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TITLE OF DIPLOMA THESIS:

Flood risk prevention and resilience management of coastal areas due to storm surges

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ABSTRACT

The current master diploma thesis examines flood risk prevention and the ability of coastal areas to recover rapidly from storm tides and floods due to storm surges. More specifically, it explores the concept of resilience in flood risk management, as well the implementation of new safety measures against coastal flooding or erosion. Sea level rising and the appearance of extreme weather events around the globe, are attributed to climate, undergoing change during the last decades. Despite the difference of opinion on the origin of this change, much of the world's population, which resides in densely urbanized coastal areas, is currently in danger. In this direction, initially the main aspects of climate change impact on coastlines are analyzed and then extreme natural events, such as storm surges and beach erosion are examined thoroughly. Secondly the concept of resilience is defined, based on Greek and foreign academic literature and web sources related to this matter. The concept is introduced in flood risk management and its main characteristics are highlighted, such as the recovery rate of a system or the graduality of response to a disturbance. The relationship between resilience and other concepts like the resistance of a system, vulnerability and adaptability is also discussed, and lastly a framework for the development of response strategies is set, through design and implementation of new protection methods. Turning to the next chapter "soft" engineering methods against flooding are described, which do not conflict but cooperate with nature. The design of such "soft" protection methods is fully compatible with the concept of Integrated Coastal Zone Management (ICZM) which also follows the European standard for Coastal Environmental Management. These new protection measures come to replace the so-called "hard" engineering methods which were used for shaping the seafront and are responsible for further coastal erosion and inefficiency towards the increasing intensity of storm surges. Finally, through the usage of these new protection techniques and resilience's main principles, a proposal for the redevelopment of Alexandroupoli's waterfront is presented, a city located in the northern part of Aegean Sea, while the latter is being hit by major floods during the last decade.

KEYWORDS

Resilience, soft engineering protection methods, storm surge, flood risk management, climate change