Editorial

In this Volume 44 Number 2, the Journal includes ten (10) research/ technical articles. The relevance and usefulness of respective articles are summarised below.

A. Lutchman, et al., "Applied Mathematical Model for Solar Energy Collection and Thermal Storage", advocated a dynamic non-linear model of Solar thermal storage systems (STSS). Ambient temperature and insolation data for Trinidad in 2017 were used as inputs. The dynamic model revealed an optimal tank aspect ratio of 2:4 m (D: H) and that three AE-40 solar collectors were sufficient. The effect of the circulation rate between the storage tank and solar collectors on energy storage was found to be negligible. The need for temperature control was demonstrated and a control strategy developed. A pilot plant was built using recommended specifications, albeit without temperature control. As predicted, drying was more than sufficient, but poor control led to burnt cocoa beans. The application of this work extended beyond the cocoa bean test case, and the open-source models built could be applied to optimise the design of any solar heating application.

In their article, "Characterisation of Acid Soluble Collagen from Catfish (Clarias gariepinus) Skin, Its Amino Acid Composition and Its Thermal Stability", **A.L. Adejumo et al.,** investigated the characterisation of acid-soluble collagen (ASC) from the skin of freshwater catfish. Results showed that a mono-fibrillated irregularly arranged crystalline surface material having 24.46 % carbon, 11.72 % oxygen and 9.40 % nitrogen. The abundance of amino acids follows glycine > arginine > proline > alanine indicating the integrity of collagen and a non-disruptive method of extraction. The denaturation temperature (T_d) of ASC was about 30°C implying its usefulness in food and pharmaceutical industries.

K. Dolcy and **T. Townsend,** "Challenges to Alternative Fuel Vehicle (AFV) Usage in Trinidad", reviewed the history and implementation of the various AFV-oriented policies and examined the effectiveness of these initiatives. The percentage of AVFs per public transit mode ranges from about 2 to 20 percent, where the higher percent goes to the compressed natural gas (CNG) buses in Trinidad. The authors identified the four key issues affecting the adoption of AFVs namely: (1) Fuel Prices (ii) Availability of Alternative Fuels (iii) Consumer Perception and Resistance and (iv) Lack of Institutional Support. In addition, six key actions were proposed to achieve the targets set in terms of CO_2 emissions from public transportation.

R.L.A. Ellis and **N. Mohammed,** "Productivity Modelling: A Health Systems Focus in Small Island Developing States (SIDS)", explored the various dimensions of measuring productivity in health systems. The overall productivity of elements of the health system, or the entire health system itself, can be measured, monitored and disaggregated for identifying areas for productivity improvement through management intervention. Evidence showed that the development of partial productivity measures would be best for decision making and improvement of performance of the health systems. The authors proposed the use of a composite measure, which is based on the partial productivity measures as a more robust measure of productivity in the health systems in SIDS.

In the fifth article, "A Meshfree Approach for Simulating Fluid Flow in Fractured Porous Media", **A.R. Lamb** and **D. Villarroel-Lamb** presented a meshfree approach for simulating fluid flow in fractured porous media using a novel fracture (FM) mapping approach. The approach simulates fluid flow through both the matrix and the fractures. The presented approach determines the fluid flow using approximating functions constructed employing the radial point interpolation method (RPIM) meshfree formulation which uses radial basis functions (RBFs) augmented with polynomials. A nodal integration procedure has been implemented thereby removing the need for background integration cells that are usually required for meshfree schemes that rely on Gaussian integration. Numerical test results illustrate the methods ability to adequately describe the fluid pressure fields within a fractured porous domain.

R.J. Murray et al., "Investigation into the Use of a Fourier Based Edge Detection Image Processing Approach for Assessing Cocoa Pod Stem Cut Quality", advocated a Fourier Peak Index (FPI) method and a windowed FPI (WFPI) for assessing cut quality. Both methods are tested using a set of 40 images, comprising of 10 reference images, 15 poor cut images and 15 good cut images. The results showed that the FPI method had a 93% accuracy in categorising good cuts, 60% accuracy in categorising poor cuts and an overall accuracy of approximately 77%. The WFPI method was found to be effective in categorising the images that were incorrectly categorised by the FPI method. The combined efforts of both methods had the potential to increase detection and categorisation accuracy to a maximum of 97%.

D. Villarroel-Lamb and **A.H. Williams,** "Quantifying Wave Runup in Data-Sparse Locations for Planning", investigated the importance of wave runup to coastal management in Trinidad and Tobago. A video camera system was established at Mayaro Beach and collected video data for a short duration. The waterline variations were rectified and then digitised by sampling pixel intensities along a cross-shore transect. It was found that disparities between predicted and observed values were attributed primarily to site-specific conditions and the lack of concurrent in-situ wave data and beach slope characteristics; these were accounted for using the modified predictor and thus enabled an improved wave runup description at the data-sparse site.

In the eighth article, "Design and Development of a Non-invasive Glucometer System", **A.O. Ogunsanya** and **D.O. Daramola** presented the design, development, and evaluation analysis of a non-invasive GSM (Glucose Screening Measurement) module glucometer to determine the glucose level in human blood. A total of forty individuals were recruited in the investigation. Repeatability, validity, and reliability were evaluated using the Bland and Altman Analysis, the concurrent validity, and the reliability analysis. Passing and Boblok Regression Analysis was used to assess the statistical significance. This study revealed that using a non-invasive GSM module glucometer to measure blood glucose effectively enhances patient surveillance in diabetes insulin treatment.

C.C-L. Virgil et al., "Climate Change Adaptation Planning in Selected Caribbean Countries: Is Enough Being Done?" explored the synergies between adaptation plans and policies and guidelines in climate change adaptation. In reviewing the national adaptation planning documents in climate change, the authors identified the factors underlying observed discrepancies and performance shortcomings and contextualised findings in adaptation measures. Synthesising the determinants and barriers would aid with closing performance gaps. The study concludes by providing evidence-based recommendations that shed light on the design and planning for sustainable adaptation measures in developing nations of the Caribbean.

OC. Falloon et al., "Physicochemical and Functional Properties of Protein Isolate from Ackee (*Blighia sapida*) Seed", investigated the production of a protein isolate from the ackee seed and determined the chemical and functional properties of the isolate. Proteins were extracted from the defatted ackee seed flour using sodium borate buffer (pH 10.0, 50 mM) and aqueous ethanol (75% v/v). The protein isolate was then dried under vacuum and milled into a powder. The ackee seed protein isolate contained low molecular weight proteins comprising principally glutamic acid, arginine, glycine and aspartic acid with hypoglycin content within regulatory limits. In comparison to soy protein isolate, ackee protein powder demonstrated high solubility, formed stable emulsions and demonstrated good foaming properties, particularly at acidic pH values, making it suitable for use in acidic foods such as fruit juices, beverages and yoghurts.

On behalf of the Editorial Office, 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:

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