



RECARE MSc / PhD Research Information

Research Title

NON-CONVENTIONAL WATER RESOURCES, GROUNDWATER-RECHARGE CHECK DAMS AND SEDIMENTATION IN SEMI-ARID ENVIRONMENTS

Abstract

Rapid population growth, climate impediments, poor implementation of regulatory frameworks and challenging political relations have led to over-exploitation of conventional water resources in the arid and semi-arid countries in the Middle East. This situation requires out-of-the-box thinking that favours research and development on non-conventional water resource technologies, including desalination, wastewater reuse, rainwater harvesting and long-distance water transfer. Desalination and water reuse journal articles comprise more than 80% of the total number of non-conventional water resource articles of these countries, published between 1968 and 2012. The number of water harvesting articles is less than 10% although the importance of water harvesting, especially for groundwater recharge purposes, has been identified by many authors. A groundwater recharge check dam can be considered a water harvesting structure. However, the recharge behind the check dam is affected by the build-up of sediment. This sedimentation is a result of erosion in the upstream watershed area, which is affected by land-use and climate change. The methodology of the research includes extensive and systematic literature research, the measurement of sediment build-up and monitoring of hydrologic components at four check dams in the Peristerona Watershed in Cyprus. The measured sediment mass will be used to evaluate the PESERA model and to apply modifications. This research will contribute to the general knowledge on non-conventional water resources and provide ideas for further research directions. Assessment of sedimentation effect on groundwater recharge and a model for sedimentation estimation will broaden the understanding on these issues and provide outcomes applicable at different locations.

Objectives of the research

(i) to assess the quality and impact of non-conventional water resources research in the Middle East and identify original research findings, (ii) to assess groundwater recharge and the effect of sedimentation on recharge at check dams; and (iii) to assess the applicability of the process-based erosion model PESERA for quantification of sedimentation at check dams in a sloping Mediterranean environment.

RECARE study site

Peristerona watershed, Cyprus

Partners in this research

Cyprus Water Development Department and Geological Survey Department

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