



# PhD in URBAN PLANNING, DESIGN, AND POLICY - 38th cycle

**PARTENARIATO PNRR Research Field: ASSESSING THE SOCIAL IMPACT AND CO-BENEFITS OF RE-NATURING MEASURES IN CITIES THROUGH THE ANALYSIS OF THE ECOSYSTEM SERVICES PROVISION**

**Monthly net income of PhDscholarship (max 36 months)**

**€ 1195.5**

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**

Greening cities policies and measures are strongly supported at the global and European level among the most effective solutions to respond to urgent climate change and environmental challenges our planet is facing. For instance, the loss of biodiversity and rapidly changing climatic conditions have a major impact on the survival of nature and people on earth. Specifically, several are the European policies and programs that focus attention on cities as relevant players in the ecological transition. In fact, numerous are the European initiatives and projects supported in the last five years to diffuse nature and Nature-based Solutions (NBS) in the urban environment, aiming at operatizing re-naturing measures in the practices of urban planning and governance, to become the new routine from "gray-to-green".

At the national level, in Italy, the "National Recovery and Resilience Plan" (PNRR), released in 2021 to respond to the Next Generation EU program, devotes ample space to the "Green Revolution and Ecological Transition" (Mission 2). Hence, if urban greening solutions are now well known and supported, if numerous are the catalogues and handbooks for implementing Green and Blue Infrastructure (GBI), NBS and afforestation strategies in the design and planning practice, nevertheless very little has been consolidated in terms of **assessment of the social and ecological impact of these measures**. For instance, scholars and policy makers promote the



	<p>multiple co-benefits that nature provides to people and biodiversity, even if little theoretical knowledge and operational tools are available to support (i) design and decision-making, (ii) monitoring of the outcomes to inform and re-direct future investments (in terms of location, sizing, typology of solutions). One of the reasons of this gap in assessment strategies is due to the <b>complexity of co-benefits generated by nature</b>. In most of the cases the overall impact of these co-benefits is very hard to grasp from a purely economic point of view (e.g., human health and wellbeing, mitigation of climate change events).</p> <p>Moreover, quantifying the <b>impact on very different areas of applications and targets</b> (e.g., climate change, people health, biodiversity), requires establishing different indicators, measurements, and cannot be easily compared or synthesized in a comprehensive index. In this project we argue that <b>the concept of Eco-System Services (ESS) can provide a useful lens to assess the impact of renaturing measures in cities</b>, taking into account the multiple co-benefits that nature can generate. Starting from regulating, supporting, provisioning and cultural services, a comprehensive assessment of urban greening strategies and measures can be derived.</p>
<p><b>Methods and techniques that will be developed and used to carry out the research</b></p>	<p>This study will (i) <b>investigate theoretical knowledge on the co-benefits of nature to society</b> with particular reference to urban environments, and consequently, (ii) <b>implement tools for mapping, quantifying the impact of urban nature on people and society</b>, exploring social, economic, environmental factors, and relying on a spatial location-based and geographical-weighted approach to phenomena. Monitoring the trends and the efficacy of greening policies in relation to the corresponding outcomes is crucial to continuously improve and adjust strategies. The impact of renaturing measures on people and society will be investigated from different perspectives and recurring to a variety of techniques and tools, like systematic literature review, spatial analysis through GIS and remote sensing, ethnographic research and social impact assessment; a list of possible studies that can be explored under the lens</p>



	<p>of the ESS follows. Increasing the presence of nature in cities has an impact on <b>human health and wellbeing</b>, both from a physical and psychological point of view. Collecting sanitary data through available databases is limited. Interviews, questionnaires, and citizen science explorations using wearable technologies or virtual reality are widely investigated to assess the perception and sensing of nature at the individual level. In addition, the effects that nature has on local climate mitigation, water absorption (hence, reducing of flooding), carbon dioxide and pollutants? absorption, can be estimated and mapped to simulate local and city-wide impact of solutions. In fact, this assessment is important in decision-making to best direct greening interventions and to respond to reducing critical hotspots to climate and pollutant hazards. The "One Health" approach to reframe urban health as a complex interplay of nature, people and the built environment will be particularly relevant for this exploration. Greening measures have impact on <b>local communities and economy</b>, in terms of enhancing relationships, increasing the sense of belonging to places, generating new occasions of social encounter and providing new urban services and favor the emergence of new economic activities. The impact on real estate market and the economic value is another impact to be taken into account. Therefore, an important focus will be placed on recognizing and assessing <b>disservices of nature solutions</b>, and how to limit the emergence of those. For instance, increasing nature can generate gentrification dynamics and exclusion; urban green is often connected to diminished perception of safety, in psychological terms (reduced visibility and fear of crime in parks) and physical terms (tree falling, wild fires).</p> <p>This project relies on the following research facilities at Dastu: Climate Change, Risk and Resilience Laboratory, Laboratorio di Simulazione Urbana Fausto Curti.</p>
Educational objectives	<p>Through this study, the candidate will develop analytical and interpretative tools, as well as research/planning/design methodologies, able to produce further advancement in urban studies, spatial and land use planning, green &amp; blue infrastructure design, urban</p>



	<p>policies and governance with particular attention to the integration of renaturing measures in planning and design and in monitoring methods.</p> <p>Specifically, the educational objective of this research is twofold: firstly, to build new knowledge and critical positioning of the urban planning discipline towards the monitoring and assessment of the multi-faceted impact of greening policies in cities, recognizing, classifying and addressing complex challenges and disservices that nature can generate, beside widely recognized and mainstreamed positive benefits of nature in cities; secondly, to operationalize methods and spatial monitoring and decision-making support systems to assess the multiple co-benefits of greening solutions within the urban planning domain. Mixed-research methods, i.e. qualitative and quantitative analysis methods, will be applied by the candidate in order to assess the impacts of greening strategies on people, as both individuals and communities, recurring to several techniques and always referring to spatial mapping and analysis to inform decision-making and monitoring of outcomes (i.e. green solutions in place). The research program aims at building a profile of a qualified researcher able to recognize, address and assess the complex interplay of nature solutions with people, society and the urban environment, translating all the knowledge acquired in spatial planning methods and tools to inform decision-making and monitoring of the efficacy of renaturing policies and outcomes. In particular, the candidate will develop knowledge in spatial analysis and planning, social impact analysis techniques, and theoretical and practical tools for the integration of NBS, the evaluation of ESS provisions, and the increase of biodiversity in cities.</p>
<b>Job opportunities</b>	<p>According to the educational objectives and its international orientation, the PhD programme in Urban Planning, Design and Policy trains highly qualified researchers and professionals in the fields of spatial planning and environmental assessment, design and management of urban greening policies and methods. Researchers with such profile may be employed by Italian</p>



	and international academic institutions, public bodies and research centres, public and private development agencies, and other private firms.
<b>Composition of the research group</b>	12 Full Professors 12 Associated Professors 0 Assistant Professors 45 PhD Students
<b>Name of the research directors</b>	Prof. Eugenio Morello

Contacts	
<p><b>Research supervisor:</b>  <i>Prof. Eugenio Morello</i>  e-mail: <a href="mailto:eugenio.morello@polimi.it">eugenio.morello@polimi.it</a></p> <p><b>PhD programme coordinator:</b>  <i>Prof. Luca Gaeta</i>  e-mail: <a href="mailto:luca.gaeta@polimi.it">luca.gaeta@polimi.it</a>  phone +39/02/2399.5426</p> <p><b>Contact in the PhD office at DASTU:</b>  <i>dr. Marina Bonaventura</i>  E-mail: <a href="mailto:marina.bonaventura@polimi.it">marina.bonaventura@polimi.it</a>  phone +39/02/2399.5165</p> <p>Further information is available at: Handbook a.y. 2018/2019 of the PhD Program in Urban Planning, Design and Policy (UPDP):  <a href="https://www.dastu.polimi.it/dottorato-urbanplanning/">https://www.dastu.polimi.it/dottorato-urbanplanning/</a></p>	

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	597.76 €
By number of months	6

Additional information: educational activity, teaching assistantship, computer availability, desk availability, any other information
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Individual funds are available to purchase books and material, participate to summer schools, workshops and conferences:

1<sup>st</sup> year: max 1.624,30 euros per student

2nd year: max 1.624,30 euros per student

3rd year: max 1.624,30 euros per student

Various forms of financial aid are available for both research and teaching activities. PhD students are encouraged to take part in these activities within the limits allowed by the regulations.

In the PhD room workstations are available for shared use connected with a printer. All PhD students can use their own laptop with a wireless connection. Workstations and other equipment are available in the various laboratories linked with the doctoral programme.