



Supplement of

Review Article: Multi-criteria decision making for flood risk management: a survey of the current state-of-the-art

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Author(s)	Year	Title of the publication	Journal	Country of application	Area(s) of application	MCDM method(s)	Were multiple stakeholders included in the MCDM process?	Which participatory technique was applied?	Sensitivity analysis was performed?	Which sensitivity analysis method was used?	Uncertainty analysis was performed?	Which uncertainty analysis method was used?
Tkach and Somonovic	1997	A new approach to multi-criteria decision making in water resources	Journal of Geographic Information and Decision Analysis	Canada	alternative ranking	SCP, CP	No		No		No	
Buzolic et al.	2001	Decision support system for disaster communications in Dalmatia	International Journal of Emergency Management	Croatia	emergency management	PROMETHEE	No		No		No	
Margeta and Knezic	2002	Selection of the flood management solution of Karstic Field	Water International	Croatia	alternative ranking	AHP, PROMETHEE I, PROMETHEE II	Yes	does not mention	No		No	
Azibi and Vanderpooten	2003	Aggregation of dispersed consequences for constructing criteria: the evaluation of flood risk reduction strategies	European Journal of Operational Research	France	alternative ranking	WSM	Yes	group meeting	No		No	
Bana e Costa et al.	2004	Multicriteria evaluation of flood control measures: the case of Ribeira do Livramento	Water Resources Management	Portugal	alternative ranking	MACBETH	Yes	interviews	Yes	one-way sensitivity analysis	No	
Brouwer and van Ek	2004	Integrated ecological, economic and social impact assessment of alternative flood control policies in the Netherlands	Ecological Economics	Netherlands	alternative ranking	WSM	Yes	stakeholder analysis	Yes	one-way sensitivity analysis	No	
Chen and Hou	2004	Multicriterion decision making for flood control operations: theory and applications	Journal of the American Water Resources Association	China	reservoir flood control	fuzzy recognition model	No		No		No	
Levy	2005	Multiple criteria decision making and decision support systems for flood risk management	Stochastic Environmental Research and Risk Assessment	China	emergency management	ANP	Yes	workshops	No		No	
Simonovic and Niruoama	2005	A spatial multi-objective decision-making under uncertainty for water resources management	Journal of Hydroinformatics	Canada	alternative ranking	spatial fuzzy CP	No		No		No	
Al-Awadhi and Hersi	2006	Surface runoff hazard map distribution in Kuwait	Management of Environmental Quality: An International Journal	Kuwait	susceptibility	AHP	Yes	Delphi technique	No		No	
Plattner et al.	2006	Integrating public risk perception into formal natural hazard risk assessment	Natural Hazards and Earth System Sciences	Germany	risk	AHP	Yes	delphi technique, workshops, questionnaires	No		No	
Simonovic and Akter	2006	Participatory floodplain management in the Red River Basin, Canada	Annual Reviews in Control	Canada	alternative ranking	fuzzy CP	Yes	interviews, questionnaires, workshops	No		No	
Gao et al.	2007	An assessment of flood hazard vulnerability in the Dongting Lake Region of China	Lakes & Reservoirs: Research and Management	China	susceptibility, hazard, vulnerability	AHP	Yes	does not mention	No		No	
Kenyon	2007	Evaluating flood risk management options in Scotland: a participant-led multi-criteria approach	Ecological Economics	Scotland	alternative ranking	rank sum method, rank order centroid	Yes	workshops	No		No	
Lee and Chung	2007	Development of integrated watershed management schemes for an intensively urbanized region in Korea	Journal of Hydro-environment Research	South Korea	hazard, vulnerability, risk	composite programming, AHP	Yes	does not mention	No		No	
Levy et al.	2007	Multi-criteria decision support systems for flood hazard mitigation and emergency response in urban watersheds	Journal of the American Water Resources Association	Japan	emergency management	ANP	Yes	interviews	No		No	

Martin et al.	2007	Urban stormwater drainage management: the development of a multicriteria decision aid approach for best management practices	European Journal of Operational Research	France	alternative ranking	ELECTRE III	Yes	questionnaires	Yes	one-way sensitivity analysis	No	
Rahman and Saha	2007	Flood hazard zonation - a GIS aided Multi Criteria Evaluation (MCE) approach with remotely sensed data	International Journal of Geoinformatics	Bangladesh	hazard	AHP	Yes	focus group discussions	No		No	
Fu	2008	A fuzzy optimization method for multicriteria decision making: an application to reservoir flood control operation	Expert Systems with Applications	China	reservoir flood control	extended fuzzy TOPSIS	No		No		No	
Raaijmakers et al.	2008	Flood risk perceptions and spatial multi-criteria analysis: an exploratory research for hazard mitigation	Natural Hazards	Spain	alternative ranking	WSM	Yes	questionnaires, interviews	No		No	
Scolobig et al.	2008	Integrating multiple perspectives in social multicriteria evaluation of flood-mitigation alternatives: the case of Malborghetto-Valbruna	Environment and Planning C - Government and Policy	Italy	alternative ranking	NAIADE	Yes	interviews, questionnaires, narrative analysis	No		No	
Sinha et al.	2008	Flood risk analysis in the Kosi river basin, north Bihar using multi-parametric approach of AHP	Journal of the Indian Society of Remote Sensing	India	susceptibility	AHP	No		No		No	
Yazdandoost and Bozorgy	2008	Flood risk management strategies using multi-criteria analysis	Proceedings of the Institution of Civil Engineers: Water Management	Germany	alternative ranking	WSM, evamix	No		Yes	probabilistic sensitivity analysis	No	
Chung and Lee	2009	Identification of spatial ranking of hydrological vulnerability using multicriteria decision making techniques: Case study of Korea	Water Resources Management	South Korea	hazard, vulnerability, risk	AHP, Composite programming, CP, ELECTRE II, evamix, Regime	Yes	questionnaires	No		No	
Jiang et al.	2009	Risk assessment and validation of flood disaster based on fuzzy mathematics	Progress in Natural Science	Malaysia	risk	AHP	No		No		No	
Kienberger et al.	2009	Spatial vulnerability units – expert-based spatial modelling of socio-economic vulnerability in the Salzach catchment, Austria	Natural Hazards and Earth System Sciences	Austria	vulnerability, coping capacity	AHP	Yes	questionnaires	No		No	
Kubal et al.	2009	Integrated urban flood risk assessment – adapting a multicriteria approach to a city	Natural Hazards and Earth System Sciences	Germany	vulnerability, risk	WSM	No		No		No	
Lim and Lee	2009	The spatial MCDA approach for evaluating flood damage reduction alternatives	KSCE Journal of Civil Engineering	South Korea	alternative ranking	CP, SPC	No		No		No	
Meyer et al.	2009	Flood risk assessment in European river basins - concept, methods, and challenges exemplified at the Mulde River	Integrated Environmental Assessment and Management	Germany	risk	WSM	No		Yes	one-way sensitivity analysis	No	
Meyer et al.	2009	A multicriteria approach for flood risk mapping exemplified at the Mulde river, Germany	Natural Hazards	Germany	risk	MAUT, Disjunctive approach	No		Yes	one-way sensitivity analysis	No	
Nijssen et al.	2009	Planning of technical flood retention measures in large river basins under consideration of imprecise probabilities of multivariate hydrological loads	Natural Hazards and Earth System Sciences	Germany	alternative ranking	fuzzy AHP	No		No		No	
Choudhury	2010	Reservoir flood control operation model incorporating multiple uncontrolled water flows	Lakes & Reservoirs: Research and Management	India	reservoir flood control	goal programming	No		No		No	
Fernández and Lutz	2010	Urban flood hazard zoning in Tucumán Province, Argentina, using GIS and multicriteria decision analysis	Engineering Geology	Argentina	susceptibility	AHP	No		Yes	global sensitivity analysis (FAST method) and Monte Carlo	Yes	Taylor's series error propagation method

Schumann	2010	Handling uncertainties of hydrological loads in flood retention planning	International Journal of River Basin Management	Germany	alternative ranking	TOPSIS, fuzzy AHP	No	No	No			
Vafaei and Harati	2010	Strategic management in decision support system for coastal flood management	International Journal of Environmental Research	Iran	alternative ranking	AHP	No	No	No			
Yahaya et al.	2010	Multicriteria analysis for flood vulnerable areas in Hadejia-Jama'are River Basin, Nigeria	European Journal of Scientific Research	Nigeria	hazard	AHP	No	Yes	one-way sensitivity analysis	No		
Ceccato et al.	2011	Participatory assessment of adaptation strategies to flood risk in the Upper Brahmaputra and Danube river basins	Environmental Science & Policy	Germany, Austria, India, Bhutan, China	alternative ranking	ELECTRE III	Yes	Delphi technique, workshops	Yes	one-way sensitivity analysis	Yes	qualitative uncertainty analysis
Chen et al.	2011	Integrated application of the analytic hierarchy process and the geographic information system for flood risk assessment and flood plain management in Taiwan	Natural Hazards	Taiwan	risk	AHP	Yes	questionnaires	No		No	
Dang et al.	2011	Evaluation of flood risk parameters in the Day River flood diversion area, Red River Delta, Vietnam	Natural Hazards	Vietnam	hazard, vulnerability, risk	AHP	Yes	workshops, interviews	No		No	
Das et al.	2011	An aggregative fuzzy risk analysis for flood incident management	International Journal of System Assurance Engineering and Management	Canada	emergency management	fuzzy AHP	No		No		No	
Deshmukh et al	2011	Impact of flood damaged critical infrastructure on communities and industries	Built Environment Project and Asset Management	USA	emergency management	AHP	Yes	questionnaires, interviews	No		No	
Jun et al.	2011	Development of spatial water resources vulnerability index considering climate change impacts	Science of The Total Environment	China	risk	TOPSIS	Yes	questionnaires, interviews	Yes	one-way sensitivity analysis	No	
Kourgialas and Karatzas	2011	Flood management and a GIS modelling method to assess flood-hazard areas—a case study	Hydrological Sciences Journal	Greece	hazard	WSM	No		No		No	
Liu et al.	2011	Assessment of capacity of flood disaster prevention and reduction with 2-tuple linguistic information	Journal of Convergence Information Technology	China	coping capacity	TOPSIS	No		No		No	
Malekmohammedi et al.	2011	Ranking solutions of multi-objective reservoir operation optimization models using multi-criteria decision analysis	Expert Systems with Applications	Iran	reservoir flood control	ELECTRE-TRI	No		Yes	does not specify	No	
Ozturk and Batuk	2011	Implementation of GIS-based multicriteria decision analysis with VB in ArcGIS	International Journal of Information Technology & Decision Making	Turkey	susceptibility	AHP	No		Yes	one-way sensitivity analysis	No	
Sarker et al.	2011	GIS and RS combined analysis for flood prediction mapping - a case study of Dhaka City corporation, Bangladesh	International Journal of Environmental Protection	Bangladesh	susceptibility	AHP	No		No		No	
Scheuer et al.	2011	Exploring multicriteria flood vulnerability by integrating economic, social and ecological dimensions of flood risk and coping capacity - from a starting point view towards an end point view of vulnerability	Natural Hazards	Germany	vulnerability , coping capacity, risk	WSM	No		No		No	
Wang et al.	2011	Flood control operations based on the theory of variable fuzzy sets	Water Resources Management	China	reservoir flood control	variable fuzzy sets	No		No		No	
Wang et al.	2011	A GIS-based spatial multi-criteria approach for flood risk assessment in the Dongting Lake Region, Hunan, Central China	Water Resources Management	China	hazard, vulnerability, risk	fuzzy AHP	Yes	Delphi technique, questionnaires	No		No	

Adiat et al.	2012	Integration of geographic information system and 2D imaging to investigate the effects of subsurface conditions on flood occurrence	Modern Applied Science	Malaysia	hazard	AHP	No	No	No			
Ball et al.	2012	A new methodology to assess the benefits of flood warning	Journal of Flood Risk Management	UK	emergency management, alternative ranking	WSM	Yes	workshops, interviews, questionnaires	Yes	one-way sensitivity analysis	No	
Chen and Chen	2012	Spatio-temporal variation of flood vulnerability at the Poyang Lake Ecological Economic Zone, Jiangxi Province, China	Water Science & Technology	China	hazard, coping capacity, vulnerability, risk	AHP	No	No	No			
Chen et al.	2012	Losses assessment for region flood disasters based on entropy weight TOPSIS model	Advances in Information Sciences and Service Sciences	China	risk	TOPSIS	No	No	No			
Elmoustafa	2012	Weighted normalized risk factor for floods risk assessment	Ain Shams Engineering Journal	Egypt	susceptibility	WSM	No	No	No			
Evers et al.	2012	Collaborative modelling for active involvement of stakeholders in urban flood risk management	Natural Hazards and Earth System Sciences	Germany and UK	alternative ranking	fuzzy TOPSIS	Yes	stakeholder analysis, interviews, group meetings, workshops, web-based platform	No	No		
Haque et al.	2012	Participatory integrated assessment of flood protection measures for climate adaptation in Dhaka	Environment and Urbanization	Bangladesh	alternative ranking	WSM	Yes	focus group discussions	Yes	one-way sensitivity analysis	No	
Irvem et al.	2012	Identification of flood risk area in the Orontes river basin, Turkey, using multi-criteria decision analyses	Journal of Food, Agriculture & Environment	Turkey	hazard	AHP	No	No	No			
Kandilioti and Makropoulos	2012	Preliminary flood risk assessment: the case of Athens	Natural Hazards	Greece	susceptibility, vulnerability, risk	AHP	Yes	questionnaires	Yes	best and worst case scenarios	No	
Li et al.	2012	Research on flood risk analysis and evaluation method based on variable fuzzy sets and information diffusion	Safety Science	China	risk	AHP	No	No	No			
Majlingová et al.	2012	An assessment of hucava mountain stream catchment susceptibility to flooding	Journal of Forest Science	Slovakia	susceptibility	WSM	No	No	No			
Markovic	2012	Multi criteria analysis of hydraulic structures for river training works	Water Resources Management	Serbia	alternative ranking	ELECTRE	No	No	No			
Musungu et al.	2012	Using multi-criteria evaluation and GIS for flood risk analysis in informal settlements of Cape Town: the case of Graveyard Pond	South African Journal of Geomatics	South Africa	vulnerability	AHP	Yes	questionnaires	No	No		
Yang et al.	2012	A fuzzy AHP-TFN based evaluation model of flood risk analysis	Journal of Computational Information Systems	China	susceptibility, hazard, risk, vulnerability, coping capacity, alternative ranking	fuzzy AHP-TFN	No	No	No			
Elmoustafa et al.	2013	Flash flood risk assessment using morphological parameters in Sinai peninsula	Open Journal of Modern Hydrology	Egypt	susceptibility	WSM	No	Yes	does not specify	No		
Gaňová et al.	2013	A rainfall distribution and their influence on flood generation in the eastern Slovakia	Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis	Slovakia	hazard	rank sum method	No	No	No			
Ghanbarpour et al.	2013	A comparative evaluation of flood mitigation alternatives using GIS-based river hydraulics modelling and multicriteria decision analysis	Journal of Flood Risk Management	Iran	alternative ranking	TOPSIS	No	Yes	best and worst case scenarios	No		
Giupponi et al.	2013	A dynamic assessment tool for exploring and communicating vulnerability to floods and climate change	Environmental Modelling & Software	India	vulnerability, coping capacity	MAVT	Yes	workshops, questionnaires	Yes	one-way sensitivity analysis	Yes	does not especify

Jun et al.	2013	A fuzzy multi-criteria approach to flood risk vulnerability in South Korea by considering climate change impacts	Expert Systems with Applications	South Korea	hazard, coping capacity, vulnerability, risk	WSM, TOPSIS, fuzzy TOPSIS	Yes	Delphi technique	No		No	
Kang et al.	2013	A sensitivity analysis approach of multi-attribute decision making technique to rank flood mitigation projects	KSCE Journal of Civil Engineering	South Korea	alternative ranking	WSM	No		Yes	one-way sensitivity analysis	No	
Le Cozannet et al.	2013	An AHP-derived method for mapping the physical vulnerability of coastal areas at regional scales	Natural Hazards and Earth System Sciences	France	susceptibility	AHP	Yes	does not mention	Yes	one-way sensitivity analysis	Yes	qualitative uncertainty analysis
Lee et al.	2013	Integrated multi-criteria flood vulnerability approach using fuzzy TOPSIS and Delphi technique	Natural Hazards and Earth System Sciences	South Korea	risk	fuzzy TOPSIS	Yes	Delphi technique	No		No	
Li	2013	Fuzzy approach to analysis of flood risk based on variable fuzzy sets and improved information diffusion methods	Natural Hazards and Earth System Sciences	China	risk	AHP	No		No		Yes	Monte Carlo
Li et al.	2013	Impact assessment of urbanization on flood risk in the Yangtze River Delta	Stochastic Environmental Research and Risk Assessment	China	hazard, vulnerability, risk	AHP	No		No		No	
Marttunen et al.	2013	How to design and realize participation of stakeholders in MCDA processes? A framework for selecting an appropriate approach	EURO Journal on Decision Processes	Finland	alternative ranking	MAVT	Yes	interviews, group meetings, questionnaires	No		No	
Penning-Rowsell et al.	2013	A threatened world city: the benefits of protecting London from the sea	Natural Hazards	UK	alternative ranking	weighted average	Yes	does not mention	Yes	one-way sensitivity analysis ,and best and worst case scenarios	Yes	qualitative uncertainty analysis
Porthin et al.	2013	Multi-criteria decision analysis in adaptation decision-making: a flood case study in Finland	Regional Environmental Change	Finland	alternative ranking	MAVT	Yes	workshops	Yes	one-way sensitivity analysis	No	
Qi et al.	2013	GIS-based spatial Monte Carlo analysis for integrated flood management with two dimensional flood simulation	Water Resources Management	USA	alternative ranking	SCP	Yes	questionnaires	Yes	does not specify	Yes	Monte Carlo
Sahin et al.	2013	Assessment of sea-level rise adaptation options: multiple-criteria decision-making approach involving stakeholders	Structural Survey	Australia	alternative ranking	AHP	Yes	questionnaires	Yes	one-way sensitivity analysis	No	
Salehi et al.	2013	Urban flood hazard zonation using GIS and fuzzy-AHP analysis (Case study: Tehran city)	Journal of Environmental Studies	Iran	susceptibility	fuzzy AHP	No		No		No	
Saxena et al.	2013	Development of habitation vulnerability assessment framework for coastal hazards: Cuddalore coast in Tamil Nadu, India—A case study	Weather and Climate Extremes	India	risk	AHP	Yes	interviews, questionnaires	No		No	
Solín	2013	Spatial variability in the flood vulnerability of urban areas in the headwater basins of Slovakia	Journal of Flood Risk Management	Slovakia	vulnerability	MAUT	No		No		No	
Stefanidis and Stathis	2013	Assessment of flood hazard based on natural and anthropogenic factors using analytic hierarchy process (AHP)	Natural Hazards	Greece	susceptibility	AHP	No		No		No	
Yang et al.	2013	Application of a triangular fuzzy AHP approach for flood risk evaluation and response measures analysis	Natural Hazards	China	hazard, vulnerability, coping capacity, risk, alternative ranking	fuzzy AHP, trapezoidal fuzzy AHP, hybrid fuzzy AHP-TFN	No		No		No	
Zagonari and Rossi	2013	A heterogeneous multi-criteria multi-expert decision-support system for scoring combinations of flood mitigation and recovery options	Environmental Modelling & Software	Italy	alternative ranking	fuzzy TOPSIS	Yes	does not mention	Yes	does not specify	No	

Zou et al.	2013	Comprehensive flood risk assessment based on set pair analysis-variable fuzzy sets model and fuzzy AHP	Stochastic Environmental Research and Risk Assessment	China	hazard, vulnerability, risk	trapezoidal fuzzy AHP	Yes	does not mention	No		No	
Anacona et al.	2014	Moraine-dammed lake failures in Patagonia and assessment of outburst susceptibility in the Baker Basin	Natural Hazards and Earth System Sciences	Chile	susceptibility	AHP	No		No		No	
Chung et al.	2014	Water resource vulnerability characteristics by district's population size in a changing climate using subjective and objective weights	Sustaintability	South Korea	hazard, coping capacity, vulnerability, risk	TOPSIS	Yes	Delphi technique	No		No	
Edjossan-Sossou et al.	2014	A decision-support methodology for assessing the sustainability of natural risk management strategies in urban areas	Natural Hazards and Earth System Sciences	France	alternative ranking	weighted arithmetic mean	No		Yes	one-way sensitivity analysis	No	
Ghasemi et al.	2014	Investigation of flooding and causative factors in Balegli Chay Watershed by GIS, RS, and AHP techniques	Journal of Environmental Studies	Iran	hazard	AHP	No		No		No	
Guo et al.	2014	Integrated risk assessment of flood disaster based on improved set pair analysis and the variable fuzzy set theory in central Liaoning Province, China	Natural Hazards	China	hazard, coping capacity, vulnerability, risk	hybrid AHP entropy weight	No		No		No	
Hashemi et al.	2014	An extended compromise ratio model with an application to reservoir flood control operation under an interval-valued intuitionistic fuzzy environment	Applied Mathematical Modelling	China	reservoir flood control	fuzzy compromise ratio method	Yes	does not mention	Yes	one-way sensitivity analysis	No	
Johnston et al.	2014	Assessing the vulnerability of coastal infrastructure to sea level rise using multi-criteria analysis in Scarborough, Maine (USA)	Ocean & Coastal Management	USA	vulnerability	WSM	No		No		No	
Lawal et al.	2014	Group-based decision support for flood hazard forecasting: a geospatial technology-based group analytic hierarchy process approach	Research Journal of Applied Sciences, Engineering and Technology	Malaysia	hazard	AHP	Yes	does not mention	No		No	
Lee et al.	2014	Robust spatial flood vulnerability assessment for Han River using fuzzy TOPSIS with α -cut level set	Expert Systems with Applications	South Korea	risk	fuzzy TOPSIS, α -level based fuzzy TOPSIS	Yes	Delphi technique	No		No	
Liu et al.	2014	Rapid assessment of flood loss based on neural network ensemble	Transactions of Nonferrous Metals Society of China	China	risk	AHP	No		No		No	
Miyamoto et al.	2014	Development of an integrated decision-making method for effective flood early warning system	Journal of Disaster Research	Bangladesh	alternative ranking	AHP-SWOT, fuzzy AHP	Yes	questionnaires, workshops	No		No	
Ouma and Tateishi	2014	Urban flood vulnerability and risk mapping using integrated multi-parametric AHP and GIS: methodological overview and case study assessment	Water	Kenya	hazard	AHP	Yes	does not mention	No		No	
Radmehr and Araghinejad	2014	Developing strategies for urban flood management of Tehran City using SMCDM and ANN	Journal of Computing in Civil Engineering	Iran	susceptibility	AHP	No		No		No	
Shams et al.	2014	Improving consistency evaluation in fuzzy multi-attribute pairwise comparison-based decision-making methods	Asia-Pacific Journal of Operational Research	Australia	alternative ranking	hybrid fuzzy AHP TOPSIS	Yes	interviews, questionnaires	No		No	
Su and Tung	2014	Multi-criteria decision making under uncertainty for flood mitigation	Stochastic Environmental Research and Risk Assessment	Greece	alternative ranking	PROMETHEE II	Yes	does not mention	Yes	one-way sensitivity analysis	Yes	probabilistic
van Loon-Steensma et al.	2014	Green adaptation by innovative dike concepts along the Dutch Wadden Sea coast	Environmental Science & Policy	Netherlands	alternative ranking	WSM	Yes	does not mention	No		No	

Yeganeh and Sabri	2014	Flood vulnerability assessment in Iskandar Malaysia using multi-criteria evaluation and fuzzy logic	Research Journal of Applied Sciences, Engineering and Technology	Malaysia	susceptibility	WSM	No		Yes	one-way sensitivity analysis	No
Zhao et al.	2014	Dynamic risk assessment model for flood disaster on a projection pursuit cluster and its application	Stochastic Environmental Research and Risk Assessment	China	risk	fuzzy AHP	Yes	does not mention	No		No
Zhou et al.	2014	Study of the comprehensive risk analysis of dam-break flooding based on the numerical simulation of flood routing. Part II: model application and results	Natural Hazards	China	risk	AHP, TOPSIS	No		Yes	one-way sensitivity analysis	No
Ahmadisharaf et al.	2015	Evaluating the effects of inundation duration and velocity on selection of flood management alternatives using multi-criteria decision making	Water Resources Management	USA	alternative ranking	SCP	No		Yes	one-way sensitivity analysis	No
Alipour	2015	Risk-informed decision making framework for operating a multi-purpose hydropower reservoir during flooding and high inflow events, case study: Cheakamus River System	Water Resources Management	Canada	reservoir flood control	AHP	No		Yes	best and worst case scenarios	No
Almoradie et al.	2015	Web-based stakeholder collaboration in flood risk management	Journal of Flood Risk Management	Germany, UK	alternative ranking	TOPSIS	Yes	web-based platform, workshops	No		No
Berry and BenDor	2015	Integrating sea level rise into development suitability analysis	Computers, Environments and Urban Systems	USA	susceptibility	AHP	No		No		No
Chen et al.	2015	Flood hazard assessment in the Kujukuri Plain of Chiba Prefecture, Japan, based on GIS and multicriteria decision analysis	Natural Hazards	Japan	hazard	AHP	No		Yes	global sensitivity analysis (FAST method)	No
Chitsaz et al.	2015	Comparison of different multi criteria decision-making models in prioritizing flood management alternatives	Water Resources Management	Iran	alternative ranking	WSM, CP, VIKOR, TOPSIS, M-TOPSIS, AHP ELECTRE I, ELECTRE III	Yes	does not mention	Yes	one-way sensitivity analysis	No
Dassanayake et al.	2015	Methods for the evaluation of intangible flood losses and their integration in flood risk analysis	Coastal Engineering Journal	Germany	risk	MAUT, AHP	No		No		No
Gao et al.	2015	Research on meteorological thresholds of drought and flood disaster: a case study in the Huai River Basin, China	Stochastic Environmental Research and Risk Assessment	China	hazard	AHP	No		No		No
Godfrey et al.	2015	Assessing vulnerability of buildings to hydro-meteorological hazards using an expert based approach – An application in Nehoiu Valley, Romania	International Journal of Disaster Risk Reduction	Romania	vulnerability	AHP	Yes	does not mention	No		No
Lai et al.	2015	A fuzzy comprehensive evaluation model for flood risk based on the combination weight of game theory	Natural Hazards	China	susceptibility, hazard, vulnerability, risk	AHP	Yes	does not mention	No		No
Lee et al.	2015	Group decision-making approach for flood vulnerability identification with the fuzzy VIKOR method	Natural Hazards and Earth System Sciences	South Korea	risk	group fuzzy VIKOR, fuzzy VIKOR, fuzzy TOPSIS	Yes	Delphi technique, questionnaires, interviews	No		No
Mamun et al.	2015	Application of a goal programming algorithm to incorporate environmental requirements in a multi-objective Columbia River Treaty Reservoir optimization model	Canadian Water Resources Journal	Canada	reservoir flood control	goal programming	No		No		No
Nivolianitou et al.	2015	Flood disaster management with the use of AHP	International Journal of Multicriteria Decision Making	Greece	emergency management	AHP	Yes	interviews	No		No

Oumeraci et al.	2015	XtremRisk — Integrated flood risk analysis for extreme storm surges at open coasts and in estuaries: methodology, key results and lessons learned	Coastal Engineering Journal	Germany	risk	MAUT, AHP	No	No	No		
Ou-Yang et al.	2015	Highway flood disaster risk evaluation and management in China	Natural Hazards	China	susceptibility, hazard, vulnerability, risk	AHP	Yes	does not mention	No	No	
Papaioannou et al.	2015	Multi-criteria analysis framework for potential flood prone areas mapping	Water Resources Management	Greece	susceptibility	fuzzy AHP, AHP	Yes	does not mention	No	No	
Ronco et al.	2015	KULTURisk regional risk assessment methodology for water-related natural hazards - Part 2: Application to the Zurich case study	Hydrology and Earth System Sciences	Switzerland	risk	weighted average	Yes	group meetings	No	No	
Roy and Blaschke	2015	Spatial vulnerability assessment of floods in the coastal regions of Bangladesh	Geomatics, Natural Hazards and Risk	Bangladesh	vulnerability, coping capacity	AHP	Yes	does not mention	No	No	
Seo et al.	2015	Development of priority setting process for the small stream restoration projects using multi criteria decision analysis	Journal of Hydroinformatics	South Korea	risk	PROMETHEE, WSM	Yes	does not mention (says only that "discussions" were made)	No	No	
Sowmya et al.	2015	Urban flood vulnerability zoning of Cochin City, southwest coast of India, using remote sensing and GIS	Natural Hazards	India	vulnerability	WSM	No	No	No		
Taib et al.	2015	Conflicting bifuzzy multi-attribute group decision making model with application to flood control project	Group Decision and Negotiation	Malaysia	alternative ranking	fuzzy TOPSIS, fuzzy AHP	Yes	questionnaires	Yes	one-way sensitivity analysis	No
Walczykiewicz	2015	Multi-criteria analysis for selection of activity options limiting flood risk	Water Resources	Poland	alternative ranking	TOPSIS, sum of the weighted mean	Yes	does not mention	No	No	
Wu et al.	2015	Integrated flood risk assessment and zonation method: a case study in Huaihe River basin, China	Natural Hazards	China	hazard, vulnerability, risk	AHP	Yes	does not mention	No	No	