Coastal processes, erosion control and shoreline management

Using Sustainable Solution For Shoreline Management

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The city of Alexandria located at the southern Mediterranean coast with a population of about 4 million inhabitants. It occupies an area of about 300 square kilometre, with an increasing demand for development of new land. Alexandria coastal zone suffers from erosion and flooding problems. In addition, Alexandria coastal zone tolerate from the degradation of water quality due to land-based pollution. The Strategic Action Plan for the Mediterranean countries has identified two hot spots (El-Mex Bay and Abu-Qir Bay) on Alexandria coast zone. These hot spots have been experiencing a continuous increase in population, development, and environmental degradation. Obtaining an sustainable shore protection and stabilization method which provides friendly environmentally coastal solution with less executing cost and duration is an important issue for governors and design makers. One of these methods is the Artificial Submerged Reefs, ASR, which have minimum influence on environment, sea traffic and can be considered a suitable environment for the growth of useful fauna and flora. A new numerical tool has been used to predict the sedimentation at the lee of an proposed Artificial Submerged Reefs (Geo-textile mega-containers sand filling) and its stability. The numerical model has been used to design the section of the geo-container sand filling for Alexandria submerged breakwater. The environmental impacts of Alexandria conventional submerged breakwater, which has been constructed four years ago to protect Alexandria coastline from erosion, is discussed and a comparative analysis between Alexandria conventional submerged breakwater and the proposed mega geo-containers artificial submerged reef is presented. The artificial submerged reef save fifty percentage in cost and seventy percentage in construction time comparing to conventional shore protection structure. On the other hand, the artificial submerged reef can improve and protect fragile ecosystems and reduce damage to natural habitats. These sustainable environmental techniques will help in touristic development and protection of Egypt coastal zone and also can be applied with the objectives raised from Alexandria Integrated Coastal Zone Management Project, Environmental and Social Impact Assessment, AICZM-ESIA. Using this technique in the protection of Alexandria coastline will adopt the Strategic Action Program for the conservation of Mediterranean marine and coastal biological diversity.
Keywords: Beach Management, Artificial Submerged Reefs, Sustainable shore protection

technique, Alexandria Integrated Coastal Zone Management. Numerical tool.