Sustainable Water Management Doctoral Programme (Water4All)

Title of the PhD Project	Revaluation of domestic wastewater as a source: Integrating water and wastewater cycles for sustainability focusing on grey water
Acronym	GreySustain
Research Fields of the Project	Environmental Engineering, Life Cycle Assessment, Bioreactor Engineering,
Keywords	Grey water, wastewater treatment, Life Cycle Assessment
Host Institution, Department and Campus Location	Istanbul Technical University, Department of Environmental Engineering, ITU Ayazaga Campuss, Maslak, 34467 Istanbul
PhD Awarding Institution and Graduate Programme	Istanbul Technical University, Graduate School, PhD in Department of Environmental Engineering
Name and Affiliation of Main Supervisor	Prof. Dr. Vedat Uyak
Name and Affiliation of Co-Supervisors	Assoc. Prof. Dr. Mahmut Altınbaş
Research Environment and Infrastructure	Istanbul Technical University is an institution that plays a leading role in science, technology, arts, and sports. ITU aims to be the center of science, which connects the past to the present by producing projects for the future. The ITU Environmental Engineering Laboratories (https://cevmuhlab.itu.edu.tr) consist of 2400 square meters of management offices, 2300 square meters of research laboratories, and 350 square meters of student laboratories. The ITU Environmental Engineering department has 17 different laboratory infrastructures, including Molecular Biology Laboratory, Instrumental Analysis Laboratory, and Physical Processes Laboratory.

Sustainable Water Management Doctoral Programme (Water4All)

Scientific Context of the Project	Water management is a process that includes a set of strategies, policies, and practices aimed at ensuring the planned, effective, and sustainable use, protection, and distribution of water resources. Water management aims to meet the water needs of societies and use water resources sustainably by balancing the economic, social, and environmental dimensions of water. Water management is practiced at various scales globally and locally. Managing water sustainably is critical to meeting future generations' water needs and protecting ecosystems. Gray water refers to slightly contaminated water from activities such as cleaning, washing dishes, or showering, which originates from homes or businesses but is not black water from toilet flushes. Integrating water and wastewater cycles for sustainability refers to an approach that involves effectively managing and reusing greywater. This integration is critical for water conservation, waste reduction, and the sustainable management of water resources. Gray water is collected from homes or workplaces and cleaned with a special purification system. The purification process makes gray water suitable for reuse. Purified gray water can be reused for purposes such as garden irrigation, potable water for toilet flushing, or industrial processes. This contributes to less consumption of clean drinking water and water savings. This approach provides comprehensive water management by taking into account water's economic, environmental, and social dimensions. Greywater management can be improved through technological innovations and recycling strategies. It is important to adopt advanced treatment technologies and systems that ensure effective water use. In this study, life cycle assessment models will be developed to integrate water and wastewater cycles for sustainability, focusing on gray water using life cycle analysis.
Brief Workplan	Characterization of domestic wastewater focusing on grey water, implementing life cycle assessment models to evaluate sustainability performance, identify environmental hotspots and identify improvement opportunities
Innovative Aspects of the Project	Research and life cycle analysis will be combined in the phase of integrating water and wastewater cycles for sustainability, focusing on gray water in the re-evaluation of domestic wastewater as a resource.
Training Opportunities of the Project	The researcher will be trained in the areas of environmental sciences and environmental engineering, data analysis and statistics, modeling, project management, knowledge of sustainability standards.

Interdisciplinary Aspects	This highly multidisciplinary project involves environmental engineering (wastewater treatment), data science and modeling (evaluating results for lifecycle analysis), economy (evaluating cost-effectiveness and economic sustainability)
Intersectoral Mobility ☐ **Short Visit** ☐ **Secondment**	Host: RS Research Context of Mobility: Training in life cycle assessment
Intersectoral Mobility ☐ **Short Visit** ☐ **Secondment**	TBD
International Academic Secondment	TBD

Sustainable Water Management
Doctoral Programme (Water4All)

Main Supervisor	
Brief CV	**Prof. Dr. Vedat UYAK** **E-mail:** uyakv@itu.edu.tr **Academic Degrees** Ph.D. Environmental Engineering, Istanbul Technical University, Türkiye 2002 M.Sc. Environmental Engineering, University of Iowa, USA 1997 B.Sc. Environmental Engineering, Cumhuriyet University, Türkiye 1989 **Professional Networks** Google Scholar: https://scholar.google.com/citations?user=8oWyPXsAAAAJ&hl=tr&oi=ao ResearchGate: https://www.researchgate.net/profile/Vedat-Uyak Scopus: https://www.scopus.com/authid/detail.uri?authorId=55996485200 ORCID: https://orcid.org/0000-0002-9368-8224
Co-supervisors	
Brief CV	**Assoc. Prof. Dr. Mahmut ALTINBAŞ** **E-mail:** altinbasm1@itu.edu.tr **Academic Degrees** Ph.D. Environmental Engineering, Istanbul Technical University, Türkiye 2007 M.Sc. Environmental Engineering, Istanbul Technical University, Türkiye 2000 B.Sc. Environmental Engineering, Istanbul Technical University, Türkiye 1997 **Professional Networks** Google Scholar: https://scholar.google.com/citations?user=xqbpVMYAAAAJ&hl=en&oi=ao

	ResearchGate: https://www.researchgate.net/profile/Mahmut-Altinbas Scopus: https://www.scopus.com/authid/detail.uri?authorId=23003289800 ORCID: https://orcid.org/0000-0003-3946-741X