Editorial

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Biographical notes: Haris Doukas is a Mechanical Engineer with a PhD on Decision Support Systems (DSS) for the promotion of Renewable Energy Sources (RES) and Energy Efficiency (ENEF) in the Energy Sector. He is currently working as a Senior Expert of the DSS Laboratory, School of Electrical and Computer Engineering of NTUA and has been involved in a number of research and consultancy projects in the fields of modelling, development and administration of DSS for energy policy and planning, promotion of technologies and management. His areas of expertise includes multicriteria models and decision support systems for energy policy, sustainable energy planning in local and regional revel, climate change economics and Kyoto GHG emissions reduction flexible mechanisms. His publications record includes more than 45 scientific publications in international journals, 20 announcements in international conferences and many articles published in magazines, journals and books.

The aim of this special issue is to provide a constructive forum among researchers for fostering discussion, developing and exchanging new ideas on multicriteria analysis and decision aid in the fields of environmental analysis and sustainability assessment.

In this special issue, five-articles were selected, which present the use MCDM models and frameworks in environmental analysis as well as the latest practices and innovations on sustainability assessment, supporting international and national authorities, as well as regional and local bodies and organisations, integrating environmental, social and economical issues in a long-term perspective.

The issue opens with the article of Nathan and Reddy, which proposes a framework for the selection of the optimum number of indicators, which is the key to any sustainable development indicator (SDI) research. A too small set of indicators may be inadequate to convey the message, while too many may dilute the purpose. This paper proposes a methodological framework, named what-how-whom (WHW), using analytical hierarchy process (AHP), to organise criteria, over which SDIs can be constructed for assessing sustainability in different domains or sectors like energy, water, infrastructure or transportation.

In the next article, Yeralan, Ozdoglar, and Azizoglu illustrate the use of mathematical programming techniques to extract more information out of composite indicators, which would assist decision-makers. This study uses the well-known environmental performance index (EPI) ranking, which, as with other composite indexes, identifies a set of criteria and assigns a score to each country for each criterion. The models presented eliminate the loss of information moving from a vector of scores to a scalar aggregate

score. Moreover, the models investigate the way the weights are assigned to the final scores and their impact to the rankings, identifying also which criteria must be emphasised.

The third paper by Turan, presents a project evaluation and impact assessment process for organisational sustainability that enables decision-makers to create a balance among their organisation's economic, environmental and social objectives (the triple bottom line). The process is presented in the context of knowledge cities with a case study where Cranberry Township is the application organisation and the analytic network process (ANP) methodology is used to quantify the perspectives, views and expectations of stakeholder groups. The case study includes the evaluation and prioritisation of a set of investment projects by the stakeholders in the township, with respect to predetermined sustainability criteria.

In the next paper, Rozakis presents positive multi-criteria models in agriculture for environmental policy analysis in terms of response curves generated through parametric optimisation from non-interactive multi-criteria as well as from interval linear programming models. Specific cases in agriculture are described, where these functions are compared with their counterparts generated by respective linear programming models. These models can more accurately predict farmers' response to market and policy parameters compared with classic profit maximising behaviour. Differences and consequences are analysed, pointing out the contribution of MCDM logic to cope with major contemporary issues.

The last paper by Halog aims to develop an integrated and structured methodological framework for analysing bio-energy systems in the pursuit of sustainable large scale production. The proposed framework uses first the AHP to aid in extracting knowledge and judgements from stakeholders. AHP determines the critical criteria and indicators representing conflicting stakeholders' interests, which can be incorporated in creating a dynamic system model for landscape-scale bio-energy modelling and assessment. Such a system is currently being applied to assess the sustainability of forest bio-energy sector in Maine, USA.

I wish to express my sincere thanks to Professors John Psarras and Constantin Zopounidis, editors-in-chief of *IJMCDM*, for having given me the opportunity of editing this special issue as well as to Dr. Panos Xidonas (*IJMCDM* associate editor) for his support and valuable comments. Sincere thanks must be expressed to all the authors whose contributions have been essential in creating this special issue. I also thank those who worked long and hard to review all the submitted papers and contributed to the achievement of this special issue's high standard.

As guest editor of this special issue, I do hope that this special issue will underline the need to develop appropriate MCDM decision support models and methods to sufficiently address the issues of sustainability at different levels and domains and to keep track of the progress towards environmental protection.