POLITECNICO DI MILANO

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

THEMATIC Research Field: * ROBUST DESIGN OF MULTISECTOR, MULTIACTOR, ADAPTATION STRATEGIES TO GLOBAL CHANGE

Monthly net income of PhDscholarship (max 36 months)
€ 1500.0
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	Global socio-economic trends are expected to increase the demand for water, energy, and food, particularly in the Global South threatening the sustainable and equitable use of water resources, which will be further aggravated by climate change. In this context, the increasing number of water crises experienced by many countries over the last few years have emphasized the need to rethink the way water resources are allocated, managed, and used at the regional and river basin scale. The research will aim at developing novel tools to support the design of robust, multisector, multiactor adaptation strategies capable of adapting to evolving conditions characterized by growing water demands and increasingly uncertain hydrologic regimes. Rather than considering single sectors independently producing analyses that are prone to underestimate both overall risks and multisectoral capacities to buffer them, the focus of the research will be on developing holistic approaches for better understanding the complex coevolution of human and natural systems, including both interconnected multisector dynamics and multiactor adaptation pathways.
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. Social learning and behavior modeling will reinforce essential baseline for adaptation. Big data, statistics, and machine learning will be leveraged to

	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 with distinctive 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 2 Assistant Professors 5 PhD Students
Name of the research directors	0

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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	750.0 €
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.