

## Hydrogeomatic System for the Economic Evaluation of Damage by Flooding in Mexico

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**Abstract :** In Mexico, each year news is disseminated about the ravages of floods, such as the total loss of housing, damage to the fields; the increase of the costs of the food, derived from the losses of the harvests, coupled with health problems such as skin infection, etc. In addition to social problems such as delinquency, damage in education institutions and the population in general. The flooding is a consequence of heavy rains, tropical storms and or hurricanes that generate excess water in drainage systems that exceed its capacity. In urban areas, heavy rains can be one of the main factors in causing flooding, in addition to excessive precipitation, dam breakage, and human activities, for example, excessive garbage in the strainers. In agricultural areas, these can hardly achieve large areas of cultivation. It should be mentioned that for both areas, one of the significant impacts of floods is that they can permanently affect the livelihoods of many families, cause damage, for example in their workplaces such as farmlands, commercial or industry areas and where services are provided. In recent years, Information and Communication Technologies (ICT) have had an accelerated development, being reflected in the growth and the exponential evolution of the innovation giving; as a result, the daily generation of new technologies, updates, and applications. Innovation in the development of Information Technology applications has impacted on all areas of human activity. They influence all the orders of life of individuals, reconfiguring the way of perceiving and analyzing the world such as, for instance, interrelating with people as individuals and as a society, in the economic, political, social, cultural, educational, environmental, etc. Therefore the present work describes the creation of a system of calculation of flood costs for housing areas, retail establishments and agricultural areas from the Mexican Republic, based on the use and application of geotechnical tools being able to be useful for the benefit of the sectors of public, education and private. To generate analysis of hydrometeorologic affections and with the obtained results to realize the Geoinformatics tool was constructed from two different points of view: the geoinformatic (design and development of GIS software) and the methodology of flood damage validation in order to integrate a tool that provides the user the monetary estimate of the effects caused by the floods. With information from the period 2000-2014, the functionality of the application was corroborated. For the years 2000 to 2009 only the analysis of the agricultural and housing areas was carried out, incorporating for the commercial establishment's information of the period 2010 - 2014. The method proposed for the resolution of this research project is a fundamental contribution to society, in addition to the tool itself. Therefore, it can be summarized that the problems that are in the physical-geographical environment, conceiving them from the point of view of the spatial analysis, allow to offer different alternatives of solution and also to open up slopes towards academia and research.

**Keywords :** floods, technological innovation, monetary estimation, spatial analysis

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