



PhD in ARCHITETTURA, INGEGNERIA DELLE COSTRUZIONI E AMBIENTE COSTRUITO / ARCHITECTURE, BUILT ENVIRONMENT AND CONSTRUCTION ENGINEERING - 39th cycle

PNRR 118 PNRR Research Field: DESIGNING GREEN INFRASTRUCTURE NETWORKS FOR URBAN RESILIENCE

Monthly net income of PhDscholarship (max 36 months)

€ 1500.0

In case of a change of the welfare rates during the three-year period, the amount could be modified.

Context of the research activity

Motivation and objectives of the research in this field

The research deals with the complex nature of Green Infrastructure development, its meanings, its perception and use as a design approach to Urban Resilience. The motivation for this PhD is to investigate the links between Green Infrastructures (GI) and Ecosystem Services (ES) to develop a combined design framework in urban landscape and planning, bringing together multiple actors. This combined approach is based on two complementary concepts: a) *the Green Infrastructure (GI) concept* which contains logics and elements relevant for landscape architects and planners, and b) *the Ecosystem Services (ES) concept* generated from conceptual frameworks and assessment tools for ecologists, planners and decision makers. To link the two concepts, this thesis aims at developing further the theoretical basis of a core principle of green infrastructure and at devising conceptual frameworks that develop relevance for landscape and planning practice, by examining the connection between landscape, ecology and planning practice. Therefore, the research questions are:

1. Can the concepts of green infrastructure and ES be linked by a framework for landscape design?
2. How are GI and ES currently considered in landscape and planning practice?



	<p>3. What are good practices for developing a green infrastructure network system?</p> <p>4. What can be recommended from the academic state-of-the-art and the "everyday's practice" approaches in to support a comprehensive consideration in urban green infrastructure planning?</p> <p>The proposed project will pose innovative questions, and collect new evidence, draw on case studies of transnational projects in urban areas. It will explore the available theories and methodologies to analyze and represent at multiple scales the projects and policies promoted by transnational actors in urban areas.</p> <p>The main goals of the research are:</p> <ol style="list-style-type: none"> 1. Provide a systematic review of the available concepts and methods used for analyzing and assessing transnational projects which are adopting GI in urban areas 2. Collect relevant evidence regarding specific GI in urban areas and related urban transformations 3. Develop new methods for analyzing and representing the challenges and opportunities for GI projects and processes at multiple scales 4. Test these new analytics and representation techniques with practitioners and decision-makers to validate the findings' relevance for landscape/urban policy and practice. 5. Disseminate the results in both academic and practice-related environments. <p>These findings will positively impact future projects in GI and meet the goals of the <u>National Recovery and Resilience Plan (PNRR) around the strategic axes for ecological transition and of Horizon Europe research and innovation activities under cluster 6 which will contribute to the objectives of the European Green Deal related to the Biodiversity Strategy to 2030.</u></p>
<p>Methods and techniques that will be developed and used to carry out the research</p>	<p>Recently, several research projects started related to GI interaction with ES and their natural ecosystem, but specific in-depth analysis regarding small and large urban projects are still missing in the international debate. Several scale urban projects developing GI networks are often characterized by limited landscape interventions adopting ES; this might have long-term negative effects</p>



for the urban ecosystem, the local communities and the urban climate. Based on existing data-bases (obtained through EU-Research Projects HARMONIA and YADES), the research aims at developing and testing new methodologies for analyzing and representing potential opportunities and risks associated with urban landscape projects related with GI and ES.

These new methodologies may involve active visualization techniques and they will be tested by stakeholders and decision makers to ensure a high impact of the final findings for urban policy and landscape practice. Digital models will be developed as part of the research and process.

The project will include:

1. Literature and methodological review regarding the GI urban projects in urban cities and the existing methods for analyzing and representing them.
2. Development of the theory, selection of cases and establishment of a data collection protocol (design phase)
3. In-depth study of at least 2 case studies of past projects and identification of best techniques of analysis and representation for the case studies as well as a broader set of example in literature.
4. Mapping of existing types of GI and their claimed relationship with challenges (identifying scales and institutional levels) to localize and derive indicators from the SDGs (Sustainable Development Goals) and the New Urban Agenda (NUA);
5. Assessing and evaluating NBS case studies where such types have been implemented and how the potential for provision of multiple ES in relation to indicators was done.
6. Drawing conclusions by comparing the cases to each other. Further results include modification of the initial theory, policy implication. Design Strategic Guidelines will be concluded that will anticipate to the future and set long-term goals to meet these challenges.
7. Dissemination of results at the national and



	<p>7. Dissemination of results at the national and international levels through publications, academic and public events.</p> <p>The results will contribute to the resilience of cities, landscape and urban planning and will address the challenges of the future. The research activities will benefit from the activities of the PhD program of DABC , as well as on specific research units and international networks.</p> <p><u>The PhD student will spend at least 6 months in a foreign University to meet the highest international standards (the destination will be decided; tentatively NTUA Athens, Greece, Polytechnic Univ. of Catalonia, TU Aachen, Germany (RWTH).</u></p>
Educational objectives	<p>The PhD program aims at providing interpretative, analytical and representative tools as well as research/planning/design methodologies to enhance landscape and urban studies, policies, and governance with specific reference to the PNRR mission and related EU policies. The PhD student will contact specialized international research centers and organizations.</p> <p>Further information for the organizations:</p> <ul style="list-style-type: none"> • World Green Infostructure Network (Home - World Green Infrastructure Network:https://worldgreeninfrastructurenetwork.org) • Europe Biodiversity (Green infrastructure (europa.eu):https://biodiversity.europa.eu/green-infrastructure) • EU Green Infrastructure Strategy (EU Green Infrastructure Strategy - English (europa.eu): https://climate-adapt.eea.europa.eu/en/metadata/publications/eu-green-infrastructure-strategy) • FAO Ecosystem Services & Biodiversity (ESB) (Ecosystem Services & Biodiversity (ESB) Food and Agriculture Organization of the United Nations (fao.org):https://www.fao.org/ecosystem-services-biodiversity/en/)



	<ul style="list-style-type: none"> Joint Research Centre (EU ecosystem services valued at almost 125 billion Euros per year (europa.eu):https://joint-research-centre.ec.europa.eu/jrc-news-and-updates/eu-ecosystem-services-valued-almost-eu125-billion-year-2019-12-11_en).
Job opportunities	<p>The PhD program trains highly qualified researchers and professionals in the fields of landscape architecture, planning, design and management of urban projects and policy, urban studies, and urban governance. Researchers with such profile may be employed by academic institutions including universities, public bodies, cultural foundations and research centres, public and private development agencies, and private firms.</p>
Composition of the research group	0 Full Professors 1 Associated Professors 0 Assistant Professors 4 PhD Students
Name of the research directors	Prof. Nerantzia Tzortzi

Contacts
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Additional support - Financial aid per PhD student per year (gross amount)	
Housing - Foreign Students	--
Housing - Out-of-town residents (more than 80Km out of Milano)	--

Scholarship Increase for a period abroad	
Amount monthly	750.0 €
By number of months	6

National Operational Program for Research and Innovation	
Company where the candidate will attend the stage (name and brief description)	
By number of months at the company	0
Institution or company where the candidate will spend the period abroad (name and brief description)	To be defined
By number of months abroad	6



Additional information: educational activity, teaching assistantship, computer availability, desk availability, any other information

Additional support:

Budget for the research activity (only for positions supported by scholarship): total amount Euro 6114.50 per student.

In detail:

- 1st year Euro 2038.17
- 2nd year Euro 2038.17
- 3rd year Euro 2038.16

Additional information about the organization and regulations of ABC-PhD programme can be found in the Regulations for the 39th Cycle of ABC-PhD: download is available at link: <https://www.dottorato.polimi.it/corsi-di-dottorato/architettura/architettura-ingegneria-dellecostruzioni-e-ambiente-costruito>

Additional information about ABC department and ABC-PhD programme: available at link: <https://www.dabc.polimi.it/>

Desk availability: The ABC department provides non-permanent desks to be temporarily booked in common PhD rooms.

This scholarship is funded by the PNRR national programme under the research line on "Generic PNRR topics" in D.M. 118. This means that the owner of the position will be obliged to submit periodical reports about her/his activity.