

Pollutants and seawater desalination on coastal environment: a case study

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Abstract

The paper is designed to present an overview of the seawater pollution in coastal and near coastal waters in South Mediterranean countries — in the region in general and Libya in particular. The objective is to assess the possible pollutants, study the harmful effects and the impact of pollutants due to coastal installations like seawater desalination plants and offshore activities and suggests some remedial measures. An overview of recent developments in solar desalination to obtain fresh water from saline water by solar stills is also presented. Considered views, perceived problems and lessons learnt from success stories from different parts of the world, including the South Mediterranean countries, are critically analyzed through a comprehensive survey and in-depth analysis of responses using a questionnaire. These initiatives are treated as best practice water desalination initiatives for their potential application in South Mediterranean countries. Potential benefits of a more efficient on-going EGA initiative over the conventional low cost technology system based upon a humidification-dehumidification process are briefly outlined. The new initiative uses a closed air-cycle type system, in which air is circulated in the unit by natural draft, between the humidifier and the condenser. Potential benefits of a proposed system in which the solar heat is utilized more than once through recovery of the heat of condensation in a manner somewhat similar to multi-effect desalination are briefly outlined. Finally the paper briefly highlights the future areas of possible research in seawater pollution monitoring, assessment, diagnosis, control and treatment which may be undertaken in South Mediterranean countries. Suggestions and recommendation are given to highlight both the theoretical development and experimental tools, techniques and technology needed for evolving an optimal design for desalination based upon performance and economic considerations. A comprehensive proposal for extending the results of the case study for its wider application is presented to seek venues of possible co-operation between EGA and potential interested agencies.

Keywords: Pollutants; Seawater desalination; South Mediterranean

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