POLITECNICO DI MILANO

PhD in URBAN PLANNING, DESIGN, AND POLICY - 41st cycle

THEMATIC Research Field: NEW RURAL LANDSCAPES: AGRICULTURAL ACTIVITIES AND GREEN AND NATURAL CAPITAL INFRA-STRUCTURE FOR THE ENVIRONMENTAL REGENERATION OF FRAGILE LOWLAND TERRITORIES

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	Polycentric and dispersed urbanization areas that remain predominantly rural represent a significant portion of the Po Valley regions. These territories can be schematically identified as the "negative space" of metropolitan, inner, and mountain areas. Examples include the southern part of Mantua, the Piacenza plain, the Reggio Emilia and Sassuolo districts, and the lower Romagna area. Two main factors of territorial fragility are evident in these regions—one well-documented within urban studies, the other primarily addressed through environmental and agronomic research: •On one hand, there are well-known dynamics of quantitative and extensive land consumption, which continues to increase, as documented annually by ISPRA reports. This issue is the subject of specific policies and containment measures by regional and municipal governments. While affecting dynamic metropolitan areas, it grows more aggressively—due to weaker governance—in small and medium-sized towns, where the market for productive and logistic development and infrastructure routing interacts with the financial vulnerability of local administrations. •On the other hand, we observe the degradation and qualitative transformation of soils and agricultural landscapes. This is the result of long-term, integrated

	processes of productive transformation in agriculture, starting with the post-WWII Green Revolution—a phenomenon already described in its early effects by Vittorio Sereni in 1962 in the final chapter of *Storia del paesaggio agrario italiano*. The Green Revolution played a fundamental role in modernization, development, and the well-being of global populations. However, despite increasing the quantity and quality of agricultural output, it also produced major impacts on soil health, water quality, air quality, led to biodiversity loss, and reduced both agronomic and ecological complexity—with consequences on both local and global scales.The effects of indiscriminate exploitation of agricultural land were first recognized in the United States before European agricultural modernization and inspired foundational ecological research on agro-ecosystems (e.g., Steinbeck, Hanson, Leopold, Carson). The environmental impacts of industrialized agriculture are now widely documented (AEA, FAO, ISPRA, Legambiente, WWF). Meanwhile, the Common Agricultural Policy (CAP) of the EU has long addressed sustainability in agricultural systems, and in the post-COVID era, environmental, climate, energy, and social aspects—along with supply chain integration—have become strategic priorities.
Methods and techniques that will be developed and used to carry out the research	The research project aims to investigate the transformation dynamics, and to define potential projects, policies, and ecological transition measures to enhance natural capital in polycentric and dispersed settlement areas of the Po Valley characterized by large expanses of intensive agriculture and environmental vulnerabilities.The working hypothesis is that it is possible to contribute to the reconstruction of widespread and long-term environmental and landscape quality with significant effects on settlements at various scales through: 1. Agricultural activities, implemented through innovative and agroecological methods and supported by environmental actions under the CAP. This involves

	examining the operational and sustainability potential of CAP tools to deliver natural capital benefits in line with different farm typologies and production goals. 2. The creation of new ecological and environmental infrastructures—such as woodlands, hedgerows, tree-lined corridors, wetlands, and permanent grasslands—within non-cultivated areas (e.g., residual natural areas, specifically designated non-agricultural land, or public/state-owned land). Historical land reclamation projects and large-scale nature restoration efforts (e.g., pine forests, river parks) show the potential for creating a new infrastructure system on lands either temporarily or permanently converted from agricultural use or on non-agricultural public lands. 3. The integration of ecological and environmental infrastructure with conventional infrastructure systems (transport, hydraulic, and energy systems). Beyond environmental compensation, infrastructure projects offer the opportunity to deliver large-scale natural capital assets.The research will be carried out through case studies and sample areas and will involve active participation from stakeholders, public administrations, and agricultural enterprises. Its transdisciplinary nature requires the integration of expertise in legal, ecological, and agronomic fields throughout the research process. The project’s outputs will consist of pilot projects and strategic guidelines for selected sample areas, designed to be scalable and transferable
Educational objectives	The research activities are funded by the Emilia-Romagna Region, which aims to develop analytical themes and design procedures consistent with the Horizon 2021–2027 Program and the Regional Smart Specialisation Strategy, particularly concerning: **Climate and Natural Resources (air, water, and land)** **Mitigation of climate change impacts** **Ecological transition management**, through interventions on green ecosystems and innovative actions

	in agriculture aligned with the productive nature of farms, energy consumption reduction, technological advancement, and digital innovation (e.g., mapping and monitoring systems).The main goal is to identify locations, implementation strategies, responsible actors, and economic models for the development of new agro-environmental systems and green infrastructure. The broader aim is to build a methodological framework based on a **"research by design"** approach, leading to studies on sample areas and pilot projects that can be scaled up and replicated, supported by comparisons with international case studies.
Job opportunities	The expected outcome is the training of researchers capable of supporting Public Administrations, Private Entities, and Agricultural Enterprises in the planning, development, and management of innovative agro-environmental systems and natural areas.
Composition of the research group	16 Full Professors 9 Associated Professors 1 Assistant Professors 60 PhD Students
Name of the research directors	Antonio Longo, Eugenio Morello

Contacts

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Further information on the PhD Program in Urban Planning, Design and Policy is available at: https://www.dottorato.polimi.it/corsi-di-dottorato/architettura/urban-planning-design-and-policy

Additional support - Financial aid per PhD student per year (gross amount)	
Housing - Foreign Students	--
Housing - Out-of-town residents	--

Scholarship Increase for a period abroad	
Amount monthly	725.0 €
By number of months	6

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

List of 5 Universities, Companies, Agencies and/or National or International Institutions that are cooperating in the research:

1. Katholieke Universiteit Leuven
2. HafenCity Universitaet Hamburg
3. Bartlett School of Planning, UCL
4. Universidade de São Paulo
5. Sciences Po, Paris

Educational activities *(purchase of study books and material, funding for participation in courses, summer schools, workshops and conferences): financial aid per PhD student per year ("DOTE"): total amount:* ***5.913,80 euro:***

1st year: max ***1.971,26 euro***
2nd year: max ***1.971,26 euro***
3rd year: max ***1.971,26 euro***

Teaching assistantship (availability of funding in recognition of supporting teaching activities by the PhD student)

There are various forms of financial aid supporting the teaching practice.
The PhD candidate is encouraged to take part in these activities, within the limits allowed by the regulations.

Workspace:

In the UPDP PhD room at Bldg. 14 in Leonardo Campus, workstations are available for shared use. All the PhD students can use their laptops with wireless or LAN connection.
Workstations and other equipment are available in the various departmental laboratories (Dastu) linked with the doctoral programme.


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