POLITECNICO DI MILANO

PhD in SCIENCE, TECHNOLOGY AND POLICY FOR SUSTAINABLE CHANGE - 39th cycle

THEMATIC Research Field: WATER SAFE OPERATING SPACE ACROSS MULTIPLE SPATIAL AND TEMPORAL SCALES

Monthly net income of PhDscholarship (max 36 months)
€ 1400.0 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	Climate change is expected to have a major impact on global freshwater availability by the end of the 21st century. In a changing climate and society water resources systems are under accelerated stressful conditions. The research will focus on developing a holistic multi-model assessment framework to operationalize and downscale the global freshwater Safe Operating Space (SOS) to the continental and river basin levels and to ultimately streamline water planning and management across different spatial scales and multiple competing sectors. Applications to European rivers as well as the Mekong river delta system will be developed.
Methods and techniques that will be developed and used to carry out the research	State-of-the-art robust decision making will be used together with optimization, optimal control, and mathematical modelling of multisector and multiactor systems. Big data, statistics, and machine learning will be leveraged to manipulate and examine the large set of observation, model simulations, and future scenarios and inform the design of adaptation strategies.
Educational objectives	

	The doctoral program offers advanced training organized in three pillars: - Basic Research, which includes methodological courses related to key aspects of theoretical and applied research in science, policy, and technology of sustainable change; - Specific Research, designed to strengthen candidates' knowledge on specific topics aligned with their research interests and increase their presence in the international scientific community through participation in conferences and presentation of their scientific work in academic contexts. - Development of the Doctoral Thesis, which allows candidates to develop leading-edge research competencies and produce original scientific work on a topic that contributes to scientific debate and has societal impacts. A period of study in worldwide most recognized research institutions is supported by the doctoral school and the supervisor.
Job opportunities	The PhD graduates will be equipped withdistinctive skills, multifocal and bottom-up approaches, and advanced trans-disciplinary knowledge that open up career opportunities as analysts, researchers, or planners at universities, institutions, R&D departments, regulatory authorities, and other public bodies.
Composition of the research group	1 Full Professors 0 Associated Professors 3 Assistant Professors 5 PhD Students
Name of the research directors	Andrea Castelletti

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	700.0 €
By number of months	6

Additional information: educational activity, teaching assistantship, computer availability, desk availability, any other information
A desk in the lab offices and a personal laptop will be provided over the duration of the PhD program. Teaching assistantship opportunities might be available over the triennium. The PhD student is encouraged to take part in teaching activities, within the limits allowed by the regulations. Super-computing facilities are available at the department.