

IAF EARTH OBSERVATION SYMPOSIUM (B1)
Earth Observation Applications, Societal Challenges and Economic Benefits (5)

Author: Mr. Jinu George
University of Dubai, United Arab Emirates, jinu.tvpm@gmail.com

GEOSPATIAL IMPACT MODELING OF NATURAL AND HUMAN INDUCED HAZARDS ON
HISTORICAL BUILDINGS LOCATED IN VARIOUS ARCHEOLOGICAL SITES ACROSS THE
UNITED ARAB EMIRATES USING THERMAL AND OPTICAL REMOTE SENSING (RS) AND
GEOGRAPHICAL INFORMATION SYSTEM

Abstract

Historical buildings in Archeological sites holds great importance for any society in any country in the world. Heritage both physical and insubstantial unites societies to the past and provides precious insights into our characteristics and progression. Historical buildings in Archeological sites are vulnerable to the antagonistic impacts of natural hazards, and climate change. Lack of maintenance and the loss of traditional knowledge have increased the susceptibility of cultural heritage assets in many regions of the world. Urbanization and accumulation of economic activity have also been applying pressures, which also includes changes in land use or zoning that may portrait Historical buildings to additional risks. When steady infrastructure is damaged by disaster, repair or reconstruction is usually conceivable; but impacts on Historical buildings can be irreversible and can also lead to economic losses, counting to loss of livelihoods.

This study focuses on analyzing the impact of various types of natural and anthropogenic hazards on the historical buildings located at various Archeological sites spread across all the emirates of United Arab Emirates by using Geospatial and Remote sensing data, tools and techniques by integrating with Analytical hierarchical process. The main objective of the paper is to find and decide the impact levels/ranks of a particular natural disaster in correspondence with the site specific land cover that could affect the historical buildings located within the boundary of each of the 72 Archeological sites. This paper focuses mainly on 9 natural disasters and its impact over the historical buildings , RS data used are Landsat 8 OLI/TIRS C2 L1 sensor Satellite images obtained from U.S. Geological Survey USGS, DEM Data of 30-meter resolution from SRTM 1 Arc-second Global v003 sensor also obtained from U.S. Geological Survey USGS, UAE Boundary data from UAE university, Multi variety Geospatial Data, Techniques and Tools were employed to perform analysis and draw the results; The spatial data being used consist of both raster and vector types they includes various satellite sensor data, data related to various natural hazard as well as location based data including Archeological site boundaries, Building footprint polygons and site location points. Techniques used includes Image classification, Confusion matrix error check, clipping and sub setting, layer stacking integrating with advanced Geoprocessing techniques. The results of this study help town planners, archeologists and administrations to plan and safeguard the historical buildings and sites with more precise decisions.