**The cost of urban rainwater harvesting in the Sonoran Desert.**

M. Violeta Vargas-Parra*1,2, M. Rosa Roviira-Val1,2, Xavier Gabarrell1,3, Gara Villalba1,3 and Joan Rieradevall1,3

1Institut de Ciència i Tecnologia Ambientals (ICTA) Universitat Autònoma de Barcelona (UAB) 08193 Cerdanyola del Vallès, Spain.
2Department of Business Universitat Autònoma de Barcelona (UAB) 08193 Cerdanyola del Vallès, Spain.
3Department of Chemical Biological and Environmental Engineering, Universitat Autònoma de Barcelona (UAB) 08193 Cerdanyola del Vallès, Spain.

*Corresponding author: MariaVioleta.Vargas@uab.cat

**Introduction**

Water is a scarce resource, especially in hot-arid areas like the Sonora Desert. In urban areas like Hermosillo city with an average precipitation of 250 mm/year, it is of imperative interest to save as much water as possible and apply alternative solutions, such as rainwater harvesting systems.

Hermosillo city has been struggling with water scarcity for decades. Nonetheless, water demand is expected to increase 57% in 2030 compared to 2006. This disarrangement between the availability and the increment in water demand causes a severe problem for the economic and social development of this city.

In this line, cost is a critical factor in the decision process. The aim of this study is to present the life cycle cost results as a helping way to alleviate water supply problems in cities with similar conditions.

**Materials & Methods**

Six different scenarios were defined to study the applicability and feasibility of rainwater harvesting systems in Hermosillo, varying the size of the house (78 m², 130 m² and 210 m²) and the location of the tank (ground level or underground). Figure 1 represents ground level and underground storage tank.

Potential rainwater supply and storage tank size were calculated using Plugrisost®, a free simulation model developed by Gabarrell et al. (2014). Demand was based on two household activities: laundry and car-washing. Laundry demand was estimated based on average behavior, considering 3 wash loads per week and 92 liters of water per wash load. And car-washing was estimated as one car-wash per week and 63 liters of water per car. Table 1 summarizes rainwater demand and supply for each of the three house sizes.

**Results & Discussion**

Results show that scenarios with bigger collection surfaces and with the tank installed at ground level have better financial outcomes.

**Conclusions**

The results from this study lead us to conclude that a rainwater harvesting system is potentially economically viable for domestic laundry and car-washing in this city and others with similar conditions. Table 2 shows the financial results where ground level scenarios obtain better results compared to underground scenarios.

**References**


**Acknowledgements**

The authors would like to thank the Catalan Government for the support to SGR Sostenipra 2014 SGR 1412 (Generalitat de Catalunya). Also to the project “Análisis ambiental del aprovechamiento de aguas pluviales” (Spanish Ministry for Science and Innovation, ref. CTM 2010-17365) for financing this study and express appreciation for the grant awarded to M. Violeta Vargas-Parra by Conacyt (National Council of Science and Technology, decentralized public agency of Mexico’s federal government.)

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