
Foreword

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Biographical notes: John Psarras is a Professor in the School of Electrical and Computer Engineering of National Technical University of Athens (NTUA) and the Director of the Decision Support Systems (DSS) Laboratory. He has been the Project Manager or Senior Researcher in numerous EC and national projects acquiring over 20-years experience in the areas of energy policy, national and regional energy planning, energy and environmental modelling, promotion of energy and environmental friendly technologies, energy management, decision support and monitoring systems. He has more than 100 publications in international journals in the above mentioned related fields.

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We are delighted to prologue this special issue on ‘Multicriteria decision-making for environmental analysis and sustainability’ of the *International Journal of Multicriteria Decision Making (IJMCDM)*. This special issue aims at publishing high quality original research on multicriteria decision-making (MCDM) models and methods for environmental analysis and sustainability assessment.

Environmental protection has become a major issue in the last three-decades and is very much connected with the increase of the standard of living, especially in the developed world. As the world economy expands in order to meet the aspirations of the

developing countries, the pressure to the environment increases and the efforts towards sustainability are becoming of paramount importance.

Sustainability, as an issue, is not new. It was included at the time of the United Nations Stockholm Environment Conference (1972), in the Limits to Growth Report, published by the Club of Rome (1972) and in the OECD Interfutures Foresight, by Jacques Lesourne (1978). The term sustainability was advanced in 1980 by the International Union for Conservation of Nature and Natural Resources (IUCN), while in 1987 the Brundtland Report, the Report of the United Nations Commission on Environment and Development, established the concept of sustainable development (SD). Examining the major environmental problems facing the world, this report established the framework under which the environmental, the economical and the social dimension could be integrated.

SD rapidly became the key principle underpinning official environmental policy at both national and international levels. The incorporation of sustainability into society's sub-systems is also an important developmental objective, such as in organisations, both in private and public sectors.

Related initiatives have been undertaken by international and national authorities and also by regional and local bodies in industrialised countries as well as in developing ones, encompassing both public and private sectors.

Research efforts have been made to assess sustainability at different levels and domains and to keep track of the progress towards achieving SD. For example, assessments of technological advances to address SD, through integrated systems-level methodologies were elaborated towards the mitigation of climate change.

However, SD is not a single concept. It is explicitly analysed in research papers that sustainability is an inherently vague concept with parameters that are in many cases difficult to be defined and/or measured. Moreover, the information needed for the evaluation of examined options in terms of their contribution to SD is often unquantifiable, imprecise and uncertain. SD requires community-based thinking, integrating environmental, social and economical issues in a long-term perspective, while assuring flexibility to differences about the way that is to be accomplished and, in some cases, even the ultimate purposes involved.

Integrative and multidisciplinary computational tools and methods are required in this respect, to include sustainability goals into corporate and government policy decision-making processes.

MCDM can support decision and policy makers faced with making numerous and conflicting evaluations, such as the case of performing sustainability assessments, whereby it is needed to take into account conflicting interests of multi-stakeholders. MCDA can provide a more structured and more informed representation of variables and criteria, relevant to sustainability evaluation, allowing the trade-offs among stakeholders' interests more explicit.

Moreover, MCDM can facilitate systemic analysis and modelling by identifying the critical variables, relations and objectives, dealing with multiple criteria that are measured on different scales (ordinal, cardinal, interval, ratio, etc.) for sustainability assessments.

We are confident that the efforts of all involved in this special issue will outline the MCDM effective contribution for environmental analysis and assessment of sustainability of examined options at different levels and domains.