



RESEARCH PAPERS IN GEOGRAPHY

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**DESALINATION OF THE SEA WATER
IN THE GULF COOPERATION COUNCIL
(GCC) : A GEOGRAPHICAL ANALYSIS**

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Abstract

Desalination of the Sea Water in the Gulf Cooperation Council States (GCC) : A Geographical Analysis.

The GCC States are located in a dry tropical region where natural fresh water is not available in adequate quantities to meet daily needs. The GCC States are currently pumping fresh water from shallow and deep aquifers at a rate far exceeding that of the replenishment. The increasing demands for fresh water for population growth, industrial development and urban expansion clearly show that the traditional water resources can not keep pace with the increasing demand. It had become increasingly apparent in the last ten years that many parts of the GCC States would have to face up to serious periodic water shortages unless new fresh water resources are obtained.

The main purpose of this study is to elucidate the geographic distribution of sea water desalination plants in the GCC States and to determine the role of this new fresh water resource in solving water shortages in the region. The study also discusses sea water conversion processes mostly used in the region and indicates the comparative advantage of each.

The water authorities of the GCC States have been sponsoring many plans to develop new resources in order to ensure a competent supply of potable water for both present and future demands. Many desalting plants have been built along the coasts of the Arabian Gulf and Red Sea producing a compined daily total of over 1050 million gallons. This quantity accounts for 59.2% of the total distilled sea water produced in the world.

Although the distilled sea water accounts for a high percentage of water supply in the GCC States, variations among them are noticeable. Kuwait, for example, relies almost entirely on distilled sea water, while the natural fresh water is still the main source for most of the communitites in Oman. The degree

of reliance on distilled sea water depends on the hydrologic and climatic conditions on the one hand, and the demographic characteristics of each state, on the other.

Sea water can be distilled in many ways. The choice of one conversion process among others is strongly related to both the cost and rate of conversion. The Multi-Stage Flash Distillation (dual purpose plants) which produce fresh water and generate electricity and Reverse Osmosis (single purpose plants) account for about 82% and 13.5% respectively, of all other processes used in the world.

The economic factor appears to be the most influential in the implementation of desalination projects. This factor entails such elements as; energy cost, manpower, and the size of the initial capital investment.

* The GCC States are : Saudi Arabia, Kuwait, United Arab Emarates, Qatar, Bahrain and Oman.