Autonomous Desalination System Concepts for Sea Water and Brackish Water in Rural Areas with Renewable Energies-Potentials, Technologies, Field Experience, Socio-technical and Socio-economic Impacts – ADIRA

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Abstract

Like most Mediterranean countries, the supply with clean and drinkable water in Jordan is a problem of high priority and national concern. This problem is more acute in rural areas with almost non-existent infrastructure and where electricity production costs are high. In regions without access to the electricity grid, this lack of drinkable water often corresponds with a high solar irradiation. Autonomous desalination is the solution when fresh water supplies are limited and seawater or brackish water is available. Several desalination technologies are available in the market but the selection of the appropriate technology for each particular rural area is a matter that should be dealt with. The ADIRA project funded by the European Commission with the partners from Germany, Jordan, Morocco, Greece, Turkey, and Spain aims at the development of optimum concepts for fresh water supply in rural areas. Units powered by autonomous renewable energy supply systems with fresh water output in the range of 100 L/day to 10 m^3/day are in the focus of this project. The project will not only cover the technical issues but also legal, social, economical and organizational matters. The main lines of action within the ADIRA project are as follows:

(1) Identification and quantification of regions, where decentralized desalination units area solution for the fresh water supply problem.
(2) Generating information on market available desalination systems through a technical study and development of technical concepts for installing sustainable desalination units in certain areas
(3) Planning, implementation and monitoring of pilot installations to achieve detailed results on technical viability, socio-technical and socio-economic concerns.
(4) Gaining information about actors in the field of water and energy supply, possible investors and the political framework in order to be able to identify potentials and barriers to boost the implementation of decentralized desalination units.
(5) Preparation of tools, data bases, training and awareness raising materials for supporting the systems designers, installers, operators and final water users in the implementation and sustainable operation of decentralized desalination units.
(6) Dissemination of the project results, the lessons learned and experiences at all levels in order to raise awareness among all relevant stakeholders at local, national and international level

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The main objective of this project is to bring a substantial contribution to boost the implementation of decentralized small-scale desalination units in the Middle East and North Africa (MENA) region. The objective of this paper is to present the current water situation in Jordan and the planned activities of the ADIRA project.

This project ADIRA wit the partners Egyptian Energy and Water Association, Fondation Marrakech 21, The Middle East Desalination Research Center, Agriculture University of Athens, National Center for Scientific Research DEMOKRITOS, Technological Institute of the Canary Islands, Jordan University of Science and Technology, Istanbul Technical University and Fraunhofer ISE is supported by the European Commission under contract number ME8/AIDCO/2001/0515/59610.
This document has been produced with the financial assistance of the European Community and MEDRC. The views expressed herein are those of JUST and can therefore in no way be taken to reflect the official opinion of the European Commission