



## Urbanization and coastal effects in Agia Pelagia, Crete Island

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Urbanization driven either from anthropogenic, such as population growth, or from the economic geography factors i.e. secondarisation and tertiarisation of the economy, has contributed in the extensive and intensive settlements expansion. Social, economic and environmental reasons lead to population and activities concentration in coastal zones (coastalisation).

At the same time, the Greek spatial planning legislation favor the urban sprawl through specific regulations. Urban sprawl in coastal areas cause many negative impacts, in the human activities e.g land use conflicts, degradation of local social-economical networks, but also to the environment by landscape degradation and natural and cultural heritage degradation and coastal erosion. Moreover, beach use for tourism purposes in a significant factor for tourism development and economic growth.

Coastal erosion is defined as the long-term retreat of coastal land relative to a fixed reference line and is the result of climatic and anthropogenic factors, which can cause significant economic, social and environmental impacts, and presents a major issue for Greek coastline.

The present study aims in defining the relation between the urban expansion of a high tourism coastal destination and coastal erosion and identify how anthropogenic activities and/or existing land uses can affect a beach. As case study, Ag. Pelagia, a high tourism destination in the central northern coast of Crete island is used. . The analysis was implemented by the use of orthophotos representing four periods (1945, 1998, 2008, 2016) by correlating urban expansion and man-made surfaces with beach evolution.

The results indicate that the expansion of the man-made environment has a significant negative effect on the coastal area, which enhanced by natural factors such as wave energy. A major impact was the erosion of the beach. Sediment sources have been dramatically reduced, while coastal structures such as coastal walls and pedestrian streets enhanced the erosional phenomena. A comparison with the period of 1945, where man-made interventions were minimal, indicated that the coastal zone had a significant reduction in its natural surface against man-made surfaces. In the beach, the loss of land is about 60%, by both beach erosion but also from urban expansion. Beach surface loss had not only environmental impacts, but also significant social, and economic impacts, as beach carrying capacity reached its limits in the last years. Due to the sediment sources reduction the beach is not able to retune to the previous state naturally.

Keywords: urbanization, coastal zone, coastal erosion, Agia Pelagia, Crete Island

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