

JOURNAL

PROJECT

UPPER - Urban
Productive Parks for the
development of NBS
related technologies
and services

📍 Latina, Italy

TOPIC

Sustainable use of land
and nature based
solutions

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Journal 1 UPPER project

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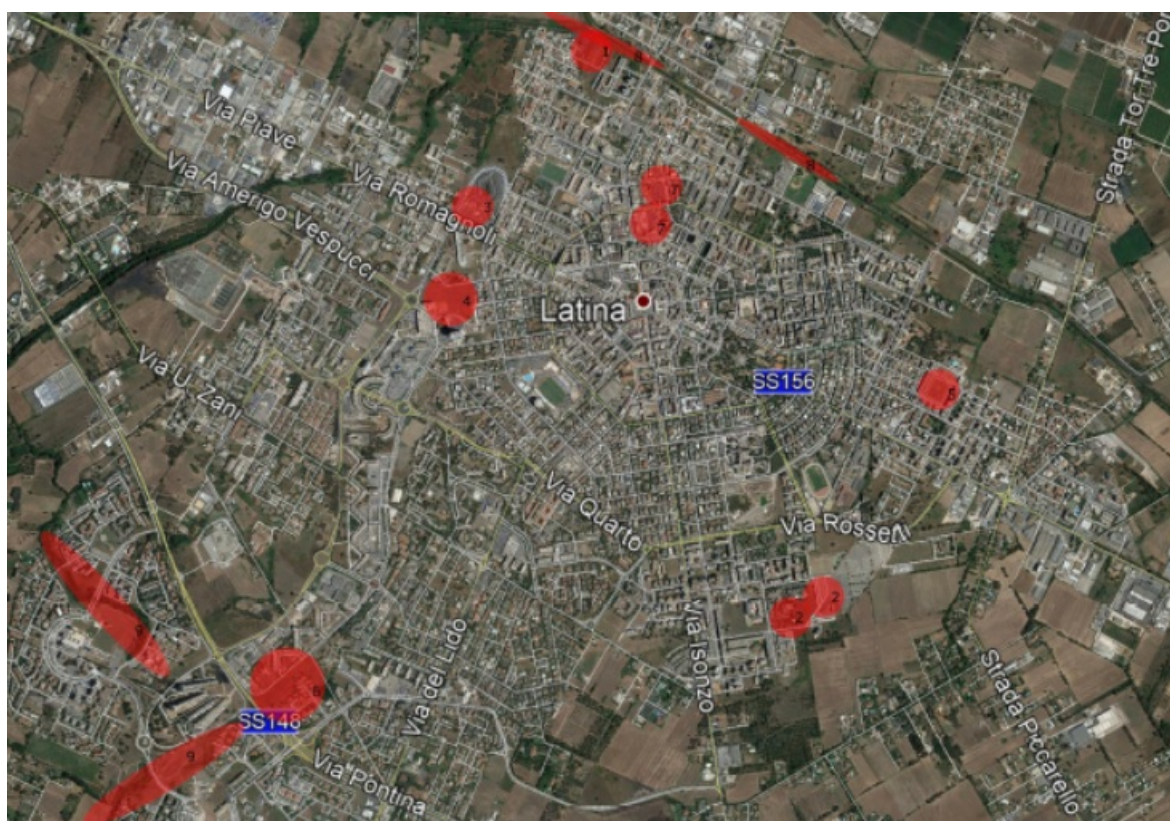
The Journal is aimed to describe the activities of the UPPER project and the results achieved during the first period of implementation. It also describes the challenges encountered in the mid of 2021 as well as in the remaining period of the project. The UPPER project shows how Nature Based Solutions (NBS) can help address broader societal challenges, including social and economic challenges within the paradigm of sustainable development. This Journal describes the processes, tools and methods used for the implementation of the activities and all the future ones till the project conclusion. The journal includes in the first chapter an overall project context description followed by the European, national and local policy contexts. Then, it provides an overview of the implementation challenges faced by the project in Year 1 (Chapter 5 and 6) and the brief conclusive perspectives are included in the last Chapter.

The UPPER project

UPPER project aims at transforming misused and abandoned green and concrete areas of the urban and peri-urban space into Productive Parks (PP) devoted to research, technological development and self-production of advanced NBS (Nature Based Solutions) and innovative nature based services to tackle the identified environmental, socio-economic and governance challenges.

The solution foresees the regeneration of three urban areas which will serve as PP, plus eight Demonstration Sites (DS) for the deployment and testing of the self-produced NBS. These productive and demonstration sites are located in different districts, characterized by specific challenges, like the concentration of Roma community, neglect, fast and unregulated urbanization, absence of public and accessible green spaces, flash floods risks, air pollution and heat island effect. The developed NBS will be applied to the local landscape (DS 1-8) to tackle context specific environmental challenges.

PP1 will act as a one stop shop to meet the demand of nature based interventions and services from the city and other local stakeholders with the need of vocational training, social inclusion and employment from most vulnerable citizens. PP1 and PP2 will involve these citizens to deliver innovative nature based services in collaboration with the wider group of stakeholders.



The overall context for the project

Latina was built in 1932 within a reclamation plan of a large swamp area that created a nexus of canals and rivers that define the landscape and run across the city and its suburbs. This ecosystem suffers from high concentration of water pollutants due to legal and illegal wastewater discharges in the narrow canal beds. The city suffers also for hydrogeological risks since the fragile system of city channels and coastal dunes is threatened by erosion and lack of maintenance, with severe consequences like flash floodings or collapse of roads and bridges.

The city has doubled its population in the last 40 years, by attracting citizens from the near metropolitan areas of Rome and Naples thanks to the development of the local industrial parks, mainly based on chemical and food industries. The fast urbanization led to unregulated exploitation of common land and natural resources, with the establishment of dormitory neighborhoods with few connections to cultural, social and ecosystem services. No attention was paid to the creation of close and accessible green spaces in the new neighborhoods. The existing city parks are mainly located in the city center and are underused due to lack of security, adequacy and maintenance.

The availability of accessible green areas per inhabitant is 12.6 sqm per person (well below the national average of 31 sqm), while an estimated 500.000 sqm of wasteland could be reconverted.

The city is also facing rising temperatures as a consequence of climate change, leading to extreme weather events, such as heat waves that exacerbate the heat island effect in the most urbanized districts, where the perceived temperature raised 49 degrees Celsius in 2018. Shortage of public economic resources, lack of coordination among the different stakeholders and governance levels and dispersion of technical knowledge and specialized skills hamper the city's capacity to address ecosystems' recovery and long-term maintenance of the green and blue infrastructures.

In addition to this, the economic crisis that involved the industrial sector together with the increasing immigration from third countries has caused a wide range of socio-economic challenges, like long term unemployment and inactivity, the youth unemployment rate is 43%, with a total 25% of NEET (Not in Education, Employment, or Training), brain drain towards other regions (70% of graduates leaving the province), illegal exploitation of migrants in the agricultural and construction sector, social exclusion and higher risk of poverty for persons with mental and physical disabilities and lonely persons (elderly, divorced parents or single living alone). The COVID-19 pandemic has exacerbated the situation further. An increasing number of industries closed or moved from the region, leaving square kilometers of brownfields and abandoned fields, mostly contaminated by chemical pollutants or illegal dumping of toxic waste.

This is why Latina applied for funding to the UIA call with the UPPER project that focuses on NBS to be used in urban areas. The following figure 1, show the main benefits NBS can bring to urban areas.



Figure 1 – benefits of NBS in urban areas. Source: adaptation of EEA Report No 1/2021

At the same time, urban parks and forests can provide additional benefits such as improved air quality, biodiversity conservation and recreation opportunities, which are important for human health. UPPER project is also one of the first interventions on sites of the Rational Architecture stile, that thrived in Italy from the 1920s to the 1940s, under the support and patronage of Mussolini’s Fascist regime.

The project in the policy context of the European union level

The EU strategy’s blueprint document (EC, 2020) highlights the value of nature-based solutions as multipurpose, no-regret solutions that are expected to be key in the new strategy. Nature-based solutions and related concepts are increasingly integrated in the global and EU policy frameworks that are relevant for resilience to climate change, biodiversity conservation and restoration and related areas. The urban agenda for the EU makes explicit reference to NBS also to ‘ensure that the changes in urban areas (growing, shrinking and regeneration) are respectful of the environment, improving quality of life’. The European Commission recognizes that stakeholder involvement, dialogue and co-design of tools and measures are key to increase awareness, to tackle potential stakeholders’ conflicts more effectively and to create social acceptance and demand for nature-based solutions. (EEA, 2021).

Being based on NBS the project is related to many EU policies (see Figure 2). The project activities can increase resilience and reduce social and environmental vulnerability; generate multiple social economic benefits and contribute to achieving climate change adaptation objectives and several multilateral environmental agreements and sectoral policy objectives; restore, maintain and improve ecosystem health; enhance governance of natural resources with respect to the use of biodiversity and ecosystem services; and empower people and provide jobs and business opportunities.

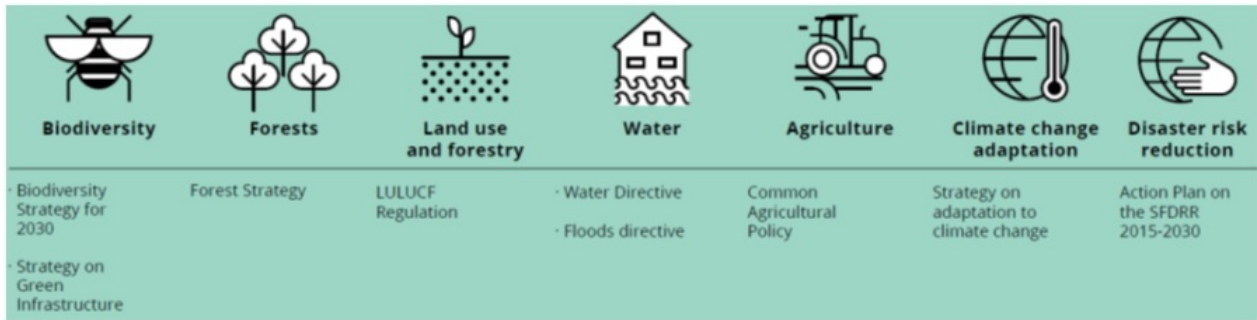


Figure 2 - Overview of nature-based concepts and their related EU policy sectors. Source: EEA Report No 1/2021

Although biodiversity is not explicitly addressed, the project is also coherent with the Action Plan for Nature, People and the Economy.

Moreover, the UPPER project has been also designed to support the ERDF Thematic Objectives and Investment Priorities, in particular:

- TO1/IP1.b, by developing links and synergies between enterprises, research and the public sector in particular promoting investment in Nature Based products and services development, technology transfer, social innovation, eco-innovation, public service applications, demand stimulation, networking, clusters and open innovation and applied research;
- OT3/IP3.a and OT9/IP9.c by promoting business oriented and social entrepreneurship, facilitating the economic exploitation of NBS, including through business incubators;

- OT5/IP5.e by taking action to improve the urban environment, to revitalise cities, regenerate and decontaminate brownfield sites (including conversion areas) and reduce air pollution

- OT5/IP5.a by supporting investment for adaptation to climate change, including ecosystem-based approaches;

- OT8/IP8.b supporting employment-friendly growth through the development of endogenous potential as part of a territorial strategy, including the conversion of declining industrial regions

and enhancement of accessibility to, and development of, natural resources;

- OT9/IP9.a investing in green infrastructure which contributes to local development, reducing inequalities in terms of health status, promoting social inclusion through improved access to social and recreational services and the transition from institutional to community-based services.

Finally, UPPER is also consistent with the United Nations 2030 agenda for sustainable development. It promotes nature-based solutions across different sectors and policy areas and support their implementation as a means of contributing to transformative change. At the UN Climate Action Summit, 23 September 2019, New York, the 'Nature-Based Solutions for Climate Manifesto' (NBS for Climate Coalition, 2019) was launched with the support of more than 70 governments, the European Commission, private sector, civil society and international organisations and set ambitious priorities for unlocking the potential of nature-based solutions for climate action in the short term.

The National level

In Italy there are many initiatives for entrusting green areas to the management of citizens, through which the citizens themselves, generally gathered in association, take care of the green area. Article 6 of Law 10/2013 states that urban green areas can become privileged places for the "sensitization of citizenship to the culture of green", through various activities, such as urban gardens and shared gardens, which in addition to having a role of sensitization towards nature i.e. contact with the earth, respect for the seasons, recovery of abandoned areas, etc., play an important aggregative and economic role such as promotion and sale of local products, short supply chain.

Italy, as holder of the G20 Presidency, would like to focus attention on the important ecosystem services that nature can provide to urban populations. To this end, the Italian Minister of Ecological Transition Roberto Cigolani, stated that "we have focused the G20 work on the evaluation of multiple benefits and how to maximize them with good quality governance. Cooperation across sectors and subnational authorities is key to fostering the integration of NBS into urban, peri-urban and infrastructure planning".

Latina also adopted the principle of "shared administration" implementing the tools and skills available to the community for the implementation of the principle of horizontal subsidiarity (Article 118 of Italian Constitution).

In its parks and green areas, the Municipality of Latina plants a tree for each child born as the provisions of law no. 113 of 29 January 1992, as amended by law no. 10/2013.

With the "La Macchina dell'Acqua" (the water machine) project, together with 9 other municipalities Latina has been identified as a pilot municipality to experiment with models of Next Generation City by city inclusive, green and livable as part of the ANCI (ANCI is the Italian National Municipality Association) project "MediAree - Next Generation City" funded by the National Department of Public Administration as an Intermediate Body, with funds from the National Operational Programme Governance and Institutional Capacity 2014-20. The three-year project aims to support the provincial municipalities in building a better future for our cities by improving the skills, processes and tools of supra-municipal strategic planning to develop urban strategies and policies in perspective of environmental transition and sustainability. The accessibility and inclusiveness of blue and green networks for citizens will be improved, enhancing the governance of the territory and stimulating the active participation of citizens, leveraging the experience of the Upper Project.

The UPPER project has also been designed following the Ministry of Environment "Guidelines for urban green management and first indications for sustainable planning".

The Regional and City level

At local level, the project is part of a set of interconnected regional and local strategies, they include:

- The Regional Smart Specialization Strategy of the Latium Region (2014), since it contributes to the cross-fertilization of business and innovation sectors, while enhancing the cooperation among University, enterprises and public authorities towards the development and market exploitation of new emerging technologies and products that address a wide range of social challenges;

- The Regional Strategy on environmental protection, green economy and sustainability “Latium Smart Green” (2013). UPPER project reflects the strategic objectives of the strategy and contributes by improving air and water quality and tackling hydrogeological risk, as well as boosting green and circular economy;

- The municipal Strategies “Latina Smart City” and the city Plan for Inclusive Urban Regeneration and Security launched in 2018, with the establishment of related Permanent Committee. In fact, UPPER project includes solutions for both smart data collection, monitoring and informed/participative urban planning as claimed by the Latina Smart City Strategy on one hand, while testing collaborative schemes for private and public green areas regeneration and maintenance as pointed out by the Plan. The project will also represent the first opportunity to integrate these strategies and a test bed for the cross-sectoral work of the different stakeholders that have been involved in their definition.

UPPER project makes also use of the results of two EU funded projects already implemented at city level: LIFE “REWETLAD -Widespread introduction of constructed wetlands for a wastewater treatment of Agro Pontino” (2010-2014) and ERDF “PLUS” project that allowed for the construction of a phytodepuration plant and floating islands along the Colmata canal. UPPER project exploits part of the resulting goals and lessons learnt to better address long-term maintenance issues and cost-effectiveness of NBS. Additionally, the project builds on the results of the pilot project on “Citizenship Governance”, that led to the signature of the first three public-people collaboration pacts in 2018 to test a participative management scheme for common goods.

Related to job inclusion of NEET and other vulnerable groups, the Municipality is running the “Farò Latina” project funded by the Italian Government, which has been offering free job orientation and training opportunities (including gardening and green areas monitoring) to more than 3.000 young in the past 10 months. Another project “La città condivisa” has involved 50 migrants hosted in local reception centers within gardening and public green areas maintenance in 2017/18.

UPPER project integrates several technologies developed by the delivery partner like the Web GIS platform www.webgislepini.it developed by La Sapienza University and the monitoring platform LIVIN’ developed by ENGIE.



Progress

Although the delays occurred also because of COVID pandemic, the activities already carried out by the project demonstrated it was able to create a living and co-managed lab involving citizens and stakeholders in the project design and implementation.

A first policy conference and related paper was produced and the media plan for local promotional campaigns issued and 3 co-design Labs with citizens have been run to collect proposals and ideas on the project activities in the targeted areas. The first co-design activity took place in person with a urban exploration of the future PP2 and a practical design session in continuity with the Kick-off citizens engaging workshop, with the involvement and participation of MUA and Labirinto.

The second co-design workshop took place online, together with UPPER Seeds presentation with Labirinto, focusing on the future use of the productive parks and demonstration sites.

The third co-design activity was expected in person on site on October 31st and has been postponed due to coronavirus local lockdown.

Preliminary indications regarding the plant essences to be planted and/or cultivated in P.P. and DS and a list of native species for nurseries has been produced. The network of environmental sensors designed and the first version of the web GIS platform has been presented to the citizens.

The first on-line informative meeting with local citizens, urban planners and neighbourhood committees was held and the Public-Private Agreements Scheme for the green areas bank produced and shared with the stakeholders. Local schools and NGOs have been involved in the design of nature based socio-educational activities by means of a call to action, a social value mapping activity and various meetings.

A first meeting with local enterprises in the field of plants cultivation and NBS was organized and the joint work with the MUA for the definition of the business models of the parks has started. The feasibility study for the public tender of investment 1 has been produced (selection of the project designers is under way).

Ce.R.S.I.Te.S developed the document "Technical Annex on the design of Demonstration Sites" using the analyzes carried out on all areas of the Upper Project. These analyzes concerned both the environmental components and the urban and territorial ones, with particular attention to ecological networks and the connections of the Green and Blue infrastructures. In order to acquire, for the selected areas, the basic information of the most representative plant communities of the area, to be taken as a reference to evaluate the effect of subsequent interventions, non-invasive and non-destructive analyzes were carried out, through spectroscopic investigations based on the survey of the chemical-physical characteristics of the leaf surfaces of tree individuals, taken as a reference. The same methodological approach was carried out for the acquisition of basic information relating to the characteristics of the soils, to be taken as a reference for evaluating the effects on soils of interventions aimed at monitoring and / or improving their characteristics.

The technique used is that of near infrared spectroscopy or NIRS (Near Infrared Spectroscopy). It is based on the measurement of the interaction between the reflected or transmitted electromagnetic radiation and the molecular structure of the surface of the sample under investigation: leaf or soil.

The activity consists in the collection of environmental data in DS before during and after the implementation of NBS. Two platforms have been customized and a tight collaboration between CERSITES and ENGIE has been put in place to decide how to better customize the two platforms for the data representation and the best users' experience.

The web GIS platform WHiP, allows to query the data represented on the map; it hosts the documentation uploaded by the collaborators during the project, published and made available to citizens. This platform is a participatory environment for the design and systematization of areas with the help of public contributions. The WHiP application is hosted in the space of the Cersites Territory Planning Laboratory; access can be made through the UPPER site https://www.cersites.gter.it/webgis_lpd/lizmap/www/index.php/view/map/?repository=lab&project=UPPER_WHIP.

Starting from the common base of the City platforms developed in house by ENGIE, the UPPER platform collects data in almost real time, display the results in real time and store them for post analysis, KPI identification and, historical data representation.

An open call to action has been launched in July 2020 by Labirinto to involve local NGOs, schools, private companies and neighborhood committees in the co-design of nature based social services and edutainment activities ("UPPER Seeds"). 10 NGOS (2 additional with respect to the mapping phase) have answered at the first cut-off date of the Call and 7 proposals have been selected and further developed to be directed towards local schools and citizens both in PP2 and in the Green Areas bank initiative.

It has proved a challenge to create a market of private investors and insurers willing to invest in NBS, as many of the benefits take time to manifest.



Challenge table with level of risk

Challenge

Observation

Leadership

Challenge level



After an initial period of settlement and active involvement of the partners, the project is adequately managed by the Municipality of Latina also with the support for the project management activities by a company with previous experience in managing UIA projects, contracted in 2021.

Public procurement

Challenge level



Public procurement represented the main issue of the project. This was mainly due to the commitment of human resources initially assigned, this was exacerbated by the urgent emergency needs caused by COVID19.

Organizational arrangements within the urban authority (cross departmental working)

Challenge level



Due to the multidisciplinary nature of the action, the project activities involve almost all the municipality departments.

However, one of the cause of the delay faced by the project was due to internal organizational problems, in particular, difficulties in setting a working group dedicated to the project with adequate competences and economic and time effort recognition.

Participative approach for co-implementation

Challenge level



Participative approach is one of the strength of the project. Local stakeholders have been involved since the project design and they are continuously consulted during all the project activities.

Monitoring and evaluation

Challenge level



Monitoring and evaluation activities are carried out by the MUA together with 3 other partners with the support of innovative monitoring tools.

The project indicators needed to be revised different times, the final version has been agreed with the UIA project officer only in August 2021.

Communication and dissemination

Challenge level



Communication and dissemination activities do not represent a challenge. They have been delivered although the impact of COVID pandemic on the project.

Upscaling

Challenge level



The project shows good potential for upscaling and replication. Several funding opportunities have already been identified, but the project is still at an early stage and they will be studied in detail when up scaling activities will be designed.

Challenges description

Leadership

The partnership led by the main urban authority (City of Latina) includes a multidisciplinary group of 8 delivery partners, that covers national and regional environmental institutions (the National Park authority and a regional public-private Foundation Caetani), the NGO sector (2 social enterprises and one no profit association), the research institutions' sector (the University), the private for profit sector (one multinational company), one international partner specialized in participatory urban planning (Tesseract). They are supported by a wider group of stakeholders composed by 3 NGOs, two networks of local associations, two neighbourhood associations and one business incubator.

The management structure include: the Project Coordination Team (PCT), the Steering Committee (SC) and a specific Quality Assurance Team (QAT) to ensure scientific advice, consistency between the project WPs, quality control of actions and results.

It was necessary for the urban authority to ensure efficient coordination between the partners and correct implementation of the project objectives, in compliance with times and costs, to oversee the administrative and financial management and to ensure financial and scientific/technical coordination, project planning and assessment of the progress. The terms of reference for the coordination of the project and a regulation of the SC have been approved during the SC meetings in order to govern the internal body responsible for taking decisions of the project, to verify its progress and to adopt adequate corrective measures in the event of risks or the need for adjustments.

However, the UPPER management body recognized that the typical organization of a municipality, even if a large one like Latina, is not suitable for to be able to bear a complex function such as that of systemic management of assets and activities that converge in the 3 PPs and related DSs.

This is why it was signed a contract with an Italian company to support the project management activities who started its activity in May 2021.

The initial project activities have also proven that there is a need of a governance model based on specific "People-Public-Private" partnerships (PPPP) to ensure the future sustainability and profitability of the Productive Parks market together with maintenance of urban green infrastructures.

Public procurement

The European Environmental Agency (EEA) recognizes that the timescales for implementing NBS are frequently a challenge^[1].

The UPPER Public procurement process was delayed due to the commitment of human resources initially assigned and exacerbated by the urgent emergency needs caused by Covid19, for which it was necessary to start, organize and carry out every activity to deal with the adverse criticalities that occurred during the calamitous event. The

Covid19 emergency has slowed down all the project activities and it was necessary to re- schedule a lot of them.

The criticality that has increasingly emerged is that in order to draw up the tender for the award of engineering and architecture services and for the construction of the 3 Productive Parks, it was necessary to first collect wishes and expectations of the stakeholders, whether they are citizens or residents of the districts concerned, as well as local businesses, and associations of citizens who have needs and projects in the area.

Therefore, a key lesson learnt was that in order to meet different types of needs, to include very technical specifications in the procurement process and in parallel, ensure compliance with public administration procedures and public procurement legislation, a lengthy consultation process had to be followed between the involved parties. This, in essence, helped in better defining needs and communicating them in a way that was understood by different types of organisations.

One of the solutions for to the unexpected delay problem, was to replace the physical place with online meeting platforms. The web has therefore been fundamental to organize online meetings, webinars and focus groups. After March 2020, despite the reprogramming of the workplan, most of the activities were carried out online and in smart working including the Project coordination meetings. The UPPER website and the social networks have been used for the communication activities too.

It was necessary to adapt the procurement and investment activities to a new time schedule. However, although the competition for the selection of designers is in the drafting phase, it will be necessary to ask for a time extension in order to reschedule a new work plan.

[1] EEA Nature-based solutions in Europe : Policy, knowledge and practice for climate change adaptation and disaster risk reduction. 2021

Organizational arrangements within the urban authority (cross departmental working)

Due to the multidisciplinary nature of the action, the project activities involve almost all the municipality departments.

The following management structures has been created:

- A Project Coordination Team (PCT), composed by the Project Coordinator and the Financial Manager will be responsible for managing the project at daily basis, comprising the risk management.
- The Steering Committee (SC), includes 1 representative per partner. Bimonthly meetings take place ensuring proper decision making & governance of the project.
- A Quality Assurance Team (QAT) providing technical and scientific support to the Project Coordination Team and to the whole partnership by ensuring scientific advice, coherence across project Wps, quality control of actions and deliverables. It is composed by one representative of each WP Leader and chaired by the partner Labirinto.

However, one of the cause of the delay faced by the project was due to the internal organizational problems of the environmental service, in particular difficulties in organizing a working group dedicated to the project with adequate competences and adequate economic and time effort recognition. It was necessary to replace the internal professional technician appointed to manage the call for tenders for the construction of the parks, who started working in a very short time and needs to deepen the many crucial aspects that obviously require adequate time.

But within the municipality, during its implementation, the project established a cross-sector and cross-department way of thinking and acting, at all administrative levels, together with mixed and integrated resources. The UPPER team has invested significant time in building connections between various sectors and departments, but establishing better communication and promoting collaboration will be an ongoing challenging for the project's implementation.

In particular, with the resolution 204/2021 of the municipal council, it was decide to assign the activities to be carried out by the departments, broken down by Upper Work Package, in terms of objectives to be achieved, financial resources for the specific implementation tasks and implementation times.

Participative approach for co-implementation

The COVID-19 lock-downs across Europe have highlighted the vital importance of local parks, pocket parks and urban forests as an essential element of people's quality of life.

UPPER project represents a best practice of how the involvement of citizens in the maintenance of public parks helps to bring the citizen closer to environmental issues and urban decor, making the relationship between green managers and its users interactive. The participation and social involvement of the various stakeholders also allows for better social acceptability of the new projects, adapted to the real needs of the local community.

The project activities are defined through co-design that have been organized with and participated by local associations and relevant components of the wider group of stakeholders, as well as other key actors (local schools' representatives, cultural or community centers, private landlords).

The engagement and co-design methods adopted draw on the Urban Reconnaissance methodological framework developed by the partner Tesserae, which comprises three steps: exploration of the area/spatial recognition; restitution on the map of ideas and proposal; collaborative elaboration of outcomes/guidelines for city planners. Each workshop includes an interaction among citizens and with citizens and local city planners on a specific project area.

Participative activities have started since the preliminary project design. The MUA has launched an open call to enlarge the Wider Group of Stakeholders and 117 Individual citizens and 41 representatives of schools and NGOs have joined. A preliminary meeting with local NGOs has been organized in November 2019 and a citizens engagement meeting has been run in December 2019 to present the project. A series of individual/group interviews has been run by Labirinto with local NGOs at beginning of 2020 to carry out the Social Value Mapping. A first First Informative Meeting with citizens and policy makers has been delivered by Circeo National Park in October 2020. An open call to action has been launched in July 2020 by Labirinto to involve local NGOs, schools, private companies and neighbourhood committees and Upper City Labs have been run by Tesserae with local citizens, schools, neighbourhood committees and NGOs for the co-design of the Productive Parks.

The activities in the park of Campo Boario are based on properties confiscated from organized crime. They foresee to provide for the promotion of the social integration of Roma, Sinti and Camminanti communities and other minorities in implementation of the European Commission Communication no. 173/2011 and implementation of measures aimed at combating social hardship deriving from irregular settlements. Resistance from some sections of the community was a possibility, but the municipality started an extensive work with stakeholders to overcome this issue.

Accompaniment and insertion interventions have been set to prevent and reduce the risks of social exclusion of particularly exposed subjects, people with addictions, with mental discomfort, immigrants, Roma. UPPER foresees also the promotion of projects aimed at facilitating the work placement of citizens with disabilities.



Monitoring and evaluation

Quantitative and measurable indicators for monitoring and evaluating the progress and effectiveness of agendas for NBS are lacking across policy arenas (Somarakis et al., 2019). Appropriate indicators, evaluation tools and integrated assessment methods are needed to allow better evaluation of the net effectiveness of nature-based solutions (EEA, 2020).

Monitoring activities are included in project management as a support action to the coordination and management activities carried out by the Lead Partner Municipality of Latina, as well as to facilitate the mandatory reporting procedure to the Permanent Secretariat (Annual Progress Reporting).

The monitoring scheme will build on the state-of-the-art methodologies and tools like the EKLIPSE Impact Evaluation Framework to support planning and evaluation of nature based solutions projects. It will include ex ante evaluation, ongoing and ex post evaluation, for at least one year after the completion of the interventions in PP and DS.

A mixed methods research will be used, that combines elements of qualitative and quantitative approaches.

The Monitoring & Evaluation activity, in the context of the UPPER project, includes two parallel processes.

a. Project Monitoring: this action is carried by Municipality of Latina with the direct involvement of the partnership and it will focus on assessing the project performance by collecting and analysing quantitative and qualitative data on the activities performed, the deliverables produced and their outputs. This activity highlights the main milestones of the project achieved in the context of the Preventive Monitoring process carried by the UIA Permanent Secretariat. It serves as the main source of information for the Annual Progress Reports to be produced by the MUA as well as a support tool to help the Steering Committee taking corrective actions for a more efficient and effective project implementation

b. Project Evaluation: this activity focuses on assessing the project results (outcomes), which means collecting and analysing both quantitative and qualitative data about the changes produced by the project activities with respect to the context (urban environment) and to the target groups involved (citizens, enterprises, policy makers). In the context of the UPPER Evaluation process, the results which are (as much as possible) exclusively attributable to the project are considered as the project short-term impact

The evaluation activity are carried by project partners Labirinto, ENGIE and Ce.R.S.I.Te.S., according to their specific thematic competences within the project.

Environmental data on air pollution and temperature are gathered on a 24h basis through a network of street sensors, while soil and water pollution will be mainly monitored by means of in situ sampling and laboratory analysis, including use of infrared hyperspectral technologies. The combination of real time measurements with historical data, both modelled and/or previously gathered from other entities (e.g. local protection environmental authorities), is analyzed through the interconnection and hyper-vision platform developed by partner ENGIE (LIVIN' platform), with the aim to isolate the different sources of heat and air pollution; additionally, non intervention sites are monitored as well, in order to get comparable results. All these elements contribute to isolate the changes attributable to the project and discount external factors.

Changes on dimensions like social inclusion, citizens' wellbeing and sense of belonging, attitude towards innovation and employability, as well as impacts on institutional capacity are assessed throughout qualitative research tools, like: self-assessment of perceived wellbeing and urban space liveability; semi-structured interviews with citizens, urban planners and business sectors' representatives; group-based deliberative evaluations; participative story-telling with the involvement of key representatives of the selected target groups in each neighbourhood.

By following the Results Oriented Framework requested by the European Commission, the evaluation activity is based on the expected results identified in the Application Form and related results indicators. Results indicator have been selected on the basis of their capacity to correspond to measurable changes in the initial situation that can somehow indicate the corresponding result's achievement. The list of project indicators has been defined in the project proposal and then rediscussed and validated by the project partners, following the guidance of the UIA project officer, after the beginning of the project.

Communication and dissemination

The project has set out a communication strategy with clear communication objectives, and has defined the target groups.

These activities consist of 3 types of dissemination activities namely: story telling sessions, public conferences with

decision makers, public conferences with the business sector; each with specific target groups and objectives.

The events could have been held in presence or online (webinars or web conferences). However, events and laboratories needed to be redrafted and planned online due to the coronavirus crisis and lockdown: digital communication was widely exploited to reach citizens and specific targets and open conference calls have been used to stimulate participation.

Concerning digital communication, Tesseractae created and manages the UPPER website and the project pages on three social networks (Facebook, Twitter and Instagram). Contents are updated with the contribution of all project partners and citizens' participation is elicited on a regular basis to capture their expectations, opinions, personal experiences in relation to the Productive Parks and their services/benefits

Partners Tesseractae, Labirinto, Innovaction Europe and Cersites produced and uploaded on the website 23 news and articles, and 11 events related to the activities, with the supervision of Tesseractae.

Two important events open to general public have been promoted by Tesseractae, the first in person on 13 December 2019 which included the kick off meeting, presentation of the project to the city, the first policy conference and the kick off citizen engaging workshop, the second on 31 October/1 November 2020, which included WHIP platform presentation by Cersites, Green areas bank presentation by Labirinto, first dissemination seminar by Parco Nazionale del Circeo and the second policy conference by Tesseractae.

Laboratories and webinars were promoted by Tesseractae (3Upper City Labs, 1Upper Stories Lab, 2 webinars for the business sector involving Cersites and Innovaction Europe) and constant information about the project and other relevant projects was provided to the city.



Upscaling

The solution is scalable since the model of city productive parks for NBS and related services depends on three key resources, namely the availability of wasteland/underutilized land or green areas in need of maintenance, the availability of skills and competences to produce NBS and related services, someone who pays for these products and services.

All the three resources are already available including city wasteland, unemployed persons, technical skills from research Centers and scientific institutions, public investments for green infrastructures installation and maintenance. They will be further elicited by the project activities (WP6) by enhancing availability of additional green areas as demo sites from private landlords (in return for incentives), business development and enterprise creation for the co-management, marketability and financial sustainability of current and additional productive parks. In addition, the project includes plans and tools for up-scaling of the solution at city level and beyond, such as:

- Involving the surrounding municipalities, as well as other public institutions (i.e. the delivery partner Circeo National Park, local hospitals and schools, the delivery partner Caetani Foundation who manages The Ninfa Gardens) in the purchasing of NBS related products and services produced within city's productive parks;
- Establishing a "green areas bank" tool, which will be integrated with the monitoring tool for city vacant/underused lands and brownfields in order to up-scale the pilot testing of incentives for private landlords;
- identifying additional underused lands to be devoted to installation and maintenance of NBS cultivated within the three productive parks, also using dynamic environmental data analysis
- making recommendations to the Regional Authorities for up-scaling productive parks at regional levels and thus

leveraging additional public funds.

The challenge addressed by UPPER project is particularly relevant to medium sized cities, which face daily problems to address installation and long-term maintenance of NBS, both in terms of financial resources and necessary technical know how, and this challenge is even more common since it is independent from the specific landscape features, NBS or environmental conditions of the city. Other complementary challenges addressed by the project, namely citizens' unemployment and social exclusion, are also common urban challenges that almost all European cities are trying to face.

The solution of productive parks for self-production of NBS related technologies and services with a focus on affordable and sustainable NBS is highly transferable, since it requires three very common resources to be adopted: the availability of wasteland/underutilized land or green areas in need of maintenance, the availability of skills and competences to produce NBS and related services, someone who pays for these products and services. While the first of these resources is widely available (wasteland), UPPER project offers a replicable solution to enhance the second and third resource (skills and demand for NBS) by testing a People-Public-Private management and financial scheme, a mechanism to meet demand and offer of job in the NBS sector and the creation of a local market for NBS from private and public purchase of Productive Parks services and products.

The project will foster replicability by producing specific guidelines and schemes that will be disseminated to national and European cities by means of communication events, tools and exchange meetings.

There is a good explanation as to how the solution, if successful, could be scaled up in this city and in neighbouring municipalities, for example by extending the purchase of plants for NBS and incorporating a 'green areas bank tool' into routine management of brownfields.

INTERREG or URBACT programmes can be used for the project up-scaling. The municipality of Latina is already involved in the URBACT net and activities. A sizeable part of the EU cohesion policy, common agricultural policy and LIFE programme funds can be used for implementing nature based solutions too. All these opportunities will be studied in detail when up-scaling activities will be designed.

SUMMING UP THE MAIN ASPECTS

UPPER is a clear example of how NBS are characterised by their multifunctionality, producing multiple benefits simultaneously, including environmental, socio cultural and economic benefits. Engaging different stakeholders in the design process, assessing NBS in relation to their multiple benefits and addressing the socio-institutional barriers is key to enhancing society's acceptance of these solutions and finding the best option.

The effectiveness of nature based solutions is highly dependent on the local context. Involving local stakeholders from the outset in the planning and design phases is crucial for ensuring social acceptance and ultimately for the full delivery of multiple benefits. For UPPER concept local inhabitants and society are seen as being not only passive beneficiaries of nature's benefits, but as key players who can proactively protect, manage or restore natural ecosystems.

Although intended mainly as a recreational resource, the proposed Productive Parks are clearly a multi-purpose solution addressing e.g. flood risk, pollution control, social exclusion and unemployment and the whole project is characterised by extensive public engagement.

The plan to set up test sites using NBS to tackle different problems facing parts of the city draws on existing knowledge and practice in the use of NBS and digital technologies rather than proposing radical new solutions. However, there will be useful demonstration of approaches tailored to local conditions, along with capitalisation of the test results in local production of the best-performing plant varieties.

The project demonstrates an holistic approach to innovation in governance by involving citizens and considering the economy, social inclusion and quality of life, while improving climate resilience.

The project clearly explains the potential added-value to the policy area concerned, stressing literally 'home grown' solutions and community buy-in to wider use of nature-based solutions (NBS) in tackling a range of urban problems.

UPPER will be one of the first solutions that transforms a problem such as the maintenance and development of green areas in a structured program also for the job inclusion of citizens vulnerable, becoming the first European example of a production park not dedicated to the production of primary goods (agri-food), but to the production of NBS and innovative services based on nature.

Despite the great difficulties encountered during the period of health emergency, the MUA was able to manage the activities with the partners and to organize and manage the online events with an optimal participation, given

the situation.

Considering the 3 years' timeframe and the delays caused by COVID pandemic, there are some concerns on the capacity of the project to achieve the environmental objectives, in particular those related to heat island and air pollution reduction, time needed for the growth of self-produced plants in the Productive Park, as well as on the time sequence for the implementation of the NBSs. A request for a temporal extension of 12 months will be submitted in October 2021.

Sustainable use of land and nature based solutions

See on UIA website

