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## Editorial

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**Biographical notes:** Ravi Jain, PhD, PE, Associate Editor, is the Dean of the School of Engineering and Computer Science at the University of the Pacific in Stockton, California. Prior to this appointment, he has held research, faculty, and administrative positions at the University of Illinois (Urbana-Champaign), Massachusetts Institute of Technology (MIT), and the University of Cincinnati. He has directed major research programmes for the US Department of Defense and has worked in industry and for the California State Department of Water Resources. He has been a Littauer Fellow at Harvard University and a Fellow of Churchill College, Cambridge University. He has published 14 books, over 150 scholarly papers and technical reports, and has received national recognition for his teaching and scholarly activities.

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From economic, environmental, and sustainability perspectives, management of solid waste has become an important consideration for society. Costs of disposal of solid wastes are increasing rapidly, land available for disposing solid waste is becoming scarce, and there are considerable long-term environmental, economic, and legal liability issues involved with improper waste disposal.

Generally speaking, land disposal of solid waste has been the least costly and most prevalent method used. From environmental and sustainability perspectives, land disposal is at the bottom of the desirable alternative hierarchy as listed:

- prevention
- minimisation
- reuse
- recycling
- energy recovery
- disposal.

More recently, issues related to extended producer responsibility, product stewardship, and polluter pays are becoming part of the public policy paradigm. Industry and municipalities are increasingly focusing on solid waste disposal practices that are not

only economical in the short-term, but are also sustainable from environmental and economic perspectives.

In focusing on sustainable solid waste management, the sustainability concept as described in *Common Future* (World Commission on Environment and Development, 1987) states:

“Sustainable development is a process of change in which the exploitation of resources, the direction of investments, the orientation of technical development, and institutional change are made consistent with future, as well as present, needs ...”

It further states that it should meet the needs of the present without compromising the ability of future generations to meet their needs ... Thus, sustainable development focuses on *obligation to future generations, industrial practices, exploitation of resources* and the role of *science and technology*, among others.

Considerable new ideas and knowledge related to solid waste management and related sustainability principles are being developed. There is considerable lag time between the generation of these ideas, their publication, and adoption. Conducting a focused workshop that brings together nationally and internationally recognised experts in the field can help communicate these ideas to various participants and generate new knowledge useful for addressing effective solid waste management and sustainability issues.

Approximately 48 participants gathered on 28–30 May 2008, in San Francisco, California, to discuss the state of knowledge and future directions related to solid waste management practices that focus on sustainability. As a result of this conference, papers for this special issue were selected, refereed, and finalised for publication.

Generally, the papers focus on optimisation models, sustainable approaches, alternate methods to control water filtration for landfills, and resource recovery through waste-to-energy concepts.

The paper on *An optimisation model for transportation of hazardous wastes* suggests that the movement of hazardous waste across US/Mexico border is likely to increase in years to come. The broad goal of this study is to develop a decision-support system to determine best routes for transporting hazardous wastes across the border and to evaluate critical factors that influence the shipment of such wastes. Conservation practices and innovative processes to minimise and possibly eliminate hazardous waste generation, as the authors propose, are necessary for long-term sustainability of such operations.

In the paper, *Sustainable approaches to C&D waste management and global warming impacts*, discussed are environmental impacts and specific achievable diversion goals for such wastes. Authors suggest that higher diversion rates of C&D wastes from the landfill sites are not only good from environmental and economic standpoints, but also are realistically achievable and sustainable. The US Environmental Protection Agency suggests a recovery and diversion goal of C&D waste to be 20–30%; military facilities and other selected organisations in the USA have approaches and policies in place to achieve a diversion rate of as high as 90%: a commendable accomplishment. The paper suggests that the cost of moving C&D waste to landfills, tipping fees, and long-term environmental impacts can be significant. Increasing the diversion rate of C&D waste away from the landfills to reuse and recovery can be achieved economically and effectively.

The paper, *Alternative methods to control water infiltration for landfills: a case study in the tropics*, describes a case study to reduce water filtration into the closed landfills. Water filtration naturally creates leachate and can pollute surface and groundwater resources. A comprehensive case study shows how different drainage mechanisms can be used to minimise infiltration into the landfill and, thus, reduce leachate.

The paper on *An overview of the sustainability of solid waste management at military installations* provides a description of available waste strategies that can be used to support sustainable waste management. Results presented demonstrate how source reduction and recycling can be the most effective sustainable solution. The paper further describes how new waste-to-energy plants and composting technologies can be deployed to improve on these well-proven techniques and allow military installations to achieve sustainable waste management goals.

In the paper, *Salvage as a recession hedge: green jobs and other economic stimuli*, presented are ideas on salvaging material from deconstruction, training the workforce for such activities, and simultaneously providing considerable economic advantages in the process. The case studies illustrate economic, environmental, and broader social benefits from such activities.

The paper on *Evaluation of resource recovery through a Waste-to-Energy plant operating with municipal solid waste* provides considerable specific information about the plant capacity (975 tons of waste/day) and the amount of electricity generated. As an example, the Arlington Solid Waste Authority plant produces enough electricity to run the plant itself and provide power for over 20,000 homes: an impressive accomplishment. Other benefits include: eliminating shipment of the waste to distant locations, transportation cost, tipping fees, and eliminating long-term environmental liability. Specific data on elimination of emission of 1,785 tons of CO<sub>2</sub> as a result is presented.

With the increase in awareness of long-term implications of improper solid waste management, considerable focus is being placed on sustainability related issues. In an earlier special journal issue (Jain, 2008), papers focused on sustainable deconstruction and recycle strategies. This special issue builds on the previous work and further describes solid waste management approaches to achieve long-term economic, environmental, and sustainability objectives.

This special issue was made possible by many authors who contributed scholarly papers. We are grateful to the many referees who critically reviewed these papers and provided useful comments to the authors. These papers are derived from a workshop/conference that was held in May 2008, in San Francisco, California, USA. Support provided by the conference sponsors, University of the Pacific School of Engineering and Computer Science, and Janet Marr, Inderscience Publishers, is gratefully acknowledged.

## References

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