Editorial

I. From the Editor

A. Editor’s Note
This issue is one of the twin Special Issues delegated to celebrate the 50th Anniversary of The Association of Professional Engineers of Trinidad and Tobago with the theme on ‘Engineering Infrastructures for Sustainable Development’.

Infrastructure is the stock of basic facilities and capital equipment needed for the functioning of a country or area. At the firms level, organisations may differ in their core business processes, functions, and infrastructure systems but commonly have significant business risks attached to the fabrication, management or use of highly engineered products or environments. For sustainable development, a nation as a whole and organisations of various sectors should stress decision making and management of various infrastructure systems from both technical and managerial points of view.

B. Call for Papers
The next issue with another theme on ‘Engineering Asset Management: Trend and Challenges’ (Volume 39 Number 1) will be targeted to publish in April 2010. Engineering asset management (EAM) continues to grow in importance in both public and private sector organisations. It is intended that contributions will provide a better understanding of trends and best EAM practices that meet the diverse needs and challenges in the Caribbean Region and a wider global context. Research and technical papers are invited and an extended submission deadline will be 30th November 2009. The ‘Call for Papers’ appears in this issue.

C. Special Issue Proposals Are Always Welcome
Proposals for special issues on topics of current interests in engineering, engineering management and related disciplines are always welcome. Please send a brief description of the concept for the issue to the Editor (KitFai.Pun@sta.uwi.edu). If the initial response is favourable, the Editor-in-chief will request a specific plan and more detailed information to be used in the final decision about proceeding with the special issue.

II. About This Issue
Volume 38 Number 1 of the Journal addresses on the current status and future trends in infrastructure planning, development and management in the engineering context. It aims to bring together the work of researchers, engineers, scientists, and practitioners, and exchange views on sustainable developments in engineering infrastructure and related areas in the Caribbean region. This issue includes ten research and technical articles. The relevance and usefulness of each paper are summarised below.

R. Al-Tahir, T. Richardson and R. Mahabir, “Advancing the Use of Earth Observation Systems for the Assessment of Sustainable Development”, argue that the gap in data and information can be managed through the adoption of earth observation technology. The paper reports on a developed methodology that involves several critical steps in using multi-spectral imagery including cloud and cloud shadow removal, image classification and image fusion. The results demonstrated the accuracy, flexibility and cost-effectiveness of these technologies for mapping the land cover and producing other environmental measures and indicators that support information for sustainable development in the Caribbean region.

D.P. Sharma, “On the Development of Sustainable VLSI Infrastructure for the Caribbean Countries”, discusses the development of sustainable infrastructure for one of the exponentially growing areas of electronics industry, that is, Very Large Scale Integration (VLSI) design for the Caribbean region. Both technical and general issues related to design of the VLSI Research Unit for Caribbean are explored to tap the Consumer Electronics market, with the help of all campuses of the University of the West Indies, industry and governments.

A.M. Sharaf and A.A.A. El-Gammal, “A Dynamic MOPSO Self-Regulating Modulated Power Filter Compensator Scheme for Electric Distribution Networks”, present a novel Modulated Power Filter and Compensator (MPFC) scheme based on Multi-Objective Particle Swarm Optimisation (MOPSO). The technique is used to find the optimal control settings that control the input control signal to the activation/triggering block of the Sinusoidal Pulse Width Modulation. The MPFC device with the dynamic error driven controller is claimed as a viable solution for voltage stabilisation, power factor correction, power quality, efficient-utilisation, and loss reduction for distribution and utilisation of electric grid systems.
C. Gray-Bernard and A.J. Chadwick, “Development of a Shoreline Management Tool for Trinidad”, develop a Shoreline Management Tool for Trinidad (SMTTT) that uses Geographic Information Systems (GIS), Database and Information Systems (DIS), mapping and other techniques to store and visualise spatial and attribute information on the coastal environment of Trinidad. The SMTTT information pertaining to the coastal environment could be made available to decision makers and other stakeholders and be used as a guide for decision making in policies of shoreline protection.

K. Singh, S.O. Kelly and M.K.S. Sastry, “Municipal Solid Waste to Energy: Potential for Application in Trinidad and Tobago”, compare various technologies for converting Municipal Solid Waste (MSW) to energy, and propose a new Waste-to-Energy (WTE) process based on plasma gasification technology. A cost-benefit analysis of the plants operations is briefly presented. The paper concludes by discussing potentials of the proposed WTE process as a feasible and environmentally favorable solution to the MSW problem in Trinidad and Tobago.

A. Mwasha, “Natural and Recycled Guanapo Quarzite Aggregates for Ready Mix Concrete”, analyses the physico-mechanical properties and micro-structural properties of recycled quartzite aggregates mixed with ordinary Portland cement. The result of this investigation can be used to explain the physical and mechanical behaviour of hardened concrete manufactured using recycled Guanapo Quartzite aggregates. This paper investigates into the sustainable use of recycled/secondary aggregates as a suitable substitute for natural aggregates in construction and other uses.

V. Seecharan, Y. Ramnath and R.R. Jagai, “Laboratory Scale Production of Biodiesel from Used Vegetable Oil”, seek to ascertain whether a generic trans-esterification reaction procedure can be used for different sample types of refined soybean oil in laboratory setting. It was found that the recycled oil had a lower yield than the refined oil when compared to the theoretical yield. In an attempt to identify an alternative energy source that supplements the conventional fuel, this is a pioneer investigation into the laboratory scale of biodiesel production in Trinidad and Tobago.

M.J. Joab and M. Andrews, “Investigating Slope Failures Using Electrical Resistivity: Case Studies”, outline a methodology used to estimate the location of failure surfaces in landslides in clay slopes in Trinidad. As illustrated in case studies, the use of electrical resistivity provides a quick and cost-effective means of extending the investigation and improving the confidence in the results of the slope stability back analyses. The paper signifies the importance of routine use of electrical resistivity that is unique to the field of geotechnical engineering in Trinidad and Tobago.

K.D. Thomas, J.A. Howard, E. Omisca and M.A. Trotz, “Exploring the Link between Ecotourism Activities and Surface Water Quality: Using Water Quality as a Sustainability Indicator”, present a framework on integrating water quality as an indicator of sustainable management of ecotourism facilities. Research at two field sites, Greencastle in Jamaica and Iwokrama in Guyana, is used to demonstrate the real use of the framework. The paper contends that once proper monitoring of the indicator takes place, longitudinally changes in land use, population and visitation can be used to correlate with the water quality results.

R.J. Murray and H.I. Furlonge, “Market and Economic Assessment of using Methanol for Power Generation in the Caribbean Region”, investigate into the use of methanol as an alternative fuel for power generation. Modifications to existing infrastructure would address the particular fuel properties of methanol in terms of its relatively low heating value, low lubricity and high inflammability. In order to assess the overall economic viability of this alternative fuel, an integrated economic model of the entire methanol to power (MtP) chain is also developed in the paper.

III. Acknowledgements

On behalf of the Association, we gratefully acknowledge all authors who have made this special issue possible with their research work. We greatly appreciate the voluntary contributions and unfailing support that our reviewers give to the Journal. Our reviewer panel is composed of academia, scientists, and practising engineers and professionals from industry and other organisations as listed below:

- Abrahams Mwasha, The University of the West Indies, Trinidad and Tobago
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- Andrew J. Chadwick, The University of the West Indies
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