized by a lack of socializing activities – with introvert families, and there is a lot of segregated living.
There are nice green areas that do not have a small resting or socializing points / facilities.
The placement of the trees does not really invite the people to use the area for leisure, besides the playground for children. The interactions between human and nature are not existing besides the aesthetics. The "social innovator" has already been introduced at the demo site
There are sporadic visitors at demo site from neighbouring societies, predominantly youngsters to practice sports
There is only one, not large enough, public socializing spot on the site. Generally, there are no public meeting places in the area. At the site, the residents can borrow the common space in one of the residential blocks
It is not fully understood at this point what is the sense of place attachment for the residents.
Residents are showing low willingness to participate in different social activities.
The cultural potential of the site is limited by fact, that it is a private residential area. Historically, there is a culture of excluding the neighbourhood from the site, but children and young people from the neighbourhood are occasionally using the football lane.
The municipality offers a wide range of activities through local associations. The municipality have a webpage giving an overview of possibilities: https://prod.workforce-planner.dk/Booking/#!/associationList
There are no information & communication systems presently developed on the site.

BUSINESS
There is a small grill / hot-dog stand on the site.
There are very few cafes, pubs, and restaurants in the surrounding area, which do not offer outdoor servings.
The Municipality has produced the Green Guide as a local environmental guide that advises on green behaviour in the way of living, using and consuming. This is done by providing practical help for self-help in the form of a local inspiration and guidance service. One such advice is that citizens should collect the food waste locally. This can in the long term become a valuable resource.
The conventional market potential of the site is limited. The local potential will be the empowerment of the residents which will create a positive social spiral.
The local positions are that the retail potential is not relevant to the site.

Table 4: City of Belgrade demo site Usce part, baseline status

URBAN
There are residential buildings adjacent to the site at the north-western side.
The permeable area of the site is 42.888 m^2, the non-permeable area is 4123 m^2 and the area covered by trees is approx. 1950 m^2.
There are currently no permanent structures on the site.
The land capacity around this park section is almost fully used.

This park section has a pedestrian walkway on the river quay, which overlaps with the cycling path, and is used by wheelchairs and strollers, which causes multiple user conflicts. Park area is not so well equipped with pedestrian paths, but people rather walk freely.
The City applies regular maintenance throughout the Usce park area, however the quality can be improved.
The places on the site are not planned as multifunctional. There are designated areas for recreation (walking, running, cycling), some children playgrounds, free climbing artificial rock, two small street basketball courts, small outdoor gym, etc.
The Park is very well connected to the rest of the City with numerous transport options (e.g., public buses, taxis, bicycle paths, etc.).
The safety in the area mostly good during the day (i.e., high visibility, good maintenance, accessibility), however at night-time it can be improved: there are parts of the site that are not illuminated sufficiently. There are safety cameras on the site, however they do not cover the entire area.
The area is very unique: it has access to the river Danube, there is a monumental diplomatic park "Friendship park" (trees planted by various diplomats visiting Yugoslavia and later Serbia), "Eternal flame" monument dedicated to military and civilian casualties in the NATO bombing of Serbia in 1999, different street-urban facilities for youth (such as a skate park), Museum of Contemporary Arts, etc.

ENVIRONMENTAL
Expected impacts of climate change in the area are a decrease in the number of rainy days, prolonged dry periods and increased daily mean temperature. The actual City data will have to be analysed for the more adequate estimate of these risks.
There is a presence of the UHI effect due to the wrong Albedo effect and materialization of streets and some walkways. Summertime temperatures are higher in the area up to 1 to 2 h after sunset.
The site is quite green; however, it is populated with non-functional greenery (not planned for wind protection, shading, not considering effects of biogenic VOCs on PH & WB, etc.). There are trees on the site, however they do not cover large areas, and do not offer benefits planned to be achieved through objectives of the euPOLIS project.
Apart from a few zones, the shading is not adequate during the summer months. Shading is considered insufficient for the users' wellbeing.
There are no natural or engineered facilities for protection from winter winds.
There are two rivers adjacent to the site, but there are no water bodies on the actual demo site. There is plenty of good quality (e.g., low turbidity, low metals, etc.) groundwater on the site.
The area contains non-polluted, healthy soil. The nutrition quality of the soil will be established during the euPOLIS monitoring process.
There is no study on the extent of biodiversity in the area.
There is a source of air pollution and noise coming from the traffic on the large boulevard passing on one side of the site.
There is groundwater energy potential that was not exploited to date. There is also a wind energy potential due to the eastern Kosava wind (coming from Carpathian Mountains and over the river Danube). The average intensity of solar radiation in Belgrade is about 1400 kWh/m2/year, which is considered a high energy potential.
There are no public toilets.

There are currently no wastewater and site water management advanced solutions applied at this demo site. Wastewater from this and surrounding areas is discharged via city sewerage system directly to the rivers. There are no surface (runoff) water management features on the site.
The area has issues with faecal waste from pets. This type of waste is owner's responsibility; however, most ignore this regulation as it is not enforced.
The city of Belgrade is currently making efforts to introduce at least basic waste management principles at the city level. Hence, there is serious potential for waste management and recycling from demo sites as well. Due to the significant number of restaurants and residential buildings it is expected that there is significant quantity of organic waste, paper, cardboards, plastics, metal, and glass, all that can be used for recycling.
Presently, urban agriculture is not developed on this location and in Belgrade in general.

SOCIAL
The area has very versatile categories of visitors: elderly, families with children, youth, businesspeople, Roma, etc. during all times of the day and night, which seek recreation, socializing, nightlife, etc. It is expected that a vast number of these visitors might be interested in taking part in the euPOLIS project.
Many park visitors do not live in the area which might be the cause why they do not have a sense of place attachment, and behave irresponsibly toward park amenities (destroy, litter, etc.).
Park visitors who live in the near vicinity are closely interconnected, and often gather to plan community actions.
This Park section is less developed in terms of park equipment but does offer some interesting kids playing and sports facilities. There is an artificial free-climbing facility, and two basketball courts.
There is a river promenade that is a significant community socializing area. There are also a few river marinas next to the site, which gather a community of recreative fishermen. The river area is also a hub for kitesurfing, rowing, water sports, etc.
One part of this park has already been used for massive outdoor musical concerts and cultural gatherings. One of the most significant cultural buildings, the Museum of Contemporary Arts is in the park. This building is a large potential for diverse cultural events.
There is no organized information & communication technology system on the site.
The interaction between the City authority and citizens is only formal at present. There is no participatory planning in place.

BUSINESS
There is only a small number of ground-level shops and stands, which are either on the river quay, or close to the surrounding boulevards.
This part of the river embankment is much used for floating bars and restaurants.
The Usce park is already one of the most important Belgrade tourist and recreational destinations. The adjacent rivers contribute to the large extent of this demo site's business potential.
For this location master plan allows for introductions of commercial activities, located within removable or semi-permanent glass pavilions, designed in a way to not disrupt the landscaping and park facilities.
There is a potential for multiple temporary small retail facilities.

There are currently no established PPP models to involve the private sector in NBS implementation across the city, neither good local business models facilitating the use of NBS.

Table 5: City of Belgrade linear park demo site baseline status

URBAN, SOCIAL, ENVIRONMENTAL, BUSINESS
The Linear Park demo site baseline status is unused devastated area, waiting for the transformation into the attractive city park. The Linear Park will be constructed along the location of former industrial rail line. The approximate total length of the park will be 4200m. The euPOLIS demonstration zones are going to be sections 7 and 8, as demonstrated at the future site plan.

Table 6: City of Piraeus - Akti Dilaveri demo site baseline status

URBAN
The merging and consolidation of Mikrolimano and Akti Dilaveri areas, will create a continuous coastal front.
The renovation of the west part of Akti Dilaveri Channel is in the design phase
All sites are very densely built so the site's upgrade due to NBS will not give opportunities for new constructions.
Lack of green spaces and recreation areas (e.g., parks, meeting places, etc.)
In all sites the existing planting was not designed as a nature-based solution. The main purpose of the planting is ornamental.
Ruined sidewalks. Several paving slabs are broken. Tree roots have broken paving slabs.
Unsustainable urban mobility (e.g., disabled, pedestrians, children, the elderly, etc.)
There is not any pedestrian, jogging and bicycle paths. Although, there are sidewalks, some of those are not accessible to people with mobility problems.
Lack of lighting of public areas
Non-utilization of inactive public spaces and buildings
Different layers of construction have created unattractive walls that could potentially be reconstructed in view or in usage
Lack of parking spaces
The whole regeneration of the area could motivate the upgrade of existing properties; the potential relocation of some new citizens in these neighbourhoods could be possible too.
Irrigation system tampering and theft in some locations also contribute to planting maintenance problems.

ENVIRONMENTAL
There is no shading provided along Akti Dilaveri.
Present shading is considered insufficient for users.
There is Presence of Heat Island effect
Water availability issues in the broader area

Despite maintenance, many trees are in poor condition due to diseases. Small tree pits have contributed to the poor health condition of the trees. Shrub planting is inconsistent and, in some areas, missing. Some shrubs show signs of chlorosis on leaves and other shrubs are defoliated and in poor condition.
Along Akti Dilaveri the quality of the palms is medium, while the quality of the shrub planting is poor.
Pruning of shrubs along Akti Dilaveri takes place 3-4 times per year and pruning of palms once per year
There is no irrigation system along Akti Dilaveri and no watering takes place.
Along Akti Dilaveri the following species have been identified: Washingtonia, Phoenix canariensis and Nerium oleander.
Tree pits are small, and the surrounding impervious paving creates problems for tree longevity.
Though the selection of plants is appropriate for urban conditions the planting design varies increasing the need maintenance under conditions of limited available resources
There are no predictions of weather extremes and / or other phenomena caused by the climate change.
As a result of local landscape morphology and presence of vast body of water, no local weather extremes are to be expected.
There are no facilities for protection from winter winds
Water pollution issue in the inland canal across Akti Dilaveri
Presence of air pollution
Heavy traffic in the area
Presence of noise pollution
Water and wastewater treatment plants are centralised (not local), no wastewater recycling facilities.
Lack of cleanliness
Sweeping/brushing of impermeable surfaces takes place daily at all demo sites.
Frequency of cleaning Daily
It is illegal not to pick up dog faeces however dog owners are not responsible. Dog faeces are located on the paving and within the planting
There are trays for pet feed and drinking water within the planting beds

SOCIAL
Local restaurants and cafeterias are located along Akti Dilaveri and is used mainly for promenading.
Most sport/athletic clubs and unions are located in Akti Dilaveri
Akti Dilaveri Area, at limited existing facilities is used by residents and athletes on a regular basis, and visitors of the area, especially the weekends for leisure activities.
In Akti Dilaveri Area, there are facilities and activities of hyper-local interest, such as theatres, stadiums, the marina and the sailing clubs and of course coffee shops, bars and seafood restaurants
Delfinario Theatre and the Peace and Friendship Stadium are facilities of hyper-local interest
The area has many archaeological sites in the mainland and underwater, that have not been excavated
There are old buildings created before the 50s called “Mikrasiatika” and most of them being categorised as Cultural Heritage by the Greek Ministry of Culture.
Lack of green spaces and recreation areas (e.g., parks, meeting places, etc.)

There are no public information networks at the site
Many unions are located and are taking actions in the demo site area.
The Municipality of Piraeus, operates the Volunteer Office, aiming at the improvement of the quality of life in Piraeus, and in parallel contributing to the cultivation of solidarity among its residents.
The Municipality of Piraeus, since 2012, has commenced the implementation of a number of voluntary programs, through the Volunteer Office, aiming at the improvement of the quality of life in Piraeus, and in parallel contributing to the cultivation of solidarity among its residents.
The Public Benefit Municipal Enterprise of Piraeus (KODEP) implements a series of new social services to support vulnerable groups in the city, in the context of strengthening the municipal social solidarity structures of the Municipality of Piraeus.
The President of the 3rd Municipal Community of Piraeus is willing to contribute to the co-process and the implementation of the project, engaging the members of their communities, according to its requirements.
Local community may not know about NBS solutions in a technical level but when engaged they will definitely understand and accept the potential positive impact of the NBS solutions on their Health and Well-being.
The stakeholder's issues and concerns had never been discussed, in a sense euPOLIS proposes, before the euPOLIS project.

BUSINESS
Local restaurants and cafeterias are located along Akti Dilaveri and is used mainly for promenading.
There is not any organized market as Mikrolimano and Akti Dilaveri are mostly accommodating restaurants and cafés and the school complex won't change its orientation.
Mikrolimano Promenade and Akti Dilaveri (Areas 1 and 2) are coastal Areas that welcome every year thousands of visitors (both natives as well as tourists) due the large collection of (fine dining) restaurants and cafes.
The increase of visitors / users will enhance the hyper local character of the area and will leverage its economic development.
There is no nursery for the production of plants.
The increase of visitors / users is possible to motivate any kind of entrepreneurship in the area, too. The retail prices of the areas 1 and 2 will rise due to the recreation of both areas, especially the rental prices of the shops.
The whole regeneration of the area could motivate the upgrade of existing properties; the potential relocation of some new citizens in these neighbourhoods could be possible too.

Table 7: City of Piraeus - Ralleion school demo site baseline status

URBAN
All sites are very densely built so the site's upgrade due to NBS will not give opportunities for new constructions.
Lack of green spaces and recreation areas (parks, meeting places, etc.)
In all sites the existing planting was not designed as a nature-based solution. The main purpose of the planting is ornamental.
Ruined sidewalks. Several paving slabs are broken. Tree roots have broken paving slabs.
Street furniture adjacent to school in poor condition
Unsustainable urban mobility (disabled, pedestrians, children, the elderly, etc.)
There are no pedestrian, jogging and bicycle paths. Although, there are sidewalks, some of those are not accessible to people with mobility problems.
Lack of lighting of public areas
Lack of parking spaces

ENVIRONMENTAL
There is no data on the soil quality of the planting beds. Some shrubs show signs of chlorosis on leaves.
There are not any major shading issues.
Shading is limited in the morning hours near the entrance at the Ralleion School complex. In the remaining surrounding green spaces, no shading is provided.
There is Presence of Heat Island effect
Water availability issues in the broader area
Despite maintenance, many trees are in poor condition due to diseases. Small tree pits have contributed in the poor health condition of the trees. One tree is dead. Shrub planting is inconsistent and, in some areas, missing. Some shrubs show signs of chlorosis on leaves and other shrubs are defoliated and in poor condition.
The quality of the shrub planting surrounding Ralleion School complex is medium, while the quality of some trees is poor due to diseases.
Pruning of shrubs surrounding Ralleion School complex takes places 3-4 times per year and pruning of trees once per year
A drip irrigation system is used to water the shrubs surrounding Ralleion School complex while trees are not irrigated.
Biodiversity is limited throughout the demo sites.
Near the Ralleion School Complex the following species have been identified Nerium oleander, Ficus sp., Populus nigra, Ailanthus altissima, etc.
Tree pits are small, and the surrounding impervious paving creates problems for tree longevity.
Though the selection of plants is appropriate for urban conditions the planting design varies increasing the need maintenance under conditions of limited available resources
There are no predictions of weather extremes and / or other phenomena caused by the climate change.
As a result of local landscape morphology and presence of vast body of water, no local weather extremes are to be expected.

There are no facilities for protection from winter winds
Ralleion School Complex is built near a major avenue so there is lots of traffic, noise, and air pollution due to the dense built environment
The school complex has toilets only for its users. There are no other public toilets. All toilets are conventional with water flushing.
Water and wastewater treatment plants are centralised (not local), no wastewater recycling facilities.
Solid waste collection is central
A waste recycling unit located on one of the Ralleion School boundaries.
Sweeping/brushing of impermeable surfaces takes place daily at all demo sites.
Frequency of cleaning Daily
It is illegal not to pick up dog faeces however dog owners are not responsible. Dog faeces are located on the paving and within the planting.
There are trays for pet feed and drinking water within the planting beds.
This demo site does not any local renewable energy sources

SOCIAL
A seating area is located at the entrance of the Ralleion School complex used mainly by parents during pick up times. The remaining green spaces surrounding the Ralleion School complex are used for walking dogs, seating and to traverse between destinations.
Parents & Teachers association of Ralleion Primary schools of Piraeus will be the representative for the Ralleion demo site.
Ralleion School has an environmental union for educational purposes, where pupils / students are learning about the environment protection, plant cultivation methods, etc.
The area is a school complex so there does not seem to be any major cultural development apart from school festivities
There are no public information networks at the site
The Culture, Sport and Youth Organisation (OPAN PIRAEUS) is charged with the responsibility of promoting sport and awareness of social and cultural issues among all citizens, and youth in particular.
The President of the Ralleion educational community is willing to contribute to the co-process and the implementation of the project, engaging the members of their communities, according to its requirements.
Local community may not know about NBS solutions in a technical level but when engaged they will definitely understand and accept the potential positive impact of the NBS solutions.
The stakeholder's issues and concerns had never been discussed, before the euPOLIS approach.

BUSINESS
There is no nursery for the production of plants.

3.2.2 The "Demo sites "Advanced status" concept

To facilitate an advanced and detailed status assessment at each demo site, it was necessary to produce a common template - the "Demo sites Advanced status" - which is based on contextual challenges, themes, and indicators. For this purpose, WP4 workgroups, in coordination with Task 3.2 and Task 8.1 team have developed a set of templates defining the Challenges, Themes and the resulting CIs in four distinct categories, i.e., the urban, the social, the environmental, and the business. At this stage, the fifth category was also added, to define impact of demo sites baseline status on PH&WB. The sources for defining Challenges, Themes and CIs are provided in Table 8. They reflect gathered information and relevant euPOLIS paradigm components. The Advanced Baseline will be used for site screening at each of the considered demo-locations, and for integrating its findings into the "Site requirements". This process will be completed, for each demo site, in the T3.3.

To define "Advanced status" for each FR city pilot site, the CIs need to be quantified for each site. This process will be accomplished through the parallel activities undertaken in T3.3 and T8.1. Within Task 3.3, CIs will be customized to each demo site and quantified to the extent possible, using the available data. Following this process, the customized CIs combined with results from the Gaps Analysis undertaken in Task 3.1 and GDPM completed in Task 3.2, will yield the demo site requirements, which will be later on exploited in the euPOLIS urban planning process. The further refinement of the CIs will take place in WP4.

Table 8: Challenges, Themes and Contextual identification data sources

	Contextual indicators sources:
1	Demo sites Baseline status
2	Stakeholders concerns and technical information – Answers on Q1, Q2, Q3 and other communicated data from FR cities
3	Extensive review of the international literature so as to obtain the definitions of Contextual Indicators
4	Original Project Description - Table 1. NBS interventions at the demo sites, affected KPI's and impacts on PH & WB
5	Original Project Description - Cities case studies (item 1.3.1.5 from GA)

4. The euPOLIS project Indicators

4.1 Overview and types of euPOLIS Indicators

The euPOLIS project includes the following three different types of indicators: CIs, EIs and KPI's.

i. The CIs are introduced to define the site's diagnosis in five specified urban living categories (see Section 3.2.2)

ii. The EIs will be identified in WP4 for the potential demo site interventions specified within the GDPM system, with an aim to assess the impact of implemented NBSs. Their aggregated values will ultimately be utilized to determine the project results, namely the euPOLIS urban planning results. The identification of EIs follows the completion of provisional GDPM, and it is out of the scope of this deliverable.

iii. The KPI's are specified in the original project proposal. The role of KPI's in the euPOLIS project is two-fold: (a) to establish the project strategic goals and (b) to define the actual qualitative impact of the euPOLIS interventions.

Figure 2 Illustrates the basic categorization of the KPI functions utilized in the GDPM.

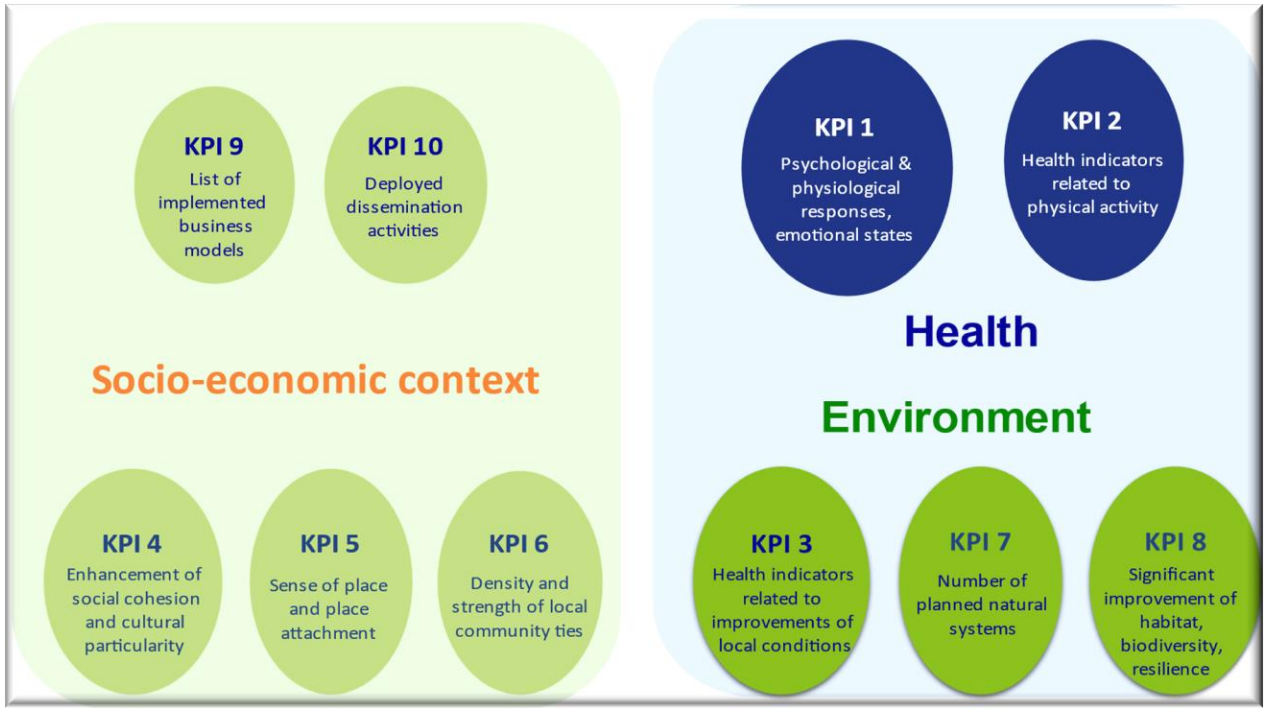

Figure 2: KPI's functions utilized in the GDPM

4.2 Indicators Identification process

4.2.1 CIs concept

To identify the CIs, it was necessary to create the set of Challenges and Themes, initially for all sites and subsequently (for indicators identification purposes) separately for each demo site.

4.2.2 Challenges and Themes as a basis for CIs

The Challenges and Themes have multiple functions in the euPOLIS planning system; they are used to accomplish an overall demo site diagnosis (site screening) with regards to the PH & WB, to identify the CIs, as well as to be used as input data for the construction of the GDPM system, thus indirectly influencing the identification of evaluation indicators (Annex 1).

4.2.3 The CIs identification

The CIs help to understand what the key issues need to be addressed in demo site with relevant NBS, e.g., people with respiratory diseases, an extensive heat island effect, an area that is prone to flooding, an area with water scarcity, number of days with temperatures above 30^{o}C, incidence of respiratory diseases, mean monthly concentration of NOx, number of days when NOx concentration exceeds specific thresholds, etc. In WP 4, CIs along with Challenges and Themes serve as a basis for developing EIs in tasks 4.1 – 4.4, where some CIs might be refined to a lower scale, both spatial and temporal, to provide an adequate tool for NBS assessment by either monitoring, or modelling at a demo site level. The Task 8.1 will use CIs in the process of identifying the suitable indicators, metrics, and benchmarks against which NBS performance will be assessed in collaboration with stakeholders.

4.2.4 The EIs identification

The euPOLIS methodology of identifying EIs for each potential site intervention offers the apparent advantage of specifying case-specific indicators that are causally linked to the actual potential solutions that could be implemented at the site of interest.

The identification and evaluation of these specific indicators, as well as the quantification process of producing aggregated indicators (from EIs) to assess project KPI's, will take part at a later project stage, in WP4, WP5, WP6, WP7 and WP8. The aggregated value of the EIs related to each GDPM target will enable the evaluation of project results related to specific KPIs.

5. The euPOLIS project Goal Driven Planning Matrix – NBS planning tool

5.1 The GDPM concept

The state-of-the-art in the urban planning methodologies has a number of recognizable shortcomings, some of which are:

- The PH&WB criteria are not employed as important planning guidelines and / or criteria,
- The urban planning comprehensive challenges are not treated in a systemic and analytical manner,
- The systemic pre-planning optimization of alternative solutions, utilizing site synergies, is not exploited by the urban planning industry.

To mitigate above shortcomings the euPOLIS project uses Goal Driven Planning Matrix - a specific urban planning tool. Is helps to define NBS and the related improvement interventions at the demo sites, and it was developed as a part of the Task 3.2 activities.

5.2 GDPM role in the euPOLIS context

One of the euPOLIS core tasks was to improve the quality of the original KPI's specified for the project. For this to be achieved, the NB and NB related improvement interventions, have to be analyzed, determined, implemented, and evaluated. The euPOLIS GDPM was constructed to fulfil this purpose. The provisional GDPM was constructed as a systemic vehicle for delivering the euPOLIS project planning and evaluation process.

The euPOLIS GDPM, represents a provisional GDPM, containing information from all FR demo sites. As a result, this GDPM version outlines all the theoretically possible potential interventions that could be applied in the FR cities. The customization of this generic GDPM version for each demo site, that is foreseen in WP6, Workshop 1, will produce a list of potential interventions on a site-specific basis. Subsequently, EIs will be attached to each customized potential intervention, for the assessment of its performance and impact on related targets and goals.

The GDPM will have three basic functions within the euPOLIS project:

1. The initial specification of potential interventions, enabling cities to identify the gaps, as required in the Task 3.1,
2. The systemic preparation and completion of the design of NBS at the demo sites, and
3. The identification of the EIs for assessing the effectiveness of each of the proposed NBS interventions.

5.3 GDPM description

The GDPM system is composed of the following main sections:

1. Goals - these are the original project KPI's converted into GDPM Goals (Table 9).
2. The set of targets / challenges, developed for each goal, basically obtained from the KPI's components/ sub-functions (column 2, Table 9).
3. The set of concept solutions / potential interventions that is developed for each target as a set of practical activities designed to meet the target requirements.

4. As a final step of the GDPM design process, the adequate site NBS facilities (adjustment of existing or new ones) are designed (as part of the WP6) to support each one of the accepted concept solutions / interventions.

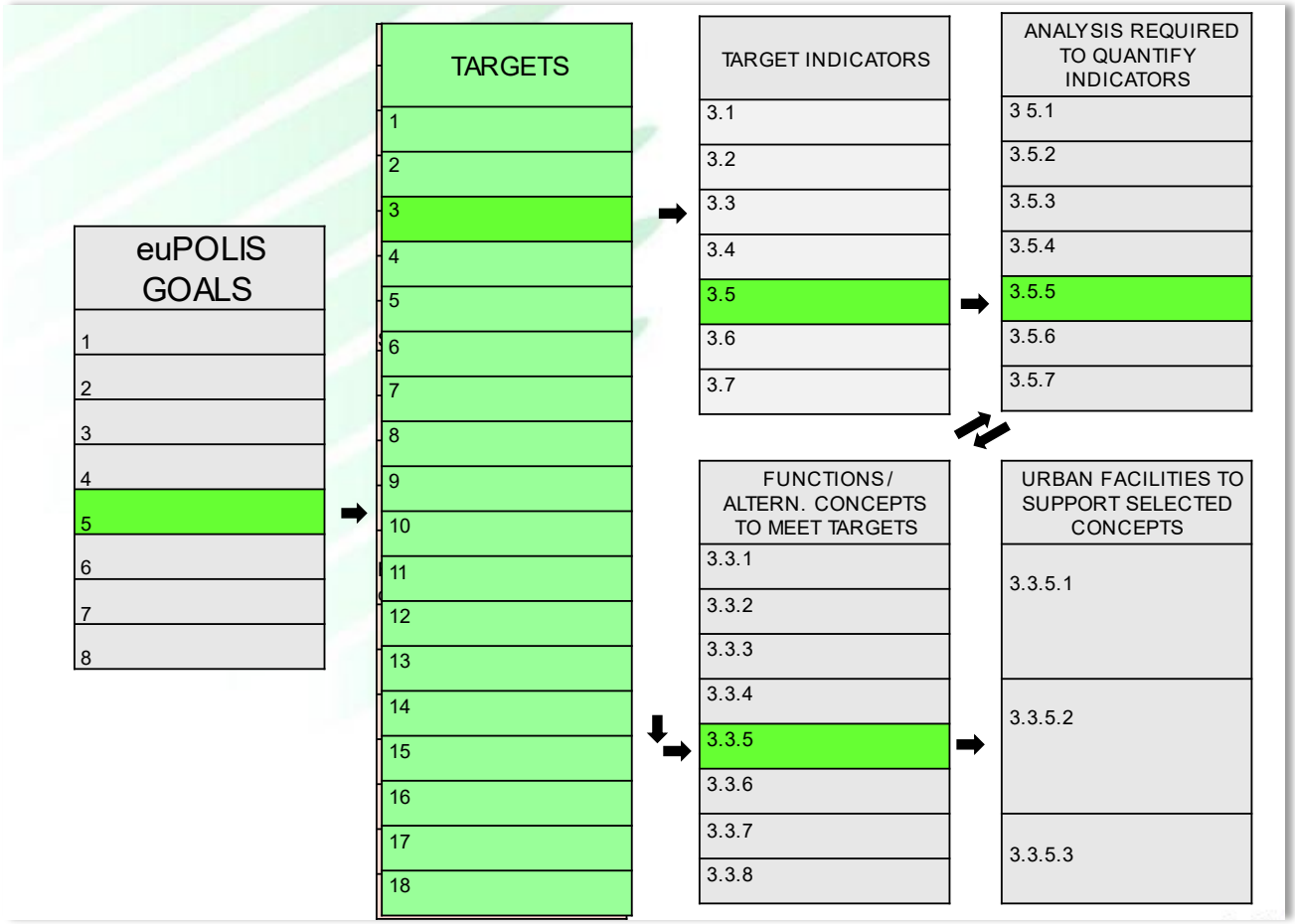

Figure 3: GDPM schematic

The KPIs conversion into the GDPM Goals is demonstrated in the Table 9.

Table 9: KPIs as GDPM Goals + site desired effects with potential positive impact on Targets

GDPM - Goal 1	
KPI_1 – Psychological and physiological responses, psycho-emotional states: Optimization of relevant psychophysiological parameters among users of re-designed public space, including the reduction of stress, depression, and anxiety levels;	
KPI sub-functions as GDPM Targets	Bases for site enhancement concept solutions / interventions (Site conditions /effects with potential impact on Targets)
Stress reduction	1.Location beauty, comfortable resting points, presence of biodiversity - urban green spaces (parks, playgrounds, and residential greenery).
	2.Presence of birdlife (positively affects mood and happiness levels)
	3.Relaxation areas, sheltered from noise
	4.Availability of spaces for physical activities
Depression reduction	1.Elements to draw visitors attention and improve their mood and provide enjoyment, such as location beauty, comfortable resting point, presence of biodiversity
	2.Inclusion in community socialisation and possibility to make new connections, through activities like community gardening
	3. Ecotherapy (a type of formal treatment which involves doing activities outside in nature)
	4.Connection with people with similar experiences (peer support)
Anxiety levels reduction	Security – passages, visibility, comfortable materialization, biophilic design and exposure to green spaces
GDPM - Goal 2	
KPI_2 – Health indicators related to physical activity (leisure activities including, e.g., walking, running, cycling, skateboarding). New activities related to an intervention, e.g., running in the new park, strolling along the new pedestrian street, etc.; Increased number and share of people involved in physical activity in the re-designed space, duration and diversity of indoor/outdoor physical activities	
KPI sub-functions as GDPM Targets	Bases for site enhancement concept solutions / interventions (Site conditions /effects with potential impact on Targets)
Physical activity - Walking	1. Optimal walking path length & width, and surface quality
	2. Adequate protection from weather extremes
	3. Adequate visibility, adequate shading and comfortable surface material
	4. Amenities to attract walkers (e.g., water fountain, seating areas, etc.)
Physical activity - Running	1. Optimal running path length & width, and surface quality
	2. Adequate protection from elements
	3. Adequate visibility, adequate shading and comfortable surface material

Physical activity - Cycling	1. Optimal cycling lanes length & width, and surface quality
	2. Adequate protection from elements
	3. Adequate visibility, adequate shading and comfortable surface material
Safety of users	No direct crossing between fast lanes, warning signs, day and night, for pedestrians and no "dead corners"
GDPM - Goal 3	
KPI_3 – Health indicators related to improvements of local conditions: Reducing the risk factors and number of incidence of non-communicable diseases (NCDs)and/or communicable diseases (CDs) through maintaining lower levels of noise and air pollution, moderate air temperature and offer exposure to a microflora in physiological range;	
KPI sub-functions as GDPM Targets	Bases for site enhancement concept solutions / interventions (Site conditions /effects with potential impact on Targets)
NCD incidence number	Acceptable levels of noise and air pollution, moderate air temperatures, exposure to a microflora in physiological range defined in:
	1. proximity of pollution sources
	2. existence of phytoremediation plants;
	3. amount and quality of green spaces (exposure to it);
	4. increased proximity to walking spaces (short distance);
	5. existence and proximity of recreation spaces with parks and playgrounds;
	6. natural protection from elements;
	7. access and permanent exposure to green spaces during various kinds of physical activities (vegetable and flower gardening at community and vertical gardens and green roofs, physical exercises…);
	8. network of pedestrian, "through nature", walkways.
CD incidence number	Acceptable levels of noise and air pollution, moderate air temperatures, exposure to a microflora in physiological range defined in:
	1. proximity of pollution sources
	2. existence of phytoremediation plants;
	3. amount and quality of green spaces (exposure to it);
	4. increased proximity to walking spaces;
	5. existence and proximity of recreation spaces with parks and playgrounds;
	6. natural protection from elements;
	7. access and permanent exposure to green spaces during various kinds of physical activities (e.g., vegetable and flower gardening at community and vertical gardens and green roofs, physical exercises, etc.);
	8. network of pedestrian, "through nature", walkways.

GDPM - Goal 4	
KPI_4–Enhancement of social cohesion and cultural particularity through ensuring sense of security and inclusion for all (with focus on gender and age equality as well as newcomers integration) allowing for the strengthening of exploratory and socializing/culture behaviours among users: Increased use of public space – both during the day and in the evenings; Increased presence of women, children, senior citizens and disabled persons as well as newcomers/migrants; Higher generational, gender and ethnic diversity visible in public spaces; New group activities engaging previously non-active community members; Significant number of local inhabitants (target > 200) taking part in project activities; Increased engagement of citizens and local authorities during the participatory processes;	
KPI sub-functions as GDPM Targets	Bases for site enhancement concept solutions / interventions (Site conditions /effects with potential impact on Targets)
Increased use of public spaces	1. Increased number and quality of comfortable public places (enlarge existing or introduce new)
	2. Increase number of inclusive amenities and services
	3. Creation of different POIs
	4. introduce facilities for diurnal and nocturnal use of space
Higher ethnic and gender diversity	1. Introduce missing facilities for different gender and groups of people (utilize BGS “gender planning criteria)
	2. Promote it in public
Strong participatory process (target>200)	1. Introduce systemic, comprehensive collaborative planning process
	2. Identify measures that will enhance citizens trust in institutions
GDPM - Goal 5	
KPI_5–Sense of place and place attachment among users: Data from quantitative and qualitative studies showing an increased positive emotional attachment to the neighbourhood as well as re-designed public space; Increase feeling of responsibility and ownership among community members; increased sense of pride of being part of local community;	
KPI sub-functions as GDPM Targets	Bases for site enhancement concept solutions / interventions (Site conditions /effects with potential impact on Targets)
Emotional attachment	1.Apply planning system where citizens are heard, and their proposals become visible
	2. Introduce visually appealing public gardens and parks, natural spaces, urban farms or collective gardens, green roofs and walls, blue spaces, and biodiversity
Feeling of responsibility and ownership	1.Diverse groups of Citizens regular inclusion into whole planning and implementation process with defined responsibility and “ownership” towards demo site solutions
	2. Promote collaborative participation with this innovative element – the ownership of solutions
	3. Analyse with the city potential for citizens professional participation in running and maintenance of the site

	4.Introduce community gardening and urban farms run by citizens
Increased sense of pride	Organise public announcement of results from planning process on social media and other platforms, stressing citizens direct impact with their proposed solutions – specify their contributions to the final planning documents
GDPM - Goal 6	
KPI_6 – Density and strength of local community ties: Higher trust in local community members; New forms of neighbourly exchange, neighbourhood engagement and cooperation; Emergence of local leaders and social entrepreneurs; Increased feeling of community efficacy;	
KPI sub-functions as GDPM Targets	Bases for site enhancement concept solutions / interventions (Site conditions /effects with potential impact on Targets)
Higher trust in local community members	Improve level and quality of communication between citizens and planning bodies in defining site requirements, make detailed participation plan with city
New forms of neighbourly exchange - neighbourhood engagement and cooperation	1.Introduce higher level and quality of communication on site planning (neighbourhood exchange) – organize citizens
	2.Organize joint work on urban farms and other joint work at site connected to NBS development
	3.Organize cultural events
Emergence of local leaders and social entrepreneurs	Invite citizens to actively engage in organizing social events
Increased feeling of community efficacy	Organise wide city public access to results from joint community activities: planning, farming, cultural events
GDPM - Goal 7	
KPI_7 – Number of planned natural systems: Quantified improvements of local conditions by implemented NBS such as microclimate control (measurable improvements in local outdoor microclimate conditions; # of kWh of energy saved through HI effect reduction);	
KPI sub-functions as GDPM Targets	Bases for site enhancement concept solutions / interventions (Site conditions /effects with potential impact on Targets)
Microclimate improvement	Systemic, multifunctional, comprehensive NBS solutions for the microclimate improvements compared to surroundings – minimum intervention areas:
	1.direct and diffuse radiation on surfaces - shading,
	2.utilization of prevailing winds for air cooling,
	3.wind chill effect control
	4. evapotranspiration
	5.natural water cooling

Energy saving in immediate neighbourhood	Create demonstration site urban components affecting energy consumption in the neighbouring buildings.
	Estimate of site NBS's present impact on buildings from: shading, direct and indirect radiation, thermal conductivity, and convection (adiabatic air cooling and wind effect reduction in winter) – (unit: estimated percentage of energy savings at: 1. north, 2. south, 3. east, 4. west side of the site)
GDPM - Goal 8	
KPI_8 – Significant improvement of habitat, biodiversity, resilience, Ecosystems (ES) in case studies: The list of Regenerated ES and resulting effects; 30% improvement of ecological status at each case study; The list of resilience measures and their expected results, € savings in case of weather extremes;	
KPI sub-functions as GDPM Targets	Bases for site enhancement concept solutions / interventions (Site conditions /effects with potential impact on Targets)
1.ESS Provisioning functions (e.g., provision of clean air, food, raw materials, etc.)	Introduce comprehensive, multifunctional NBS system, purposely designed to enhance ESS quality and intensity significantly contributing to PH&WB and site resilience
2.ESS Regulating functions (e.g., water purification, soil quality, microclimate, etc.)	
3.Socio-Cultural ESS (e.g., facilities for mental and physical health, positive emotional experience and sense of place, etc.)	
Ecological environment status / effects	With NBS enhance quality of site ecology conducive to enhanced PH&WB
Site components / functions with climate resilience at extreme conditions effects	Improve quality of site components related to PH&WB function. Additionally, based on existing city / site vulnerability study introduce additional site resilience measures to cope with extreme weather conditions
GDPM - Goal 9	
KPI_9 – List of activated/implemented business models: Number of new marketable products and/or new business initiatives, such as urban farms, food coops, social entrepreneurships, start-ups (>5 new products and >3 new businesses); Number of businesses that master and adopt new BGS paradigm and tools (>5 new trained);	
KPI sub-functions as GDPM Targets	Bases for site enhancement concept solutions / interventions (Site conditions /effects with potential impact on Targets)
Demonstration Site related, new business initiatives	1- Utilize business activation matrix to test site business activation potentials as creation of:
	urban farms, food coops, social entrepreneurships, tourist initiatives,

	site maintenance
	site tourism
	other small and medium business ventures
	2. Analysis of site related existing business initiatives / activities for compatibility with euPOLIS targets
Number of new marketable products	Food, expensive flowers, aromatic plants, herbal plants, tourist offers, …etc
Number of neighbourhood businesses that master and adopt new BGS paradigm and tools	Introduce site overall quality contributing to neighbourhood Companies employees' comfort, energy savings and other direct benefits
	Investigate whether neighbourhood Companies would be interested in utilizing BGS as own business drivers and/or NBS financing

5.4 GDPM Inputs & outputs

The data and information sources for identification of Goals & Targets, as well as the GDPM outputs, are presented in Fig. 4.

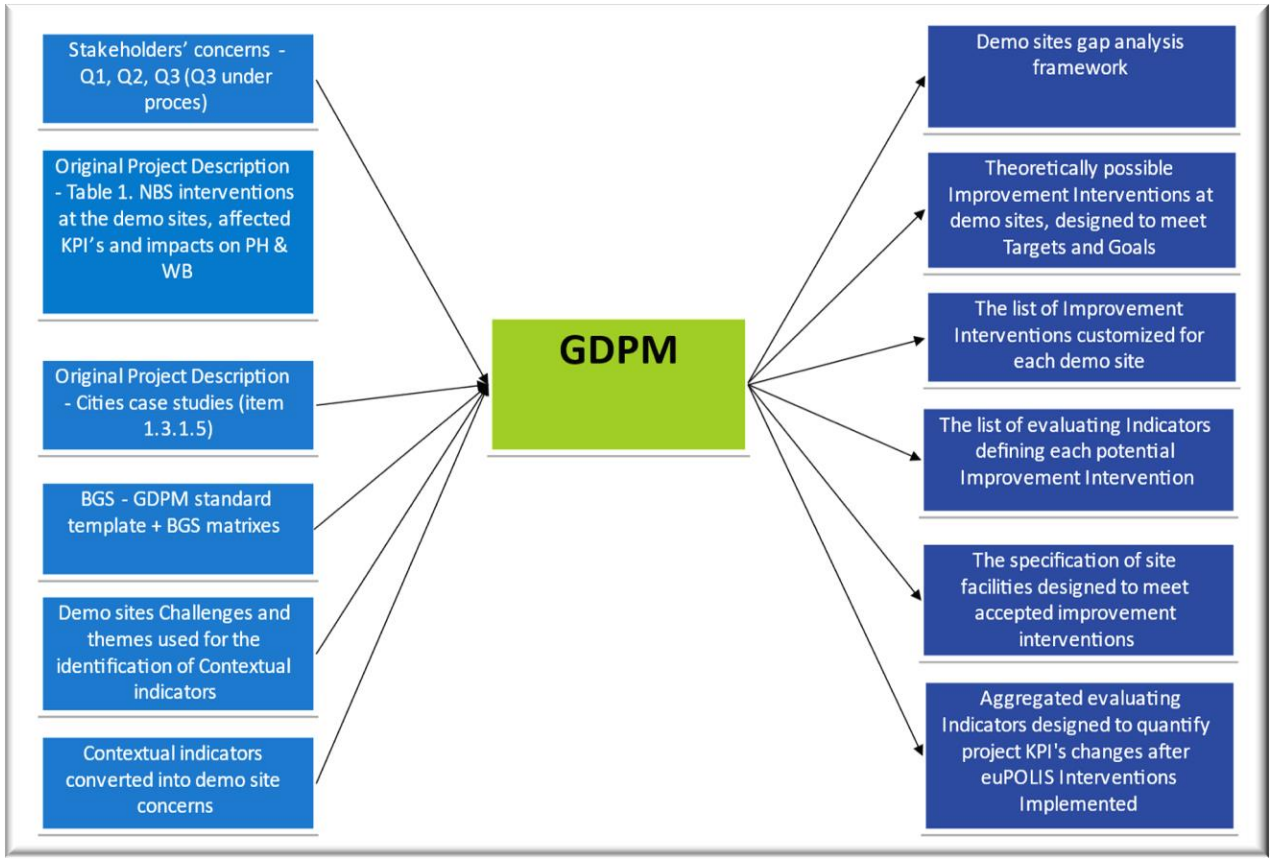

Figure 4: GDPM-Inputs & outputs

5.5 GDPM construction process

Table 9 was constructed in order to demonstrate that systemic preparation for the design of NBS's at the demo sites begins with the conversion of the project KPI's into GDPM Goals.

In this process, the KPI's are broken down into their main components / sub-functions (taken from KPI description). This process enables the planners to define, from these sub-functions, the basic GDPM Targets that will support the KPI's in an optimal manner. These sub functions are used to define the site conditions /effects with a potential impact on Targets.

In this way, the Table 9 produces initial information for the definition of Targets within the GDPM system.

5.6 Use of Challenges, Themes and CIs data in GDPM

Challenges, Themes and CIs developed for the five considered categories point out the necessity of undertaking a specific analysis towards the definition of potential improvement actions and are all incorporated into the GDPM system.

The additional targets, which were derived from the site Challenges & Themes, are added to the basic target list. This is done by means of a systemic screening of the originally constructed list of targets and proposed interventions, through the list of Challenges & Themes specified in the Tables 2 to 7, and the GDPM relevant adjustments to include these requirements as well.

The process of including the Contextual Indicators into the GDPM was completed by converting the Contextual Indicators into site "concerns", which were then used for the final adjustments of GDPM Targets and Interventions.

5.7 Provisional GDPM template

As a final result of the above-described process, the provisional GDPM template (see Annex 3) was completed, including the summarized input data and information obtained from all demo sites.

The provisional GDPM template contains all the theoretically possible interventions that could be implemented to address the relevant Targets. This integrated approach has been adopted to demonstrate for all cities a spectrum of possible solutions that might not have been included in their individual lists but could positively influence the demo site euPOLIS-driven regeneration.

Additionally, during the planning stage (WP6), the provisional GDPM template will be customized for each demo site to reflect the specific local conditions. This will be a duty of city planners and their supporting partners. The FR cities should also align the specified targets and potential interventions with the city planning strategies and the existing relevant documentation / regulations. Cities are also expected to add any desired interventions missing from the proposed GDPM list, which are likely to influence the demonstration sites impact on PH & WB.

6. Conclusion

This deliverable has clearly defined the framework for outlining baseline status/challenges at the demonstration cities (i.e., urban design, social, environmental, hydrological, etc.). The main stakeholders' concerns/problems (answers to Q1, Q2 and Q3, as well as information from project partners coming from their direct contacts with citizens) are entered into the euPOLIS' planning system by converting them into site requirements and subsequently into provisional PH and WB related goals and targets as a roadmap to the identification of a comprehensive set of site requirements. The D3.2 has identified the demo sites baseline status and relevant city functions related to PH & WB, also considering the projected impacts with regards to climate, weather and water resilience, and urban regeneration. These baselines will be used at a later stage for comparing the improvement attained after the NBS deployment. The provisional GDPM was produced for demonstration sites in order to formulate a system which would reveal a path for addressing stakeholders' requirements in an appropriate manner.

Challenges and lessons learned from the indicators' definition process:

- The main Task 3.2 challenge was to identify a methodology for aggregation of different sources and types of complex urban environment impact on a set of indicators, given that the available international literature is not offering practical solutions for such a problem. D3.2 summarises the novel methodology proposed for addressing lack of a coherent framework in NBS-based urban planning, which is expected to be revisited and further elaborated during the implementation of WP4, WP5, WP6, WP7 and WP8.
- Cities routine thinking, management, and urban planning proved to be another challenge for the euPOLIS project in general, and Task 3.2 was no exception. On a positive note, the first city reactions to the euPOLIS approach were encouraging. The practical test will take place during the customisation process of indicators templates in Task 3.3. The level of acceptance for the proposed methodology is anticipated to also increase further following its full utilisation at demo sites during WP6 and the proof-of-concept which will be showcased during WP8.

Data available from stakeholder's and cities' inputs, collected so far, indicate that FR cities are at different levels of preparedness for planning and implementing NBSs (policy wise, availability of monitored/ reported data across different categories and scales, citizen engagement, etc.).

In terms of urban category, all FR cities have a similar level of data availability, which is at least at the municipality level. Multifunctionality and accessibility (pedestrian, cycling, wheelchair, and stroller paths) are identified in all cities to be the most challenging urban development features.

In terms of environmental category, the data mostly exists at the city level, some at national, and all cities lack local data on status of greenery and biodiversity. Cities differ most in terms of air quality (well correlated with urban density at demo location): Piraeus, Belgrade, Lodz, Gladsaxe (starting with poor going to good).

In terms of social category, FR cities differ mostly in demographic diversity of demo site potential users (which is well correlated with site size): Gladsaxe, Lodz, Piraeus, Belgrade (starting with low going to high).

In addition, participatory processes (citizen engagement) already implemented in the cities vary substantially, with Lodz being the most advanced, followed by Gladsaxe and Piraeus being medium, and Belgrade having the lowest level. In terms of business category, the greatest potential for new ventures is available in Belgrade and Piraeus (which have the most diverse users), followed by Lodz with a medium size lot and diversity, and Gladsaxe being very limited, due to low user diversity and private-only access to the site.

Annexes

A1. Challenges, Themes and contextual indicators tables
A2. Contextual Indicators conversion into site concerns
A3. The Provisional Goal Driven Planning Matrix

A1. Challenges, Themes and Contextual Indicators

Table 10: Urban Development Challenges and Themes

	Challenge 1	**Challenge 2**	**Challenge 3**	**Challenge 6**
	Multifunctionality	Accessibility	Safety	Identity
Theme 1	Blue-Green Spaces	Public transport	Urban lighting	Heritage
Theme 2	Sustainability	Private vehicles	Visibility	Unique spatial elements
Theme 3	Land Use efficiency	Pedestrians	Protections	Visibility
Theme 4	Amenities	Bicycles	Universal access.	Esthetics
Theme 5	Flexibility	Personal transport	Orientation	Sustainability
Theme 6	Interactivity	Universal access.	Maintenance	Materials

	Challenge 4	**Challenge 5**	**Challenge 6**	**Challenge 7**
	Impact	Density	Demography	BGS Planning Approach
Theme 1	Scalability	Accommodations	Ageing	Vision
Theme 2	Connectivity	Intensity	Population mobility	Legislation
Theme 3	Direct/indirect effects	Frequency	Floating Population	Participation
Theme 4	Interactivity	Sustainability		Implementation
Theme 5	Urban Spillover	Seasonability		Management
Theme 6		Diurnal/nocturnal		

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Table 11: List of Urban Contextual Indicators

No	Variable / Parameter name	Scale	Units	Data source examples / guidance
1	Surface area of demo-site	Site	km2	euPOLIS Questionnaire Q2, data provided by cities, maps
2	Average green space per inhabitant	Site	km2/in	euPOLIS Questionnaire Q2, data provided by cities, maps
3	Number of houses	Site	Units	euPOLIS Questionnaire Q2, data provided by cities, maps
4	Functional diversity of adjacent buildings	Site	<2; 3-5; 6>	euPOLIS Questionnaire Q2, data provided by cities, maps
5	Accessibility. Measure of the ease of reaching (and interacting with) destinations or activities distributed in space (DS)	Site	High/Medium /Low	This indicator includes both pedestrian and transport accessibility. euPOLIS Questionnaire Q1 and Q2, data provided by cities, maps
6	Frequency of public transport service	Site	High/Medium/Low	euPOLIS Questionnaire Q2, data provided by cities, maps
7	Urban open space coverage	Site	%	euPOLIS Questionnaire Q2, data provided by cities, maps
8	Presence of obstacles in the use of the public space	Site	Absence - Presence (N°)	euPOLIS Questionnaire Q2, data provided by cities, maps analysis
9	Presence of unique spatial elements (sculptures, monuments etc.)	Site	Absence - Presence (N°)	This indicator relates to the space's identity and recognizability. euPOLIS Questionnaire Q1 and Q2, data provided by cities, maps
10	Life expectancy	City	Years	www.data.oecd.org This variable can also be calculated through the indicator: Proportion of people aged above 60 years (%)

Table 12: Environmental Challenges and Themes

	Challenge 1	**Challenge 2**	**Challenge 3**	**Challenge 4**
	Climatic Resilience	Water Management	Circular economy	Integrity (or Biodiversity loss) habitat fragmentation
Theme 1	UHI, Thermal comfort & Air Cooling	Runoff & Flooding / Urban Drainage	Biomass used on place	Soil vitality
Theme 2	Energy consumption / GHG emissions	Water availability (surface & GW) & consumption	Water reuse	Species diversity
Theme 3	Carbon sequestration	Sanitation / Wastewater Treatment	Energy recovery	Habitat connectivity and reduced fragmentation
Theme 4			Waste/Material reuse	Habitat type creation and restoration

	Challenge 5	**Challenge 6**
	(environmental) Pollution	Access to ecosystem services
Theme 1	Air Quality	Green space availability
Theme 2	Water quality	Green space accessibility
Theme 3	Noise pollution	Formal / informal greenery
Theme 4	Light pollution	BGI & human activities (or service functions?)

Table 13: List of Environmental Contextual Indicators

No	Contextual indicator	Variable / Parameter name	Scale	Units	Data source examples / guidance
1	Heat Risk (Number of combined tropical nights (>20° C) and hot days (>35° C))	Maximum and minimum daily temperature (timeseries)	City Level	deg C	Local climatic data from closest meteorological station
2	Freshwater scarcity (EEA WEI+)	Data / Information related to freshwater scarcity in the respective catchment where the site is located	River basin	Qualitative	- Water Resources Assessment report/study - RBD Data (WFD) data
3	Groundwater scarcity (EEA WEI+)	Data / Information related to groundwater scarcity in the respective aquifer where the site is located	Local aquifer	Qualitative	- Water Resources Assessment (Groundwater) report/study, - RBD Data (WFD) data
4	Groundwater salinization / Seawater intrusion	Data / Information related to potential salinisation issues in the respective aquifer where the site is located	Local aquifer	Qualitative	- Water Resources Assessment (Groundwater) report/study, - RBD Data (WFD) data
5	River & sea floods (% of the area that would flood for a specific return period)	Flood Risk Assessment for the sites or the greater area including them	Site Level or catchment	Qualitative	- Local Flood Risk Assessment report/study, - EU Flood Directives Preliminary Flood Risk Assessment
6	Urban Drainage Flooding (% of impervious area)	% of impervious areas on site	Site Level	%	Local land cover data / maps
7	Surface water quality (surface water quality status relevant to ecological and chemical characteristics). In case of water quality measurement for a specific water body near/on site, please include this local assessment too	Information on the water quality of surface water bodies on site or the broader area	River basin (or site level if applicable)	Qualitative	- Water Quality Assessment (surface water) report / study / database - RBD Data (WFD) data

8	Groundwater quality (groundwater quality status relevant to chemical characteristics)	Information on the water quality of groundwater bodies / local aquifers	Local aquifer	Qualitative	- Water Quality Assessment (groundwater) report / study / database - RBD Data (WFD) data
9	Climate change adaptation (existence of environmental policies in general)		National / District Level		National data
10	Wastewater treatment coverage (% of WW treated)	Wastewater treatment coverage (% of WW treated)	City / Urban Water Zone Level	%	Local data, probably from water / wastewater utilities
11	Level of wastewater treatment	Level of wastewater treatment (e.g., primary, secondary, tertiary, etc.)	City / Neighborhood Level	Descriptive	Local data, probably from water / wastewater utilities
12	Air Quality	Air Quality data	City / neighborhood Level	concentration of pollutants	Local air-quality data from closest air-quality monitoring station (e.g., levels of PM10, PM2.5, NO2, O3, etc.)
13	Water reuse (on-site)	Information on Water reuse / alternative water sources used on site (central wastewater reuse, greywater recycling, rainwater harvesting, desalination)	Site Level	% or m3	Local available data

Table 14: Social Challenges and Themes

	Challenge 1	**Challenge 2**	**Challenge 3**	**Challenge 4**
	Inclusion for all. Used by various groups of people	Social cohesion	Sense of security	Diversity
Theme 1	seniors	Feeling as part of the community	making the space safe for women after the dark	The space is used by people of all genders and age
Theme 2	women	Trust towards the community	making the space safe for kids during the day.	The space is used by minorities
Theme 3	immigrants	Feeling of the community efficacy	making the space safe for people from minorities	The space is used by people of various incomes
Theme 4	low-income families			
Theme 5	kids			
Theme 6	people with disabilities			
	newcomers			

	Challenge 5	**Challenge 6**	**Challenge 7**	**Challenge 8**
	Accessibility	Sense of place and Place attachment	Citizen's willingness to participate	Activation of the whole community in participatory processes.
Theme 1	The space should be especially accessible for elderly people and people with disabilities	Place attachment	Whether citizens will be motivated to participate in longitudinal design studies but also in the project at all.	Education and substantive support of partners from FR Cities in the field of planning and conducting participatory processes
Theme 2	There is a space for kids of all ages (for example playground)	Sense of ownership of the space	Dropout rate of participants in longitudinal design study.	A wide information and promotion campaign about the project, tailored to the inhabitants of demo sites

Theme 3	The space should be well-connected in terms of public transport	Sense of pride in being part of the local community		participatory activities tailored to the specificity of the local area
Theme 4				A significant number of local inhabitants (target > 200) taking part in project activities;
Theme 5				Engagement in the local activates

	Challenge 9
	Strengthening local community ties / the effect of the NBS implementation on the community.
Theme 1	Whether the NBS implementation will have a lasting effect on trust, solidarity among the community, tolerance, and respect.
Theme 2	Interactions between various groups of users.

Table 15: List of Social Contextual Indicators

No	Variable / Parameter name	Scale	Units	Data source examples / guidance
1	Age and gender distribution in the neighborhood	Site, Neighborhood / (sub)municipality level		Available social, socio-demographic, or socio-economic reports, also Q1 questionnaire (but maybe very big scale)
2	Social status	Site, Neighborhood / (sub)municipality level		Available social, socio-demographic, or socio-economic reports, also Q1 questionnaire (but maybe very big scale)
3	Education level	Site or Neighborhood level compared to the municipality level		Available social reports, municipality data
4	Quality of education	Site or Neighborhood level compared to the municipality level		Available social reports, municipality data
5	Unemployment	Site or Neighborhood level compared to the municipality level	% of people without a job	Available socio-economic reports, municipality data
6	Sectors of the employment (main sectors of employment)	Site or Neighborhood level	% of people employed in specific sectors	Available socio-economic reports, municipality data
7	Economic situation of households (average income of the household)	Site or Neighborhood level compared to the municipality level	Local currency	Available socio-economic reports, municipality data
8	Type of housing arrangement (type of residency)	Site or Neighborhood level compared to the municipality level	% of people living in a given category of housing arrangements	Available social reports, municipality data

9	Life expectancy	Site or Neighborhood level compared to the municipality level	years	Available reports, municipality data
10	Racial, ethnic, and religious diversity	Site or Neighborhood level compared to the municipality level	% of people of different racial, ethnic descent or beliefs	Available social reports, municipality data
11	Number of children in foster care	Site or Neighborhood level compared to the municipality level	Number of children	Available social reports, municipality data
12	Number of families receiving social benefits	Site or Neighborhood level compared to the municipality level	Number of families	Available social reports, municipality data
13	Poverty	Site or Neighborhood level compared to the municipality level	% of people	Available social reports, municipality data
14	Voter turnout in the last election (it should be available on the neighborhood level)	Site or Neighborhood level compared to the municipality level	% of people	Available social reports, municipality data
15	Number of community-based organizations	Site or Neighborhood level compared to the municipality level	Number of organizations	Available reports, municipality data Some information included in Q1
16	Number of local businesses and type of businesses	Site or Neighborhood level compared to the municipality level	Number of businesses in given sectors	Available reports, municipality data Some information included in Q1
17	Access to culture (number of theaters, cinemas, art galleries, museums in the neighborhood)	Site or Neighborhood level	Number of facilities	Available reports, municipality data

18	Access to sport facilities (number of public sport areas)	Site or Neighborhood level	Number of facilities	Available reports, municipality data
19	Crime rate (police statistics on minor crimes in the neighborhood)	Site or Neighborhood level compared to the municipality level	Number of reported minor crimes	Available reports, municipality and police data
20	Population change rate	Neighborhood level	% Annual change in urban population	Available socio-demographic reports, municipality data
21	Local government expenditure on similar projects (i.e. including participatory processes, environment, NBS)	Municipality level	Local currency	Available reports, municipality data (some information in Q1)
22	Things to enjoy in the existing space	Site or neighborhood level	% of the most popular activities on the site	Questionnaire 3 and social study
23	Functions of the existing space	Site level	% of the functions of the site	Questionnaire 3
24	Aesthetic of the space	Site level	7-point Likert scale	Questionnaire 3 and social study
25	Type of users	Site level	% of residents and users visiting the site	Social study

Table 16: Economic & Business Challenges and Themes

	Challenge 1	**Challenge 2**	**Challenge 3**	**Challenge 4**
	Creation of the livable and vibrant urban spaces conducive to business activation	Site related business initiatives - opportunities for small SME + individual business	Convince city to finance private start-ups for site, NBS related businesses, primarily one enhancing PH&WB	Comprehensive positive impact from business on neighborhood
Theme 1	Eupolis present planning conduciveness' to c1 (PLANNING CRITERIA)	Identified opportunities	Adaptable existing city polices	Positive impact on PH&WB
Theme 2	Enough space for any type of small business	Existing site related businesses	Creation of proposals to city	Any other positive impact (reduction of unemployment rate)
Theme 3	Financing availability	New marketable product & services		
Theme 4		Creation of new jobs		

	Challenge 5	**Challenge 6**
	Engagement of neighboring companies into NBS paradigm and support and enhancement of existing business with NBS's	NBS's which contribute to the increased neighborhood value - surrounding property value
Theme 1	Local companies mapping and interviews	Gentrification risk?
Theme 2		How we convert property higher values in citizens benefit

Table 17: List of Economic&Business Contextual Indicators

No	Indicator name	Units	Scale	Data source
1	Existing regulations restricting business activities	Yes / No /Partially	Site	Partner - (FR city) + Supporting Partner
2	Existing businesses related to the site (i.e., interacting with euPOLIS interventions e.g. restaurants, cafes)	Number of	Site and potentially surrounding area (depending on the local conditions)	Partner - (FR city) + Supporting Partner
3	Surrounding [comparative] property value (a. Offices b. Residential, c. Commercial)	Euro/m²	Neighborhood	Partner - (FR city) + Supporting Partner
4	Neighborhood people acceptance/satisfaction on the site impact on PH&WB as is -	Q1, Q2 and Q3 answers (Low, medium, high)	Neighborhood	Partner - (FR city) + Supporting Partner
5	Unemployment rate in site neighborhood	%	Neighborhood (preference) or municipality (if data for Neighborhood not available) or city (if data for municipality not available)	Partner - (FR city) + Supporting Partner/ Local unemployment offices
6	Local companies interest in supporting euPOLIS vision (once presented to them)	Number of companies	City	Partner - (FR city) + Supporting Partner
7	Municipality budgeting for NBS interventions at the pilot site other than those supported by euPOLIS	% of [infrastructure] expenditure	Demo site	Partner - (FR city) + Supporting Partner

Table 18: Health and Well-Being Challenges and Themes

	Challenge 1	**Challenge 2**	**Challenge 3**	**Challenge 4**
	Physical activity	Mental health	Risks for Respiratory Diseases	Risks for Cardiovascular diseases, Diabetes type 2, Obesity
Theme 1	Walking, running, cycling (individual activities)	Sensory effects of the environment	Quality of urban components contributing to air quality	Walking, running, cycling (individual activities) - "good place"
Theme 2	Collective sports	Safe and secure environment	Presence of allergens	Work therapy (gardening…)
Theme 3	Work therapy (gardening…)	Socialization	Traffic and Air pollution	Education on a healthy lifestyle
Theme 4	Cultural events	Productive physical activities	Walking (walking in good place)	Outdoor environment control
Theme 5	Physiological parameters of health condition	Productive mental activities	Physiological parameters of health condition	Physiological parameters of health condition
Theme 6		Psycho-emotional state (MyFeel)?		Should we include Indoor environmental control?

	Challenge 5	**Challenge 6**
	Risks for Communicable Diseases	Wellbeing
Theme 1	Water quality	Interaction between people and nature
Theme 2	Pest management	Social engagement
Theme 3	Waste management	Feeling of responsibility
Theme 4	Sanitation & urban drainage	Emotional attachment to neighborhood
Theme 5		Positive emotions
Theme 6		Positive relationships

Theme 7	Should we include Indoor environmental control?	Feeling of meaning and accomplishments

Table 19: List of Health and Well-Being Contextual Indicators

No	Variable / Parameter name	Scale	Units	Data source examples / guidance
1	Prevalence of allergic respiratory diseases	Municipality or City	%	Health report or health database. National health survey.
2	Prevalence of smoking	Municipality or City	%	Health report, health database. National Health survey.
3	Incidence and mortality of chronic respiratory diseases (chronic obstructive pulmonary disease- COPD and asthma)	Municipality or City	Number per 100.000 of %	Health report or health database. National Health survey.
4	Incidence and mortality of cardiovascular diseases	Municipality or City	Number per 100.000 of %	Health report or health database. National Health survey.
5	Prevalence of hypertension	Municipality or City	%	Health report or health database. National Health survey.
6	Incidence and mortality of diabetes	Municipality or City	Number per 100.000 of %	Health report or health database. National Health survey.
7	Prevalence of diabetes	Municipality or City	%	Health report or health database. National Health survey.
8	Prevalence of obesity	Municipality or City	%	Health report or health database. National Health survey.
9	Prevalence of depression	Municipality or City	%	Health report or health database. National Health survey.

10	Prevalence of physical activity	Municipality or City	%	Health report or health database. National Health survey.
11	Incidence of alimentary infections	Municipality or City	Number per 100.000	Health report or health database. National Health survey.
12	Incidence of vector borne diseases	Municipality or City	Number per 100.000	Health report or health database. National Health survey.
13	Incidence of zoonoses	Municipality or City	Number per 100.000 of %	Health report or health database. National Health survey.

A2. Contextual Indicators conversion into site concerns

Table 20: Contextual Indicators conversion into site concerns

	List of potential contextual indicators on Urban Development (Indicator name)	DEMO SITE CONCERNS - URBAN
U1	Surface area of demo-site	Is site large enough for project demonstration testing
U2	Presence of blue and green spaces	Not enough green spaces
U3	Change of natural available space (described as the change of the availability of natural space for urban infrastructure and building purpose)	The risk of green space reduction real / not real - proposal for the mitigation of potential negative process missing
U4	Land use change (Described as the conversion of a piece of land's use by humans from one purpose to another)	Land use change - proposal for the mitigation of potential negative process missing
U5	Use of sustainable materials (Number of sustainable materials used for building in an urban development)	Risk mitigation of potential use of non-sustainable materials not defined
U6	Built space area	No concern
U7	Building's typologies	No concern
U8	Multifunctionality - functional diversity of adjacent buildings	Not changeable
U9	Compactness index (CCI). Equilibrium degree of urban construction land	No concern
U10	Public vs Private built space area	Not changeable
U11	Land use efficiency LUE (input-output ratio of various factors for land use per unit area)	Land not used sufficiently efficient to improve impact on PH&WB through NBS's
U12	Flexibility (elasticity, adaptability, manipulability)	Site does not have flexibility required by euPOLIS
U13	Interaction between building's street level and public spaces	Site access quality
U14	Interactivity: interrelation with spatial elements	Site spatial elements not interactive enough with surrounding buildings and visitors

U15	Accessibility (transportation) Measure of the ease of reaching (and interacting with) destinations or activities distributed in space (DS)	Not changeable
U16	Roads per capita	Not changeable
U17	Clean transport	Not euPOLIS project subject
U18	Bike lines	Not enough euPOLIS bike lines
U19	Parking spaces	Not changeable
U20	Urban (street) lighting (multifunctionality day and night)	Not sufficient lighting
U21	Presence of obstacles in the use of the public space	There are physical and functional obstacles in the use of public space
U22	Clear markings of crosswalk	Crosswalks not clearly marked - not euPOLIS project subject
U23	Pedestrian protection from transport and accidents	Pedestrian protection from transport and accidents to be analysed and defined - mitigation, if required to be addressed
U24	Protection from adverse sensations (wind, rain/snow, cold/heat, dust, bright light, noise)	Not adequate protection from adverse sensations (wind, rain/snow, cold/heat, dust, bright light, noise)
U25	Number of houses	Not euPOLIS project subject
U26	Accommodation size (Amount of people you can accommodate in a particular number of dwellings and their size)	No concern
U27	Housing demand	Not euPOLIS project subject
U28	Use of public spaces (Amount of people using open and accessible spaces)	The Amount of people using open and accessible spaces to be analysed - if required mitigation to be introduced
U29	Active travel	Active travel at the site not sufficient
U30	Local heritage	Local heritage not identified and protected
U31	Protected buildings	Surrounding buildings not protected by site NBS's
U32	Presence of unique spatial elements (sculptures, graffiti, original urban furniture etc.)	There are no Presence of unique spatial elements (sculptures, graffiti, original urban furniture etc.) That can enhance site attractivity

	List of potential contextual indicators on Environmental status (Indicator name)	DEMO SITE CONCERNS - ENVIRONMENTAL
E1	Heat Risk (Number of combined tropical nights (>20° C) and hot days(>35°C))	Heat island protection not adequate
E2	Freshwater scarcity (EEA WEI+)	Freshwater scarcity presently not addressed
E3	Groundwater scarcity (EEA WEI+)	Ground water availability not established
E4	Groundwater salinization / Seawater intrusion	Potential Groundwater salinization / Seawater intrusion mitigation not introduced
E5	River & sea floods (% of the area that would flood for a specific return period)	River & sea floods (% of the area that would flood for a specific return period) - does exist at the demo site
E6	Urban Drainage Flooding (% of impervious area)	Impervious area not adequate
E7	Surface water quality (surface water quality status relevant to ecological and chemical characteristics)	Surface water quality not satisfactory
E8	Groundwater quality (groundwater quality status relevant to chemical characteristics)	Ground water quality not established
E9	Climate change adaptation (existence of environmental policies in general)	Demo site original planning did not have climate change adaptation as criteria - the actual site characteristics not at the optimal level for CCA
E10	Wastewater treatment coverage (% of WW treated)	There is no wastewater treatment relevant in any way to the site
E11	Level of wastewater treatment	Present WWT is not satisfactory
E12	Air Quality	Air quality parameters not known - but the urban setup indicate poor air quality in site border areas
E13	Water Quality (of relevant water bodies)	Water Quality (of relevant water bodies) seems not conducive to positive PH&WB impact
E14	Area of greenery (formal / informal)	Site does not have optimal and functional greenery cover
E15	Connectivity	Connectivity with neighbouring greens not adequate
E16	Quality (BD, tree condition, soil viability)	Greenery and soil quality unknown
E17	Greenery use (intensity, type?)	Greenery use not adequate - to euPOLIS standard
E18	Level of recycling of resources	No recycling of resources noticeable at the site

E19	Preliminary Assessment indicator on Biodiversity?	Site does not have adequate biodiversity preconditions
E20	Noise pollution?	Noise pollution present
E21	Light pollution?	Light pollution unknown
E22	GHG emissions / Carbon footprint?	Carbon footprint does not look optimal - value not known
E23	Water reuse (on-site)	No water reuse on the site
E24	Waste Management?	Only standard waste management in place

	List of potential contextual indicators on social status (Indicator name)	**DEMO SITE CONCERNS - SOCIAL**
S1	Age and gender distribution in the neighbourhood	Age and gender distribution in the neighbourhood - not known – not confirmed information is that present visitors gender distribution not optimal
S2	Social status	Social status of neighbourhood and visitors not known
S3	Education level	not known
S4	Quality of education	not known
S5	Unemployment	not known
S6	Sectors of the employment	not known
S7	Economic situation of households	not known
S8	Type of housing arrangement (type of residency)	not known
S9	Life expectancy	not known
S10	Racial, ethnic and religious diversity	not known
S11	Number of children in foster care	not known
S12	Number of families receiving social benefits	not known
S13	Poverty	not known
S14	Voter turnout in the last election	not known
S15	Number of community-based organizations	not known

S16	Number of local businesses and type of businesses	Local businesses interaction with the site not optimal as per euPOLIS standards
S17	Access to culture	Access to culture - minimal or non-existent - lack of regular organized events
S18	Access to sport facilities	Access to sport facilities limited
S19	Things to enjoy in the existing space	Things to enjoy in the existing space - not enough to attract additional visitors
S20	Functions of the existing space	Functions of the existing space - not at the euPOLIS level
S21	Aesthetic of the space	There is room for improvement of site aesthetics
S22	Uniqueness of the neighbourhood	not known
S23	Use of public space	not known
S24	Type of users	not known
S25	Crime rate	not known
S26	Population change rate	not known
S27	Government expenditure on similar projects (i.e. including participatory processes, environment, NBS)	not known
S28	New group activities	not known
S29	Level of trust in the neighbourhood	not known
S30	Perception of security (safety) of the space	not known
S31	Place attachment	not known
S32	level of trust in the neighbourhood	not known
S33	perception of community efficiency	not known
S34	feeling as part of the community	not known
S35	Sense of ownership of the space	not known
S36	Sense of pride of being part of the community	not known

	List of potential contextual indicators on Economic – Business (Indicator name)	**DEMO SITE CONCERNS - ECONOMIC - BUSINESS**

B1	Existing regulations restricting/allowing business activities	Partially in existence within the city planning regulations
B2	Existing businesses related to the site (i.e. interacting with euPOLIS interventions e.g. restaurants, cafes)	Existing businesses related to the site (i.e. Interacting with euPOLIS interventions e.g. Restaurants, cafes) - non or minimal
B3	Surrounding [comparative] property value (a. Offices b. Residential, c. Commercial)	Either the value or site impact on it - not known
B4	Neighbourhood people acceptance/satisfaction on the site impact on PH&WB as is -	Not known
B5	Unemployment rate	Not known
B6	Local companies interest in supporting euPOLIS vision (once presented to them)	Not known
B7	Municipality budgeting for NBS interventions	Not adequate in relation to the known benefits from NBS's

List of potential preliminary / contextual indicators on Health & Well-Being (Indicator name)	**WHAT HAS IMPACT ON THIS PHENOMENON**	**DEMO SITE CONCERNS - PH & WB**
Prevalence of allergic respiratory diseases	Site air quality, recreational facilities and greenery quality	Site is exposed to air pollution + Site does not have optimal quantity and quality of recreational facilities
Prevalence of smoking	Site recreational facilities	Site does not have optimal quantity and quality of recreational facilities
Incidence and mortality of chronic respiratory diseases (chronic obstructive pulmonary disease- COPD and asthma)	Site size and dedicated usage	Site does not have optimal quantity and quality of recreational facilities - site dedicated usage contradicts euPOLIS approach
Incidence and mortality of cardiovascular diseases	Site recreational facilities and greenery functional quality	Site does not have optimal quantity and quality of recreational facilities
Prevalence of hypertension	Monitoring of visitors	There are no data on visitors monitoring
Incidence and mortality of diabetes	Visitors' education and offer of monitoring devices	Site does not have optimal quantity and quality of recreational facilities + there is no organized visitors' education

Prevalence of diabetes	Quality of NBS design at site	NBS quality at the site not optimal
Prevalence of obesity	City management willingness to create socializing public spaces	Not known (to be defined)
Prevalence of depression	Site attractiveness and qualities related directly to PH & WB	There is considerable room for improvement of site attractiveness
Prevalence of physical activity	Site attractiveness and qualities related directly to PH & WB	There is considerable room for improvement of site attractiveness
Incidence of alimentary infections	Site location air quality	Conditions for low air quality present on the site
Incidence of vector borne diseases	Site location water quality	Conditions for low vector control near water present on the site
Incidence of zoonoses	Site location water quality and waste management	Conditions for low waste management present on the site

A3. The Provisional Goal Driven Planning Matrix

Table 21: The Provisional Goal Driven Planning Matrix

Goal 1 - *Psychological and physiological responses, psycho-emotional states: Optimization of relevant psychophysiological parameters among users of re-designed public space, including the* ***reduction of stress, depression, and anxiety levels****;*		
TARGETS FOR THIS GOAL		*FUNCTIONS THAT SUPPORT TARGETS // CONCEPTS, SOLUTIONS*
1.1 Stress reduction *- (Introduce: Location beauty, comfortable resting points, presence of biodiversity)*	*1*	*Introduce measures to* ***increase the use of green areas****: systematically increase awareness of city greenery - strong green recreation areas promotion on all media and stimulate the number of pedestrian day trips to green areas*
	2	*Green areas* ***health related public usage education*** *to be introduced at all levels and public domains (short media information at top hours as well as information panels at site itself)*
	3	*General approach:* ***Bring nature to city*** *at all acceptable locations (vacant sites in the neighborhood): trees, shrubs, meadows, swales, porous walkways (streets to become parks), parking's porous tiles, greenbelts, and blue belts (Introduce water noise if practical) to provide more enjoyable and friendly walkways and bikeways for people. All these interventions should be checked against robust sustainability. Main criteria: introduce maximum efficiency land use to achieve optimal impact on PH & WB*
	4	*Consider* ***visual*** *(attractive greenery and art)* ***and functional*** *(recreational and production facilities)* ***attractions*** *as well as recreational working and cultural events + Obtain* ***attractive green visual connections with the new and existing buildings*** *in the neighborhood + Create NBS corridors for continuous* ***quality visual access to the other parts of the city*** *+ Negotiate with new buildings implementation of green walls and green roofs*
	5	***Trees nine functions*** *to be introduced into planning process - introduce greenery functionality as a planning criterion - Make sure that new trees planted should meet the following conditions: right tree, at the right place, with specific function*

	6	***Introduce planting, running and maintenance plan,*** *introduce measures to evaluate and protect-properly maintain greenery + involve locals + green waste (biomass) use and management, ...*
	7	***Intensify presence of biodiversity****, introduce ecological corridor connected with neighboring green spots/areas - greenbelts and blue belts allow wildlife to disperse between larger habitat patches - consult experts on specific solutions*
	8	***Heat island effect*** *- consider all methods to reduce 1. radiation and2. thermal mass negative effect on site*
	9	*If practical, construct* ***multi-functional pocket parks*** *with MF green spaces designed to affect: 1. Micro-climate control: evaporative cooling, reduction of direct radiation, reduction of UHI, wind barriers in winter, 2. create socializing areas for all local groups within the pocket park*
	10	*Check green areas for their* ***negative impact on PH*** *(allergens and BVOC) and other - introduce mitigation measures*
	11	*take measures to systematically* ***analyze existing trees and other greenery health*** *and take necessary measures, including analysis of soil nutrition values*
	12	*Remove any greenery (particularly trees) that destroy pavements and alike*
	13	*Analysis of* ***soil quality*** *and required interventions to support new trees - the nutrient quality of soil to be checked, nutrients supply to be considered,*
	14	*Analyze* ***water availability*** *for irrigation purposes, consider other water resources for dry seasons - soil watering from surrounding buildings to be analyzed*
	15	*If areas are* ***not neat enough to attract people****, consider improvements - improve maintenance - Make sure maintenance creates spotless environment at all times - check and improve protocols for the city greenery maintenance - consider private business involvement*

	16	*Make sure that new trees planted should meet the following conditions: **right tree, at the right place**, with specific function - **1. Shadow - walking routes***
	17	*Make sure that new trees planted should meet the following conditions: right tree, at the right place, with specific function - **2. Shadow - cycling and running routes***
	18	*Make sure that new trees planted should meet the following conditions: right tree, at the right place, with specific function - **3. Shadow - buildings** - Extend NBS interventions towards surrounding buildings to affect indoor and outdoor comfort and reduce energy consumption*
	19	*Make sure that new trees planted should meet the following conditions: right tree, at the right place, with specific function - **4. evaporative cooling** (capitalizing on revealing summer winds)*
	20	*Make sure that new trees planted should meet the following conditions: right tree, at the right place, with specific function - **5.air purification***
	21	*Make sure that new trees planted should meet the following conditions: right tree, at the right place, with specific function - **6. evapo transpiration***
	22	*Make sure that new trees planted should meet the following conditions: right tree, at the right place, with specific function - **7. socialization***
	23	*Make sure that new trees planted should meet the following conditions: right tree, at the right place, with specific function - **8. animal corridors***
	24	*Make sure that new trees planted should meet the following conditions: right tree, at the right place, with specific function - **9. winter wind barrier** - introduce NBS measures to reduce negative West-East winter wind effect*
	25	*Make sure that new trees planted should meet the following conditions: right tree, at the right place, with specific function - **10. reduced emission of negative compounds** such as BVOC*

	26	*Planning to **emphasize location positive visual characteristics - include necessary experts, artists, architects** for peer review of engineering site solutions + Check on local heritage and emphasize it + Introduce unique spatial elements (sculptures, graffiti, original urban furniture etc.) that can enhance site attractivity + alternative spaces for public art installations*
	27	*Introduce comfortable **resting points with nice views** but secluded enough*
	28	*If possible, influence the **creation of transport links** for easy public to existing and new green areas*
	29	*If allowed by planning documentation, introduce **seasonal eco café** (demonstrating sustainable, nature-friendly mode of operation, cooling and resource recycling) with outdoor serving*
	30	***Introduce surface waterway** (from different sources) with freshwater aquatic biotope (attractive flora and fauna elements), complete with integrated constructed wetland and number of bio filters of different types for storm water treatment (water quality improvement)*
	31	*Analysis of **ground water availability** for water amenities and surface waterways (for microclimate improvements) and attractive water features*
	32	*Introduce Multi-Functional roof garden + Vertical Farms at suitable places (empty walls)*
	33	*Analyze necessity to introduce **water retention NBS's** and / or develop model estimating surface water irrigation potentials from water retention sources*
	34	*Create systemic site usage for appropriate cultural events. Make public **displays informing visitors of each particular function***
	35	*Utilize above interventions to create conditions for visitor's **active interaction with nature** at regular intervals*
	36	*Plan demo **site to achieve usage and impact flexibility** as required by euPOLIS project - to secure best results in the area of urban planning, environmental regeneration, optimal social cohesion, opportunity for business development and inclusion as well as PH&WB*

1.2 Depression reduction *- (Introduce: Elements to take visitors attention and cheer them up, amuse them + Location beauty, comfortable resting point, presence of biodiversity)*	*1*	*Remove unattractive site components - Create or enhance existing urban NB and NB related elements to attract and occupy visitor's attention and cheer them up, amuse them (consult medical partners on all this)*
	2	*Check all physical **opportunities to connect with nature** - create big urban gardens to support families and space where people can safely meet - Develop human / ESS regular interaction points - Introduce facilities / functions that provide Care for nature - demonstration and contact with nature - introduce components for daily care and enhancement of biodiversity done by visitors.*
	3	*Create space in all regenerated areas for increased **exposure of visitors to arts and crafts***
	4	*Analysis of **heritage points** and their preservation*
	5	*Use recognizable local materials*
1.3 Anxiety levels reduction *- (Introduce: Security – passages, visibility, comfortable materialization + biophilic design)*	*1*	*Security - provide overall easy access and **walking security day and night** - for night security lighting introduce sufficient lighting from the renewable sources. Check also pedestrian protection from transport and accidents*
	2	***Visibility** - introduce relatively acceptable length of visible space + clear undisturbed visibility in direction of pedestrian and cycling movements + clear visibility to surrounding attractive points*
	3	*Provide **Comfortable surface** materialization - physically comfortable (new technology materials) and mild color material and Improve quality of walking surfaces improve pavements, kerbs + introduce materials with lowest thermal mass*
	4	*Master plan should develop urban components using Biophilic design: Basis of a Biophilic approach: - **a. Nature in the space patterns, b. Natural analogues patterns, c. Nature of the space patterns***
	5	*Create **dedicated family outing zones** - analysis of family outing habits and desires with target communities*
	6	*Analysis of **local environment pollution**: Air, noise, thermal, light, visual, soil, harmful levels of electromagnetic radiation - introduce specific NBS mitigation measures*

	7	*Analysis of **potential pollution hazards** - floods, storms, heavy rains floods... - direct impact on health - define long term integrated remedy solutions*
	8	*Introduce **NBS for pluvial floods** elimination and surface runoff and water quality management with NB solutions. Storm water control and evaporation enhancing NB systems*
	9	*Make analysis of number of people potentially using this site - **overcrowding** should be discouraged*

1.4 Enhanced cognitive performance - *(memory, judgment, language, intuition and the ability to learn) - (number of senior citizens increases, innovative, related planning required to make them more functional)*	*1*	*Counter neurological decline typically seen among the elderly -* ***create stimulus for senior people daily exercise walk****. The methods to be developed by euPOLIS social and health experts*
	2	*Create urban* ***options for new experience and creativity*** *(particularly for senior people): create facilities for walking competition, urban farming, competition in solving mental games,*
	3	***Creative engagement of senior citizens through*** *Vertical farms and pocket farms irrigated with rainwater harvested from surrounding buildings. Farms with proper education (by senior citizens) to expand through the neighborhood*
	4	***Seniors regular mixing with kindergarten kids*** *(kindergarten NBS facilities at location) - small lectures to very young from own specific subjects (small curriculum to be created and short lessons to be introduced as regular addition to kids' activities)*
	5	*Create* ***urban challenges for senior people*** *with this in mind: when you are inside your comfort zone you may be outside of the enhancement zone - experience should be unfamiliar and mentally challenging: 1. participation in assessment of particular city functions, tiding-up, maintenance, participation in planning, 2. walking in unfamiliar places, 3. meeting unfamiliar people, 4. attending events not seen before*
	6	***Introduce participatory planning*** *on all-natural items - introduce mental challenge + new experience*
1.5 Enhanced additional psychological health and well-being - *(contentment, satisfaction with all elements of life, self-actualization) & spiritual benefits of interacting with nature*	*1*	*Introduce* ***Greenery multifunctional corridors*** *systematically distributed through the demo site - canopy corridors connect to all surrounding streets and gardens + create connection with the green area in front of nursery school*
	2	*Creation of* ***all gender groups categories socializing*** *(and entertainment) spots within corridors (mapping of existing & enhancement)*
	3	*Introduce* ***community urban farming*** *contributing to overall more sustainable food system*

Goal 2 - *Health indicators related to physical activity (leisure activities including e.g.,* ***walking, running, cycling, skateboarding****) 1: New activities related to an intervention, e.g., running in the new park, strolling along the new pedestrian street, etc.; Increased number and share of people involved in physical activity in the re-designed space, duration and diversity of indoor/outdoor physical activities*		
TARGETS FOR THIS GOAL		*FUNCTIONS THAT SUPPORT TARGETS // CONCEPTS, SOLUTIONS*
2.1 Optimal walking distance and quality of surfaces and environment	*1*	*Introduce solutions that* ***increase walking length*** *at the demo site to be sufficient for the PH&WB impact testing*
	2	*Existing grey areas replaced or retrofitted to increase permeable areas at sidewalks, parking's, (playing field?)*
	3	***Walking pathway materialization*** *- semi soft advanced technologies, sustainable material with NBS quality enhancement*
	4	***Protect recreational areas from sun and views*** *from surrounding buildings with adequate greenery*
	5	*Create different visitors* ***Engagement facilities*** *– to incentivize active time in the park (important point for co-design with citizens)*
	6	***Urbanism to promote daily walking routine*** *(on streets - low traffic, pleasant and protected streets) with access to demo site - min 50 meters for in all connecting streets*
	7	***Schools' outdoor sports*** *in NBS supported environment to be more frequent, to be radically improved (discuss with schools on preferred facilities)- develop greenery (walls, roof) + green filter at the fresh air intake*
	8	*Schools - promote and* ***monitor impacts of NBS*** *and students' sports at other outdoor recreational facilities*
	9	*Introduce and promote regular physical* ***health assessment of neighborhood and visitors*** *(starting with absence of diseases to fitness level)*
	10	*Provide* ***sufficient walking length*** *- reasonable for recreational walking (to be recommended by medical partners)*

	11	***Heat islands eliminated*** *- Albedo effect optimal + pathways in shade min 80% in the afternoon in summer*
	12	***Winter wind control*** *- adequate number of green windbreaker trees in the winter wind direction*
2.2 Adequate running distance and quality of surfaces and environment	*1*	***Running length*** *- reasonable for recreational running with NBS quality enhancement -*
	2	***Running pathway materialization*** *- semi soft advanced technologies, sustainable material with NBS quality enhancement*
	3	*Measures for* ***heat island effect radical reduction*** *–(criterions pathway Albedo effect optimal + pathways in shade min 80% in the afternoon in summer) -* ***r****educe radiation and negative thermal mass effect*
	4	***Winter wind control*** *in areas / corridors popular for recreational activities during cold weather season- adequate number of windbreaker trees in the winter wind direction*
	5	*Trees selected and positioned for* ***evaporative cooling***
	6	***Quality maintenance*** *on the open-air demo sites during winter periods regarding site usability*
2.3 Adequate cycling distance and quality of surfaces and environment	*1*	*Introduce* ***cycling length*** *- reasonable for recreational cycling*
	2	***Pathway materialization*** *- semi soft advanced technologies material*
	3	*Introduce measures for* ***heat island effect radical reduction*** *- pathway Albedo effect optimal + pathways in shade min 80% in the afternoon in summer*
	4	***Winter wind control*** *- adequate number of windbreaker trees in the winter wind direction*
	5	***Summer shading*** *- to cover 80% of public space in afternoon in summer*
2.4 Safety of users crossing cycling / rollers routes -	*1*	*All* ***pathways' crossings safety*** *should be clearly reflected - potential accidents eliminated by design solutions or site installed visible instructions*

(Introduce: No direct crossing between fast lanes + warning signs for pedestrians + no "dead corners")	*2*	*Easy **availability of sports equipment** renting in NBS supporting environment*
2.5 Introduction of sport facilities	*1*	*Make analysis of **outdoor sport facilities** desired but missing in the neighborhood. Discuss applicability with citizens and city planners*
Goal 3 - Health indicators related to improvements of local conditions: Reducing the risk factors and number of incidence of non-communicable diseases (NCDs) and/or communicable diseases (CDs) through maintaining lower levels of noise and air pollution, moderate air temperature, and offer exposure to a microflora in physiological range;		
TARGETS FOR THIS GOAL		*FUNCTIONS THAT SUPPORT TARGETS // CONCEPTS, SOLUTIONS*
***3.1 NCD incidence number reduction -** (Introduce: Acceptable levels of noise and air pollution, moderate air temperatures, exposure to a microflora in physiological range +?)*	*1*	***levels of noise** - analyze potential for NBS for protection from traffic noise*
	2	***lower air pollution** - analyze NBS for protection from traffic pollution - other sources of air pollution: visual pollution, water pollution, odor, waste, pest, soil pollution*
	3	*Moderate air temperature, as item 1.1.9*
	4	***Exposure to a micro flora** in physiological range - introduce solutions that stimulate and preserve site biodiversity on regular level*
	5	*Analyze site greenery **for BVOC emissions**, remove trees that are producing these undesirable emissions*
	1	***levels of noise** - analyze potential for NBS for protection from traffic noise*

3.2 CD incidence number reduction - (Introduce: Acceptable levels of noise and air pollution, moderate air temperatures, exposure to a microflora in physiological range +?)	*2*	***low air pollution** - analyze NBS for protection from traffic pollution - any other pollution at the site?*
	3	*Moderate air temperature, as item 1.1.9*
	4	***Exposure to a micro flora** in physiological range - introduce solutions that stimulate and preserve site biodiversity on regular level*
3.3 Improvement of local Outdoor Environmental conditions related to PH & WB	*1.1*	*The improvement of citizens **Health could be directly influenced** by the improvement of Outdoor Environment Conditions. These are:* *1. **Comfort values** and their influence on occupants defined by: a. Combination of temperature and relative humidity (T &RH), b. Radiant temperature (RT) (usually defined as mean radiant temperature), c. Resultant temperature (RST) (combination of T and RT), d. velocity feel (VF) caused by air movement, e. CO2 and TVOC's concentration. One way of expressing direct influence on occupants is the Predicted Main Vote (PMV) value.*
	1.2	*2. The second set of parameters influencing occupant's health are **pollution phenomenon**: a. air quality pollution by harmful gasses and particles, b. noise contamination, c. visual contamination (glare and unpleasant reflections), d. Soil contamination, e. Pests, f. microbial parasites, g. Extreme weather*
	1.3	*Cities are strongly advised to check with medical partners items 1.1 and 1.2 and enter necessary corrections, to make sure that the recommendations from the following item 2 are correctly selected*
	2	*Proof that the euPOLIS interventions do have impact on PH will be obtained by adequate exposure of tested occupants to the changes of parameters described in above item 1. **Therefore, the optimal testing route, where parameters from item will be changed (improved), will have to be proposed for the euPOLIS Health parameters testing process related to implementation of NBS's or NB inspired solutions***
	3	*The Overall Well-being of citizens is potentially influenced by all Goals, Targets and most of potential interventions described in this GDPM and will be tested through different methodologies*

Goal 4 - *Enhancement of social cohesion and cultural particularity through ensuring sense of security and inclusion for all (with focus on gender and age equality as well as newcomers integration) allowing for the strengthening of exploratory and socializing/culture behaviors among users:* ***Increased use of public space*** *– both during the day and in the evenings; Increased presence of women, children, senior citizens and disabled persons as well as newcomers/migrants;* ***Higher generational, gender and ethnic diversity*** *visible in public spaces;* ***New group activities engaging previously non-active community members****;* ***Significant number of local inhabitants (target > 200) taking part in project activities; Increased engagement of citizens and local authorities during the participatory processes****;*		
TARGETS FOR THIS GOAL		*FUNCTIONS THAT SUPPORT TARGETS // CONCEPTS, SOLUTIONS*
4.1 Increased use of public spaces - *(Introduce: Increased and comfortable public places - enlarge existing or introduce new)*	*1*	*Planning to include* ***missing types of public spaces*** *+ more versatile public spaces, night use safety access and facilities. Planning to consider site present and future intensity, frequency and Seasonality of site occupation*
	2	*Social–Urban Hub created as* ***BGS demo/Edu-center*** *and community activator in the domain of culture and environmental regeneration*
	3	***NB MF "canopy" units*** *for natural shading of 30m2 (irrigated vertical climbing vegetation) for socializing, recharging electronics, playing chess, or waiting for buss*
	4	***Open air gym*** *with clear usage instructions*
	5	*Analysis of* ***other attractions*** *to bring more visitors (consult city tourist management and citizens)*
	6	*If there are no cycling paths, consider fixed bicycles small renting outfit as a private business*
	7	*Organize regular* ***sports events*** *for people of all ages and genders as well as for people with disabilities. Create conditions in which everyone feels welcomed to take part.*
	8	*The site should be* ***accessible for foreigners****. Therefore, any signs should be at least in English.*
	9	*New opportunities for* ***tourism.***

	10	*The site should be **accessible for people with disabilities**, i.e., no stairs to climb but instead a ramp, signs with enough contrast but also written in Brail*
	11	*The site should be **accessible for seniors**, i.e., enough benches in shade, low curbs, ramps instead of stairs*
	12	*The site should be **accessible and safe for parents with kids**, i.e., ramps for trolleys, low curbs, a safe zone for kids where the risk of being hit by a car is minimal*
***4.2 Higher ethnic and gender diversity -** (Introduce: Introduce missing facilities for different gender and people groups –utilize BGS "gender planning criteria)*	*1*	*Planning with NBS toll "gender related planning criteria" with accent on gender groups that are presently not attending site, applying NBS solutions to attract them*
	2	*Planning should try to adopt **appropriate distribution** of public, communal / semi-public, and private spaces (present status analysis and recommendations to city planners)*
	3	*Ensuring high-quality usage of public spaces during different seasons*
	4	*Include **active transportation** with delineating bicycle traffic from pedestrian and automobile traffic, creating pathways for skateboards, rollerblades, and other transportation, and separating pedestrian pathways from traffic), while ensure barrier-free design.*
	5	*planning should **exclude any physical barriers** not suitable for older people and people with disabilities + ensure walkways have a smooth surface + pedestrian pathways should be naturally shaded in summer*
	6	*the design to incorporate public open places, squares, and public sites **to correspond to neighborhood size and characteristics** (age, religion...)*
	7	*Design to consider that various levels of effective spatial buffers structure the area, creating a **sequence of spaces with different qualities.** Light and shade denote quiet and active zones, change, and differentiated spaces. Both sunny and shaded areas are incorporated in the public spaces and are easily accessible*
	8	*If there is one, the **common courtyard** helps to define the neighborhood, and creates a safe and nurturing place for children and youth*

	9	*Places that include **technology, play, and social interaction and cohesion** are an important part of Child and Youth Friendly communities, especially in meeting their social, physical, and emotional health needs. Create technological areas for free Wi-Fi, etc., that is easily accessible for children and youth*
	10	*The **areas of active play** to be included - Introduce arrangement of special-use areas for specific groups: e.g., playgrounds for small children within visual and voice range of the apartments + water toys, water playground to attract younger generations*
	11	*consider **discernible social centers**, such as plazas, squares, or green spaces with transportation located nearby.*
	12	*Make **picnic and seating** areas available*
	13	*Parks to include **designated play areas** for age appropriateness, while also incorporating a space conducive to **family gatherings***
	14	*Park should demonstrate **good visibility**, clear orientation and pathways, efficient lighting, well maintained public toilets and spaces that foster frequent use*
	15	*Entries to the park should coincide with bus stops and crosswalks*
	16	*Provide sheltered areas for senior people*
	17	*Major Park signs should be lit for **night visibility***
	18	*The design of the playground should reflect the **preferences of children** of all ages and genders as well as be suitable for the needs of children with disabilities*
	19	*Create **youth hangout zone** at the perimeter of the park*
	20	*Create few **small private areas** where couples or small groups can sit*

	21	*Provide one or two **green axes** through whole area and position sport facilities on or along them*
	22	*To make it **more usable for girls**, divide large areas into smaller areas to avoid large area being dominated by the one particular group - provide open spaces that can be (safely) used by girls and dividing open areas into more private spaces with landscaping.*
	23	*Park paths should be **well lit** (care to be taken of light pollution)*
	24	***Young people meeting areas** should be located along to pathways to discourage onlookers - to motivate girls to stay active and use these public spaces*
	25	***Youth centers**, are important meeting-points and places of communication*
	26	*Create places of undisturbed retreat that also **allow youngsters to be noisy and exuberant***
	27	*A need for small, **quieter, contained green spaces** in the fringe areas of the city rather than the large busy parks used by children*
	28	*The site should be accessible for people with disabilities, i.e. no stairs to climb but instead a ramp, signs with enough contrast but also written in Brail*
	29	*The site should be accessible and safe for parents with kids, i.e. ramps for trolleys, low curbs, a safe zone for kids where the risk of being hit by a car is minimal*
	30	*Increase tolerance and respect in the neighborhood.*
***4.3 Strong participatory process** (target>200) - (Introduce: Introduce systemic, comprehensive*	*1*	*Introduce **compulsory participatory planning** (even better: co-planning) in all demo site planning phases*
	2	*With NBS and related interventions **create conditions for more intensive site use**. Define new, group activities, mostly NBS based (local farming - food, flowers aromatic plants + other joint social activitie, any cultural activities (exchange of different culture manifestation), any joint business, actions to increase biodiversity, etc.,), for previously non-active citizens, follow their level of acceptance*

collaborative planning process)	*3*	*Introduce euPOLIS demonstration hub*
	4	*Organize one day workshop between FR cities to exchange their experience in multiple aspects of participatory planning*
	5	***Attractive incentives.** Not only in terms of feasible benefits but also in terms of symbolic, i.e. being included at every stage of the planning*
	6	*Increase citizens involvement in environmental education activities*
4.4 Other livability targets relevant to PH&WB *(ISS, please propose livability targets list) -- (DEVELOP: livability indicators describing different aspects PH & WB)*	*1*	*Propose to city management introduction of **legislation promoting euPOLIS innovations***
	2	*Retail management and the creation of **public-private partnerships** to increase the first needs products availability (for example, plan for encouraging local entrepreneurship to open grocery shops)*
	3	*Creation of spaces where **art and culture** might be nourished (spaces where local authors might exhibit their works)*
	4	*Creation of spaces where dogs owners might **walk their dogs***
	5	***Amenities for local service providers** (e.g., local barbers, cinemas, restaurants, etc.)*
	6	*High accessibility to public services and healthcare in the neighborhood*
	7	*Amenities for seniors and people with disabilities*
	8	*Well-connected in terms of **public transport***
	9	*Security of the location*
	10	*The quality of pavements and cleanliness of public spaces*

	11	***Increase mental and physical health**, both objective (the number of hospital admissions) and self-reported (perceived health and well-being)*
	12	***Increase the attractiveness of the space** in terms of aesthetics but also usefulness. The effect might be measured with both objective (the number of tourists, the value of the property, the number of restaurants, schools, etc.) and self-reported (whether citizens and visitors see the place as attractive) indicators.*
4.5 Improve overall usage stability of the location	*1*	*Introduce appropriate access to location*
	2	***Visibility** of location from different city points as well as visibility at the location*
	3	*Introduce **NB walking and sitting points shading** as a factor of site usage durability and stability (summer, I am sitting in the shade with beautiful view)*
	4	*Consider all euPOLIS domain measures that will stimulate population to develop **stronger attachment to the location** and live longer in this area*
***Goal 5 -** Sense of place and place attachment among users: Data from quantitative and qualitative studies showing an increased positive **emotional attachment** to the neighborhood as well as re-designed public space; Increase **feeling of responsibility and ownership** among community members; **Increased sense of pride** of being part of local community;*		
TARGETS FOR THIS GOAL		*FUNCTIONS THAT SUPPORT TARGETS // CONCEPTS, SOLUTIONS*
5.1 Create local conditions conducive to citizens participation process	*1*	*Produce citizens **participation manual** and instigate public discussion with city authorities*
	2	*Discuss possible activities at community level and agree with citizens and cities on participation logistic practically applicable*
	3	***Educate citizens** on: 1.BGS, 2. their roles in the participation process*

	4	*Discuss with city management and community's methodology to **engage as many relevant participants as possible** and measures to **mitigate the Dropout rate** of participants in longitudinal design study - analyze citizens interests and develop incentives - improved participants social role, health monitoring incentives, any other incentives*
***5.2 Enhance emotional attachment** - (Site and method - Apply planning system where citizens proposals become visible +?)*	*1*	*Secure quiet, relaxing spaces within the demonstration site*
	2	*Gather citizens from the neighborhood to brief them on euPOLIS project direct and indirect results from the NBS implementation, particularly influence on creation of social cohesion by creating a sense of the community between citizens.*
	3	*Apply (negotiate with city management) planning system where citizens proposals become visible - consider this extremely important*
	4	*Increase place attachment by **increasing the sense of ownership**. Participants who will take part in participatory planning will feel more responsible for space.*
***5.3 introduce / enhance feeling of responsibility and ownership -** (Introduce: Citizens regular inclusion into whole planning and implementation process + ?)*	*1*	*Include **citizens regular participation** into whole development implementation process - for that purpose devise system to be approved and adopted by the city management (their formal instruction needed)*
	2	*Introduce **elements to increase biodiversity** including rainwater-based drinkers and shelters for animals*
	3	*Make list of all functions of this passage space (analyze with citizens) - **present demo site multifunctionality***
	4	*Consider introducing on **empty walls greenery or vertical farming** (product placement analysis required) combined with temporary products selling / market / distribution spots*
	5	***Engage** existing site **enthusiast into co-planning** and also try to introduce ways and means(financial) for them to feel really responsible owners*

	6	***Increase the sense of belonging*** *of the community by engaging them in as much as practical outdoor or indoor joint activities. Citizens who will be involved in the euPOLIS project will feel like part of the community build around the project.*
5.4 Increased sense of pride *- (Introduce: Public announcement of results from planning process stressing citizens direct impact with their proposed solutions + ?)*	1	*Introduce* ***public marketing of results achieved****, stressing citizens direct impact (proposed solutions) - use all available platforms*
	2	*Increase self-reported pride in being part of the community and living nearby.*
	3	*Organize a contest in which all citizens could participate, for example, the best community garden wins a small prize or at least is recognized*
Goal 6 - Density and strength of local community ties: Higher trust in local community members; New forms of neighborly exchange, neighborhood engagement and cooperation; Emergence of local leaders and social entrepreneurs; Increased feeling of community efficacy;		
6.1 Higher trust in local community members - *(Introduce: Level and quality of communication in defining site requirements + ?)*	1	*Enhance* ***level of communication between citizens and city planning*** *structures in defining site requirements through collaborative planning process*
	2	*Increase the* ***level of trust*** *towards community*
	3	*Increase the level of trust towards authorities*
	4	*Increase the sense of belonging to the community*
	5	*increase solidarity among neighbors*
6.2 New forms of unneighborly exchange - neighborhood engagement	1	*Community work on different site engagement activities for citizens*
	2	*Community work on cultural events*

and cooperation - (Introduce: - joint work on urban farms - cultural events + ?)	*3*	*FR cities to propose their specific concepts for 6.2*
	4	*Increase the number of perceived social interactions*
	5	*Increase the number of perceived social support network*
	6	*Increase the willingness for participation in projects like euPOLIS*
6.3 Emergence of local leaders and social entrepreneurs	*1*	*Retail management and the creation of public-private partnerships to increase the first needs products availability (for example, plan for encouraging local entrepreneurship to open grocery shops). Enable local stakeholders to access project's data (such as local needs for functions expressed by citizens in Q3) / Facilitate / enhance networking and exchange among local stakeholders during the project's participatory activities*
	2	*Amenities for local service providers (e.g., local barbers, cinemas, restaurants, etc.)*
6.4 Increased feeling of community efficacy - (Introduce: - results from joint activities: - planning, - farming, - cultural events - + ?)	*1*	***Make public the results** from joint activities: planning, farming, ….*
	2	*Create and monitor indicators for **community efficacy** and Allocate money for funding citizens' projects and Invest into grassroots initiatives*
	3	*Increase the **sense of empowerment**: perceived control and influence over decision making*
	4	*Increase the number of **cultural and historical events** in the neighborhood.*
	5	*Increasing **social capital** of participatory processes participants.*
***Goal 7 -** Number of planned natural systems: Quantified improvements of local conditions by implemented NBS such as **microclimate control** (measurable improvements in local outdoor microclimate conditions; # of kWh of **energy saved through HI effect reduction**);*		

TARGETS FOR THIS GOAL		FUNCTIONS THAT SUPPORT TARGETS // CONCEPTS, SOLUTIONS
7.1 Microclimate improvement - *(Introduce: Comprehensive and noticeably better quality microclimate compared to surroundings)*	*1*	*Analysis of **negative effects on microclimate**: Materialization, artificial sources of heat, lack of natural protection from radiation, urban displacement - all in line with item 3.3!*
	2	*Introduce **terrain coverage** by specifically designed greenery - Trees, water, greenery. Exploit potential to plant greenery at any vacant piece of land, even if temporary*
	3	*Systemic **increase of microclimate related greenery** as per euPOLIS pocket park solution or similar - greenery m2 / person to exceed present status significantly*
	4	*Narrow **streets to be equipped** with small and medium pots with greenery at the ground level and at the facade (windows) level*
	5	***Air conditioners exhausts to be directed** upwards with small aesthetically acceptable barriers - or units to be removed to the roof level if possible*
	6	*School air quality control - **NBS's at the school air intake** for the artificial ventilation system*
	7	*Air quality at streets and public spaces - design and construct **extensive NBS barriers** between pollution sources and recipients*
7.2 Energy saving in immediate neighborhood - *(Introduce: Demonstration site urban components affecting energy consumption in the neighboring buildings)*	*1*	*Analysis and activation of **site present impact on buildings** from shading, decreased direct and indirect radiation, change in thermal conduction and subsequent convection on buildings (adiabatic air cooling od wind effect reduction in winter) - For this purpose utilize NBS's*
	2	*Vertical gardens for noise prevention, shading and cooling (green walls, green walls/façades with solar panels)*
	1	*Analysis of site-specific urban components reducing Heat Island effect*

7.3 Heat Island reduction - *(Introduce: Demonstration site urban components affecting directly and indirectly Heat Island intensity at the site and at the neighboring buildings)*	*2*	*Solutions that **mitigate the effect of HI effect** sources (measured or simulated) - introduction of specific interventions designed to reduce / eliminate HI effects - Trees, water, greenery, materialization, …*
7.4 Enhance environment	*1*	*Introduce **climate change adaptation as planning criteria**. Example: enhance the "sinks" that accumulate and store these greenhouse gases (such as the greenery and soil). Analysis of city, site related, vulnerability data - identify potential weather extremes and other climate change risks, propose mitigating solutions*
	2	*Introduce site management sustaining **regulatory services and self-regulatory potential of nature** - analysis of what is achievable at this limited location; example: introduce minimum 5% of the demo site surfaces to be covered by the flowers to enhance wild bees' activities*
	3	*Introduce flora and fauna **biodiversity enhancing solutions** both with greenery and water and construct safe passageways to protect animals' migration from collision with the local traffic*
	4	*Introduce **green wall** on "inviting" walls*
	5	***Make use of the presently unused space** - example: recreation area or playground for kids from nursery?*
	6	*Propose regulations imposing stronger **obligations on local investors** / builders towards protecting and enhancing natural capital*
	7	*Make sure all **NBS interventions are planned to be scalable** as urban functional components*
	8	*Introduce in city legislation **green space preservation** instructions, including land use change*
	9	*In case that the urban setup indicates poor **air quality** in site border areas consider phytoremediation solutions with greenery*

	10	*Consider **recycling potential** at the site - introduce systemic recycling if applicable*
7.5 Provide adequate infrastructure for water amenities	*1*	*introduce **watering points** - number as per expected number of visitors + Enhance / introduce water amenities*
	2	*introduce **public toilets** - number as per expected number of visitors*
	3	*In case of heavy clay soils, consider other means for surface (rain) water management as local evaporation, and directing it with the terrain toward acceptable locations, and other measures **eliminating the risk of local flooding***
	4	*Advise on **groundwater availability, quality** and potential Groundwater salinization / Seawater intrusion mitigation measures in place - to inform planners on possible use*
	5	*Consider whether the **existing WWT** is state of the art. If not consider mitigation solutions*
	6	*Analyze **water bodies quality** - in case of poor results propose mitigation solutions*
	7	*Analyze **water reuse** - introduce where possible*
Goal 8 - Significant improvement of habitat, biodiversity, resilience, Ecosystems (ES) in case studies: The list of Regenerated ES and resulting effects; 30% improvement of ecological status at each case study; The list of resilience measures and their expected results, € savings in case of weather extremes;		
TARGETS FOR THIS GOAL		*FUNCTIONS THAT SUPPORT TARGETS // CONCEPTS, SOLUTIONS*
8.1 City ESS mapping	*1*	*An **Eco System Services City assessment tool** - Demo site assessment model to be created to demonstrate Eco System Services, different functions and interactions between different BGS components and interactions with other BG categories, their synergy influences and potential for improvements - that can be implemented in any city*
	2	Clear, arrange, manage **access to any potential natural components** providing ESS
	3	Create, promote set of recommendations related to the **preservation of ESS**

8.2 Meet basic urban planning criteria for quality ES	*1*	*Introduce **"functional greenery"** as important urban planning criterion*
	2	*The effect of **ecosystem services depends directly on**: 1. the amount of sunlight it receives, 2. the amount of soil moisture it requires, 3. The niche for a plant species might consist of the type of soil on which it is found, - adequate improvements of soil quality, 4. introduce adequate maintenance protocol to meet above requirements*
***8.3 City to develop system to support the private sector** in its efforts to use market-based approaches and payments for ecosystem services*	*1*	*This item will be developed under item 9*
8.4 Test above interventions to adjust solutions to produce tangible results and other positive impacts from ESS	*1*	*Demo sites should be considered as **pilot projects** that demonstrate how markets and payments for services can produce improved results at a lower cost than some existing, opportunistic approaches. 1.This will require careful integration with existing conservation programs that are already producing tangible benefits. 2. These pilot projects can also help to further identify the legal implications of ecosystem services programs, and aid in figuring out ways to address laws and regulations that could impede progress and identify legislative opportunities to support ecosystem services. City teams to investigate and implement items 1 and 2.*
	2	*(Based on related evaluation indicators, **improvement of ESS services (in %)** to be defined upon site interventions and monitoring completed)*
***8.5 ESS Provisioning functions** - provision of clean air, food, raw materials,… (Introduce: ESS quality and intensity significantly contributing to PH&WB and site resilience)*	*1*	*Analyze possibility to **introduce air purification regulating NBS** at all critical site locations as well as joining streets, covering walking and resting points*
	2	*Analyze introduction of system for the **utilization of biomass** for energy*
	3	*introduce **biomass composting** in a clear demonstration manner*

8.6 ESS Regulating functions - *(Introduce: ESS quality and intensity significantly contributing to PH&WB and site resilience)*	*1*	*To benefit from ESS Regulating function, analyze and improve local site microclimate, water purification, soil quality,*
	2	*euPOLIS **introduce micro-climate regulating NBS** at all critical site locations as well as joining streets, covering walking and resting points. Particular attention on evaporative cooling corridors with right greenery utilizing natural forces, as well as winter wind barriers*
	3	*Introduce "cleaning-up" and populating **near shore underwater environment** with marine aquatic BG concept.*
8.7 Socio-Cultural ESS - *(Introduce: ESS quality and intensity significantly contributing to PH&WB and site resilience)*	*1*	*Create facilities contributing to enhanced mental and physical health, positive emotional experience and sense of place,..*
	2	*Introduce euPOLIS "pocket parks" complete as described in the project proposal, at suitable locations - as **socializing and cultural exchange points***
8.8 ecological environment status / effects *- With NBS enhance quality of site ecology conducive to enhanced PH & WB*	*1*	*Above 8.1 to 8.5 items cover green component*
	2	***The blue component**, equally important: 1. at demo site consider water purification by ecosystems - soil micro-organisms are important in water purification. 2.Exploit the fact that both vegetation and soil organisms have profound impacts on water movements: vegetation is a major factor in controlling floods, water flows and quality; 3. Due to the fact that vegetation cover in upstream watersheds can affect quantity, quality and variability of water supply consider these interventions as well; and soil invertebrates influence soil structure, decreasing surface runoff. 4. The planning should consider that the terrain permeability and slopes would affect surface runoff*
8.9 Improve quality of site components related to PH & WB function. Additionally, based on existing city / site vulnerability study introduce additional site resilience measures to cope	*1*	*Define **Site components with climate resilience function** status - Get vulnerability issues from cities*
	2	*Introduce Additional **resilience measures** Improvements related to specific vulnerability conditions: .....*
	3	*Influence CO2 emissions related to buildings energy consumption - **site impact on energy consumption***
	4	*Control Carbon storage and sequestration in vegetation – annual determination*

with extreme weather conditions	*5*	*Improve total surface area of **wetlands***
	6	*Introduce regular check at site on Predicted Mean Vote-Predicted Percentage Dissatisfied **(PMV-PPD)***
	7	*introduce analysis and control of **Urban Heat Island** (UHI) incidence*
	8	*Improve **reduction in peak summer temperature** - reduction in peak temperature, a key factor in improving the livability of urban areas during summer months*
	9	*Create NBS's with Cooling function of ambient air*
	10	***Optimize Tree shade** for local heat reduction*
	11	*Analyze, enhance, and stabilize **Rate of evapotranspiration** with NBS's - important for score with rains to determine conditions for greenery maintenance*
	12	*Intervene to achieve optimal Surface Reflectance - **Albedo effect***
	13	*Define in detail **euPOLIS NB interventions implementation details**: planning, design, tendering, commissioning, running and maintenance and monitoring of PH&WB resulting parameters*
Goal 9 - List of activated/implemented business models: Number of new marketable products and/or new business initiatives, such as urban farms, food coops, social entrepreneurships, start-ups (>5 new products and >3 new businesses); Number of businesses that master and adopt new BGS paradigm and tools (>5 new trained);		
TARGETS FOR THIS GOAL		*FUNCTIONS THAT SUPPORT TARGETS // CONCEPTS, SOLUTIONS*
9.1 Demonstration Site related new business initiatives	*1*	*Analyze and propose specific business models facilitating use of NBS's. Investigate possible implementation of different business forms as urban farms, food crops, social entrepreneurships, tourist initiatives - with recycling sections where possible*
	2	***Construction, installation** of small horizontal and vertical urban gardens at site and in immediate neighborhood, to produce rare expensive flowers, aromatic plants, ...*

	3	*Introduce system for **citizens (of particular city areas) education** on urban farming and enhancement of ESS*
	4	***Sale and distribution of products** - communal units exchange based on excess / shortage between them*
	5	***Create Financial small service** to create small financing model for NBS's and promote it with city and businesses. Propose program for small grants for gardens and facilities for pollinators*
	6	*Construction of **small nursery to supply plants to neighborhood** - 500m range as well as creation and support of green infrastructures network through the neighborhood - private gardener*
	7	*Create public spaces with **microclimate conditions conducive to a small business** (positive aesthetic and climatic conditions)*
	8	*Negotiate with city introduction of **private site maintenance of public greenery** as well as soil improvements and nutrition*
	9	***Site tourism** based on creation of **a**. exclusively beautiful spots to attract tourism and **b.** detailed information and demonstration of NBS multiple functionalities and resulting PH&WB benefits - presented as model for upscaling - by seniors (as a part of a wider tourist package)*
	10	*Creation of **NBS secluded areas** for renting and maintenance of recreational and play equipment*
	11	*Create **NBS attractions to bring more visitors:** 1. more attractive, 2. something to do, 3. enjoy food (make arrangements with local restaurants) in beautiful surroundings, …*
	12	*Create multifunctional **NBS spatial connections between different areas**. Interaction between them might instigate new activities and new business*
	13	***Promotion of this demo site** at city locations, specified to be at a short walking distance - if there is critical mass of visitors than small businesses activation is possible. Selling of seveners, art, ????*
	14	*How do we utilize the advantage of excellent public transport connections*

	15	*Create **exercising areas** secluded and shaded by NBS's and introduce temporary outdoor activities of neighboring sport clubs, of shops and.....*
	16	*Negotiate with apartment building developer to finance small private business for **spotless site maintenance** (good marketing for him)*
	17	*Consider **wi-fi coverage** for the demo site*
	18	*Introduce **beekeeping facilities (pollination)**, training by volunteer enthusiasts*
	19	*Biodiversity restoration - planning, implementation with neighborhood*
	20	***Promotion of NBS's benefits** to surrounding businesses by seniors or ??*
	21	*Provide place for regular **street performers** from whole city and other cities*
	22	*Organize ecological, social, ..., **research for universities**, that will pay for access and use of facilities on regular basis*
	23	*Introduce **Smart technology-based site monitorin**g performance + Close site statistical follow-up wit regular reporting on PH&WB and Business activation results as a guide to scaling-up - contract with private person*
	24	*Analysis of **site related existing business initiatives** / activities for compatibility with euPOLIS targets*
	25	*Analysis and possible **adjustments of existing regulations** restricting business activities at demo site, with cities*
	26	*Discuss with community to introduce **organic waste recycling** which opens business to collection and delivering*
9.2 Number of new marketable products	*1*	*Food, expensive flowers, aromatic plants, herbal plants, ...*
	2	*Tourist offers*

	3	***Education on urban farming*** *and other euPOLIS solutions*
	4	*Dynamic advertising of companies utilizing euPOLIS BGS paradigm*
	5	*Small business running and maintenance services at euPOLIS locations and ....*
9.3 Number of neighborhood businesses that master and adopt new BGS paradigm and tools - (Introduce: - Site overall quality contributing to neighborhood Companies *- neighborhood Companies utilizing BGS as own business drivers – or NBS financing*	*1*	*Propose NBS environments, spaces, public areas, that create conditions for surrounding companies to use them as* ***their business enhancement*** *- consult with them first*
	2	*Neighborhood survey to identify* ***Companies utilizing BGS as own business drivers*** *– or NBS financing*
	3	*Develop system to promote* ***NBS's that will attract interests of neighboring and other city companies*** *to provide their financing of demo site and/or other NBS introduction*
	4	***Analysis of business drivers****, with city supporting partners, to prepare discussion with surrounding companies and/or city level extrapolation*
9.4 Define and check applicability of components treated by BGS which contribute to the increased neighborhood value	*1*	*Define and implement all urban NBS based urban components treated by BGS which contribute to the* ***increased neighborhood value***
	2	*Introduce NBS's conducive to* ***added aesthetic values***
	3	*Introduce NBS's conducive to PH&WB values and* ***publicly display*** *their expected and achieved effects*
9.5 Systemic analysis of green economy potential businesses at the site	*1*	*a. Logistics:* *1. Organize* ***green economy education for citizens*** *- test their willing to participate, test their abilities* *2. Negotiate with city management to introduce* ***financing for small PPP*** *dealing with green economy*
	2	***Resource's preservation*** *and management - existing resources & waste recycling*

	4	*Climate change related weather extremes mitigation*
	5	*ESS regeneration and protection*
	6	*Outdoor water management and preservation*
	7	*Circular economy - sustainable production & consumption*