Title of the PhD Project	Adaptive Planning for Urban Water Security with Smart Solutions
Acronym	APUWaterSmart
Research Fields of the Project	Urban Water Management, Climate Change Adaptation, Sustainable Planning, Policy and Governance
Keywords	Resilience, Sustainability, Adaptation, Innovation, Urbanization
Host Institution, Department and Campus Location	İstanbul Technical University, Department of Urban and Regional Planning. Taşkışla Campus, Istanbul, Turkey.
PhD Awarding Institution and Graduate Programme	İstanbul Technical University, Department of Urban and Regional Planning. Urban and Regional Planning Doctorate.
Name and Affiliation of Main Supervisor	Assoc. Prof. Dr. Başak Demireş Özkul İstanbul Technical University, Department of Urban and Regional Planning
Name and Affiliation of Co-Supervisors	NA
Research Environment and Infrastructure	The PhD student will be working in the ITU Environment and Urbanism Applied Research Center located in the Taşkışla Campus
Scientific Context of the Project	The project titled "Adaptive Planning for Urban Water Security with Smart Solutions (APUWaterSmart)" aims to develop innovative solutions for sustainable urban water management in the face of increasing water scarcity, population growth, and climate change. Led by a dedicated PhD student and supervised by experts in relevant fields, the project adopts a multidisciplinary approach integrating advanced data analytics, technology, and nature-based solutions. Through predictive modeling, stakeholder

engagement, and customized planning approaches, the project seeks to enhance water resilience and ensure equitable access to water resources in metropolitan cities. By integrating socioeconomic factors, policy frameworks, and community engagement, the project aims to develop contextually relevant and inclusive solutions tailored to the specific challenges of urban areas. Through pilot studies, policy recommendations, and knowledge transfer activities, the project aims to generate actionable insights and foster long-term sustainability in urban water management practices.

The scientific context of the project encompasses a multidisciplinary approach that integrates insights from diverse fields to address the complex and interconnected challenges of urban water management in a rapidly changing world. The various areas that can be integrated are:

Environmental Science: Understanding the dynamics of water resources, including availability, quality, and the impact of environmental factors such as climate change, pollution, and urbanization.

Data Science and Analytics: Utilizing advanced data analysis techniques, including machine learning and Geographic Information Systems (GIS), to analyze large datasets and derive insights for informed decision-making in water management.

Social Sciences: Examining the socioeconomic drivers and implications of water use and management practices, including the influence of population dynamics, economic development, governance structures, and societal behaviors.

Policy and Governance: Investigating the legal and institutional frameworks governing water management at local, regional, and national levels, and assessing policy interventions to promote sustainable and equitable access to water resources.

Further investigations can be included within the fields of engineering, ecology and conservation biology and landscape planning

Brief Workplan	Year 1: Project Initiation and Literature Review The first year will focus on project initiation, literature review, and research planning. The PhD student will work closely with their supervisors to establish the project's scope, objectives, and research questions. They will conduct an extensive literature review on urban water management, climate change adaptation, and

relevant technologies. The student will collaborate with their supervisors to identify key datasets and research methodologies. Stakeholder engagement activities will be initiated, with guidance from supervisors, to ensure alignment with the project's objectives. By the end of the first year, the student will develop a detailed research plan and begin collecting necessary data for analysis.

Year 2: Data Analysis and Technology Development

In the second year, the focus will shift towards data analysis and technology development. The PhD student will work under the supervision of experts to analyze collected data using appropriate statistical and computational methods. They will develop predictive models and simulations to assess water demand, supply, and resilience in urban areas. Simultaneously, the student will collaborate with their supervisors to develop and test innovative technologies for urban water management, such as sensor networks and GIS applications. The student will receive guidance and support from their supervisors throughout the research and development process.

Year 3: Pilot Studies and Policy Recommendations

During the third year, the PhD student will conduct pilot studies to test the effectiveness of proposed solutions and interventions. With guidance from supervisors, the student will implement pilot projects in selected urban areas and collect data to evaluate their impact. The student will analyze findings and work closely with their supervisors to develop policy recommendations for sustainable water management. Dissemination activities will be initiated, with the student presenting project outcomes at conferences and workshops under the guidance of their supervisors. Throughout the year, the student will receive mentorship and support from their supervisors to ensure the successful execution of project activities.

Year 4: Scaling Up and Thesis Writing

The fourth year will focus on scaling up successful interventions and thesis writing. Under the guidance of their supervisors, the PhD student will scale up effective strategies to additional urban areas or regions. They will assess project impacts and identify lessons learned for future replication and scaling efforts. The student will dedicate significant time to thesis writing, synthesizing research findings, and documenting the project's outcomes. With guidance from their supervisors, the student will prepare their thesis for submission and defense. Throughout the year,

	the student will receive ongoing support and mentorship from their supervisors to complete their research and successfully defend their thesis.
Innovative Aspects of the Project	Overall, the project's innovative aspects lie in its holistic and participatory approach to urban water management, leveraging data analytics, technology, and nature-based solutions to address the multifaceted challenges of water scarcity, climate change, and urbanization in a rapidly changing world.
Training Opportunities of the Project	
Interdisciplinary Aspects	The project "Adaptive Planning for Urban Water Security with Smart Solutions (APUWaterSmart)" embodies a strong interdisciplinary approach, integrating insights and expertise from diverse fields to address the complex challenges of urban water management. Drawing upon disciplines such as environmental science, engineering, data analytics, social sciences, and policy analysis, the project adopts a holistic perspective that considers the interconnectedness of environmental, socioeconomic, and technological factors shaping urban water systems. By fostering collaboration and knowledge exchange among researchers, practitioners, and stakeholders from different disciplines, the project seeks to develop contextually relevant and inclusive solutions that enhance water resilience and promote sustainable urban development. Through interdisciplinary collaboration, the project aims to bridge gaps between academic research and practical application, fostering innovation, resilience, and long-term sustainability in urban water management practices.
Intersectoral Mobility ☐ **Short Visit** ☐ **Secondment**	TBD

Intersectoral Mobility ☐ **Short Visit** ☐ **Secondment**	TBD
International Academic Secondment	TBD

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