

# **A Fuzzy Approach to Enhance Uncertain Post Flood Damage Assessment for Quality Risk Analysis**

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The flood disaster has become the most common natural disaster that brings serious losses to human all over the world. Element at risk is people, infrastructure, building, and other natural/manmade feature that are valuable to human, but vulnerable to flood disasters. There have destructive effects on human and wildlife, economy and environment. Post flood damage assessment supply crucial information to decision support and policy development in the fields of flood disaster management and adaptation planning to climate change. This assessment is gaining more importance within this evolving context of decision-making in flood risk management. However, due to various uncertainties that originate from data collection, damage figure, and damage function in post flood damage assessment model, it is still insufficient to obtain accurate flood damage estimation with the required lead times. Therefore the uncertainty analysis and thorough investigation of model inputs and assumption should be compulsory for each flood damage assessment.

The objective of this research is to model post flood damage assessment model using Artificial Intelligent approach called fuzzy systems. Parameters that are identified as uncertain are to be considered and constructed because these are the main determinants of the damage assessment result. Uncertain parameters cover both minimum and maximum value of the data classification, rather than an average value. These parameters include water depth, water velocity, types of debris, duration of flood, types of property and its size and market value of the property. Fuzzy approach is used in the damage assessment model due to the characteristics of the parameters, which are identified as uncertain. This would improve the current assessment model that gives a better result. The model is will be tested and evaluated using the real data and output of this research will improve the post flood damage assessment model with uncertain parameters.

Keywords: Flood Damage Assessment, Artificial Intelligent, Uncertainty, Fuzzy System, Risk Analysis.