



# PhD in SCIENCE, TECHNOLOGY AND POLICY FOR SUSTAINABLE CHANGE - 40th cycle

**THEMATIC Research Field: INVESTIGATING FOOD SECURITY'S ROLE IN NAVIGATING THE SAFE OPERATING SPACE ACROSS SCALES**

**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, threatening the sustainable and equitable use of environmental resources. This situation will be further aggravated by climate change, emphasizing the need to rethink the way resources are allocated, managed, and used at the regional and river basin scale.

The research will aim at developing novel tools to support the definition of a safe operating space incorporating robust, multisector, multiactor adaptation pathways capable of adapting to evolving conditions characterized by growing demands and increasingly uncertain hydroclimatic 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.

The position is cofounded by the SOS-WATER - Water Resources System Safe Operating Space in a Changing Climate and Society EU Horizon Project ( <https://sos-water.eu/> ) .



<b>Methods and techniques that will be developed and used to carry out the research</b>	<p>State-of-the-art robust decision making will be used together with optimization, optimal control, and mathematical modelling of multisector systems.</p> <p>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.</p>
<b>Educational objectives</b>	<p>The doctoral program offers advanced training organized in three pillars:</p> <ul style="list-style-type: none"> <li>- Basic Research, which includes methodological courses related to key aspects of theoretical and applied research in science, policy, and technology of sustainable change;</li> <li>- 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.</li> <li>- 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.</li> </ul>
<b>Job opportunities</b>	<p>The PhD graduates will be equipped with distinctive skills and advanced trans-disciplinary knowledge that open up career opportunities as analysts, researchers, or planners at universities, international research centers, public and international institutions, R&amp;D departments, regulatory authorities, policy institutions, and other public bodies.</p>
<b>Composition of the research group</b>	<p>1 Full Professors 1 Associated Professors 2 Assistant Professors</p>



	11 PhD Students
<b>Name of the research directors</b>	Prof. Matteo Giuliani / Prof. Andrea Castelletti

<b>Contacts</b>
<p><b>Matteo Giuliani, PhD</b></p> <p>Associate Professor  Environmental Intelligence Lab  Dept. of Electronics, Information, and Bioengineering  Politecnico di Milano  Piazza Leonardo da Vinci, 32I-20133 Milano, Italy  Phone: +39 (0)2 2399 9040  <a href="https://www.deib.polimi.it/eng/people/details/579646">https://www.deib.polimi.it/eng/people/details/579646</a></p> <p><b>Andrea Castelletti, PhD, PE</b></p> <p>Full Professor  Head, Environmental Intelligence Lab  Dept. of Electronics, Information, and Bioengineering  Politecnico di Milano  Piazza Leonardo da Vinci, 32I-20133 Milano, Italy  Phone: +39 (0)2 2399 3584  <a href="https://www.deib.polimi.it/eng/people/details/131704">https://www.deib.polimi.it/eng/people/details/131704</a></p>

<b>Additional support - Financial aid per PhD student per year (gross amount)</b>	
<b>Housing - Foreign Students</b>	--
<b>Housing - Out-of-town residents (more than 80Km out of Milano)</b>	--

<b>Scholarship Increase for a period abroad</b>	
<b>Amount monthly</b>	750.0 €
<b>By number of months</b>	6

<b>Additional information: educational activity, teaching assistantship, computer availability, desk availability, any other information</b>
<p>A desk in the lab offices and a personal laptop will be provided over the duration of the PhD programme.</p> <p>Teaching assistantship opportunities might be available over the triennium.</p> <p>Supercomputing facilities are available both at the department and with external associated</p>



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