

A GIS-based Decision Support System for Flash Flood Risk Management

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Selecting the storage volume and hence the cost of structural measures used to manage flash flood risks is a multi-disciplinary problem. Unfortunately, usually, some members of decision team are not familiar with specialised tools such as the geographic information system (GIS). Hence, the need arises to develop an easy tool to support understanding the expected risks and the return of implementing different protection structures. This work tries to develop such a tool in the form of an add-in to ArcGIS using ArcObjects and Visual Studio .NET programming environment. A case study in Wadi Abu Sobeira, Aswan, Egypt was selected to apply and test the tool. The first section of this tool reads land use shapefile and raster layers of flow depth and velocity that was generated by external hydrodynamic models. The second section applies flood/damage functions or curves to determine spatially and degree of flood risk over the threatened area. The third section is for defining experts opinions about the relative weight of flood damage based on both land use and risk degree. The fourth section export/print the tabulated, graphical and maps output. The tool produces curves that compare cost/benefit of user defined alternative protections. Applying this approach saves decision makers time and allows them to focus on putting and comparing protection alternatives.