

Coastal Cliff Protection in Beit Yanai, Israel: Examination of Alternatives and Public Preference Analysis

Authors : Tzipi Eshet

Abstract : The primary objectives of this work are the examination of public preferences and attributed importance to different characteristics of coastal cliff protection alternatives, and drawing conclusions about the applicable alternative in Beit-Yanai beach. Erosion of coastal cliffs is a natural phenomenon that occurs in many places in the world. This creates problems along the coastlines, which are densely populated areas with highly developed economic activity. In recent years, various aspects of the aeolianite cliffs along the Israeli coast have been studied extensively. There is a consensus among researchers regarding a general trend of cliff retreat. This affects civilian infrastructure, wildlife habitats and heritage values, as well as increases the risk to human life. The Israeli government, committed to the integrated coastal zones management approach, decided on a policy and guidelines to deal with cliff erosion, which includes establishing physical protection on land and in the sea, sand nourishment and runoff drainage. Physical protection solutions to reduce the rate of retreat of the cliffs are considerably important both for planning authorities and visitors to the beach. Direct costs of different protection alternatives, as well as external costs and benefits, may vary, thus affecting consumer preferences. Planning and execution of sustainable coastal cliff protection alternatives must take into account the different characteristics and their impact on aspects of economics, environment and leisure. The rocky shore of Beit-Yanai Beach was chosen as a case study to examine the nature of the influence of various protective solutions on consumer preferences. This beach is located in the center of Israel's coastline, and acts as a focus of attraction for recreation, land and sea sports, and educational activities as well. If no action will be taken, cliff retreat will continue. A survey was conducted to reveal the importance of coastal protection alternatives characteristics and the visual preferences to visitors at beach Beit-Yanai and residents living on the cliff (N=287). Preferences and willingness-to-pay were explored using Contingent-Ranking and Choice-Experiments techniques. Results show that visitors' and residents' willingness-to-pay for coastal cliff protection alternatives is affected both by financial and environmental aspects, as well as leisure. They prefer coastal cliff protection alternatives that are not visible and do not need constant maintenance, do not affect the quality of seawater or the habitats of wildlife and do not lower the security level of the swimmers. No significant difference was found comparing willingness-to-pay among local and non-local users. Additionally, they mostly prefer a protection solution which is integrated in the coastal landscape and maintains the natural appearance of the beach. Of the possible protection alternatives proposed for the protection of the cliff in Beit Yanai beach are two techniques that meet public preferences: rock revetments and submerged detached breakwaters. Results indicate that the visiting public prefer the implementation of these protection alternatives and will be willing to pay for them. Future actions to reduce retreat rate in Beit-Yanai have to consider implications on the economic, environmental and social conditions, along with weighting public interest against the interest of the individual.

Keywords : contingent-ranking, choice-experiments, coastal cliff protection, erosion of coastal cliffs, environment

Conference Title : ICSRD 2020 : International Conference on Scientific Research and Development

Conference Location : Chicago, United States

Conference Dates : December 12-13, 2020