

Master's Thesis:

## **Sustainable Watershed Management in a Semi-Arid Region - A case study in Zacatecas**

submitted by :

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# Abstract

The integration of environmental, economic, political and social aspects in watershed management is necessary if we want to archive the sustainability of the ecosystems. Challenges become bigger in arid environments, where water scarcity, soil degradation and an increasing world population threaten the future and present livelihood of those areas. Where the objective of this study was orientated to assess the vulnerability of a semi-arid watershed, by mapping desertification risk and proposing measures to overcome these threatens. It was clear that watershed management theory, environmental vulnerabilities and vulnerability indicators methods review, and geospatial technology experiences is a key factor for assessing watershed vulnerabilities. Throughout an Analytical Hierarchy Process (AHP) we were able to prioritize vulnerable watersheds in our AOI, and after obtaining the desertification risk map, and together with socio-economic parameters, we were able to assess and rank vulnerable watersheds and sub-watersheds. It was possible to emphasize the importance of the NDVI in the desertification risk model checkup, because as a ratio band, is a powerful tool in geospatial assessments.