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THE POTENTIAL CONSEQUENCES OF CLIMATE CHANGE ON KOTYCHI LAGOON

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EXTENDED ABSTRACT

The impact of sea level rise (SLR) is an issue, which is insufficiently understood by coastal management organizations and inadequately planned for. While sea levels have changed significantly over the past 18.000 years, the most recent changes created by global warming, resulting from man's impact on the world's environment are occurring at a rate considerably greater than those associated with interglacial periods. Other changes may accompany sea level rise. An increase in temperature is certain, between 0.5 and 2^{o} C by 2030 and 1.0 and 5.0^{o} C by 2070. Rainfall patterns are likely to change with decreased precipitation and less intense rainfall in summer and an increase in rainfall and greater intensity in winter. Finally, a rising sea will increase the salinity of marshes, estuaries and aquifers, disrupt marine life and possibly threaten drinking water supplies. Fortunately, the most adverse effects can be avoided if, timely, actions are taken in anticipation of SLR.

Areas of greater risk from the effects of sea level rise are sandy coasts, low altitude plains, wetlands, lagoons and estuaries. The effect of the climate change and sea level rise may include a marked increase in coastal erosion and recession, flooding of low lying coastal plains, greater sand erosion, rise in water tables and changed vegetation patterns and animal habitats.

Kotychi lagoon is a large coastal lagoon of varying salinity, associated marshes separated from the sea by an extensive dune system, smaller lagoons and wet meadows. The coastal dunes are in good condition with well-developed vegetation. The surrounding areas are used for intensive agriculture. Due to its great importance, the site was placed on the Montreux Record in 1990 because of agricultural chemical inputs and grazing pressure. Kotychi lagoon is the Ramsar site No. 63.

The present case study examines the impacts of climate change on the lagoon aiming at assessing its vulnerability. Large-scale topographic maps, air photographs spanning half a century of coastal changes and bathymetric maps were digitized to produce a 3D accurate topographic background. Using different scenarios for static and dynamic models, the impacts on the lagoon can be estimated for the 21st century. The response of the lagoon to the moderate even scenario is an appreciable retreat resulting in a bay and losing its crucial environmental role. Soft or hard protection methods must be timely implemented before nature loses its local balance.

Key words: climate change, sea level rise, erosion, shoreline change, Kotychi lagoon