



PhD in INGEGNERIA AMBIENTALE E DELLE INFRASTRUTTURE / ENVIRONMENTAL AND INFRASTRUCTURE ENGINEERING - 40th cycle

Research Area n. 3 - Environmental and Hydraulic Engineering and Geomatics

PNRR 629 PA Research Field: ENVIRONMENTAL AND SOCIAL VALUE OF THE SOIL-
WATER NEXUS IN PERI-URBAN AREAS

Monthly net income of PhDscholarship (max 36 months)

€ 1450.0

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

Our research will target the interplay between water and land use in peri-urban areas. Peri-urban areas are complex environments at the interface between urban fabric, agricultural activities and natural landscapes. As a consequence, they typically host heterogeneous land covers and use (such as croplands, urban areas, recreational facilities, green spaces etc.) as well as critical infrastructures (water treatment plants, roads etc). Management of environmental resources under alternative and often competing criteria requires an integrated and holistic approach. The research will focus on assessment and optimization of environmental quality with a focus on management of water availability and quality. The work will prominently include the social dimension with active involvement and co-design of solutions with civil society to increase social awareness on the relevance of water and soil resources and, more generally, the environment. The project contributes to diverse sustainable development goals, notably SGD 11 (target 11.3) and SDG 6 (target 6.3). The project will focus on the soil-water nexus with a particular focus on the southern peri-urban area of Milano. The area has been used for agricultural purposes for centuries and now sees a co-existence of land uses,



	<p>centuries and now sees a co-existence of land uses, including permanent conventional crops, urban green, residential areas, small industrial activities, and workshops. A key collaboration will be with Osservatorio Lambro APS, this NGO having signed a collaboration agreement with Comune di Milano for the environmental monitoring of the waterways in the area and notably the Vettabbia channel, adopting a "citizen science" approach. The research will contribute to this activity and notably to "civil monitoring activities", mentioned in the collaboration agreement signed by Osservatorio Lambro and Comune di Milano. At the same time Polimi is currently implementing the off Campus Nosedo site. Off Campus is a centre for the development and sharing of knowledge and skills between university (teachers, researchers, students) and local actors, on issues concerning the peri-urban context. Off Campus hosts a variety of activities, including R&I studies and projects on the topics of peri-urban development, water management, landscaping, agri-food supply chains, circular economy, and soil health. The site hosts projects co-created with local stakeholders linked to environmental quality and water management strategies. This PhD will then offer the opportunity to strengthen the existing network between academia, civil society and the public administration in a joint effort to protect environmental resources with the active involvement of local communities. This is in line with PNRR objectives, notably Mission 2 focusing on land and water resources protection and notably Component 4.</p>
<p>Methods and techniques that will be developed and used to carry out the research</p>	<p>The project will encompass the development of water resources modelling tools and monitoring activities. In particular:</p> <ul style="list-style-type: none"> •Understanding and quantifying the feedbacks between subsurface and surface water bodies, and stormwater management practices •Mapping water uses and assessing sustainability of water management practices •Monitoring activities leading to enhanced understanding of the environment for local communities <p>Design, co-design of optimal solutions for water management including both surface and subsurface water</p>



	management including both surface and subsurface water bodies and environments
Educational objectives	The candidate will be trained to assess and quantify relevant processes affecting environmental quality and water management in terms of availability and quality. A strong multidisciplinary training will be targeted also through collaborations across three different departments at Polimi. Training on communication and organizational skills will be delivered to enable the candidate to interact with a broad range of audiences (civil society, academic partners, stakeholders, etc).
Job opportunities	Academy, Public sector, Environmental consultancy, Outreach and scientific dissemination.
Composition of the research group	1 Full Professors 2 Associated Professors 0 Assistant Professors 0 PhD Students
Name of the research directors	Giovanni Michele Porta

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	725.0 €
By number of months	6

National Operational Program for Research and Innovation	
Company where the candidate will attend the stage (name and brief description)	Osservatorio Lambro APS and Comune di Milano within the activities included in the Collaboration Agreement (Patto di Collaborazione, signed on March 7th 2024). https://www.lambrolucente.eu/
By number of months at the company	6
Institution or company where the candidate will spend the period abroad (name and brief description)	University of Erlangen



By number of months abroad	6
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Additional information: educational activity, teaching assistantship, computer availability, desk availability, any other information

Educational activities (purchase of study books and material, funding for participation to courses, summer schools, workshops and conferences): the Ph.D. programme supports the educational activities of its Ph.D. students with an additional funding equal to 10% of the scholarship, starting from the first year.

Teaching assistantship: availability of funding in recognition of support to teaching activities by the PhD student. There are various forms of financial aid for activities of support to the teaching practice. The PhD is encouraged to take part in these activities, within the limits allowed by the regulations.

Computer availability and desk availability: 1st year +2nd year +3rd year: individual use.