



Participatory approach, mixed methods, and urban sustainable development in the Horizon 2020 URBiNAT project

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Abstract. This study examines critically the methodologies used in the H2020 EU Financed URBiNAT (Urban Innovative and Inclusive Nature) project, with the aim of investigating the effectiveness of different methods analysing intervention areas in deprived urban environments prior to the implementation of nature-based solutions. The main contribution focuses on the challenges faced when intersecting objective data with subjective ones collected from citizens: our hypothesis is that mapping both qualitative and quantitative data is indispensable for evidence-based urban planning and offers outstanding potential for gaining useful insight into urban spaces and their impact on citizens. The URBiNAT project introduces and tests a mixed-method approach for urban design, project assessment and monitoring valuation based on multidisciplinary work. For the underserved intervention areas, a new concept, the so-called Healthy Corridor (HC), has been introduced by URBiNAT researchers. Different areas or neighbourhoods of the city have been connected through healthy corridors, which consist of innovative and flexible NBS, i.e. many micro NBS emerging from community-driven processes and boosting environmental, economic, and social sustainability and cohesion. By emphasizing the growing significance of participatory techniques, our research stresses the synergistic benefits of employing diverse methods in urban planning. The city of Nova Gorica is a practical example of the applied participatory approach. The outcomes of the URBiNAT project are a benchmark providing practical insight for future attempts to evaluate effectively and transform urban intervention zones.

Keywords: Nature Based Solution, Co-diagnostic, mixed methods, healthy corridor

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1 Introduction

URBiNAT is a transformative initiative funded by the EU H2020 program aiming to rejuvenate urban neighbourhoods. Its goal is the co-creation of nature-based solutions (NBS) that have social, environmental, and marketable implications, specifically for social housing neighbourhoods. This project means to analyse different areas of the cities, identify and characterize the deprived ones, and rebalance different areas through NBS based regenerative interventions.

This paper focuses on the effectiveness of different methods that assess intervention areas prior to the implementation of nature-based solutions: our hypothesis is that integrating objective data with subjective ones collected from the citizens is crucial for evidence-based urban planning and offers outstanding potential for gaining useful insight into urban spaces and their impact on the citizens [1]. This approach is innovative in its perspective: it starts with the identification of a deprived area in a city and, through the implementation of solutions co-designed and co-developed in community-driven processes, it introduces new forms of NBS triggering the creation of so-called healthy corridors.

The transdisciplinary approach of the URBiNAT project is crucial and is applied starting from the co-diagnosis process in order to profile the selected ecosystem and define a potential co-created regeneration plan. URBiNAT uses four interrelated approaches:

1. Co-diagnostic - Evaluating the area in terms of its territorial, social, and economic fabric.
2. Co-design - Actively involving citizens to brainstorm ideas, craft strategies, and delineate solutions.
3. Co-implementation – Building the co-designed solutions.
4. Co-monitoring - Regularly checking the implemented solutions for effectiveness.

2 Literature review

One of the purposes of this paper is to demonstrate the effectiveness of mixed methods for decision-making in urban design by tackling socio-economic, ecological, technical, political and ethical perspectives [2; 3; 4]. Urban design inherently involves a multitude of stakeholders and potential outcomes, making decision-making a complex endeavour. This complexity demands an intricate balance of various elements, from technical parameters and empirical data to social perceptions and emotional responses.

Mixed-method frameworks are gaining traction for their ability to synergize quantitative and qualitative data analyses. This approach integrates the two forms of information and uses distinct designs for the broad purposes of breadth and depth of understanding and corroboration [5; 2; 6; 7].

Urban planning ideally reflects and incorporates all public and private parties, and minimizes conflicts to achieve well-balanced planning results, preferably for all citizens: thus, all available information and knowledge sources should potentially be considered in the planning process [8; 9]. The importance of this participatory approach

is increasing because citizens are becoming more emancipated and demanding and are clearly articulating their claim for participation in urban planning and decision-making [10]. This is also evident in other relevant sectors, such as tourism [11], where the involvement of local communities has become particularly crucial to the success of responsible tourism development and its benefits [12; 13].

This paper focuses on the challenges of integrating objective data with subjective ones collected from citizens: the hypothesis is that mapping both qualitative and quantitative data is indispensable for evidence-based urban planning and offers potential for gaining useful insight into urban spaces and their impact on citizens.

Although there is an ongoing debate among scholars on whether mixing methods is legitimate, successful real examples in environmental decision and policy making are still insufficient [14]. As very few applications of mixed methods can be found in the field of urban and regional planning [e.g., 15; 16; 3], the URBiNAT project can be used as a case study and a practical example for the investigation of suitable methods for successfully assessing areas.

3 URBiNAT: how to investigate the urban ecosystem

URBiNAT is primarily geared towards rejuvenating underprivileged urban locales. Partner municipalities within the URBiNAT umbrella have pinpointed their pilot areas aligning with persistent local challenges. The cities of Porto, Nantes, and Sofia, considered 'frontrunners', were selected based on their prior engagement to nature-based solutions (NBS) for urban regeneration. Conversely, 'follower' cities such as Siena, Nova Gorica, Brussels, and Høje-Taastrup aim to assimilate and replicate the knowledge and methodologies pioneered by frontrunners. The selection criteria for these cities are rooted into their historical NBS engagement and political will, with emphasis on their enthusiasm and adaptability to re-employ NBS strategies.

Specifically, URBiNAT promotes the community-driven co-design and co-implementation of healthy corridors, i.e. connecting spaces characterized by improved living conditions thanks to traditional and innovative nature-based solutions, NBS, for territorial and social regeneration.

The first step for a healthy corridor design is its definition through the assessment of the urban area to regenerate. This step is implemented thanks to in-depth local diagnostic research [17; 18]). In this document different areas in each city with their own specific characteristics are analysed to single out complex realities and needs, and describe the areas identified as deprived. The further and crucial objective is to rebalance them with other city areas. The information necessary to do so is very broad and encompasses both existing data and new information collected specifically for the project.

Most cities and urban communities, including the members of URBiNAT, face specific issues such as:

- i) poor air quality (Nantes, Bruxelles, Sofia).
- ii) heat island effects (Nantes, Porto, Siena, Bruxelles).

iii) increased frequency/severity of extreme events, such as floods, droughts, storms and heat waves (Nova Gorica).

iv) run down industrial sites (Sofia, Siena, Nova Gorica, Bruxelles);

v) malfunctioning urban areas (Porto, Nantes, Sofia, Siena, Nova Gorica, Høje-Taastrup);

vi) increased criminality, social exclusion, inequalities, marginalisation, scarce availability of healthy food for low-income groups, as well as poverty (Porto, Nantes, Sofia, Siena, Bruxelles, Nova Gorica, Høje-Taastrup); and

vii) increasing health problems (Porto, Nantes, Siena, Nova Gorica, Høje-Taastrup).

Tackling such issues with an interdisciplinary approach makes a difference for many reasons:

- NBS are very different, and the study areas are very diverse (different countries, cultures, lands, needs, etc.). The cities face specific challenges (poor air quality, malfunctioning urban areas, criminality, social exclusion, inequalities, increased frequency/severity of extreme events) and have great expectations for an inclusive and sustainable urban regeneration.
- It enables researchers to evaluate all the aspects playing into the specific situation of the intervention areas: each city that has been analysed is as an entity with many connected dimensions. As a result, the area under scrutiny has not been considered or studied as isolated but rather as part of a dynamic urban environment. This allows researchers to explore different fields and sectors to reach solutions based on a new understanding of complex situations.
- It involves drawing appropriately from many disciplines to redefine problems outside normal boundaries. As the evaluation of alternative scenarios is a complex decision-making problem, both technical aspects, based on empirical observations, and non-technical ones based on social beliefs, preferences and feelings need to be considered simultaneously. A deep and multilateral investigation is conducive to understanding why the proposed solutions are different from other similar ones and therefore worth taking stock of.

Crafting such detailed urban solutions requires the expertise of a broad spectrum of professionals, from urban planners and architects to economists, sociologists, statisticians, legal experts, engineers, and scientific researchers.

3.1 Comprehensive Static Assessment

The analysis of the local context is performed through the collection and description of existing information about specific characteristics of each city area: these may be broad spatial and social urban descriptions as well as administrative and strategic policies. The data that need to be collected have been classified into three main categories: territorial, social and economic.

By dissecting variables across these categories, a comprehensive picture of a city's unique attributes emerges. Holistic understanding is instrumental to pinpointing

potential zones ripe for the introduction of 'healthy corridors', ultimately aiming to enhance the residents' quality of life.

3.2 URBiNAT: Methodological Approach

The co-diagnostics aims to assess each selected area of the city by specifically focusing on deprived study areas. Thanks to it, it is possible to learn more about the area itself and to compare it with the other areas. In this stage of the co-diagnostics, many methods are performed through a set of participatory activities that produce new data specifically for URBiNAT.

A broad set of the methods was necessary because of the nature of the healthy corridor and the diverse set of NBS implemented in it.

Therefore, the partners involved in the co-diagnostics set up a list of activities and methods. Among these nine were used, each one generating qualitative and/or quantitative data: Cultural Mapping (quantitative and qualitative results), Behavioural Mapping (quantitative results), Walkthrough (quantitative and qualitative results), Photovoice (qualitative results), Focus Group and observation (qualitative and quantitative results), Face-to-Face Interview (qualitative results), Neighbourhood Survey (quantitative results), Laboratory Analysis (quantitative results), and Territorial Mapping (quantitative results).

Each of the selected methods was conducive to finding relevant information and grasping specific aspects: the complementary nature of the methods used helped to enrich the overall picture and to make connections, problems and limitations more evident.

The qualitative and quantitative data collected were then fed into a digital platform producing actionable insight through the implementation of different research methodologies in each of the intervention cities.

Moreover, the interdisciplinary approach expanded the horizon of the data collection. This holistic approach allowed for a thorough examination of both the positive and negative externalities, encompassing both the direct and indirect effects associated with the evaluation of the healthy corridor.

3.3 Healthy Corridor: Introducing a New Concept

URBiNAT co-diagnostics process advances the co-creation, development, implementation, and assessment of nature-inspired and human-nature centric solutions. Throughout the underserved intervention areas, a so-called healthy corridor (HC) has been created by urban planners, architects and other URBiNAT stakeholders.

Different areas or neighbourhoods of the city have been connected through healthy corridors, which are innovative and flexible NBS, i.e. many micro NBS emerging from community-driven processes that boost environmental, economic and social sustainability and cohesion. In fact, the name healthy corridor doesn't only consider the health of the area, it also refers to all the aspects that influence its wellbeing, including social, economic, and environmental ones. The healthy corridor intervenes on and

conditions the urban ecosystem, as a system of material and immaterial values present in a given area.

The purpose of the corridor is to connect the impoverished neighbourhood with the rest of the city in order to further inclusivity, increase attractivity and create a green path for health improvement and ecosystem regeneration: the healthy corridor is therefore a physical construction, which aims to lift stereotypes, misconceptions, and geographical barriers through the connectivity between diverse neighbourhoods, both in terms of economic variables, as well as of ethical backgrounds and gender aspects. The combination of NBSs with different characteristics contributes to create synergic effects, and creative cross-over results within the healthy corridors, which have been co-created thanks to bottom-up citizen participation: therefore, it is a new endogenous growth model that URBiNAT has applied in the studied area.

4 The Methodology of URBiNAT: The Case of Nova Gorica

The city of Nova Gorica has actively taken part in the URBiNAT project as a follower with the commitment of testing the URBiNAT methodology designing an urban plan that may include the definition of a healthy corridor in the selected area. During the URBiNAT project the city has also been appointed European Culture Capital 2025. It has been nominated together with the neighbouring Italian city of Gorizia, which has been included the URBiNAT project as an ongoing good practice in the environment axe. Nova Gorica didn't have any experience in participatory practices for urban regeneration, except for the participatory budget enabling citizens to propose and vote the distribution of some dedicated funding in the municipal area, usually targeting small objectives such as new benches or the maintenance of children facilities etc. Testing the new URBiNAT approaches meant that the city of Nova Gorica would activate a new urban dialogue that involved the Slovenian and the Italian communities in assessing the area and suggesting potential cost cuts. It would also combine sustainable solutions based on resilient techniques, technologies and materials regenerating disused urban segments. Both communities were involved as Nova Gorica and Gorizia are two different cities that today appear as a unique urban agglomerate, due to the elimination of the border built in the 1940s at the end of World War II.

During the pandemic, the city of Nova Gorica carried out thorough static data research, using the available resources from the GIS systems of both cities, the statistical data of both countries and regions, as well as consulting several reports on strategies, weaknesses, and future policies. When the data gathering process was over and people met again after the COVID-19 restrictions (that were imposed with different timing in both cities), the following processes were carried out:

1. Behavioural mapping in October and November 2021;
2. Territorial mapping in October and November 2021;
3. Stakeholders Mapping in October and November 2021;
4. Photovoice in October, November and December 2021 in 2 different schools with different classes;
5. Face-to-face interviews from December 2021 to May 2022;
6. Well-being survey, from October 2021 to March 2022,

7. Walkthroughs in December 2021, March 2022 and May 2022 (also with Italian Citizens);

The data already available on soil and water confirmed that both could be employed for public use. In June 2022, the results were presented to the public in the URBiNAT Living Lab, the X-Centre, during an open event in the presence of public authorities such as the mayor and some important local institutions such as the Culture Capital Office (EPK). The following main needs of the population were highlighted asking for their validation (as per URBiNAT approach):

- More green areas, more trees, more tree-lined avenues, parks and natural shade, including the organisation of shelters for many animals;
- Removal and rearrangement of informal community gardens;
- Bring the Koren stream (main water element of the corridor) closer to the people by cleaning, arranging and maintaining its banks, rebuilding the bridges with more natural materials (wood, glass);
- Provide better access to water;
- Providing for a multiple crossing of the riverbed with the help of walking stones or piers, etc.;
- Multiple containers for a separate waste collection, feeding wild animals is prohibited;
- More outdoor spaces for socialising and spending free time in nature, a bar for socialising;
- Arranging a spot for people with reduced mobility;
- Arranging a circular learning pathway (with educational boards). Arranging new natural paths;
- Improve the accessibility of the area for wheelchairs and baby strollers;

In the following months, the URBiNAT team worked to translate these intentions into a plan. In August 2022 a draft was presented to the population asking for their feedback. A document, encompassing many NBS, is in its approval phase.

5 Conclusions

This paper documents the steps necessary to identify, collect, systematise, visualize, and integrate information from a selected urban area through a multidisciplinary and hybrid static-fluid approach. Such approach has been introduced and tested in many urban contexts in partner cities within the URBiNAT project with the contribution of different actors. The work on the local diagnostics has been essential both to identify the profile of the ecosystem and establish relationships between the actors. Moreover, the trust and knowledge that will be the base to build the next steps of the URBiNAT project have been created.

Additionally, the work was conducive to obtaining unique information through the implementation of participatory methods. Also, thanks to it, different actors were

mobilized, and the approach that studies municipal and area based NBS policies was thoroughly revised.

Within the study area, the combination of NBS with different profiles contributed to produce endogenous growth and cross-over processes that have led to new creative content.

The URBiNAT co-creation process model aims to support the creation of Communities of Practice or Communities of Interest. Because throughout this process, we have engaged with local citizens as part of the design and implementation phases of NBS, after the completion of the project, the plan is to leave the citizens and the main stakeholders of the neighbourhoods knowledge, tools, social and solidarity economy business models, training tools and the self-governance models for active participation, to ensure the continuity of co-creation in favour of the community.

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