Introduction

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Biographical notes: Bahram Alidaee received his BS from the University of Tehran, Iran, his MBA from the University of North Texas and his PhD from the University of Texas at Arlington. He is currently a Professor of Operations Management at the School of Business Administration, the University of Mississippi. His main research interests include applied optimisation in variety of real applications including supply chain and logistics management, graph optimisation, complex systems, game theory and cost allocations. He is a member of INFORMS, DSI, POMS, APICS, ISM and IEEE Computer Society.

Mustafa Altinakar is the Associate Director of the National Center for Computational Hydroscience and Engineering (NCCHE) of the University of Mississippi. Previously, he served as the Acting Director of the Hydraulic Research Laboratory of the Federal Institute of Technology, Lausanne, Switzerland (EPFL). His research interests cover free surface hydrodynamics, fluvial processes, water infrastructures and GIS-based decision support systems. He has co-authored two textbooks and published more than 70 journals and conference papers. He holds a BS and MS in Civil Engineering from the Middle East Technical University, Turkey, and an MS and PhD in Hydraulics from the EPFL.

This special edition of *IJSSci* on 'Emergency and disaster operations management' was organised by Bahram Alidaee and Mustafa Altinakar, both at the University of Mississippi. Disasters are generally large-scale intractable problems. They have short and long-run technologic, economic, social, humanitarian and environmental effects that need to be addressed. Emergency responses are an important part of disaster management and response. To tackle such complex intractable problems variety of techniques needed to be integrated and employed. In this special issue, the authors used different models including social network analysis, simulation, mathematical programming, expert systems, project management, manufacturing techniques, business and supply chain models to analyse such complex problems. This special issue of *IJSSci* solicited original research papers both theoretical and practical and in both strategic and tactical aspects of disasters and emergency operations management. We were very impressed with the quality of paper

submitted to this special issue. In final, seven papers passed the review processes. Hopefully, the models presented in this special issue will open avenues both for further research as well as practical applications. A short introduction of each paper follows.

In the 'first' article, 'The incident commander's problem: resource allocation in the context of emergency resource', Simpson and Hancock argue that a large-scale emergency response generally relies on a single decision-maker, the Incident Commander, to spontaneously allocate resources that change continuously in both availability and status to control and resolve an equally dynamic incident. The authors present an exploratory study examining the general form of the Incident Commander's problem. Table-top simulation applied in a novel application of social network analysis is presented and shown great promise in the further study of emergency response.

In the 'second' paper, 'Analysing covert social network foundation behind terrorism disaster', Maeno and Ohsawa use a covert social network foundation hidden behind the terrorism disaster. Their model aims at integrating the expert investigator's prior understanding, insight on the terrorists' social network nature derived from the complex graph theory and computational data processing. The social network responsible for the 9/11 attack in 2001 is used to execute simulation experiment to evaluate the performance of the method.

In the 'third' article, 'Strategic planning for disaster relief logistics: lessons from supply chain management', Altay et al. examine the various stages of disaster management in terms of the logistics function. They build an integrated logistics model based on elements of supply chain management theory. This model provides specific recommendations to practitioners and identifies important areas to be researched.

In the 'fourth' article, 'A decision support tool for emergency planning', Wang et al. propose a framework on developing a decision support tool for emergency management planning. Their framework involves development of innovative dynamic risk and uncertainty analysis methods known as quality function deployment. Rule-based expert system is used to handle the interdependency among the criteria. The expert system with composite rules is encoded into a Boolean satisfiability problem then solved by a quadratic unconstrained binary optimisation method. An approach based on the use of the visualisation tools by integrating with GIS and other information support systems is discussed.

In the 'fifth' article, 'A product-based emergency knowledge management model', Wang and Rong analyse the complex and changing emergency situations. After analysing the characteristics of emergency knowledge management, the authors characterise knowledge management in emergency responses as 'quotation', 'manufacture', 'management' and 'supply of a special product' – emergency knowledge product (EKP). The paper presents a new product-based knowledge model that includes the agile knowledge supply chain, the emergency knowledge flow management and EKP production. The model aims at achieving agility and effective responses in emergency knowledge acquisition.

In the 'sixth' article, 'Disaster risk management for critical infrastructure: a services-based viewpoint', Zobel et al. emphasises on how to protect critical infrastructure and key resources from the effects of a disaster in order to maintain continuity of both public services and private enterprise. The authors argue that many of the critical resources are themselves privately owned and operated and thus, they are often subject to the same market pressures that force businesses to concentrate on improving the efficiency of their operations at the possible expense of guarding against

potential disruptions to those operations. Under these circumstances, the process of designing an effective (and acceptable) disaster mitigation plan for critical infrastructure resources requires a shared understanding of both the business aspects and the technical aspects of different mitigation alternatives. The article examines the decision-making process behind such disaster mitigation planning from a services standpoint and discusses how taking such a viewpoint can provide a more effective approach to sustainable disaster risk reduction.

Finally, in the 'last' article, 'Allocation of emergency and recovery centres in Hidalgo, Mexico', Ablanedo-Rosas et al. use a covering problem in a real situation in Hidalgo, Mexico. The authors present a model to allocate emergency/recovery centres throughout the state in such a way that all municipalities are within 55 kilometres of the closest centre. In the analysis of the problem different features are added including population, state economy participation, physicians' availability and kilometres of roads.