

Title: Critical Infrastructure and the Resilient-Sustainable Reconstruction of Puerto Rico After Hurricane María

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Critical infrastructure poses a substantial risk in the face of hazardous phenomena. Hurricanes, storms, earthquakes, heavy rains and other natural disasters are the most likely and most impacting events. Puerto Rico's location greatly exposes the island to these phenomena and makes it vulnerable to damage, as was the case of Hurricane María. Category 4 Hurricane María made landfall in Puerto Rico through the southeast region in the early morning of September 20, 2017. The event caused severe damage to the Island's critical infrastructure which was determined to be in poor condition and mostly below updated and adequate engineering resilient design standards. For its reconstruction, increasing the resilience of Puerto Rico's infrastructure is of utmost importance. As a response, objectives are set to identify appropriate design and construction concepts that apply to critical infrastructure. Furthermore, recommendations to work with the interdependence of critical systems are paramount for this investigation. Available literature suggested for advanced construction techniques that consider resilient and sustainable designs to be applied. Risk mitigation measures must be restrictive, well applied, and maintained in order to obtain a good functioning and prevalence of the structures. Reconstruction must consider the performance of individual components for the overall performance of an entire system with a long-term vision to avoid recreating risk and vulnerability. A cycle for the resilient design and preparation of infrastructures in the face of risks and potential harmful events was documented. The cycle focuses on establishing a recursive process to maintain a good state of mitigation, response, recovery, and resilience.