

**Project name** Rain Water Harvesting for Istanbul



**Keywords** rainwater harvesting (RWH), collection, treatment, reuse, characterization of rainwater, water scarcity

**Start of project** 2012

**End of project** In operation

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**Short project description / project function** Rainwater harvesting (RWH) may be considered as a partial solution for the cities suffering from water stress. This model is applicable to suitable buildings or residential areas in urban environment. The RWH pilot system is designed and constructed to verify and test the conditions for use of harvested RW for irrigation, various sorts of cleaning and toilet flushing purposes. The pilot system includes collection of RW, first flush filtration-diversion, filtration layers, storage and disinfection. A comprehensive characterization and monitoring program was carried out for environmentally sound parameters for climate change impact perspective. The study focuses on PAH, PCB and THM measurements, evaluation of the results and mitigation measures along with the monitoring of conventional parameters for water reuse. The samples representing the RW characteristics from roofs are collected from the roof of the lodging building in TUBITAK-MRC.

**Water** RW may be considered as reliable water resource alternatives as long as appropriate measures are taken for compliance with hygienic requirements. Technical options for treatment and reuse of RW are tested at the case study site for Istanbul. The local conditions and the specific objectives are appraised. RW characterization study from various sources, including roof areas and roads/pavements of Istanbul, collection, treatment, storage and reuse are accomplished and assessed. The case study includes collection of RW from the roof of a building in TUBITAK-MRC premises, first flush filtration-diversion unit with a vortex-fine filter, sand-anthracite filtration layers, a storage tank, cartridge type filters and a UV disinfection unit.

**Energy** The use of RW in Istanbul is considered as an adaptation measure towards climate change threads in connection with

	growing water stress. The energy requirements and relevant environmental impacts, CO2 emissions calculated based on the data obtained from case study and assessed at larger scale.
<b>Biomass</b>	not applicable
<b>Project benefits</b>	<p>The results obtained up-scaled for further assessment studies in large residential or catchment areas for the implementation of the concept. In case of RWH systems suitably designed and operated in integrated manner they may significantly contribute to the reduction of potable water consumption and also run-off control in urban districts.</p> <p>Along these lines the concept may be considered as a partial adaptation strategy for climate change impacts.</p>
<b>Project level</b>	Pilot project
<b>Financial scale</b>	<p>Total construction costs = 7100 €</p> <p>Yearly management =142 €</p>
<b>Environmental conditions</b>	Climate zone: The region has a transitional climate between Black Sea and Mediterranean Climate characteristics. In summer the weather is hot and humid and during winter it is cold, wet and sometimes snowy. Istanbul is located at 41.0136 North latitude
<b>Altitude</b>	113 m above sea level
<b>Description of special local conditions</b>	The district of Gebze is located in the westernmost portion of Kocaeli Province, situated 30 miles east of Istanbul on the northern shore of the Sea of Marmara.
<b>Context Zero Emission Buildings</b>	<p>RW is thought as an alternative water resource, constitutes an advantage for sustainability and mitigation of carbon foot print, contributes conservation of valuable natural resources.</p> <p>References: Constructed and operated throughout the project Zer0-M (<a href="http://www.zer0-m.org">www.zer0-m.org</a>) and upgraded and operated during the project PREPARED (<a href="http://www.prepared-fp7.eu">www.prepared-fp7.eu</a>)</p>