CALL FOR APPLICATIONS

Doctoral Opportunity in Green Infrastructure and Urban Resilience

Centre Régional de l'eau et de l'environnement – Wajdi Najem, CREEN

The Regional Center for Water and Environment – Wajdi Najem, CREEN, at Saint Joseph University of Beirut (USJ), in collaboration with "Laboratoire Eau, Environnement et Systèmes Urbains (LEESU)" at the "École nationale des ponts et chaussées", France, announces a call for applications for a PhD for the 2025-2026 academic year.

Research Theme

Optimization of Green Infrastructure Practices in Urban Environments: Challenges, Issues, and Opportunities

Research thesis Description

Context

Green infrastructure represents an innovative approach to enhancing urban resilience in the face of hydrological and climatic challenges. However, the implementation of green infrastructure in urban areas raises several concerns regarding its hydraulic efficiency, integration with existing infrastructure, and long-term viability. In Lebanon, where hydraulic infrastructures are already under significant pressure, it is crucial to scientifically assess the benefits and limitations of green infrastructure. This research aims to propose optimal strategies tailored to local constraints, in order to maximize the potential of these solutions in urban settings.

Objectives

Development of a methodological framework to assess the performance of green infrastructure in urban environments, considering hydrological and climatic factors.
Conducting simulations and modeling to analyze the impact of green infrastructure on stormwater management and flood risk reduction.
Studying the interactions between green infrastructure and urban systems to optimize their integration into sustainable urban planning strategies.
Identifying the feasibility and adaptability criteria of nature-based solutions in rapidly urbanizing contexts.

Methods

The research will adopt a numerical approach combining hydrological and hydraulic modeling. Simulation models will be developed to evaluate the effectiveness of green infrastructure under various climatic and urban scenarios. A comparative analysis will be conducted between different urban configurations to optimize their design and integration. The methodology will also incorporate statistical analysis and multicriteria optimization techniques to determine the optimal conditions for application.

Expected Results

Development of a comprehensive framework to scientifically evaluate the effectiveness of green infrastructure in urban areas.

Generation of optimized stormwater management scenarios that incorporate nature-based solutions.

Recommendations for improved integration of green infrastructure into urban planning and coordination with existing systems.

Impact and Perspectives

This research will provide a significant scientific contribution to enhancing urban water management through the integration of green infrastructure. The results will also contribute to the adaptation of cities to environmental and climatic challenges. The findings will be valuable for guiding policymakers and urban planners in Lebanon toward sustainable, locally adapted solutions.

Application Process

Qualified candidates are invited to prepare the following documents:

1. Thesis Proposal (maximum 5 pages): The Thesis proposal should cover the following sections:

- Project Title: Choose an innovative title.
- Relevance of the chosen topic: Describe the innovation, relevance, and significance of the chosen topic, emphasizing its alignment with growing challenges of urban flood management and climate adaptation, by exploring sustainable, nature-based solutions.
- Literature Review: Summarize key studies relevant to the topic.
- Problem Statement: Clearly define the research problem, its importance, and the primary objectives of the study in the Lebanese context.
- Theoretical Framework: Outline the theories, concepts or models that will support and frame the research.
- Research Methodology: Describe the innovative research methodology: Methods, selected tools, and approaches that will be used in conducting the research.
- References: Enlist main references related to the topic.

2. Additional Required Documents:

- A recent Curriculum Vitae
- A recent photo of the applicant
- A Motivation Letter

Eligibility and Requirements

- Hold a master's degree in sciences, water engineering, environmental studies, or related field.
- Be willing to dedicate significant time and effort to the research project, including a one-year research stay at the "Ecole de Ponts", Paris, France.
- Conduct the thesis in either English or French.
- Project duration: 3 years.

Evaluation and Selection

The selection of candidates will be based on a comprehensive evaluation process that includes:

1. **Application assessment:** assessment of the written Thesis Proposal and the required documents. The application should contain all the required documents as a main condition for eligibility.
2. **Oral Presentation assessment:** The candidate will present the research proposal in front of an academic jury (20 minutes).

Application Deadline

The Application must be submitted by **Monday, March 31, 2025**.

Selected candidates will be notified of the date for the oral presentation in front of the jury.

How to Apply

You may submit your application by email with the subject: "Application for PhD in Green Infrastructure" to: secretariat.esib@usj.edu.lb

For More Information

Email : secretariat.esib@usj.edu.lb

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