



Water Management Strategy in Assessing the Water Scarcity in Northern Western Region of Nile Delta, Egypt

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Sustainable development in the Nile Delta of Egypt is retarded by serious environmental problems, where land-use and land-cover of the region are subjected to continuous changes; including shoreline changes either by erosion or accretion, subsidence of the delta, as well as by sea level rise due to climate change. The current research attempts to; (1) study the vulnerability of the northern western region of the Nile Delta coastal zone to climate change/sea level rise while setting basic challenges, review adaptation strategies based on adaptation policy framework, and highlight recommended programs for preparedness to climate change, (2) study the scarcity of water resources in the area of study with review of the socioeconomic impacts and the critical need of establishing desalination plants with new standards assessing the environmental situation and population clusters, and (3) monitor of the brine water extracted from the desalination plants and injected to subsurface strata. This monitoring process is divided into 3 main directions: 1) studying the chemical characteristics of water extracted from the water desalinations plants qualitatively and quantitatively. 2) mapping the subsurface of which that brine water will be injected to it and the flow directions and effects using resistivity data, and 3) using GIS and suitable numerical models in order to study the effect, volume, flow of the brine water and its long term environmental impacts on the area.

The results indicate that the area is particularly vulnerable to the impact of SLR, salt water intrusion, the deterioration of coastal tourism and the impact of extreme dust storms. This in turn will directly affect the agricultural productivity and human settlements in coastal zones. The paper presents different scenarios for water management and recommends the most suitable scenarios in order to establish a core for water management strategy in the region according to existing socio-economic and environmental situations.

Key words: Nile Delta, climate change, socioeconomic, sea level rise, groundwater monitoring, GIS