Sustainable Water Management

Doctoral Programme (Water4All)

Title of the PhD Project	Modeling of Artificial Recharge for the Sustainability of Groundwater Resources
Acronym	Mod4Rech
Research Fields of the Project	Water Resources, Groundwater Resources
Keywords	Groundwater, hydrogeology, recharge, sustainability
Host Institution, Department and Campus Location	Izmir Institute of Technology, Department of International Water Resources Gülbahçe, Izmir, Türkiye
PhD Awarding Institution and Graduate Programme	Izmir Institute of Technology, Department of International Water Resources
Name and Affiliation of Main Supervisor	Prof. Dr. Alper BABA Izmir Institute of Technology,
Name and Affiliation of Co-Supervisors	Prof.Dr. Orhan GÜNDÜZ, Izmir Institute of Technology Prof. Dr. Koray K.YILMAZ, Middle East Technical University
Research Environment and Infrastructure	The selected candidate will have access to the research infrastructure available at Izmir Institute of Technology and Middle Technical University. When a specific instrument or expertise is needed, all other national laboratories will also be contacted.
Scientific Context of the Project	The technique of distributing or impounding water over land to improve soil infiltration and percolation in the aquifer, or the direct injection of water into the aquifer through wells and ponds is called artificial groundwater recharge. In many countries, groundwater levels are falling because the extraction of water by humans exceeds the natural recharge rate of the aquifer. A reversal of the falling water table can be achieved in part through artificial groundwater recharge. The process of increasing the amount of water entering an aquifer under human control is known as artificial recharge. The aim of this project is using different model for artificial recharge for the sustainability of groundwater resources.

Brief Workplan	Evaluate climate change on water resources Evaluate different recharge Apply artificial groundwater recharge Use physical and numerical model for recharge
Innovative Aspects of the Project	A comparative analysis of groundwater availability before and after the construction of the artificial recharge system is discussed and evaluated. In addition, the groundwater levels and the yield of the wells before and after construction are compared. Isotopic, chemical and numerical models are used. In addition, spatial interpolation techniques in a geographic information system (GIS) are used to delineate the enlarged area of influence of the artificial recharge system.
Training Opportunities of the Project	Numerous field studies related to the project Visiting organizations working on this issue and examining what they do innovatively
Interdisciplinary Aspects	This project will be carried out with a fully interdisciplinary approach. The project will involve many contacts between climate scientists, civil engineers, hydrogeologists, geologists and environmental engineers.
Intersectoral Mobility **☒ Short Visit** **☐ Secondment**	State Hydraulic Works
Intersectoral Mobility **☒ Short Visit** **☐ Secondment**	Izmir Water and Sewerage Administration
International Academic Secondment	Villanova University

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Main Supervisor	
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Co-supervisor:	
Brief CV	**Prof. Dr. Orhan GÜNDÜZ** **E-mail:** orhangunduz@iyte.edu.tr **Academic Degrees** Ph.D. Environmental Engineering, Georgia Institute of Technology, USA 2004 M.Sc. Civil Engineering, Georgia Institute of Technology, USA 2000 M.Sc. Environmental Engineering, Middle East Technical University, Türkiye 1997 B.Sc. Environmental Engineering, Middle East Technical University, Türkiye 1994 **Professional Networks** Google Scholar:

	https://scholar.google.com/citations?user=zmIGAlsAAAAJ&hl=en ResearchGate: https://www.researchgate.net/profile/Orhan-Gunduz Scopus: https://www.scopus.com/authid/detail.uri?authorId=9743239900 ORCID: https://orcid.org/0000-0001-6302-0277
Co-supervisor:	
Brief CV	**Assoc. Prof. Dr. Koray K. YILMAZ** **E-mail:** yilmazk@metu.edu.tr **Academic Degrees** Ph.D. Hydrology and Water Resources, Univ. of Arizona, USA 2007 M.Sc. Geological Engineering, Middle East Technical University, Türkiye 1999 B.Sc. Geological Engineering, Middle East Technical University, Türkiye 1996 **Professional Networks** Google Scholar: https://scholar.google.com.tr/citations?user=olbhvrYAAAAJ&hl=tr&oi=ao ResearchGate: https://www.researchgate.net/profile/Koray-Yilmaz-5 Scopus: https://www.scopus.com/authid/detail.uri?authorId=56568516600 ORCID: http://orcid.org/0000-0002-6244-8826