Editorial

This Volume 39 Number 1 includes ten (10) research articles. The relevance and usefulness of respective articles are summarised below.

Obada, D.O. et al., "Flame Temperature Characteristics and Flue Gas Analysis of an Improvised Biogas Burner", present the results of an experimental investigation of a prototype and an improved burner to report the quality of biogas which was produced from a mixture of cattle dung and poultry droppings operated as feedstock in the ratio of 1 part of dung and droppings to 2 parts of water at a retention time of 30 days. A liquefied natural gas burner was used to do a comparative analysis with the aid of a thermocouple. The ambient temperature of the flame produced was taken at three positions viz; the cone flame, the burning flame, and the flue gas. The results showed that the improvised burner had the lowest temperature at the three positions of measurement and provides room for subsequent improvement for household use in farmsteads and rural applications.

Oladele, I.O. and Khoathane, M.C., "Influence of Chemically Modified Sisal Fibre on the Mechanical Properties of Reinforced Homopolymer Polypropylene Composites", investigate the influence of chemical modification on the mechanical properties of soil-retted, sisal-fibre-reinforced homopolymer polypropylene (PP) composites. Sisal fibre was extracted by the soil-retting process, after which parts were treated with selected chemicals—KOH, HCl, NaCl and Ethanol—with varying mole fractions, producing 16 chemically modified sisal-fibre samples. Reinforced homopolymer PP composites were formed by using a compression molding machine to develop samples for mechanical tests—tensile, impact and hardness. This treatment gave the best sisal-homopolymer PP composite in terms of hardness, tensile strength and impact strength. The chemical treatments were found to be effective in enhancing the properties of sisal-homopolymer PP composites.

Thin wall ductile iron (TWDI) castings are a viable substitute for lightweight applications for energy saving in automotive industries. In their article, "Mechanical Properties of Thin Wall Ductile Iron Cast in Moulding Sand/ Aluminum Dross Mix", **E.F. Ochulor at al.** investigate into the effect of incorporating 2-12 wt. % aluminum dross (AlDr) on the thermal properties of moulding sand and on the microstructure and mechanical properties of as-cast TWDI parts. Moulding sand thermal characteristics is vital to defining the solidification mechanism of a cast part, which in turn influences evolving microstructure and mechanical properties. The results showed that aluminum dross used as a moulding sand additive reduced the hardness and ultimate tensile strength values but significantly improved percent elongation.

C.A. Fapohunda, et al., "Suitability of Crushed Cow Bone as Partial Replacement of Fine Aggregates for Concrete Production", present an assessment of the strength properties of concrete containing crushed cow bone (CCB) as partial or full replacement of fine aggregates. The slump test and the compacting factor test were used to assess the workability of the concrete sample specimens. The density and compressive strength were determined using 150 mm cube specimens. The results showed that: (i) increase in the percent replacement of sand with CCB resulted in less workable concrete, (ii) replacing sand with CCB resulted in different types of concrete, and (iii) a compacting factor test will be appropriate to assess the workability of concrete containing CCB because of the resulting dry mix and (iv) up to 20% of sand replacement with CCB will result in compressive strength that is not significantly different from the control.

H. Martin et al., "Risk Perception in a Multi-Hazard Environment: A Case Study of Maraval, Trinidad", investigate the relation of risk perceptions to the socio-economic impacts of hazards and explore how this would determine the pivotal decision elements in planning mitigation strategies. A survey of 119 persons in Maraval, Trinidad was undertaken. Analysis of variance (ANOVA) and regression analysis showed that risk perception of flooding is influenced significantly by previous experience. Hence, to minimise the development of inappropriate cultural norms, communities must be reminded of the dangers associated with occupying hazard-prone locations. High risk perception towards landslides, storms and earthquakes is significantly affected by low levels of income and education. This suggests that disseminating scientific information through educational programs should change people's beliefs about a hazard, and lead to the adoption of appropriate mitigation strategies.

In their article, "A Study of Stakeholder Perception Regarding Quality of Education in Civil and Environmental Engineering at The University of the West Indies", **L.A. Ellis and E.J. Ochieng**, attempt to evaluate the quality of the undergraduate programmes offered. The study utilised questionnaires which were administered to undergraduate and recently graduated students as well as employers. The results showed that the majority of undergraduates and graduates shared concerns on the lack of practical content in the course material and the high work load due to the condensed length of the programmes. Employers agreed that although graduates had a positive work ethic, they were found to be lacking critical workplace skills. The findings indicate that efforts must be made to strengthen the link between theory and practice in the curriculum, and serious consideration given to the extension of the current 3-year programme to 4-year programme.

I.O. Oladele, and I.S. Afolabib, "Development of Brown Paper Pulp Filled Natural Rubber Composites for

Structural Applications", describe the influence of natural rubber on the flexural and water absorption properties of paper-pulp-filled natural rubber composites for structural applications. The developed composites were detached from the mould and allowed to cure in air at room temperature for 27 days. Flexural and water absorption tests were done on the samples. The composite developed from the mixture of 70 wt % brown paper pulp and 30 wt % natural rubber gave the best result for flexural properties, while the sample with 60-40 wt % emerged the best composition for the water absorption property.

S.O. Adeosun et al., "Mechanical and Microstructural Characteristics of Rice Husk Reinforced Polylactide Nano Composite", explore the application of polylactides in tissue engineering in their paper. The morphological, mechanical and water permeability properties of electrospun treated and untreated rice- husk reinforced polylactide- nano- composite fibres are presented. The treated rice- husk particulates were ground, subjected to steam explosion and chemical treatment to remove its lignin and hemi-cellulose contents so as to increase the crystallinity of the filler. Young's modulus, fracture stress, water permeability and other properties are also enhanced. This work shows that; the mechanical properties and biodegradability of scaffolds for tissue engineering can be improved by reinforcing polylactide with rice-husk instead of petroleum- based polymeric- nano- fiber composites.

D.O. Obada et al., "Physical and Mechanical Properties of Porous Kaolin Based Ceramics at Different Sintering Temperatures", investigate the properties of the sintered samples of the kaolin based ceramics as pore formers. It was observed that the apparent porosity and water absorption of the samples decreased with increased sintering temperature, while the bulk density, apparent density and cold crushing strength of the samples increased with increased sintering temperature. It was concluded that the samples which were sintered at 850°C with 5% wt pore former of powdery high density polyethylene gave the optimum properties in terms of the porosity and mechanical strength of the samples.

In their article, "A Biosensor for Automated Feature Extraction and Non-invasive Cardiovascular Diagnosis Using Photoplethysmography Waveforms", **N. Gayapersad and S. Rocke,** derive indices from the morphological features of photoplethysmography waveforms and link the results to enhance patient risk assessments on cardiovascular diseases. A system that performs real-time, automatic feature extraction for cardiovascular diagnosis is presented. Results demonstrate the feasibility and utility of the system as an enabler of personalised healthcare systems, for cardiovascular care. This paper also offers valuable insights into the challenges in deploying automated, non-invasive, continuous monitoring systems for extraction of cardiovascular features beyond heart rate and blood pressure.

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July 2016