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Book of ABSTRACTS

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SHAHJALAL UNIVERSITY OF SCIENCE & TECHNOLOGY, SYLHET

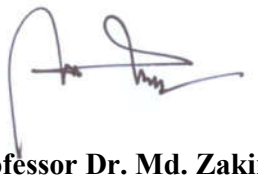
Preface

The SUST Research Centre is established with the aim to enhance the research environment in order to perform quality research by the teachers of this university. As a tertiary level educational institution, the teaching-learning activities of SUST are notable at the national level; however, the research Activities are not successful mostly due to lack of financial and technical supports. Against this backdrop, the SUST Research Centre has been trying to expedite the process of research activities since 2011 by allocating grants. Research and it outcomes are the internal part of development. The vision of the SUST Research Centre is to improve the research potentials of the teachers and students of SUST

The SUST Research Centre has successfully organized the "Fifth Annual Conference on Research Findings 2017" during 21-23 January, 2018 at SUST campus, Sylhet, Bangladesh. The honourable Chairman of the University Grants Commission of Bangladesh Professor Abdul Mannan was present in the Inaugural Ceremony as the Chief Guest. Professor Dr. Md. Elias Uddin Biswas, Treasurer of SUST and Mr. Mohammad Ali, Deputy Managing Director and CTO of Pubali Bank Limited were present as the Special Guests. The honourable Vice Chancellor of SUST Professor Farid Uddin Ahmed chaired the Inaugural Session.

I am happy to inform you that the findings of 82 out of 90 research projects have been presented at the conference through six technical sessions. I congratulate all the investigators who successful completed their research projects and also presented their findings in the conference. I look forward to see the research outcomes as articles in renowned peer-reviewed journals.

I would like to thank the honourable Vice Chancellor Professor Farid Uddin Ahmed for his effective support to the conference. I express my gratitude to all members of the management committee of SUST Research Centre for their continuous support and team work. Special thanks to all the participants whose gracious presence and active participation made the conference a grand success.



Professor Dr. Md. Zakir Hossain
Director
SUST Research Centre, SUST

Session Schedule

Technical Session 1
Day 2 (23.01.2018); Time: 9:30 - 2:00 pm; Venue: SUST Research Centre
Session Chair: Professor Dr. Md. Mizanur Rahman, Dept. of CHE, SUST
Project Codes: **AS** 01-06, 19-21; **PS** 01-07, 18 (Total: 17)

Technical Session 2
Day 2 (23.01.2018); Time: 9:30 - 2:00 pm; Venue: SUST Research Centre
Session Chair: Professor Dr. Kamal Ahmed Chowdhury, Dept. of SOC, SUST
Project Codes: **SS** 01-12, 23-26 (Total: 16)

Technical Session 3
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Session Chair: Professor Dr. Mohammad Iqbal, Dept. of IPE, SUST
Project Codes: **AS** 07-16; **PS** 9-16 (Total: 18)

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Session Chair: Professor Dr. A Z M Manzoor Rashid, Dept. of FES, SUST
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Technical Session 1

Day 2 (23.01.2018); Time: 9:30 - 1:00 pm; Venue: SUST Research Centre

Session Chair: Professor Dr. Md. Mizanur Rahman, Dept. of CHE, SUST

AS-01: Rheological behavior of jute-fiber reinforced polymer composites: Mathematical modeling

Humayun Ahmed & Md. Ferdaus Alam

Department of Chemical Engineering & Polymer Sciencs, SUST

Abstract

This article reports an experimental study on the effect of composition and process parameters on the viscosity of short jute fiber reinforced high density polyethylene (HDPE) composite. The fibbers with length of 2-3 mm were mixed in molten state with HDPE in double roller open mixer machine, and the composition was cut into small pieces with sizes suitable to feed into the tube of a melt flow indexer, a device adapted to study the rheological behaviour of polymers. The factors under study were: i) length to diameter ratio of die, *L/D*, ii) load, *P,* iii) fibber content, *x*, and iv) temperature, *T*. A two level full-factorial design scheme was prepared with the lower and higher level of the parameters as follows: (*L/D*: 3.03, 4.15, *P*: 32.9, 49 N; *x*: 0.05-0.15; and *T*: 135-145 °C. 16 sets of experiments were conducted as per full-factorial design scheme of 2^4. The homogeneity of the experimental data was tested with Cochran's criterion, and the significance of the contribution of different parameters and their interactions have been tested with t-criterion. The adequacy of the model was confirmed by Fisher's test (F-value). It was found that considering the *L/D*-ratio as variable, the data did not meet homogeneity criterion, but the adequacy test satisfactorily met with a confidence range of 0.95. If the data were treated as three factorial experiment with *L/D*= 3.03 and 4.15 separately, all the tests provided satisfactory results. The regression equations satisfactorily predicted the viscosity of the composite in molten state with the four variable parameters. The viscosity was found to decrease with temperature, increase with fiber content, decreases with load and increases with L/D.

Keywords: HDPE, viscosity, Jute fiber, temperature, load, temperature, factorial design

AS-02: Mesoporous activated carbon from lignocelluloses materials: Preparation, characterization and application as a potential adsorbent for the treatment of textile dye-contaminated wastewater

Dr. Md. Tamez Uddin & Mithun Chandra Bhoumick

Department of Chemical Engineering & Polymer Science, SUST

Abstract

Effluents from the textile industries are major sources of water pollution, because dyes in wastewater undergo chemical as well as biological changes, consume dissolved oxygen, and destroy aquatic life. Therefore, it is necessary to treat textile effluents prior to their discharge into the receiving water. Among several chemical and physical methods, adsorption has gained importance as a purification, separation and recovery process on an industrial scale. Activated carbon (AC) is perhaps one of the most widely used adsorbents in industry for environmental applications. However, the high cost of commercial activated carbon has prompted a growing interest into the production of low cost activated carbon. In the present study, activated carbon were produced from peanut shells using KOH as activating agent and its ability to adsorption cationic dye methylene blue dye (MB) from aqueous solutions was studied. The effect of various process parameters such as impregnation ratio, carbonization temperature, and holding time on the yield of the AC was investigated. The prepared adsorbent was characterized by N_2 adsorption–desorption isotherms, SEM and FT-IR. Point of zero charge (pH_{pzc}) of prepared activated carbon prepared by solution drift method was about 6.2 ± 2. The batch adsorption experiments were carried by varying operation parameters such as concentration of MB, pH, amount of adsorbent, contact time and temperature. The adsorption capacity was greatly influenced by solution pH and a basic media was favorable for the adsorption of MB onto AC. The equilibrium adsorption data were well fitted to Langmuir isotherm model and maximum adsorption capacity was obtained to be 1389.0 mg/g. The adsorption followed the pseudo-second order kinetic model. In order to investigate the industrial applicability of the prepared adsorbent for the removal of dyes, a continuous fixed bed (column) study was carried out. The maximum adsorption capacity determined by using the Thomas model in continuous mode experiments was found to be 1090.0 mg/g. Considering high dye adsorption capacity, activated carbon prepared from peanut shells can be use as a promising low cost adsorbent for the removal of cationic dyes from aqueous solution.

Keywords: Activated carbon; Peanut shell; Methylene blue; Adsorption; Kinetics; Langmuir isotherm.

AS-03: Conversion of waste plastic into liquid fuel

Rahatun Akter & Mohammad Saiful Alam Amin

Department of Chemical Engineering & Polymer Science, SUST

Abstract

Fuel obtained from waste plastics by pyrolysis method is a prospective way to decline the dependence on non-renewable resources and to meet environmental concern. The present work is focused on the thermo-catalytic pyrolysis of waste polypropylene plastic to produce fuel in a lab scale batch reactor. The plastics were pyrolyzed at 350 – 450 0 C, with catalyst (Alumina and Zinc oxide) and without catalyst, to obtain liquid fuel and to observe the effect of critical factors such as temperature, reaction time, and catalyst. The maximum liquid fuel yield was found 60 wt. % at 450 0 C in the absence of catalyst and 58 wt. % at 450 0 C in the presence of catalyst. The physical properties and the quality of fuel obtained by both thermal and catalytic pyrolysis were measured and found to be very close to ideal values of commercial fuel oil

AS-04: Optimization of process parameters for jute fiber reinforced polymer composite using mathematical modeling

Dr. Md. Mostafizur Rahman & Dr. Mohammad Mastabur Rahman

Department of Chemical Engineering & Polymer Science, SUST

Abstract

Interest on using fiber reinforced Polypropylene (PP) composite has been increasing significantly in recent years. This study focuses on improvement of physical and mechanical properties of polypropylene (PP) composite using additives. Blend of polypropylene (PP), inorganic filler, organic modifier and jute fiber reinforcement may contribute to attractive properties of the PP composite. The blend of polypropylene (PP), inorganic filler, organic modifier, and jute fiber reinforcement may contribute to attractive properties of the PP composite. In this experiment, PP composites were prepared by using$CaCO_3$/rice husk ash (RHA) as filler, low density polyethylene (LDPE) as modifier, and jute fiber as reinforcement. Both chemically treated and untreated jute fibers were used in the experiment. The effects of filler, modifier, and chemically treated and untreated reinforcement on the mechanical (tensile strength, impact strength, elongation at break) and physical (water absorption) properties of the PP composite were studied. The optimum contents of $CaCO_3$/RHA, LDPE, and jute fiber in the PP matrix were evaluated separately. The result shows that the tensile strength of PP/RHA composite is similar to that of PP/ $CaCO_3$ composite which clearly indicates the potentiality of RHA as filler in the PP matrix. An experiment was designed in which all possible combinations of the factors at all levels involved were used. The design was based on a full factorial design with three categorical factors. In this study, the contents of RHA, LDPE, and jute fiber were taken as independent variables and tensile strength as the response. A regression equation was obtained to analyze tensile strength, and the optimum additives contents were identified. Optimum ratios for the jute fiber reinforced PP composite were found 2 wt% RHA, 2wt% LDPE, and 30wt% jute fiber.

AS-05: Optimization and control of bioconversion (fermentation) Process for the production of volatile fatty acids (VFA) from municipal solid waste

Dr. Md. Salatul Islam Mozumder & Md. Sumon Reza

Department of Chemical Engineering Polymer Science, SUST

Abstract

Volatile fatty acids (VFAs) are proposed platform molecules for the production of basic chemicals and polymers from organic waste streams. In this study we developed a simple bio-reactor to produce VFAs at a high rate and yield while minimizing potential operational costs. A lab-scale anaerobic batch reactor was fed with potato waste and banana waste as substrate to find out the potential organic waste which has maximum VFAs production capacity. Between these two wastes, banana waste was found better for VFAs production. The product spectrum remained similar at the pH range 4.0-4.5 but higher pH reduced the VFAs production. The operation of anaerobic digestion with uncontrolled pH reduced the pH 4.0 to 4.5. Therefore, it is better to run the anaerobic digestion without controlling the pH while aiming to VFAs production. A small amount nutrient (ammonium nitrogen) significantly increases the VFAs production but higher amount nutrient has an inhibition effect. However commercial surfactant has a strong inhibition effect on VFAs producing organism and hence reduced the VFAs production. The efficient production of VFA at uncontrolled pH with a small amount of ammonium nitrogen increases the economic feasibility of waste-based VFAs production

AS-06: Investigation of oxygen transport in different organic liquids at different experimental conditions

Dr. Muhammad Nurunnabi Siddiquee & Mohammad Rakib Uddin
Department of Chemical Engineering & Polymer Science, SUST

Abstract

Oxygen transport from the gas phase to liquid phase has a profound effect in liquid phase oxidation of hydrocarbons to produce petrochemicals, oxidative degradation of organic effluents by aerobic microorganism, etc. Oxygen is consumed during oxidation and oxygen availability in liquid phase greatly influences the oxidative conversion and product selectivity. Mass transport data is used in various engineering design, calculation and operation of different chemical processes. Although experimental data is highly desirable for the design of chemical processes involving oxygen transport in liquid hydrocarbons, a few systematic studies are found to describe mass transport and bulk phase concentration of oxygen during liquid phase oxidation. Experimental investigations are found little in literatures because of challenging nature of in situ monitoring of oxygen transport. Recently a method was developed by principal Investigator in which in situ oxygen partial pressure was measured in the organic liquid phase by using a flat interface reactor equipped with an oxygen phase fluorometer. The main objective of this work is to show step–by–step how such measurements can be used to calculate different engineering parameters such as diffusion coefficient, mass transfer coefficient and Henry's law constant in different organic liquids at different experimental conditions. Diffusion and mass transfer coefficients were calculated from the experimentally measured liquid phase oxygen content in benzene, indan, n-hexane and n-decane. The experimentally determined diffusion coefficients were 1.1×10-7 (m2/s) and 6.6×10-8 (m2/s) and overall mass transfer coefficients ($k_L a$) were 0.0021 s-1 and 0.0024 s-1 for oxygen transport in benzene and indan respectively at 50 °C. Again, at 40 °C experimentally determined diffusion coefficients were 3 × 10-6(m2/s) and 2 × 10-6 (m2/s) and overall mass transfer coefficients (kLa) were 0.005 s-1 and 0.003 s-1, respectively for n-hexane and n-decane. This study also addressed the opportunities to predict and validate the oxygen transport in the homologous chemical compounds to enrich the literature with experimentally determined oxygen transport data. The experimental work is still in progress by using different chemicals such as toluene, hexadecane, cyclohexane etc.

Keywords: Liquid phase oxygen, n-hexane, n-decane, fluorometer, diffusion coefficient, mass transfer coefficient

AS-19: Groundwater quality and environmental impact assessment (EIA) of the Saint Martin Island, Cox's Bazar, Bangladesh

Dr. Md. Rafiqul Islam
Department of Petroleum & Mining Engineering, SUST

Abstract

Not presented in the conference.

AS-20: Petrography and geochemical analysis of the Sylhet Limestone

A T M Shahidul Hoque Muzemder & Dr. Md. Shofiqul Islam
Department of Petroleum & Mining Engineering, SUST

Abstract

The fossiliferous Sylhet Limestone Formation of Eocene age in the Bengal Basin is important for scientific and geoheritage study. In this study, geochemical and mineralogical characteristics of the Sylhet limestone were carried out by analyzing twenty eight (28) samples from two exposed and two underground (boreholes) locations in the Bengal Basin. Geochemical results show that the samples are comprised of high CaO (14.296 to 53.326%) with a significant amount of Fe2O3 (0.095 to 18.482%), Al2O3 (0.664 to 7.357%), K20 (0.83 to 2.274%), MgO (0.157 to 8.109%), and SiO2 (0.08 to 0.451%). Beside the major oxides, some minor and trace elements like Sr, Mn, Zr, Zn, Sc, Co, V, Ba, Ni, and Cu were also measured. Among these, Sr, V, Mn and Cu concentration within the Sylhet Limestone directly indicate its depositional environment at shallow continental shelf marine condition and its diagenetic change to convert as dolomitic limestone. The XRD analysis shows that the calcite is the most dominating mineral in samples along with some amount of wollastonite, siderite, ankerite, MgO, Al2O3 and berlinite. Presence of crystal structure of calcite, wollastonite, silica (SiO2) and MgO were confirmed through SEM-EDX analysis. Geochemical characteristics indicate that the Sylhet Limestone is highly dolomitized with high Ca/Mg ratio and was

deposited in a low energy shallow continental shelf marine depositional environment. Higher values of Ca/Mg ratio of the studied Sylhet Limestone also confirms lower salinity in the area of deposition. The presence of silica in the limestone was observed with a positive/negative correlation with Ca implies that the silica is derived either from a terrestrial source or dissolution from the siliceous shells of fossils that replace the calcite.

Key words: Sylhet Limestone, calcite, geochemical analysis, CaO, digenesis.

AS-21: Bioenergy recovery from Municipal Organic Solid Waste and Agricultural residue in Bangladesh

Md. Ashraf Hussain & Dr. Engr Salma Akhter

Department of Chemical Engineering & Polymer Science, SUST

Abstract

Biogas plants that process raw materials from agriculture are one of the most significant applications of anaerobic fermentation for sustainable development of society. As common raw materials of biogas are not so available in everywhere in our country search for alternative source of biogas is demand of time. The aim of this paper is to determine the possibility and comparison of biogas production from municipal solid waste, Rice straw and Jatropha with Cow Manure (50gm) & Sewage Sludge along with application of 1% NaOH. The aim was also to justify the use of Co-digestion in biogas production for better nutrition. Sewage Sludge (500ml) was inserted initially as seed of bacteria. Loading rate was maintained 200gm/L. The whole operation was done in 1 L reactor for 641.25 hours. Result shows that Jatropha with Cow manure and Sewage Sludge were producing more biogas than Rice Straw with Cow manure and Sewage Sludge.

Keywords: Energy, Co-digestion, Biogas, Sustainable Development

PS-18: An Application of hydro geochemical and Multivariate Statistical analysis to characterize the surface water Quality around the imported coal stock pile of Tamabil for environmental implications

Dr. Sabina Islam & Dr. M. Farhad Howladar

Department of Statistics & Petroleum & Mining Engineering, SUST

Abstract

The study area is situated around the coal stock pile area under Gowainghat and Jaintapur Upazila of Sylhet district (Fig.1). Coal is a variety of sedimentary rocks which can be used for different purposes. The important use this coal for the generation of electricity. Currently, some of the industries are mostly dependent on coal. In order to meet these demands, the country imports about 0.8 to 0.85 million tons of coal through Sylhet border from India every year. But, this imported coal contains high ash and high sulfur. Also, coal contains many heavy metals which can create a chronic toxicity in the environment. Many of the heavy metals from coal are getting mixed with soil and water by leaching at the time of rain. As a result, the threats of environmental pollution increase day by day. Therefore, a detail research for understanding the quality of water bodies, their interaction with the surface environment and possible impacts with a sustainable management plan are very much needed

PS-01: Microwave assisted condensation reaction between carbonyl compounds and active methylene compounds

Dr. Md. Mizanur Rahman & Shameem Ara Begum

Department of Chemistry, SUST

Abstract

Organic reactions under solvent-free and aqueous conditions have increasingly attracted chemists' interests, particularly from the viewpoint of green chemistry. The application of MW irradiation to provide enhanced reaction rates and improved product and it proves quite successful in the formation of carbon–heteroatom and carbon–carbon bonds. An efficient and solvent free-approach for Knoevenagel condensation of substituted aldehydes and active methylene compounds under microwave irradiation catalyzed by NH4OAc have been investigated. The method is convenient and useful. Several arylidene –acrylate, such as ethyl 2-cyano-3- (4-fluorophenyl) acrylate, ethyl 2-cyano-3-(4-cyanophenyl) acrylate , ethyl-2-Cyano-3-(2-thienyl)-2-Propenoate, ethyl 2-cyano-3-(pyridyl)-2-propenoate etc were prepared by Knoevenagel condensation reaction of ethyl cyanoacetate with corresponding aldehydes in presence of ammonium acetate(NH4OAc), using microwave irradiation under solvent free condition. The reaction is clean with shorter reaction time, mild reaction condition, eco-friendly, and reduces the use of volatile organic compounds (VOCs). The structures of the condensation products will be established by spectroscopic analysis.

PS-02: Catalytic and biological activities of transition metal (Ru and Co) complexes containing water soluble legends

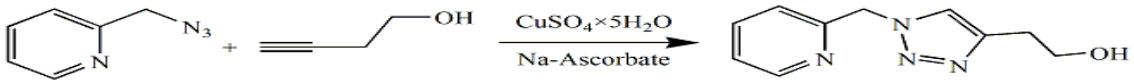
Dr. Md. Mahbubul Alam & Dr. Md. Mostafizur Rahman

Department of Chemistry, SUST

Abstract

In this research work, the author synthesized a water soluble triazole ligand by the Cu-catalyzed azide alkyne cycloaddition reaction. The synthesis consist of three distinct reactions. In the first reaction, 2-(chloromethyl)pyridine was prepared by the dehydrohalogenation 2-(chloromethyl)pyridine hydrochloride in presence presence of Na2CO3 in water at 10-12 pH and characterized by1H NMR spectroscopy. In the second reaction, 2-(azidomethyl)pyridine was prepared by the reaction of 2-(chloromethyl)pyridine with NaN3 using TBAHS in dichloromethane-water solvent. The product was characterized by1H NMR spectroscopy. Finally, prepared 2-(azidomethyl)pyridine reacts with 3-butyn-1-ol in presence of Cu catalyst (CuSO4/Na-Ascorbate) gave water soluble triazole ligand 1 (Scheme 1). The ligand 1 was yellow oil, purified by extraction with chloroform and characterized by FT-IR (liquid) and 1H NMR spectroscopy.

The water soluble 2-(1-((pyridin-2-yl)methyl)-1H-1,2,3-triazol-4-yl)ethanol (ligand 1) employed as chelating ligand to prepare Co(II)-triazole complex. Co(PF6)2.6H2O reactis with ligand 1 in methanol to gave the yellowish green complex which has been characterized by FT-IR. Further characterization of metal complex and their catalytic study are under investigations.



Scheme 1 Synthesis of 2-(1-((pyridin-2-yl)methyl)-1H-1,2,3-triazol-4-yl)ethanol (ligand 1).

PS-03: Polyvinyl alcohol-AgI nano composite films for organic dye removal: Synthesis, Morphology and Thermal properties

Dr. Mohammad Mizanur Rahman Khan & Dr. Dipen Debnath

Department of Chemistry, SUST

Abstract

Polyvinyl alcohol (PVA) has attracted extensive attention of researchers because of its good film-forming nature, nontoxicity, biodegradability, excellent mechanical properties and optical transparency [Singhal et al., 2012; Jia et al., 2007]. PVA-AgI nanocomposite films have been prepared by the addition of different amount of PVA (0. 2 to 0. 8 mg mL−1) through solvent casting method. Fourier transform infrared spectroscopy (FTIR), ultraviolet–visible spectroscopy (UV-Vis) and photoluminescence spectroscopy (PL) spectra revealed the possible incorporation of AgI onto PVA and interactions between AgI and PVA molecules. Field emission scanning electron microscopy (FESEM) and energy-dispersive X-ray spectroscopy (EDX) data revealed the variation of morphological feature of PVA-AgI nanocomposite films. Thermogravimetric analysis (TGA) data showed that thermal stability of PVA-AgI nanocomposite films could be greatly improved by the incorporation of AgI into the system. Differential scanning calorimetry (DSC) measurements revealed that the melting temperature (Tm) of PVA-AgI composite films are higher than PVA. The photocatalytic measurements exhibited comparatively lower degree of photocatalytic degradation ability of composites than bare AgI. The photocatalytic performance and excellent luminescence properties make the PVA-AgI nanocomposite films promising candidates for the removal of organic dyes for water purification and enable their application in near-UV white LEDs.

PS-04: Synthesis, X-ray crystal structure and photoluminescence studies of M (II) complexes of the bidentate N.S donor legend

Mst. Sabina Begum & Mst. Khurshida Begum

Department of Chemistry, SUST

Abstract

The N,S bidentate proligand S-hexyl-β-N-(4-methoxybenzylidene)dithiocarbazate (HL) obtained by condensation of S-hexyldithiocarbazate with 4-methoxybenzaldehyde, has been used to synthesize six metal complexes, namely NiL2,

CuL2, ZnL2, CdL2, PdL2 and PbL2, which have been characterized by physicochemical techniques and spectroscopic methods. Single crystal structural analyses for NiL2 and CuL2 show that these are square planar complexes with each metal bischelated by the Schiff base in its deprotonated monoanionic form. In both cases, the ligands show a trans-configuration, although they crystallize in different space groups. All the metal complexes with the exception of the nickel derivative show a significant decrease in fluorescence intensity with respect to the free proligand HL. Free HL and all six complexes were tested for antibacterial activity against three pathogenic gram-negative organisms. The metal complexes show a moderate although diverse activities; however free HL as well as the copper(II) complex did not reveal any antibacterial activity against the tested organisms

PS-05: Cost effective removal of heavy metals (Pb, Zn, Cu, Cr, Fe) from water by using biosorbents

Dr. Ahmed Jalal Faried Us Samed & Dr. Syed Shamsul Alam

Department of Chemistry, SUST

Abstract

Different biodegradable adsorbents were developed and their physicochemical properties were studied thoroughly. Removal of some heavy metals were investigated by using these sorbents. Among these, iron (Fe) got priority for this investigation due to its importance and availability of our current instrumental facilities. Other metals like Pb also showed promising results.

Cost effective development of biodegradable sorbents were one of the prime objectives of this project. To fulfill this criteria, present research focused on the development of biodegradable sorbents from taking waste of natural origin (like carbonaceous waste from leaf, bark of plants and preparation of composite from these). Discarded wastes were utilized in our present study to develop biodegradable sorbents for removing Fe and other materials and thereby cost is remarkably reduced compared to the conventional synthetic methods. Among these BD-1 and BD-3 showed excellent performance to reduce Fe from waste water.

Based on our current instrumental facilities we successfully focused the first part of this project that is the development of the biodegradable sorbents within our limited capacities. Then we studied the removal of iron by using these. Also we tried our method to remove the Pb from waste water.

Under this project, some adsorbents like BD-1 and BD-3 showed excellent performance to remove Fe from water in the batch adsorption studies. Adsorptive capacities got affected by pH. Their thermodynamic and kinetic studied were also performed and results were well fitted to Langmuir isotherm. On the basis of the present observation and findings, we could recommend the BD-1 and BD-3 as a potential candidate for the removal of Fe from the waste water treatment plant. Further advance analysis using AAS would be helpful for its exact evaluation to confirm their efficiencies

PS-06: Application of Thiocyanate-Modified Gold Electrodes Electrochemical Sensing of Hydrogen peroxide

Dr. Md. Rezwan Miah & Mr. Md. Saiful Alam

Department of Chemistry, SUST

Abstract

In the present project, reversible oxidative adsorption/desorption of thiocyanate anion (SCN^-) onto the electrochemically cleaned surface of polycrystalline gold (Au (poly)) electrode in aqueous media was studied using electrochemical techniques, such, as cyclic voltammetry, amperometry, open circuit potential etc and the SCN^--modified electrode was used for the reduction of hydrogen peroxide (H2O2). The results reveal that a full monolayer of SCN- very effectively inhibits the (i) catalytic decomposition and (ii) electrochemical oxidation of H_2O_2 at relatively higher potentials of the studied potential range, while both of the reactions occur simultaneously at the bare Au (poly) electrode. Therefore, the main achievement of the present studies is the simplification of the voltammetric curve for the reduction of H_2O_2 at the Au (poly) electrode in aqueous media by virtue of SCN--adlayer. This simplification is significantly important for reliable quantitative sensing of H_2O_2. The reduction of H_2O_2 takes place each time at the in situ-created, highly clean electrode surface. This enable us to detect H_2O_2 quantitatively using the thiocyanate modified Au (poly) electrode. The calibration curves are linear over a wide range of H_2O_2 concentrations. The sensitivity of the SCN-(ads)|Au (poly) electrode is higher than that of the bare Au (poly) electrode. The electrode response is highly reproducible because of the inhibition of the surface catalytic decomposition of H_2O_2 as well as the protection of the electrode surface from the adsorption of unknown impurities and the oxidative degradation by H_2O_2. The interference of air oxygen and some biological electroactive substances such as uric acid, ascorbic acid was

examined. The detection of H_2O_2 was possible avoiding the interference of the mentioned substances. The SCN^--adlayer in the submonolayer coverage at the Au (poly) electrode also significantly enhanced the oxidation current of H_2O_2 in the alkaline media.

PS-07: Studies on synthetic routes to Electron Deficient Ynamines with Ni(II), and Zn(II)-cyclam complexes

Dr. Rockshana Begum & Dr. S M Saiful Islam

Department of Chemistry, SUST

Abstract

Recently attentions were increasing towards functionalization of cyclam, the oligoazamacrocyclic ligands, producing pendant-arm complexes that show high catalytic potential. These type of complexes can stabilize unususal oxidation states of coordination transition metal ions. We attempted to synthesize metal complexes with ynamine-cyclam ligands. Ynamines are highly reactive subgroup with predictable regioselectivity in their transformations, where a nitrogen atom directly attached to the triple bond of carbon (Figure 1). While attempted to synthesize electron deficient ynamines, in which we introduced fluorophore unit (arylethynylene) into multidentate cyclam, we used a new synthetic strategy and synthesized Ni(II), and Zn(II) complexes (2a, 2b) of cyclam-ynamine conjugate by using corresponding metal-cyclam complexes (1a, 1b) as a precursor. These complexes have been characterized by uv–vissible spectra and IR spectroscopy. Further characterization is under progress.

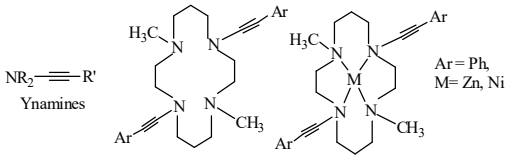
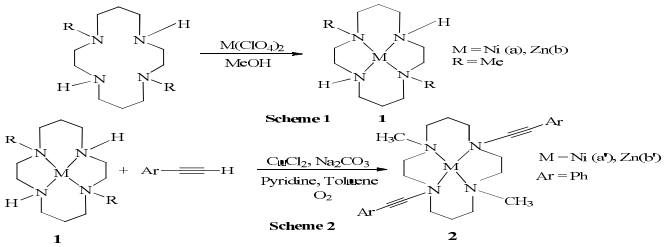


Figure 1



Technical Session 2

Day 2 (23.01.2018); Time: 9:30 - 1:00 pm; Venue: SUST Research Centre

Session Chair: Professor Dr Kamal Ahmed Chowdhury, Dept. of SOC, SUST

SS-01: Institutional diversity and Resilience: Evaluating the outcomes of CBFM program at Tangoar Haor, Bangladesh

Mohammad Anwar Hossain & Al-Amin Rabby
Department of Sociology, SUST

Abstract

Community-based fishery management (CBFM) emphasizes poor fishers' resilience through ensuring their rights to use a fishery. While CBFM considers institutional diversity as an effective means of improving fishers' resilience, we examine how various in-practice institutions fail to enhance fishers' ability to deal with social-ecological complexities: unequal access to fishery and its benefits and decline of fish habitat and its production restrain poor fishers from achieving resilience in **Langalkata Ozurbeel (local name of the fishery), Sunamganj, Bangladesh**. Based on key informant interviews (KII), this paper explores that poor fishers attain some financial benefit from the fishery while a few dominant members of fishers association exploit most of the profits. This paper also explores that poor fishers surrender even their rights to influential members to manage the fishery.

Key Words: Institutional diversity, fishery management, fishers' livelihood, and resilience

SS-02: Water resources management and resilience to natural disasters: Case study on wetland-communities in Bangladesh

Mohammad Faruque Uddin & Mahed-Ul-Islam
Department of Sociology, SUST

Abstract

We draw insights broadly from two research streams, namely common pool resources management and community resilience to natural disaster. Our study investigates the problem at the interface between these two research streams. Water resources management in the wetland (haor) areas is very critical in ensuring sustainability of livelihoods, especially in the context of climatic variability. Human communities living in the wetland areas almost entirely depend on wetland ecosystem services for livelihoods. Due to climatic variability, the livelihood sustainability of wetland-community is at risk. In recent years, wetland-communities have experienced number of extreme weather events like flash flood, drought, hailstorm, and over rain. Communities living in the wetland areas rely upon a single crop (i.e., boro) in a year, but contribute significantly to the national production of rice. These extreme weather events adversely affect their livelihood option (e.g., production of boro crops). Apart from nature induced shocks and stresses, wetland-community is also vulnerable to human-induced stresses like marginalization and exclusion from common pool resources, such as water and fish. Politics and conflict over water resources governance in wetland areas is crucial in shaping livelihoods. Often there are conflicts over water resources due to diverse and competing livelihood activities (e.g., farming and fishing), where power dynamics plays a crucial role. However, using mixed method approach, especially from the PRA tools, we find that 'during' and 'ex-post' community resilience through shock depends mainly on occupational diversity. Marginalization and maladaptation occur due to management practices of water resources in the Sunamgang area. Water resource is thus a contested common pool resource in the wetland areas of Bangladesh. Therefore, we recommend for vibrant and vigilant inclusionary practices.

SS-03: How does the perception of risk of dying and Change in land size related with fertility performance in vulnerable areas to extreme weather events in Bangladesh

Dr. Shah Md. Atiqul Haq & Dr. Jasim Uddin
Department of Sociology, SUST

Abstract

Not presented in the conference.

SS-04: Scrutinizing decent working-condition of SME Sector in Sylhet city

Dr. A H M Belayeth Hussain & Nadia Haque
Department of Sociology, SUST

Abstract

The unbridled growth of the informal sector and the absence of decent working conditions are of great importance in labour issues in the global context. The present study aims to explore various factors associated with the perceptions of working conditions with the perception of life satisfaction of SME owners. More specifically, this research project attempts to measure key indicators of perceptions of precarity and decent working conditions and their relative effects on the perceptions of entrepreneur's life satisfaction.

Using a random sample survey, this study interviews a total of 103 entrepreneurs in four districts of Sylhet division in Bangladesh. Utilizing the Smart PLS application, the samples were iterated with 1000 times which results a new sample size stands at 499. This project employs a Likert type five-point scaling with appropriate items related to the latent constructs of the model that has been used aiding PLS-SEM path analysis.

The project finds that the perceptions of precarious works have the highest direct impact on social dialogues and workplace relations followed by unacceptable works and working hour issues. Similarly, the perceptions of precarious works have a very good direct impact on an entrepreneur's perceptions of his or her satisfaction with life. However, the perceptions of precarious works have a very good direct impact on the perceptions of life satisfaction. Therefore, in this study, the perceptions of precarious works are present in the model with their highest effects on other indicators engaged in. Employing an importance-performance map analysis, this study concludes that the perceptions of precarious works are the most important construct in order to have entrepreneurs achieve their life satisfaction. Thus, in a ceteris paribus situation, an increase of one point in the performance on the perceptions of precarious works is expected to increase in the performance on the perceptions of life satisfaction by a total effect level of 0.428.

It was assumed in the study that if an owner becomes knowledgeable about the working conditions, (s)he may be able to ensure decent working conditions for their workers involved in. The study recommends that, as an integral part of the informal sector, the SME owners should have a good knowledge about the precarity and decent working conditions which can score a life with satisfaction for entrepreneurs and workers as well.

Keywords: Precocity, decent works, life satisfaction, SMEs, PLS-SEM

SS-23: Socio-economic Effects of Micro-credit on Women in Bangladesh: A Study on Sylhet

Dr. Tanzina Choudhury & Mohammad Morad
Department of Social work, SUST

Abstract

A good number of researches have been carried out on micro-credit which assessed its role in augmenting women's status both in domestic and public sphere. The apostles of micro-credit prefer throwing important light on the brighter side of micro-credit. For them micro-credit boosts women's socio-economic standing by easing women's access to cash and thereby serves to form the basis of a more equitable society. Authors who don't see this with rose-tinted spectacles emphasize, quite contrarily, the pitfall of micro-credit. Adopting a feminist glance we sought to look into, in this study, women's situation in the process of borrowing money and reimbursement of the loans of the credit agency. This study unveils that access to credit does not automatically enhance women's status at home as in most cases they only play the role of a media of borrowing money and rarely manage to establish control over the money. We argue that instead of promoting women's wellbeing access to micro-credit on many occasions exposes them to further vulnerability. The qualitative study was based in Sylhet, Bangladesh and data for this study were collected from clients of three leading micro-credit organisations – GB, BRAC and ASA

SS-24: Voting Culture in Party based Union Parishad Election-2016: A Study on Three UP, Sylhet

Dr. Md. Abdul Ghani & Md. Mahmud Hasan
Department of Social Work, SUST

Abstract

The century-aged non-partisan Union Parishad (UP), the lowest tier of rural local government in Bangladesh, election system has been changed in 2016. The newly amended law has introduced political party-based

nomination for Chairman Position and allowed them to use party symbol in the election. Under the new system, an election has been held over the country in 2016. These changes in election system have added new aspects and dynamics in the voting culture of rural area. This study attempts to explore these newly added dynamics that included the process of candidate nomination, voting behaviour and its impact on the local power structure. Following the mixed method of social research, survey and in-depth interview techniques have been applied to collect data from the voters, candidates and the elites of the local power structure from two UPs in Sylhet district. It is found from the study that the respondents in most cases are not very happy with party-based nomination and election system at local level. The study also found that majority of the voters did not choose to cast their votes in favour of their corresponding party-based candidates. Personal qualities of the candidates have played the most important role among the voters. However, a significant numbers of the voters have considered the party symbol for choosing their candidate. Members of local power structure have been sparse in influencing voters. Thus, members of the same kinship group were divided among themselves because of their different party loyalties.

SS-05: Assessing internet usage intention and digital divide: Evidence from Sylhet

Plaban Chandra Saha and Dr. Munshi Naser Ibne Afzal

Department of Economics, SUST

Abstract

This Study found that Digital divide is present in Sylhet region. Despite this large number of the participants use internet by using mobile phone packages but slow speed and network problem is hindering their use of internet in mobile phone. Moreover most people are not concerned about ICT training. Though the use of citizen based application is not satisfactory but the percentage of E-mail service user, use of internet for recreation and news is satisfactory. Age and duration of use of internet is negatively related. The older participants' duration of use of internet is less than younger participants. It's indicates that younger participants have more capability to adjust with new technology than older participants. Result of the analysis shows that female participants' duration of use of internet is less than male participants. Gender discrimination is present on the duration of use of internet. This can cause digital divide. The duration of use of internet is increased for ICT training. Internet usage inefficiency and digital divide is the hindrance on the path of development or improvement of any city. So finally it can be concluded that digital divide in the Sylhet should be reduced by making internet more accessible & more affordable. Various types of computer training at affordable or no cost should be extended to the relatively disadvantaged people of the region.

SS-06: Land Dispute, Displacement and Vulnerability: Evidence from different Indigenous Groups in Bangladesh

Mohammad Abdul Munim Joarder & Amit Roy

Department of Economics, SUST

Abstract

Among others, land is considered as one of the most strategic factors of economic survival and wealth of households. Access to and control of land determines social relations of production and reproduction within which dispute between individuals and groups are bred that have extensive negative effects on economic wellbeing of households. Opportunities for gain through illegal grabbing of land in Bangladesh are widespread vis-à-vis the indigenous people are the worst victims. According to Bangladesh Population Census (BBS, 2011), there are 15,86,141 ethnic people in Bangladesh which accounts for 1.06% of total population. They live primarily in the Chittagong Hills Tracts and in the plain regions of Mymensingh, Sylhet and Rajshahi divisions of Bangladesh. According to Oxfam (2008), the percentage of land losing by the indigenous people of Sylhet has increased from 6% in 1947 to 29% in 2007. In this backdrop, we studied the impact of land dispute on consumption smoothing among indigenous people in Sylhet using a cross sectional survey. Using stratified sampling method, we collected 218 sample data from 4 key different inhabiting clusters of indigenous people in Sylhet Division, namely, Sylhet City and Tea gardens area, Lauwachora Tripura Polli, Kamalgong Monipuri Village and Jaflong Khasia Punji. Using probit and logit models, we found that increases in land loss increase the predicted probability of real asset loss as well as household income loss. Moreover, an increase in land dispute reduces the household consumption by Tk. 1026.69 per month holding all other factors constant. We also found that gender and schooling of household head, structure of family, living area, composition of tangible and

intangible assets and family shocks have significant effects on consumption smoothing. Our findings broadly suggest that reducing land dispute through government intervention will enhance smooth consumption of indigenous people, thereby increase their overall life satisfaction.

SS-07: Determination of household Choice of energy Source: Emphasizing Environment friendly Device Use

Syed Hasanuzzaman & Md. Akther Husain
Department of Economics, SUST

Abstract

Energy is a pivotal factor for trigger the growth and development of a country . Efficient use energy ensures the quality of human capital, poverty situation and quality of environment. Use of clean and environment friendly fuel for cooking is crucial for achieving sustainable development and reduce energy poverty. In this regard, the aim of the study is to determine the determinants of household choice of energy source: emphasizing environment friendly device use. This study is conducted by collected primary data from sample of household from sylhet district in Bangladesh through structured questionnaire. Our descriptive statistics shown that majority of sample household use firewood and traditional clay stove for cooking. Our logistic regression shown that proportion of firewood expenditure to total energy expenditure, distances to energy sources, respiratory diseases, secondary education of the household head and cooking time is statistically significant determinant to used improved cooking stove that is environment friendly. So, improved cooking stove suppliers should focused on making stove that required less fuel, less cooking time etc. than traditional clay stove.

SS-25: Household behavior under Shocks

Nazmunnessa Bakth & Chowdhury Abdullah-AL-Baki
Department of Economics, SUST

Abstract

Our purpose of the study is to examine the impacts of various climatic and family shocks on the households. We know that shocks affect the vulnerable members first or with more severity. Children and women being the more vulnerable group among household members, we try to examine impact of shock on child schooling. We found that among other various determinants of school absenteeism is significantly impacted by climatic shock. We took two period data for change in school absenteeism before and after the flood and estimated logit regression model (where child's school absenteeism due to flood is recoded as 1 and no school absenteeism is 0). Among various determinants of school absenteeism, we found child gender; child health and household works are responsible. And it is also found that to cope up with shock, respondents who do farm work sell their asset and respondent with higher monthly expenditure sell more assets.

SS-08: Woman Empowerment Through Microfinance: A Study Conducted in Slums of Sylhet City

Neaz Ahmed & Abul kashem
Department of Social Work, SUST

Abstract

With the objective of exploring correlation between microfinance and women empowerment a study was conducted in slums of Sylhet City. All adult female those who have been using microfinance from selected organizations for the last two years or more considered as the population of the study. Based on the list provided by the organizations (NGOs and Government) of the study area, ninety seven sample was taken by using systematic random sampling. Microfinance receivers have both positive and negative experience in relating to their social empowerment. One of the key questions related to social empowerment of microfinance receiver how they have seen their life changes after receiving microfinance. Most of them (68.04 per cent) answered that their social life has changed positively due to receiving microfinance. It is noted here that a significant number of respondents' life have no change in their life. Many of the respondents shared that microfinance helps in reducing poverty as they can be able to invest money which ultimately increases their happiness. Their life quality becomes diversified as they are engaging many social, economic activities. A significant number of the respondents share that microfinance helps in increasing their personal earning which increases their social status in the family. Besides, it helps in availing education for their children that increases their social status too. Study reveals that involvement in decision making process by women in family or society is not commonly determined

by microfinance rather determined by other variables such as social position, education and social structure of the society. The study findings indicated that there is little or no influence in decision making authority after receiving microfinance. It is seen that majority of the women do not show increase of their social participation after receiving microfinance. The key reason of not changing social participation is that most of the microfinance receiver have traditional look and have to work more time for paying installment. Another reason is that most of the women do not invest money on their behalf; they just took loan and gave it to their family that is why they cannot expect any increase of their social participation. This study shows that most of the women who receive microfinance do not have sole authority of profit that is generated from the invested money. There are several reasons behind the fact for example; women receive money not for them but on behalf of their family, women does not have control over decision making in family, no involvement in income sources. Family income increases due to respondent become able to make a fixed income for their family; some of them had existing business, or some of them earn profit from invested loan from different income generation i. e. buying rickshaw, van etc. However, family income not only associated with microfinance but also related to other factors like income from engagement income by a new family member, occasional child labor, overtime work, donation or help from other member of the society. Political empowerment is a key indicator of empowering women. This study also focuses on any changes of political dimension, decision regarding involvement in political party by microfinance receiver. The study found that very rarely women are involved in political party or any other political organizations before taking loan and even after receiving microfinance no change regarding political involvement and decision took place. Though some of the women become more engaged in political organization after it and it happens to the group leader or key member of the microfinance group. They become vital and political leader consider them as a gate keeper to enter into their group or society and they are very much motivated and sometimes valued by political leader. Whether women should take legal support in case of domestic violence or not, in response to this question most of the respondent emphasized that family is the best mediator and supporter instead of legal authority. They also pointed that for the sake of family and future of children, women to be tolerable and affectionate to family bond. However, all of the respondents answered that if domestic violence crosses the limit, anyone must seek legal aid from appropriate authority. Economic involvement increases their ability to contribute which bring some psychological advantages in their personal, family and social life. Some of the women shared, now they understand the issue of profit and loss about business. They can choose business item and can share it with husband or family members. Now they can deal with many people than before which increases their self-confidence. It is also noticeable that level of confidence is closely connected to amount of income. Though microfinance has positive and negative impact on women empowerment but loan receivers face inconveniences while to take loans.

SS-09: Issues and Challenges of Field Practicum in Social Work Education in Bangladesh: A Study

Md. Faisal Ahmed & Ms. Tahmina Islam

Department of Social Work, SUST

Abstract

Social work education internationally has always embraced both academic and practical components. Social work education comprises of a theoretical component taught in the classroom and field- based education involving integration of the academic aspect and practice. Field Practicum, which is also known as field instruction, field placement, field education, field work or internship is therefore an integral component of social work education that provides students with the opportunity to apply the theoretical foundations of the profession to the practice arena. It is considered to be a central aspect of social work education (Maidment, 2000) and has even been described as the “signature pedagogy” of the profession (Council of Social Work Education, 2008, p. 8). But here in Bangladesh, social work is not recognized as profession and students do not take the field practicum seriously and therefore expected competencies are not achieved. From above background following the guideline of qualitative research the study found limitations, needs and problems of filed practicum in Bangladesh.

It was found that field practicum is not professionally handled by any stakeholders. Lack of logistics, recognition of profession and the sufficient manpower, the objectives field practicum is partly achieved here in Bangladesh. Due to shortage of suitable agency students are found to be placed in many agencies where social work practice is not or partially possible. It was found that though there is a course on field practicum in all of the universities; some of the universities do not complete course lecture before the placement. Therefore the course remains

useless to the students. Due to not having field practicum manual both students get confused about their tasks responsibilities and threats.

In order to make filed practicum more effective all of stakeholders suggested that a field work manual must be developed focusing the needs of the agencies, students and supervisors. They felt that sseminar, conferences, training and workshops should be arranged regularly with all stakeholders to find-out the limitations of field practicum and ways to go forwards. Most of the respondents recommended for introducing a provision of remuneration for agency supervisors by the university authority and opined that the students should be entitled to get monthly stipend during the period of filed practicum like medical interns. Faculty supervisors sometimes show their disinterest as they do not have vehicle facility or travel allowance. In order to compensate this, faculty supervisors should be awarded with travel and daily allowances for field visits and they should be self motivated in regular field visit and supervisory conference in presence of agency supervisor. It was suggested that every social work department should have separate office on field practicum which will be responsible for overall management of field practicum. This office will make regular contact with the agency and will minimize gaps between department and the agency authority. Many suggested for concurrent field practicum addressing different needs and problems of the communities adjacent to the university areas. Some recommended for international faculty-student exchange program to share the experience of developed and underdeveloped countries in the management of field practicum. All of the stakeholders were agreed that the present mode of field practicum is poorly capable of building special skills to practice social wok professionally. And thus, they recommended for introducing an effective field practicum programs in all universities considering existing needs, problems and social service program of the government.

SS-10: Situation analysis of pre-primary education of Government and non-government primary schools: A Study to be conducted in Sylhet City corporation

Dr. Md. Amina Pervin & Priyanka Bhattacharjee

Department of Social Work, SUST

Abstract

Pre-primary education has become popular strategy to protection drop-out from formal education of children in Bangladesh since 2010. It is widely recognized as having a significant impact on the performance of children in basic education programs. The main purpose of the study was to analyze the situation of preprimary education provided in the both government and nongovernment primary schools of Sylhet City Corporation. The study involved both qualitative and quantitative approaches respectively. Teachers teaching preprimary classes, head teacher of primary schools, parents of preprimary students and outdoor play areas were used as a source to secure relevant data. Stratified random sampling was used to select four wards among 27 wards of Sylhet City Corporation and simple random sampling was employed to select two government and two non-government schools from each wards. Questionnaire, checklist for observation and focus group discussion were the main tools of data collection. The findings revealed the way of implementing preprimary curriculum in the both government and nongovernment primary schools, necessity of adequate classrooms and outdoor spaces for child development, availability of materials and equipment supply in relation to the improvement of pre-primary education, usefulness of professionally skilled and competent teachers, and promoting effective partnerships with parents for effective child learning process etc. In conclusion, an effective coordination and collaboration approach between government and non-government primary schools is necessary in preprimary education system of our country. The difficulties in terms of shortages of personnel, classrooms, resources and teachers for pre-primary education cannot be underestimated.

Keywords: Situation analysis, Pre-Primary Education, Government and Non-government schools, Sylhet City Corporation

SS-11: Impact of Climatic Disasters on the Health of Coastal Populations: A Study in the South-west Coast of Bangladesh

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Abstract

Impact of Climatic Disasters is one of the most pressing issue in Bangladesh. Many natural calamities (e.g. low pressure, cyclone, storm surges, saline water intrusion, flood, water logging etc.) come across the coastal lines of

the country and cause colossal losses of lives and properties of the habitats. These impacts make them socioeconomically more vulnerable, intensify their sufferings, and multiply their health hazards, risks, and problems, and increase their disease burden. The people who have wealth and resources, somehow manage themselves, but the vulnerable people cannot because of their socio-economic miseries. On the other hand, socioeconomic conditions e.g. poor housing, lack of safe water and sanitation, inadequate health care services increase the incidence and prevalence of their health problems and diseases.

For finding out the impacts of climatic disasters (i.e. storm surges, salinity intrusion, flood, and water-logging) on physical and mental health of the coastal populations living in the South-west coast of Bangladesh, a cross-sectional study with a random sample consisted of 155 household heads was conducted on three villages of the Burigualini Union of Shyamnagar Upazila in Satkhira district.

Major findings reveal that the coastal people meet any or many of the climatic disasters like cyclone, storm-surges, flood, salinity intrusion, water logging, river erosion and tornado almost all the year round and lose many lives and properties which ultimately impact on their settlements, livestock, agriculture, crops, vegetation, employment and income. Among the disasters, cyclone and storm surges have many immediate deaths and sufferings, worse effects on the sources of food and drinking water, sanitation, and living environment, create many health hazards, risks, problems and diseases than any other disasters which contribute to the increase of their sufferings from diseases like diarrhea, malaria, malnutrition, pneumonia, eye infections, skin diseases, post-traumatic stress and depression. Flood is a recurrent phenomenon in the coastal area. During and after flood period, people suffer from different diseases i.e. diarrhea, stomach upset, jaundice, itching, eczema etc. Peoples with loses of lives and properties fall in tension that increase the risks of mental diseases like anxiety, depression, and frustration to lives. Thus, the experiences of fear and trauma of loses of lives and properties for a long time cause their high blood pressure, diabetes, etc. **S**aline water intrusion into the coastal lands caused by cyclone, storm surges, tidal waves, flood and sea level rise create many health problems including diarrhea, skin diseases, hypertension, respiratory infection, miscarriage among pregnant women, heart diseases, strokes etc. in the study areas. Water logging is also a catastrophe along the coast in recent days and associated with flood, tidal ways, storm surges and sea level rise. This calamity carries immense stunning impacts on various aspects of coastal populations. The people such as poor, pregnant women, children, older people become the worst affected for water logging. Diseases like typhoid, diarrhea, fever, influenza, and dysentery are spread out. The study concludes that health impacts of these climate catastrophes are many and diverse. In order to get the overall pictures of the impacts of climatic disasters, further study needs to be conducted almost in all regions of the coastal districts in Bangladesh.

SS-12: Struggle against the Odds: The Survival of Transgender People in Bangladesh

Md. Ismail Hossain & Md. Al-Amin
Department of Social Work, SUST

Abstract

Sexual minorities, particularly transgender people (Hijra), are socially stigmatized, politically powerless, and economically downtrodden. The holds different social identity and are refrained from access to civic services. Social taboos and socio-religious stricture refrains people from getting many of the human rights. Therefore, the paper aims to explore the exclusion and livelihood vulnerabilities of transgender people (Hijra) in Bangladesh. It also addresses how transgender people adapt with social stigmas and taboos. The paper is based on qualitative data gathered through in-depth qualitative interviews and FGDs with transgender people, NGO activists, local leaders and other stakeholders. For acquiring data from the field, the researchers employed one research assistant and two data collectors. The research team first contacted with Bandhu Social Welfare Society, a voluntary organization working for the wellbeing of transgender people and became connected with transgender people. Then the team visited the different places where transgender people live with prior appointment. For analyzing the data, the study followed social exclusion theory. The study finds that transgender people struggle with various social stigmas. Major stigmas against transgender people are unnatural or a deviation of nature, mentally disturbed or ill, sexually deviant and promiscuous, deceitful and dishonest, aggressive, and generally immoral. These social stigmas are forced them to be deprived from the basic human rights including social, economic, political, sexual and reproductive rights. They fail to get proper education and treatment and access to other civic services. They are discriminated for finding employment. They lead their lives by collecting money or commodities from markets, shopping malls and market places and very often involved in sex work. Sexual

violence and molestation makes them more vulnerable. They are usually forced to have unsafe sex and bear the high risk of HIV. They are psychologically depressed, socially excluded, economically marginalized and politically powerless. The study suggests that transgender people need social and psychological support for which social work intervention is required. Social workers can counsel transgender people to adapt with social environment, connect them with service delivery institutions, provide training for job placement and rehabilitate them in the society. Above all, the attitude of community people towards transgender people should be changed through advocacy and public awareness. The findings of this study offer a useful guideline for policy makers for protection of trans-people's rights in Bangladesh

SS-26: Life & Livelihood of Street Vendors in Bangladesh

Krittebas Paul & Professor Dr. Md. Tulshi kumar Das

Department of Social Work, SUST

Abstract

Street vendors are integral part of the urban community. Street trading has now become a common scenario all over the world, especially in developing countries. Bangladesh is no exception to that. Hawkers are found in all major cities of Bangladesh. Many of the urban dwellers prefer to buy different products from the streets rather than from markets or super shops. In spite of the profits made by the street vendors, street trading is generally not allowed either by the City Corporation or any other government agencies. Moreover, street vendors often face threat of eviction from the police, local politicians and the hoodlums. The current study aims to understand the life and livelihood of street vendors, trading on the streets of two major cities namely, Sylhet and Dhaka of Bangladesh. Survey method is used to collect data from selected 200 street vendors, 100 from Sylhet and 100 from Dhaka using accidental sampling technique. Case study and FGD are also carried out in both the places to complement survey findings. According to the findings, most of the street vendors are male (97.5%) who sell different products on the streets either on mobile style or occupy a small place on the street itself to carry on with their petty business. Though most of the street vendors (90%) do not have trade license, they however continue their business by giving bribe to the law enforcing agency (48%), and other extortionists. The study reveals that street vendors face continuous threat of eviction from law enforcing agencies, and their trading is frequently obstructed by different political elements and also due to unpleasant attitude of the customers. The study further shows that the street vendors remain frustrated because of enormous sufferings they go through due to lack of security for their business, and a kind of uncertain future they predict for their children. The study suggests that appropriate policy may be designed from the part of the government to address the problems associated with street trading and take appropriate measures that would facilitate the life and livelihood of the street vendors in a better manner in a country like Bangladesh.

Key words: Street vendors, livelihood, eviction, threat and frustrations

Technical Session 03

Day 2 (23.01.2018); Time: 9:30 - 1:00 pm; Venue: SUST Research Centre

Session Chair: Professor Dr Mohammad Iqbal, Dept. of IPE, SUST

AS-07: Investigation of the degradability of low density Polyethylene (LDPE) with pro-oxidant additive

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Department of Mechanical Engineering, SUST

Abstract

In this work, the degradation of low density polyethylene (LDPE) was enhanced by adding a commercial pro-oxidant, namely, Addiflex. The effect of the pro-oxidants on the degradability was assessed by examining the mechanical (tensile strength and elongation at break) and rheological properties of the LDPE-Addiflex composites. The pro-oxidant was mixed in molten state with LDPE in a double roller open mixer machine, and the composition was cut into small pieces with sizes suitable to feed into the injection molding machine for making dumb-bell shaped samples. Six different compositions of LDPE-Addiflex blend (Pure LDPE, 1%, 2 %, 3%, 4% and 5% Addiflex) were tested. The test samples underwent thermal and/or radiation treatment in four ways: i) heat treated at 70°C for 80 days, UV irradiated for ii) 18hr, iii) 36 hr and iv) 54 hr and then each of the UV treated samples were further heat treated in oven at 70°C for 80 days. The mechanical properties of the samples were monitored at every twenty days' interval. It was found that without any thermal and radiation treatment, the polymer-Addiflex blend preserved the utility properties for adequate time-period (tested time is 80 days). The degradability of samples, however, was highly enhanced by UV irradiation. The elongation at break decreased drastically to less than 5% for radiation-treated LDPE-Addiflex blend. Infrared spectroscopy (IR) spectrum analysis clearly suggests a high level of oxidation occurred in these samples. Breakdown of polymer into lower molecular fractions was confirmed by Melt Flow Index (MFI). It is evident that LDPE-Addiflex blend preserves the utility property under normal condition, and simultaneously the blend has become really a degradable material under heat and radiation treatment. It is concluded that Addiflex could be recommended for use in blend with LDPE for practical purposes meeting the environmental requirements

Keywords: Low density polyethylene (LDPE), Pro-oxidant, Addiflex, Tensile strength Elongation at break.

AS-08: Total Automation System of Shahjalal University of Science & Technology (SUST) by using RF ID

Tuhin Dey & Jibesh Kanti Saha

Department of Electrical Electronics Engineering, SUST

Abstract

The typical method of manual attendance documentation is very time consuming, inefficient and unable to ensure security. Laboratory access is hard to manage by traditional processes. In this report, we proposed a system that resolves recurrent lecture attendance monitoring problems and tracks laboratory entrance using Radio-frequency identification (RFID) technology. In this research, an RFID based system has been developed to produce an attendance management system incorporated with proper security measures to prevent unauthorized access and proxy attendances. The hardware part comprises of an embedded device installed near the classrooms which incorporate an RFID module interfaced with a microcontroller. Data has been stored to a Micro SD Card as well as in the database. A user-friendly Graphical User Interface (GUI) was developed to gain access to the attendance data by the administrator.

Keywords- Radio-frequency Identification, RFID Tags, GUI, Micro SD card

AS-09: Automatic Cleaning System of Shahjalal University of Science and Technology (SUST) by Using Robot

Mohammad Kamruzzaman Khan Prince & Saiful Islam

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Abstract

Any university campus and its surrounding area need to be cleaned regularly which is tiresome and costly. Moreover, in our society people dump dirt here and there recklessly. As a result, the whole environment is getting dirty and unhygienic. It requires continuous monitoring and sufficient manpower for this process. Frequently this isn't done properly which creates dusty and unhealthy environment. However, if there is an automatic and robust system, which will detect as well as clean the dirt, the overall environment could be clean,

healthy and hygienic. Our proposal is to make the overall cleaning process automatic by using the robot.

In this project, we developed a robotic vacuum cleaner named "Cleaning Bot". The name "Cleaning Bot" comes from the cleaning robot which will monitor the specified environment and clean it automatically after calibration. This cleaning robot can map an area or three-dimensional structure of a room by using Lidar and clean it. The main Processing devices are ATMega 2560 microcontroller and Raspberry Pi Board. It can avoid any kind of obstacles during the cleaning process using IR Proximity Sensor and Ultrasonic Sensor. As the robot is programmed in microcontroller and Raspberry Pi, the process is fully automated and robust. It is very reliable as well as cost-effective. Our primary concern is SUST campus, however the system could be used on a bigger scale.

Our robot can roam around the floors from one place to another. Ultrasonic sensor, Lidar, and IR Proximity sensor help it to roam around by mapping and detecting obstacles. The vacuum cleaner is used to suck the dirt up and store in a storage which can be dumped later to any dedicated place. The fully functional system works by following an algorithm. It takes the wall of a structure as a reference. The suction of dirt is done by the sucker attached beneath the mechanical structure. We had to consider the varying magnetic field all over the campus for proper working of the BOT. For the mechanical structure, some parts are imported and some are made by our team.This robot can maintain a neat & clean environment in a cost-effective and efficient way. Primarily we will apply our project in IICT building then gradually it could be deployed for cleaning the overall campus

AS-10: Automated Bengali License Plate Detection and Recognition

M. Jahirul Islam & Marium E-Jannat

Department of Computer Science & Engineering, SUST

Abstract

Bangladesh is a country in South Asia that uses Retro Reflective license plates. The plate has two lines with words, letters, and digits. An automated system to detect and recognize these plates is presented in this project. The system is divided into four parts: plate detection, extraction, character segmentation and recognition. At first, the input image is enhanced using CLAHE and a matched filter specially designed for a license plate with two lines is applied. Then tilt correction using Radon transformation, binarization and cleaning are performed. For character segmentation, mean intensity based horizontal and vertical projection is used. In recognition, we have used two different Convolution Neural Network (CNN) to classify digits and letters. Tesseract OCR is used for district names. We have developed a dataset of over 400 images of different vehicles (e.g., private car, bus, truck etc.) taken at different times of day (including nights).

The plates in this dataset are in different angles, including blurry, worn-out and muddy ones. Using this dataset, the proposed system achieved a success rate of 96.8% in detection, 89.5% in extraction, 98.6% in segmentation and 98.0% in character recognition.

AS-11: English to Bengali Statistical Machine Translation

Md. Abdullah Al Mumin & Sabir Ismail

Department of Computer Science & Engineering, SUST

Abstract

Significant improvements have been achieved in Machine Translation over the past few years, mostly motivated by the appearance of Statistical Machine Translation technology, which is currently considered the best way to perform machine translation of natural languages. Our research focus is to build statistical models and resources for a Statistical Machine Translation system from English to Bangla. Statistical machine translation systems always need good amount of quality sentence by sentence aligned parallel data for the system training. The good amount of quality monolingual and parallel data helps in producing better quality translation results. This research focuses on the strategies to build monolingual corpus for Bangla and bilingual corpus for English and Bangla. We develop a representative Bangla monolingual corpus named SUMono (Shahjalal University Monolingual corpus). SUMono corpus contains more than 27 million Bangla words which is the largest of its kind. We also develop a balanced English-Bangla parallel corpus named SUPara (Shahjalal University Parallel corpus). SUPara corpus contains more than 500 thousand words in each parts of English and Bangla texts. This research also discusses the steps required to develop an English to Bangla machine translation system using phrase-based statistical approach. We develop a system named SUSTran (Shahjalal University Statistical Translator). The performance of SUSTran has been compared with the performance of Google's translator. Our

system clearly outperforms the Google's system by 6.62 BLEU score.

AS-12: Service time reduction through facility re-location of existing hospital facilities

Jahid Hasan and Dr. Chowdhury Abul Anam Rashed
Department of Industrial Production & Engineering, SUST

Abstract

In recent days, healthcare systems face lots of problems to cope up with the changing environment, market demand and customer expectation that force them to improve their existing systems continuously. One of the aspects of improving healthcare system is to redesign their existing facility in an optimal way. Since inappropriate layout results unnecessary movements of patients and human resources, it is essential to design optimal facility layout to cope up with the huge volume of patients. This paper examines facility layout of a local hospital and aims to relocate departments based on the closeness priority between them and to reduce the overall movement cost. Here, Systematic Layout Planning (SLP) technique under process layout approach is used to arrange the departments within the predefined facility boundary. Then movement costs for existing and proposed layout were calculated in MS Excel based on an already developed mathematical model. The model has four attributes, namely travel frequency or number of trips, trip difficulty rating, baseline travel cost and distance between departments for determining the movement cost. The calculation evaluates the effect of different proposed layouts based on movement cost and shows a significant reduction in movement cost from the existing layout. Among four proposed layouts, optimal layout shows 47% reduction in movement cost compared with the existing layout.

Keywords**:** hospital facility layout, movement cost, Systematic Layout Planning (SLP)

AS-13: A Disruption Mitigation Model in a Production Inventory System with Demand Uncertainty and Uncertain Disruption Time

Dr. Md. Ariful Islam & Syeda Kamrun Nahar
Department of Industrial Production & Engineering, SUST

Abstract

Disruption in the supply chain is a common phenomenon. It is an uncertain occurrence and costly event that hinders smooth business operations of a manufacturing business. This study aims to develop a model for mitigating inventory disruption. Numerous works has been done concerning all the terms supply, demand uncertainty, production, inventory and disruption. Most of the papers considered mitigation as the disruption-management strategy. Considering the gaps in the literature regarding inventory model, addressing disruptions in uncertainties demand and uncertain disruption time length, this proposed research project is unique in nature and novel. The objective of the study was to develop a mathematical model for mitigating inventory disruption considering demand and disruption time length as uncertain variable. The target mathematical model for disruption model has been developed. The application of the developed model has been performed in a manufacturing sector of Bangladesh in the context of checking its validity. Decision variables (dependent and independent) has been identified from literature review and confirmed for the model with fuzzy parameters. MATLAB optimization function has been used to run the model for verification and validation.Disruption mitigation is very important in manufacturing sector to optimize profit in real life, uncertain situations. This research has been conducted with the objective of developing a model for mitigating inventory disruption with uncertain demand and uncertain disruption time. The study focuses on a single-stage production-inventory system that is hampered by disruptions. Here, a specific production run of one product from a ceramic industry has been observed. For one month, in depth data has been collected for case study and the effects of disruption have been noticed. As disruption durations are random, it is difficult to estimate optimize production plan in uncertain situation (uncertain demand).To address these problems, a mathematical model with logical constraints have been established, which can be used for both uncertain demand and uncertain disruption time simultaneously. The model deals with all cost factors and the expected revenue, which can be used to maximize profit. The collected data has been used for the model run with MATLAB simulation software. Also, some iterative recovery plans have been generated randomly, using simulation. Then, proposed model has been run using those data and the constraints have been obliged. After the analysis, results have been compared and the optimal solution has been suggested for selected company. The characteristics of costs in different plans have been briefly discussed, too. There has been a sensitivity analysis conducted too, to understand the effect of

different cost factors on total cost, thus implicating where the company should focus more. Also, some other variables have been discussed which may be manipulated to maximize revenue or minimize costs. A set of recommendations have been proposed for the studied system. As this study has its limitations, future scopes have been notified, too

AS-14: Study of skin burn injuries and development a two dimensional finite element model for analysis of heat transfer in human skin layers

Dr. Abul Mukid Mohammad Mukaddes & Dr. Muhamood Hasan

Department of Industrial Production & Engineering, SUST

Abstract

The objective of this research paper is to develop a 2-dimensional finite element model for the solution of skin burn injuries problem using the bio-heat equation. The Pennes bio-heat equation is considered for the purpose. The cases of skin burn injuries and their treatment processes have been studied. The intensity of the burn and causes of the skin burns have been analyzed. The finite element model is developed using the weighted residual method. The linear and quadratic triangular elements are used. The code is developed using the C language. The developed system can be used for different boundary conditions: conduction, convection and radiation. The causes of the burning are reflected in the system as boundary conditions. The human skin can be damaged by contact with a hot object, hot water, fire and chemical hazards. The system developed under this research can measure the temperature of skin during burn and also measure the intensity of the burn. The sensitivity analysis is performed considering different parameters. The time required to cause the first degree, second degree and third degree burn is calculated. The results predicts that intensity of the burn depends on the exposure time and temperature. The information gathered from the system can be used in the treatment of the burn. The future work of this research to extend the model to solve 3 dimensional problems.

AS-15: Study on Existing occupational Health Hazards of Selected Tea Gardens Workers in Sylhet, Bangladesh

M. A. Karim and Dr. Mohammad Iqbal

Department of Industrial Production and Engineering, SUST

Abstract

The tea industry plays a significant role in the national economy. In Bangladesh first tea garden was established in Malnicherra, Sylhet in the year 1854. At present there are 162 tea gardens in Bangladesh. Five types of companies are involved in tea cultivation in Bangladesh. Sterling Company, National Tea Company, Bangladesh Tea Board, Private LTD Company and Proprietary. All tea gardens are owned by Bangladesh Nationals. Once an exporter, now Bangladesh is an importer of tea due to improper management of tea estates. To regain its status, it's necessary to improve the working environment of tea estates in Bangladesh. As the workers are the core of any kind of improvement, the barriers to the safe working environment should be addressed. This research was conducted in three selected tea estate namely Malnicherra Tea Estate, Lackatoorah Tea Estate and Khadim Tea Estate in Sylhet region with a view (i) To find out the influential occupational hazards faced by the workers of the surveyed tea (ii) To analyze the health problems of the surveyed tea estates and (iii) to analyze the safety aspect of the selected tea estates.

Analysis and finding shows that the ranking of major factors for Malnicherra Tea Estate is as follows: firstly, 'Physical hazard', secondly, 'Psychosocial hazard', thirdly, 'Biological hazard', fourthly, 'Mechanical hazard', and lastly, 'Chemical hazard'. In Lackatoorah Tea Estate, the ranking is as follows: firstly, 'Physical hazard', secondly, 'Chemical hazard', thirdly, 'Psychosocial hazard', fourthly, 'Mechanical hazard', and lastly, 'Biological hazard'. In Khadim Tea Estate, the ranking is as followed: firstly, 'Psychosocial hazard', secondly, 'Physical hazard', thirdly, 'Chemical hazard', fourthly, 'Mechanical hazard', and lastly, 'Biological hazard'. In overall ranking of the major factors, physical hazard ranked is 1st, psychosocial hazard is 2nd, chemical hazard is 3rd, mechanical hazard is 4th and Biological hazard ranked 5th.

In the overall ranking of the most influential sub factor, recognition and reward ranked 1st, Manual material handling ranked 2nd, Noise ranked 3rd, Organizational justice ranked 4th, Pesticides ranked 5th, Heat ranked 6th, Conflict ranked 7th, Hours of work ranked 8th, Rotary Machinery ranked 9th and Mosquitoes ranked the 10th position.

Also it is found that the management of the three selected tea estate should provide sufficient number of personal protective equipment and fire precautions equipment for the workers to safeguard the working environment

including workers lives. The management should take necessary steps to standardize the fire safety system of the factory.

KEYWORDS**:** Tea workers, Health hazard, Safety and Health.

AS-16: Optimization of Energy Utilization in Steam Generation Unite Used in Textile and Apparel Industry

Dr. Mohammad Muhshin Aziz Khan & Shanta Saha

Department of Industrial Production & Engineering, SUST

Abstract

The activities of textile and apparel industries are, however, energy intensive. Stem system is a part of almost every major textile processes. Steam boilers are specifically used to produce steam in textile industries. Therefore, there is a tremendous waste heat potential to utilize in textile application. In this paper, an effort is made to show the common steam engineering practices in textile sector in Bangladesh. The techniques and technology of efficiency enhancements and heat recovery are analyzed in this project. Overall performance of steam generation unit is calculated by input-output method and then thermodynamic parameters are optimized. The thermal efficiency is defined as the objective function and is maximized using genetic algorithm subject to a list of constraints to obtain the numerical values of the optimum process parameters. Energy consumption amount by the individual textile processes is also estimated. As most three energy consumed processes; dyeing, ironing and washing activities are come out. It is observed that malpractices are causing a lot of wastage of energy and making the process inefficient. Various sources of heat losses are identified. The investigation shows, maximum amount of heat (42%) is lost for leakage. It is followed by boiler blowdown (30%) and due to unrecovered condensate (17%). Cause-effect analysis is performed to investigate the root cause of these occurred energy losses. Some suggestions and possible implementation system for heat recovery or improvement of these losses are given. By turning to heat recovery, it will reduce manufacturing cost and obviously assist in environmental friendly production.

PS-09: Computer code development of mass-lumped Galerkin linear finite element solution of Richard's Equation

Dr. Mohammad Sayful Islam & Razwan Ahmed

Department of Mathematics, SUST

Abstract

Robust, accurate and efficient mass conservative modeling of saturated-unsaturated flow is of great importance in environmental science and engineering. A commonly accepted mathematical model of water flow through variably saturated-unsaturated porous media is Richards' equation, a nonlinear parabolic partial differential equation well known in hydrology and related sciences. Numerical solutions of such highly nonlinear models are prone to convergence difficulties. The Richard's equation for water movement in unsaturated soil is not solvable analytically unless unrealistic and oversimplifying assumptions are made regarding the attributes, dynamics, and properties of the physical systems. Therefore, conventionally, the standard finite element numerical technique coupled with an Euler time discretizations are the feasible procedures to model flow in partially saturated porous media. Except for the fully explicit forward method, any other Euler time-marching algorithm generates nonlinear algebraic equations which should be solved using iterative schemes such as Newton and Picard iterations. In this study, a code is developed for the case of lumped mass in the frame of Picard and Newton iterative techniques which were evaluated to determine the most efficient method to solve the Richards' equation and compared with the mass distributing phenomena. Robustness, stability, accuracy and computational efficiency of the model and performance criterion of the Picard and Newton models are obtained for a wide variety of one-dimensional flow processes in unsaturated porous media including infiltration into very dry systems. Verification and examples demonstrated that, the conventional mass distributed finite element method suffers from numerical oscillations at the wetting front, particularly for very dry initial conditions. Distributed case can exhibit erroneous behavior even for small meshing for all the test problems due to the highly nonlinear nature of the Richards' equation. On the other hand, the mass lumping, that is diagonalization of the time matrix is shown to be necessary for monotonic solutions. The algorithm poses excellent mass balance property and can easily be used in both saturated and unsaturated regions without special treatment of fluid content of porous media. The proposed algorithm can also be extended to simulate multiphase and multidimensional flow

problems

PS-10: Analysis of Biological systems which exhibits Chaotic Dynamics

Dr. Pabel Shahrear & Dr. Muhammad Mizanur Rahman
Department of Mathematics, SUST

Abstract

Activities of genes are controlled in a combinatorial fashion by the concentrations of chemical called transcription factors. We model this type of network by piecewise linear differential equations formed by embedding a logical switching network in a differential equation. We reveal the state transition diagram for a particular four dimensional system. Possible outcomes are listed based on the orientation of the systems node. We generate discrete nonlinear equations by replacing the derivative terms with the discrete time step function We carry out numerical studies of the discrete and piecewise linear equations for a 4 dimensional example with particularly interesting and complex behavior, showing that the dynamics in the discrete equation approaches those in the piecewise linear equation.

PS-11: Algebraic coding for secured data transmission

Dr. Md. Rashed Talukder & Dr. Muhammad Salah Uddin
Department of Mathematics, SUST

Abstract

In this project, we mainly aimed at the study of error-correcting codes which have applications to data transmission and data storing methods. Error-correcting codes are used to detect and correct errors that occur when data are transmitted across some noisy channel or stored on some medium. Historically, decreasing the error rates in data transmissions was achieved by increasing the power of the transmission. Alternatively, at present, algebraic codes are being used for detecting and correcting errors in error-correcting codes. In order to study the general algebraic codes, we require stronger foundations of incidence algebraic structures of error-correcting codes. In this connection, we study the methods of correcting and detecting errors in linear codes, generator matrices of linear encoding and parity check matrices for linear decoding. We introduce an incidence matrix called poset matrix and we establish the constructions of poset matrices for different sums and products of ordered sets. We study the incidence algebras behind poset matrix and we plan to apply the notion of poset matrix to algebraic coding. This is, however, a big work and will be conducted in future projects. Since some computations in ordered sets are lengthy and complicated, as an immediate application of poset matrix, we develop an algebra toolkit, a MATLAB package named Ordered Set Processor (OSP), for testing different properties of finite ordered sets by using the definitions directly. In the current project, we emphasize the constructions of poset matrix, its applications and further research possibilities

PS-12: Software development for simulation of singular initial value problems

Dr. Md. Shajedul Karim & Mr. Md. Matiar Rahman
Department of Mathematics, SUST

Abstract

Singular initial value problems are often encountered in the formulations of science and engineering problems. Many of them are singular especially in the field of mathematical physics, astrophysics and ecology. Most of the cases, such singular problems are of second order. In some cases a first order or a system of first order initial value problems are also encountered. Generally, the first order singular initial value problems are used to express a leading-edge model in the computation of the run-out length of dry-flowing avalanches. On the other hand, for obtaining numerical solutions the governing equations more than first order is transformed in to a system of first order initial value problems. If all the first order initial value problems do not have the singularity then the classical Runge-Kutta is one of the best method and sufficient to obtain solution with the desired accuracy. In addition, many problems have been solved by the approximate analytic and numerical techniques.

The numerical technique in order to obtain the solution of singular initial value problems is not significantly improved. The implicit Runge-Kutta methods may be one of the useful methods for solving such singular initial vale problems. But, its derivation is either beyond of capacity or cumbersome. A unified algorithm based technique that can be effectively applied to solve the initial value problems with or without singularity is highly demanded. The aim of this study is to present a new and simple technique for solving initial value problems with

or without singularity. Consequently, in the chain of the derivation of the method, we chronologically develop: (i) the unified algorithmic numerical technique to evaluate the integral of singular or nonsingular integrands, (ii) improved numerical integration rules such as Trapezoidal, Simpsons' and Weddles, and (iii) finally unified algorithm based method for obtaining numerical solutions of initial value problems with or without singularities. The method so developed is also applicable for obtaining numerical solution of singular integral equations. Thus, the developed method will find better applications in many areas of physics and engineering.

PS-13: Numerical Modeling of Tsunami Inundation by using the Method of Lines (MOL) Technique

Dr. Mohammed Ashaque Meah & Md. Shah Noor
Department of Mathematics, SUST

Abstract

A numerical technique is developed to simulate the extent of inland inundation as well as tsunami propagation and run-up due to 2004 Indian ocean tsunami in a boundary-fitted curvilinear grid model. The vertically integrated shallow water equations are solved by using the method of lines (MOL). For this purpose the boundary-fitted grids are generated along the coastal and island boundaries and the other open boundaries of the model domain. To use the regular finite difference scheme to the spatial derivatives, a transformation is used so that the physical domain is transformed into a rectangular one. The method of lines is then applied to the transformed shallow water equations and the boundary conditions so that the transformed equations are converted into ordinary differential equations initial value problem. Finally the 4th order Runge-Kutta method is used to solve these ordinary differential equations. The moving boundary technique is applied instead of fixed sea side wall or fixed coastal boundary to ensure the movement of the coastal boundary. The extent of intrusion of water and associated tsunami propagation and run-up are simulated for the Indian ocean tsunami 2004 along the west coast of Peninsular Malaysia and southern Thailand. A comparison has been carried out with the simulated data from another model and the data available in the USGS website. All simulations show excellent agreement with the observed data.

PS-14: Preliminary Investigation of the optical behavior of the photoactive bulk organic heterojunction film

Dr. Nazia Chowdhury & Mr. Md. Mohibul Alam
Department of Physics, SUST

Abstract

Energy conversion efficiencies of photovoltaic cells made with pure conjugated polymers were typically 10 -3 to 10 -2 % (1), too low to be used in applications. The discovery of photoinduced electron transfer in composites of conducting polymers as donors and buckminsterfullerene (C60) and its derivatives as acceptors provided a molecular approach to high-efficiency photovoltaic conversion (2). The need to develop inexpensive renewable energy sources stimulate new approaches to production of efficient, low-cost photovoltaic devices. This work is concerned with the preliminary investigation of the optical behavior of the photoactive bulk heterojunction film, which consists of a composite of semiconducting polymers with fullerenes. The optical absorption spectra of the conjugated polymer, fullerene and blends of the conjugated polymer and fullerene demonstrate the amount of light absorbed by the polymer, by the fullerene and by the blends. Photoluminescence (PL) is often used as an indicator of how well excitons can diffuse to a donor-acceptor interface, where they can be split into free charges, since photolumenescence occurs when the excitons recombine emissively prior to splitting. Photoluminescence (PL) studies were carried out on the P3HT: C60 blends relative to neat reference solution of C60 and P3HT at different concentrations. Photoluminescence (PL) quenching of blends was observed. PL quenching suggest efficient hole transfer from the donor polymer P3HT to the acceptor that may lead to increased charge generation for photocurrent.

PS-15: A study of quality of automated machine made environment friendly brick sample using neutron Radiography

Dr. M. Habibul Ahsan & Dr. Md. Shah Alam
Department of Physics, SUST

Abstract

Manufacturing building materials like bricks has become very good option of business in the developing countries like Bangladesh. Quality control of these materials and assurance of environmental friendly structure

made by these bricks are very much necessary. Quality control of the products should be done for the betterment of such industrial establishments. Among the non-destructive testing (NDT) techniques Neutron Radiography (NR) is the most common procedure to study internal structure, homogeneity, any inclusion voids or cracks inside these samples. The water penetration behavior and structure can be identified more effectively through this NDT technique. Present study has been carried out to differentiate two types of brick manufacturing processes named Hoffman Kiln method and conventional/100 years old traditional local method. Thermal neutron radiography facility of 3 MW TRIGA Mark-II research reactor of Atomic Energy Research Establishment (AERE), Savar, Dhaka has been utilized in this research work. Densitometry measurements of the neutron radiographic images of the samples have been made in the present work. The samples were collected from different places of Bangladesh depending on their manufacturing process including fuel to burn, burning process etc. At first the appropriate irradiation time was determined for the samples and then neutron radiographs were taken. Finally radiographs of the samples were taken after drowning them up to 1 inch into water for 5, 10, 15 and 20 minutes consecutively. The radiographic images under all these conditions for individual samples have been investigated and it can be concluded with the statement that bricks made of Hoffman Kiln method are more homogeneous inside, contain small internal porosity, the incremental water intrusion area is very poor, absorb lower amount of water and most importantly products of this environment friendly system can construct better, safer and long lasting building structure for livelihood.

PS-16: Investigation of the crystal structure of La0.8Y0.2CoO3

Muhammad Omar Faruk & Professor Dr. Shamsun Naher Begum

Department of Physics, SUST

Abstract

Polycrystalline La1-xYxCoO3 (x=0, 0.2) has been prepared by the standard solid state reaction technique. The internal structure, surface morphology and electrical properties of polycrystalline La1-xYxCoO3 (x=0, 0.2) have been studied by X-ray diffraction, Scanning Electron Microscope (SEM) and Manual Dilatometer 6517B respectively. The X-ray diffraction analysis for the samples sintered at 1300℃ confirmed that the sample is single-phase and is formed perovskite structure. The Lattice parameters are calculated using the Nelson-Riley function. The optical micrograph of the sample exhibits a homogeneous microstructure and the average grain size is determined by the linear intercept method. The experimental volume of unit cell for LaCoO3 and a0.8Y0.2CoO3 are 332.707(Å)3 and 320.225 (Å)3 respectively. This decreases of the volume of the unit cells of LaCoO3 and La0.8Y0.2CoO3 may be due to the variation of ionic radius of Y3+(104 pm) and La3+(117.2 pm). This work has also studied I-V characteristic and temperature dependence resistivity for La1-xYxCoO3 (x=0, 0.2). It is observe that I-M phase transition for the sample LaCoO3 and La0.8Y0.2CoO3 follows the theory of polaron hopping

Technical Session 04

Day 2 (23.01.2018); Time: 9:30 - 1:00 pm; Venue: SUST Research Centre

Session Chair: Professor Dr. A. Z. M. Manzoor Rashid, Dept. of FES, SUST

AS-17: Removal of Chromium (VI) from industrial wastewater through Phytoremediation

Dr. Bijit Kumar Banik & Khairul Hasan,
Department of Civil and Environmental Engineering, SUST

Abstract

Chromium (VI), predominantly anthropogenic, is toxic and carcinogenic. Different industries such as: ore refining, chemical and refractory processing, cement-producing plants, automobile brake lining and catalytic converters for automobiles, chrome alloy production in steel industries, leather tanneries, and chrome pigments contribute to the chromium contamination. Due to the rapid industrialization in Bangladesh, in recent time, those industries are growing in numbers. To maintain the environmental standard of Chromium at the effluent of those industries, an economic and sustainable secondary treatment is necessary. Those Chromium can be removed by two broad processes, physicochemical process and biochemical process. However, chromium removal using physicochemical process demands strict operational condition as well as cost. That is why, as a cheap and less stringent process the biochemical process is already showing high potentiality. Among those biochemical processes phytoremediation seems more environmentally clean and in recent years its application has been greatly increased. Lots of researches have been conducted using phytoremediation techniques, especially on constructed wetland. Although constructed wetland seems a very promising phytoremediation technique for removing Chromium from wastewater, due to the land scarcity in Bangladesh this method might not be the best one to choose. In this research, three indigenous floating plant species, *Pistia* stratiotes (Water Lettuce) and Lemna minor (Duckweed) and *Eichhornia crassipes* (water hyacinth), have been chosen to investigate their potentiality in removing Chromium from wastewater. Wastewater sample was collected from the same pond, situated at Shahjalal University campus, where the plants were also collected. Two sets of experiments (one at acidic (pH 6.5) and other at alkaline (pH 7.5) condition) were conducted for seven days each. In each setup, five different concentrations (1 mg/L, 2 mg/L, 3 mg/L, 4 mg/L and 5 mg/L) were synthetically produced using standard K2Cr2O7 solution. Hourly data was collected using atomic absorption spectrophotometer for first 12 hours, afterwards 12 hourly data was measured for next three days and finally daily data was taken for rest of the days. From the analysis it was observed that after 3 days the removal efficiency of *Eichhornia crassipes, Pistia* stratiotes and Lemna minor was found as (31.2%, 23.5%), (44.5%, 40.6%) and (82.2%, 87.2%) for pH (6.5, 7.5). Moreover, although there was no notable removal of Chromium during 4 to 7 days for Eichhornia *crassipes* and Lemna minor, a significant increase in removal efficiency (90.5% and 71.6% for pH 6.5 and 7.5 respectively) was observed after 7 days for *Pistia* stratiotes. It was also observed that *Pistia* stratiotes was intolerant to Chromium contamination. Among those three plant species, Lemna minor had shown high promise to remove Chromium from industrial wastewater.

Keywords: Atomic absorption spectrophotometer, Chromium, Floating plant, Phytoremediation, Wastewater.

AS-18: Assessment of Landslide and slope stability in Sylhet City

G. M Munna & Dr. Md. Jahir Bin Alam
Department of Civil and Environmental Engineering, SUST

Abstract

Bangladesh have aggravated the landslide vulnerability in the hilly areas. During periods of intense rainfall landslides occur in Bangladesh which indicates that rainfall is a crucial factor and consequent movement of groundwater in slope stability. When rain water infiltrates into the soil it creates a positive pore water pressure that produces a hydraulic uplift force which reduces shear strength of soil i.e. it reduces cohesion and friction on potential failure surfaces. Rainfall and earthquake can trigger landslides and cutting of hillocks is proceeding indiscriminately owing to population growth and urbanization it has become very important to assess the slope stability of hillocks in different areas of Sylhet. So, main objectives of the study are to evaluate Landslide Possibility Index (LPI) value and then Hazard degree of slope also analyzing the landslides of the sylhet considering peak ground acceleration or critical ground shaking value. Landslide probability along the selected

sites in Sylhet city is evaluated with Landslide Possibility Index System (LPI).The value of landslide related features were measured based on field observation and subsequent ranking the features is the basis of this system. From the calculation it is seen that all three of sites have low hazard category and falls in moderate hazard zone. From the selected sites soil specimen was collected which shows that soils are medium sand (34~78%) to fine sand (18~ 29%). Rampant hill and hillocks cutting not only destroying the natural beauty and ecology of the picturesque of Sylhet city, but also rendering the inhabitants living at the foot of the hills to the danger of fatal landslides. Despite the fact that hill cutting is banned without proper legalization, it goes on in full swing as government does not strictly enforce laws.

BS-01: Corporate Sustainability Reporting Practices in Bangladesh

Syed Mohammad Khaled Rahmman & Dr. Md. Nazrul Islam
Department of Business Administration, SUST

Abstract

Sustainability reports are one of the modern concepts of interdisciplinary reporting. Sustainability reporting ensures the long- term sustainability of the corporate firm by providing competitive advantages. The core objective of the study is to make an evaluation of corporate sustainability reporting practices in the corporate sectors in Bangladesh. Sample size is 258 companies of 18 industrial sectors. The study is based on mainly secondary data which are collected from the annual reports of the sample companies for the period 2011-2015. There are 149 criteria for sustainability reporting in G4 of GRI (Global Reporting Initiative) in which 58 are general and 91 are specific. The content analysis method was employed to identify the presence of sustainability reporting requirements. The study found that almost half of the sectors did not disclose any information regarding society. Environmental disclosure is excessively low. In term of economic disclosure more or less all sectors disclose information. Regarding labor practice only information disclosed are fulltime employee's facility and some health and safety benefits. Information related to gender or child labor was not disclosed by any sectors. Authors found that three sectors did not disclose information related to human rights. In terms of product responsibility only 4/5 sectors disclosed information which was extremely low because they only disclosed 3/4 points. Grand total amount of product responsibility disclosure is only 1.2%. In this study it was found that the corporate, social and environmental disclosure is very low. Based on G4 index, it can be said that disclosure for sustainability is poor in Bangladesh's listed manufacturing companies.

BS-02: Tourists' attitude toward beach management and reorienting the strategies for sustainable development: a study on beach tourist in Bangladesh

Syed Towfiq Mahmood Hasan & Sobhana Tanzima Atiq
Department of Business Administration, SUST

Abstract

Not Presented in the Conference

BS-03: Impact of green banking implementation on sustainability, profitability and customer satisfaction: an empirical study

Dr. Mohammad Shahidul Haque & Mohammad Mizenur Rahman
Department of Business Administration, SUST

Abstract

The study examines impact of green banking implementation on sustainability, profitability, and customer satisfaction which is a significant issue in recent times. Green banking is a banking term used as promoting environmentally friendly practices that aid customers in reducing their carbon footprint through their banking operation activities. As a targeted goal to make all investments eco-friendly, central bank insists all commercial banks to issue at least (five) 5% direct green loan disbursement/ investment from 2016. Though it is new concept in Bangladesh, it needs to investigate whether the green financing has positively impacts on the profitability and customer satisfaction of the commercial banks in the context of Bangladesh. Thus, the core objective of this study is to find out overall impacts of green banking on the sustainability, profitability and customer satisfaction of the banks in Bangladesh. This study has conducted based on the quantitative method. Data was collected mainly from the primary as well as secondary sources. Employees and customers are the main sources of primary data while Annual reports, internal documents of the banks were considered as sources of secondary

data. Data analyzed by using SPSS 22 and spread sheet analysis. Ratio analysis, correlation and regression analysis was used as analytical tools in this study. Conclusion was drawn based on the findings of the study. The study conclude that green banking activities of the bank has direct impact of the banks has significant impact on sustainability, profitability and customer satisfaction of the banks.

Key words: Green banking; Green financing; Bank's profitability; Sustainability; customer satisfaction

BS-04: WIb Model and Performance Measurement : A Study on Primary School Teachers in Bangladesh

Dr. Md. Khairul Islam & Md. Abdul Hamid

Department of Business Administration, SUST

Abstract

The major intend of this research to examine the key influencing variables that impact female primary school teachers, analyze the work environment and organizational supports that impact on attitude towards work life balance among the female primary school teachers. In associations and on the home front, the test of work life is ascending to the highest point of many managers' and representatives' awareness. HR are the most profitable and extraordinary resources of an association. In the present quick paced society, instructive foundations look for choices to decidedly affect the primary concern of their resources, enhance personnel assurance, and hold resources. Work life adjust has been one of the central point in impacting the association's productivity. A convenience sampling was used for data collection and the data collected was analyzed by using a statistical tool like Z test. Statistical Package for the Social Sciences (SPSS) version 21.0 for Windows has been used for data coding and analysis. The outcomes of this study are that the first factor divulges dependents, time flexibility, role clarity and co-worker support and the second factor extracted discloses family culture, working hours and head support. Management has to distillate on time flexibility, role clarity, co-worker support, working hours and head support for managing work life balance of the female teachers. Management also need to emphasis on dependents of the teachers.

Keywords: Work Life Balance, Primary school teacher, Factor analysis.

MS-01: Climate Change and salinity: Its socio-ecological impact in the southern districts of Bangladesh

Dr. Romel Ahmed & Dr. Narayan Saha

Department of Forestry & Environmental Sciences, SUST

Abstract

Natural and human induced climate change makes the socio-economic conditions more vulnerable for under privileged people. The consequences of climate change force to lead a complex lifestyle for the people of coastal region. This study was conducted in two contrasting saline zone of high and medium salinity in the coastal areas of Bangladesh. The change of land use and livelihoods pattern and changing trend of homestead plant diversity from 1990 to 2016 were assessed in the present study. The existing land uses capacity to provide various provisioning ecosystem services (ES) was also investigated. Household survey and FGDs were done to collect relevant information of a total 120 respondents (60 from each saline zone), 4 FGDs and 6 key informants. Livelihoods of the local people were shifted from agricultural farming to shrimp and other labor intensive job. A reduction of 34% agricultural land and increase of 38% shrimp farming from 1990 to 2016 were reported by the respondents. The changes presumably influenced by natural hazards like flood, salinity and cyclone. Consequently, natural hazards and salinity reduced the land capacity to provide various provisioning ES like food, fodder, fuel woods etc. and increased the capacity to provide shrimp and other brackish water fish as found the study areas. Due to excessive salinity homestead plant diversity significantly reduced during last 26 years and some species are now absent or very rare to find. Local people are trying to cope with the climate induced unfavorable conditions by using their indigenous and adaptive knowledge. Implication of sustainable policy for coastal area management and enhancement of resilience capacity of the local people of this area is very crucial in the current context

MS-02: Extreme Climatic Events and Adaptation of Local People in the North-Eastern Region of Bangladesh

Dr. Mohammed A. S Arfin Khan & Fahmida Sultana

Department of Forestry & Environmental Sciences, SUST

Abstract

Not Presented in the Conference

PS-17: Developing Health care System Performance Model and the Impact of Climate Change on Dengue Transmission in Dhaka Region

Dr. Azizul Baten & Dr. Md. Kabir Hossain
Department of Statistics, SUST

Abstract

Dengue is an infectious disease that causes a significant public health problem. Eearly warning dengue transmission control models with a hybrid of Stochastic Frontier Analysis and Poisson regression approach are employed to evaluate the dynamic consequences of dengue fever control strategies. Using the log-likelihood ratio test, an appropriate stochastic frontier health efficiency model has been developed. Followed by Battese and Coelli (1992; 1995), Cobb-Douglas and Translog gender-specific stochastic frontier health efficiency models are formulated and analyzed in health care system. Battese and Coelli (1995) was found better than Battese and Coelli (1992) as it showed higher general (male & female) efficiency. Female health efficiency was observed higher than male health efficiency. The number of doctors played a significant role to increase the health efficiency. Translog stochastic frontier health production model was found an appropriate than Cobb-Douglas model. The climate factors such as maximum temperature, rainfall and humidity had shown positive impact on dengue transmission. Minimum temperature and health inefficiency had shown negative impact on dengue transmission. This study provides the message to health policy makers such as the Ministry of Health and Welfare, Bangladesh, practitioners, and researchers to integrate their collaboration in exploring the strategies to reduce the future burden of the increase in dengue transmission in Bangladesh. Keywords: Climate Change, Health Care System, Dengue Transmission, Stochastic Frontier Analysis, Poisson Regression Approach

PS-19: An evaluation of the health status of adolescents of the North-Eastern part of Bangladesh

Dr. Sumonkanti Das & Mr. Sabbir Tahmidur Rahman
Department of Statistics, SUST

Abstract

Background: Overweight and obesity in childhood and adolescence have increased substantially worldwide over the past four decades. In Bangladesh, the exact proportion of overweight and obese children and adolescents are not yet estimated. The study has attempted to evaluate the health status of adolescents aged 10-19 years living in the Sylhet district. Objectives: The main objectives were to determine the proportion of overweight and underweight adolescents at Sylhet district and its sub-district levels, and to explore the risk factors of overweight for the target adolescents. Data: A systematic PPS sampling procedure is followed to select 40 rural and 20 urban clusters covering all the sub-districts at first and then about 12 households were selected randomly from each of the selected clusters. Finally a total of 730 adolescents were included in the analysis. Methods: The BMI-for-age z-score recommended by WHO (2007) instead of BMI has been utilized in this study to determine the health status of the adolescents. Exploratory data analysis including chi-square and gamma tests was implemented to explore the independently associated explanatory variables. Finally, crude and adjusted logistic regression models have been applied to determine the ultimate risk factors of adolescents' health status. Necessity of considering cluster effect has also been assessed using likelihood ratio test. Results: The proportions of Overweight, Healthy and Underweight adolescents were 14.1%, 67.3% and 18.6% respectively with considerable variation by sub-districts. A number of environmental, socio-demographic, physical activity and dietary habit related variables are found independently associated with adolescents' health status. Adolescents' household socio-economic status (SES), small households with hygienic sanitation, use of electronic device during meal, and participation in physical activities are found as the ultimate determinants of overweight and obesity in the Sylhet district. Conclusions: The study shows that the adolescents who belong to urbanized locality with access to modern infrastructure are more likely to be overweight. Findings of the study also alarm the guardians about the risk of overweight and obesity for the adolescents who have better household environment with access to electronic devices and junk food, and limited scope of physical activities due to overloaded academic activities. Keywords: Dietary habit, Physical activity, Overweight, Sylhet District, Underweight

PS-20: Sea Beach Erosion and Its Impacts on coastal livelihoods & Tourism is Cox's Bazar

Md. Tarikul Islam Rana and Nusrat Jahan Koley
Department of Geography & Environment, SUST

Abstract

Cox's Bazar sea beach is the longest unbroken sea beach and globally regarded as the natural sandy beach. The movement of sand in this sandy beach is a normal natural occurrence, but when too much sand is moved at a time, or too little sand is produced that is a problem. It is known as beach erosion. This research was conducted in order to provide the initial framework for analyzing the beach erosion and its impact on coastal livelihoods. Moreover, the study tried to present the changing trend of beach erosion of Cox's bazar coast. By using a series of satellite remote sensing data, topographic and coastal maps, spatio-temporal changes in erosion and responsible causes were recorded and evaluated. Field survey was conducted to understand the present erosion status, a physical survey of sediment collection was conducted by using 'Agur' of 1.5ft, 2ft and 4ft. Five areas from erosion prone beaches were selected as sediment sampling stations. These samples were used to determine the present sediment status of the beach through its grain size distributions. For this analysis both the methods (Sieve and Hydrometer method) were used. Besides, a detail questionnaire survey was done to know about the changing trend of shoreline and its impact on coastal people due to beach erosion over 20 to 30 years. Data were collected from adult respondent of local inhabitants as well as the persons who involved with tourism sectors. Primarily shoreline detection map have been prepared and ground truthing has been done to check the changing pattern and erosion status of the study area. The study revealed that erosion has been increased at kolatali moor and Himchari area. It has also observed that accretion has occurred at diabetic point up to 2010 but this point is now dominant by tidal creeks having medium grain size of 0.2-0.6mm and also started to erode from the recent years at an alarming rate as the sand washed over into lagoons/inlets and removal of beach sediments by run off which is increasing due to rapid urbanization and constructional activities from Laboni point to the beach of Diabetic points. Now the accretion has occurred Nazirertek area which is formed by the fine-very fine sediment(less than 0.075mm) and dominated by coastal sand dunes. Moreover, extensive erosion has been evaluated at kolatali moor to south kolatali (old marine drive road). About 1.7 Sq.km beach areas have been eroded between 1972 and 2010. According to respondents, the shoreline was 1.60 to 2.00 Sq.km away from present marine drive road. In this study, changes have been identified particularly, in agricultural sectors and hill forest coverage. The present study has been discussed about the total sandy beach and its total amount of erosion and has also been integrated between remote sensing data, grain size data & people's perception regarding beach erosion. From the study it is found that Sandy beaches with comparatively coarse sand particles (0.6-2mm) are the rapid erosion zone of the Cox's Bazar coast due to human intervention. From this study, Continuous surface run-off flow over the beaches, lack of supply of sands, destruction of beach berm and sand dunes, storm surges are identified as the major reasons of Cox's Bazar Beach erosion. This study also reveals that due to beach erosion 65% people have lost land recourses, 23.75% people have to change their occupation from agriculture to fishing and 26.25% agricultural labor become fisherman and. due to losses of land and local erosion refugees, beach area getting polluted and destructed as a result it lost the beauty to attract the tourist. Though Beach erosion and deposition are the natural phenomena but now a days, its alarming rate become a disaster to the coastal people. Therefore, Stop waste water draining and continuous surface run off over the beach, save the sand dunes and sea grass and ripple bars, creation of mangrove forest near at Nonierchara, Kustora ghat and Reju khal etc preventive steps can minimize the human induced erosion as well as the problems of Cox's Bazar Beach.

PS-21: A Study on Comprehensive Earthquake Preparedness and Awareness in Sylhet City Corporation: The case of word no.1

Md. Bahuddin Sikder & Md. Muyeed Hasan
Department of Geography & Environment, SUST

Abstract

Bangladesh hasn't been subjected to any large damaging earthquakes in the recent past but in the past few hundred years, several large fetal earthquakes hit here. All the major recent earthquakes have occurred away from major cities, and have affected relatively sparsely populated areas. This has limited the human casualty and the economic losses. However, 1993 Killari, 2001 Gujrat and 2005 Kashmir earthquake in India has amply demonstrated that inappropriate construction technology may lead to high casualty levels even for moderate

earthquakes.

If a powerful earthquake striking in major urban centers like Dhaka, Chittagong, Sylhet, then in a result, there may be massive properties are subjected to be damage and destruction and may the entire nation have suffered a long-term for this consequence. After the independence, most of the major urban centers have grown tremendously because of integral migration from the smaller town and rural areas. Thus, the cities have developed in unplanned way and there is little consideration of proper town planning norms. For that reason, it will need to plan a logical mitigation effort in order to minute effects of these disasters. Through the introduction of suitable mitigation programs, the level of damage of structure and casualty that happened for future earthquake can be reduced. Theses mitigation programs can be run two ways like structural and non-structural. The structural programs directly influence the performance of building stock though strengthening the code provisions and prevalent construction practices. It is so much important as appropriate construction practices reduce the vulnerability of any building type. The non-structural programs included improvement the awareness and preparedness level, monitoring land use pattern and the infrastructure related to response following a disaster. Through these programs, it will be possible to reduce the casualty levels following an earthquake.

In order to reduce the consequence of a major earthquake in the cities of Bangladesh, it is necessary that appropriate structural as well as non-structural measures be undertaken.

The main objective of the study was to show the awareness and preparedness of the respondent about earthquake. Along with that also wanted to see the current buildings situation. To find out the result total survey result was divided into few categories like present status of buildings, knowledge of earthquake, participators perception, earthquake awareness and preparedness. This study was conducted in the Ward no. 1, Sylhet City Corporation. Data were collected from a sample randomly selected 320 buildings out of 1201 since in this project, building counted as a population. The data were collected through personal interview and side-walk observation during the period of October - November 2016.

The findings revealed that most of house about 79.06% had high building performance score which means that vulnerability of those buildings was low if compared with 7.19% moderate and 13.75% poor performance score. Moreover, majority of the respondents about 58% were feeling safe in their houses. From the field observation, it was found that most of the respondent didn't take any suggestion from engineering before building a house. But higher safe status was found because of abundance of low rise building (almost 60%).

Again, the findings revealed that 37% participants had sufficient knowledge about earthquake wherein 36% inquired having good sense about tremor and others didn't know about quake.

From the survey data analysis, it was found that though majority of the persons have enough knowledge about earthquake but most of the respondent had medium earthquake awareness about 55.6% compared to 16.6% having high and 27.8 had poor earthquake awareness. Participants claimed that though this region is highly vulnerable but lack of proper training by the Government or NGO's, they were not able to understand what to do before such disaster. Due to that reason their preparedness level was very low. And it was assumed that these participants will be suffered mostly during and after earthquake.

Technical Session 05

Day 2 (23.01.2018); Time: 2:00 - 5:00 pm; Venue: SUST Research Centre

Session Chair: Professor Dr. Md. Shamsul Haque Prodhan, Dept. of GEB, SUST

AS-22: Optimization of antioxidant activity from freeze dried Jackfruit (Artocarpus heterophyllus Lam.) seed and pulp by using response surface methodology (RSM)

Mohammad Afzal Hossain & Mukta Roy

Department of Food Engineering & Tea Technology, SUST

Abstract

Response surface methodology (RSM) was applied to optimize the experimental conditions for maximum yield of antioxidant activity from jackfruit seeds and pulps. Three independent variables such as solvent Types (ml), temperature (°C) and time (min) were studied to optimize the extraction condition. Extraction of antioxidant compounds from freeze-dried powder of jackfruit seeds and pulps were optimized. Antioxidant activity of the extracts was determined by the scavenging activity of 1,1-diphenyl-2-picrylhydrazyl (DPPH) radical, total phenolic compounds (FCR) and ferric reducing antioxidant power (FRAP) assay. DPPH values for pulp and seed were varied from 45% to 67.90% and 49% to 72.14% respectively. Total phenolic content (FCR) were varied from 2.27 to 5.42 and 2.109 to 5.02 mg GAE/100 g DM for pulp and seed respectively. FRAP for pulp and seed were varied from 63.30 to 156.39 mg AAE/100 g DM and 54.90 to 298.00 mg AAE/100 g DM, respectively. From the optimization method, the optimum conditions for maximum antioxidant activity for seeds were as follows: temperature 65 °C and time 10 (min), DPPH 8.7683%, FCR 2.81788, FRAP 149.993 and desirability 0.998; and the maximum antioxidant activity for pulp were as follows: temperature 50 °C and time 10 (min), DPPH 45.4276%, FCR 3.06958, FRAP 129.058 and desirability 0.99. This method could be utilized industrially to prepare crude extract for food additives to protect food products and retain sensory quality.

AS-23: Tea waste management by converting it to bio-energy in Bangladesh

Mr. Ramkrishna Saha & Dr. Animesh Sarker

Department of Chemistry and Food Engineering & Tea Technology, SUST

Abstract

The project is all about tea waste management that means tea biomass convert into biomass energy. For this experiment collected Tea waste (drier upper side), Tea waste (sorting side), Tea waste (Dryer side), Tea waste (after consumption) were collected from Gazipur Tea State. After preparing the sample, total energy was calculated by Bomb Calorimeter and Channiwala and Parikh (2002) and that of Boie's (1953).

$$HHV = X1C + X2H – X3\ S – X4\ N + X5\ O + X6\ A$$

Where, C, H, O, N, S and A in equation, represents carbon, hydrogen, oxygen, nitrogen, and sulfur and ash contents of materials expressed in mass percentage on dry basis. After getting the higher heating value, we recognized the quantity of bio-energy from tea biomass. In tea processing the raw materials, energy, labor and water are the major inputs that generate solid wastes as dusts and stalks, liquid wastes as fermented liquor and gaseous waste like flue gas and exhaust off tea dryer. Tea production in Bangladesh faces a great challenge due to high cost of production. By managing tea waste in a reproductive way may help to reduce the cost of tea production as well as contribute to build up a better environment though in food processing industries a few studies have been done on designs on waste management systems ignoring vital wastes. The project goal is to find out more efficient technique for managing tea waste which is economically viable and beneficial.

AS-24: Study on Tea (Camellia sinensis) Compounds of Anti-Microbal Activities

Md. Belal Hossain Sikder & Md. Hazrat Ali

Department of Food Engineering & Tea Technology, SUST

Abstract

Natural products are affluent source of therapeutic agents for the alleviation, prevention and cure of diseases. The purposes of the current study were to determine the antibacterial activity on some selected gram negative and gram positive bacteria like, E. coli, Pseudomonas spp., Klebsiella spp. and S. aureus, respectively by using

extracts (polyphenols) of juvenile and fresh leaves of tea (Camellia sinensis) and to observe the response of its components. The study revealed prospective activity against the growth of some selected gram negative and gram positive bacterial isolates. The diameters of the inhibition zone observed and calculated for extracted polyphenols from juvenile and fresh leaves of tea showed adequate performance against those selected bacterial isolates. In disk diffusion method, polyphenol extracts have revealed effective results against Pseudomonas spp. (19.33±2.52) at 100 mg/ml concentration and S. aureus (18±3.61) at 75 mg/ml where in well diffusion method, the extracts have shown effective results against Pseudomonas spp. (17±2.65) at 100 mg/ml and E. coli (15±2) at same concentration. Considering the results of the present study, it can be indicated that extracted polyphenols from juvenile and fresh leaves of tea have great inhibitive effects against the growth of those selected bacterial isolates

LS-01: Development of New Drug from Local Flora: Pharmacological Evaluation of Bioactive Compounds from Medicinal Plant for Anti-Arthritis Effects in Disease Model

Dr. Md. Abdullah Al Mamun & Rehana Parvin

Department of Genetic Engineering & Biotechnology, SUST

Abstract

Background: Rheumatoid arthritis (RA) is an autoimmune disease that involves in chronic inflammation, cartilage and bone destruction, and synovial hyperplasia in the joints. Although the pathogenic mechanisms have not yet been fully elucidated, inflammatory cells and cytokine networks found to play pivotal roles in synovitis as well as in joint destruction. Within the joints, fibroblast-like synoviocytes (FLS) and inflammatory cells produce pro-inflammatory cytokines such as interleukin-1β (IL-1β), IL-6, IL-17, and tumor necrosis factor-α (TNF-α). These cytokines attract and activate other inflammatory cells, propagating a vicious inflammatory cycle that leads to joint destruction. The current clinical treatment regimens for RA are anti-arthritis drugs, which maintain bone mass by inhibiting osteoclast's functions, such as parathyroid hormones (PTH), PTH receptor analogues, calcitonin, and bisphosphates. However, the low efficacy, long lasting and possible side effects are the real challenge of these drugs to use. Therefore, a sustainable drug is desirable which can provide better and safe treatment. Traditional medicine is an important source of diverse therapeutic agents. Previous studies showed that different plant-derived flavonoid compounds could stimulate osteoblasts function, and inhibit osteoclasts functions either alone or in combination. Due to their natural occurrence and lack of side effects, flavonoids are considered to be safer than the conventional drugs in different disease including osteoporosis. Decoctions of the Tridax procumbens from leaves and root bark have been traditionally used for treatment of dropsy, anaemia, arthritis, and gout, ulcer, piles, and urinary problems. Recently, our study showed that Tridax procumbens flavonoids (TPFs) could promote the osteoblasts differentiation and bone formation. Another study found the inhibitory effects of TPFs on osteoclast differentiation and bone Resorption. Thus, it can be hypothesized that TPFs can open a new avenue to develop a cheap, potential, safe and naturally occurring drug for anti-arthritis and other anti-inflammatory disease. However, the effects of TPFs for anti-arthritis and anti-inflammatory agent remain unclear. In this study, TPFs was investigated as an anti-arthritis agent in induced arthritis-mouse model

Methods: For the current experiment Tridax procumbens bioactive compound was prepared in a multistep procedure and was used to analyze its potential in the anti-arthritis activities. In vivo experiment with diseased mice model was executed in our pathology lab to evaluate the anti-arthritic potential of the plant extract.

Results: A noticeable improvement in the physical condition of the Tridax procumbens bioactive compound treated mice compared to the control mice exhibits promising prospects of this plant as a great source of herbal medicine.

LS-02: Genetic improvement of two eat fish -Shing (Heteropneusters fossilis) and Magur (Clarias batrachus) with their production performance in the GEB experimental fish pond, SUST through cage system

Md. Faruque Miah & Anindita Chakrabarty

Department of Genetic Engineering & Biotechnology, SUST

Abstract

In this study, two catfish such as stinging catfish (Heteropneustes fossilis) and Asian catfish Magur (Clarias batrachus) are two popular and high valued fish in Bangladesh and these two fish are considered for observing

genetic improvement as well as growth performance in cage system. Among several approaches are practicing in the world to genetic improvement of fish, crossbreeding has the advantage of simplicity and the often immediate and visible impact on animal performance. In Bangladesh very limited researches has been recorded for genetic improvement of particular few fish and genetic improvement of these experimental two fishes are incredibly limited, however, induced breeding program of these fish are recorded. In this study, the specific objectives of this research are to observe the genetic improve of two catfish - Shing (Heteropneustes fossilis) and Magur (Clarias batrachus) through breeding biotechnology, to detect the genetic improvement through marker biotechnology and to assess the growth performance through cage system.

In this study induced breeding and embryonic development of Shing was observed but unfortunately, during the experiment embryonic development of Magur fish was not observed due to limited facilities. Therefore, embryonic development of Shing was observed where induced breeding and embryonic development of shing has already been established. However, in this study of embryonic and larval development some new informations were generated which will be help to induced breeding of this fish. The latency period was found 8 hours where the previous study it was found 8 to 24 hours Haniffa & Sivasubbu, (2002) 21 to 24 hrs Roy and Pal, (2006). The incubation period was found short (22 -23 hrs, 8 mins) at 29ºC which was found long in earlier studies (16-18h at 26ºC) (Kohli and Vidyarthi 1990). The diameter of fertilized egg was found 1.3 to 1.5mm which was previously found 1.4 to 1.6mm (Thakur et al. 1974). 1st cleavage with 2 cells was found by 15-20 min which was found 30 min by Thakur et al. (1974). 16- cell stage was observed in 90 min and this little bit more (70-80 min) than the previous study (Thakur et al., 1974). Morula stage was observed in 120 min where Thakur et al. (1974) observed in 100 min.

In this study, the growth rate of shing, H. fossilis under different stocking densities (70,100, 130, 160 and 200) using cage system was recorded. The results indicate that, the growth rate, in essence of biomass increment value (BIV), weight gain and length increment depends on stocking densities. It has been recorded that, the growth rate increases at lower densities, but down to a specific optimal density marks. The overall production beyond and after the optimal stocking density mark, was lower. At low stocking density, although the survival rate was higher, the overall production rate from aspects of its total biomass increment and length increment was lower. At higher stocking density, not only the mortality rate was higher, the overall growth rate was also very low. Only at an optimal stocking density (130), the rate of mortality, weight gain, length increment was recorded satisfactory for the species.

In this study, the growth performance of magur, C. batrachus confined within rectangular cages, stocked with different densities (70,100, 130, 160 and 200) of seed individuals was analyzed. The results reflect that, the growth performance, in terms of BIV, mean weight gain and mean length increment, swings with the stocking densities. Alike the cases of H. fossilis, upto a specific mark, the growth performance increases at lower stocking densities. Although the survival rate remains high at low stocking densities, the BIV, mean weight gain (g), mean length increment (cm) gets a fall and only at an optimal stocking density (130), the survival rate, mean weight gain, mean length increment illustrates a satisfactory level for cage culture of the fish.

In this study, RAPD markers were used to assess genetic diversity among 7 individuals of Shing and 7 individuals of Magur for evaluating genetic improvement of F1 generation. Genetic diversity of offspring of Shing and Magur were compared with their parents. Considering different genetic data such as banding pattern of DNA, polymorphic loci, polymorphic information content (PIC), inter individual pair wise similarity, Nei genetic similarity, genetic distance, phylogenetic relationships, allele frequency, genotype frequency, intra locus gene diversity and average gene diversity of parents and offspring of shing and magur fish were analyzed and finally in both cases higher genetic diversity was found in F1 generation than parents.

LS-03: In vivo and Biochemical Assessments of Nutritional and Medicinal Values of Satkara (Citrus macroptera) Fruits in Its Maturity Stages

Dr. Md. Jahangir Alom & Sabrina Suhani

Department of Genetic Engineering & Biotechnology, SUST

Abstract

Natural products have been a good source of nutrition, therapeutic agent and treatment of various diseases. In this study, nutritional and antioxidant value, antimicrobial activity and cytotoxicity of three varieties of satkara (Citrus macroptera) fruit peels (BARI, Advance Line and Local) at different maturity stages were evaluated. Highest amount of total soluble sugar was found in the mature stage of local variety (2.8±0.496 %gm) and

lowest value was found in ripen stage of Advance line (0.8±0.12 % gm). Amount of reducing sugar was obtained highest in mature local variety (0.6±0.248 % gm) and ripen advance line had the lowest amount (0.09±0.014 % gm). Non-reducing sugar content also had similar result (highest in mature local variety; 1.9±0.124 % gm and lowest in ripen advance line 0.67±0.05 % gm). Amount of starch was comparatively higher in the mature stage (1.9±0.248 % gm; highest in local) than the ripen stage (1.4±0.001% gm; highest in local). Lowest values in both mature and ripen stage was recorded in the advance line (0.9±0.141 % gm and 0.5±0.14 % gm respectively). The amount of sugar and starch content seemed to decrease with the change of maturity. The total amount of antioxidant increases with the change of maturity. Highest content was observed in ripen BARI (0.025±0.008 % gm) and lowest content was found in BARI mature stage (0.012±0.001 % gm).

The antioxidant activity seemed to increase with the change of maturity. DPPH activity was seemed higher in the local variety comparing to the other varieties. Total phenolic compounds was found highest in the ripen stage of local variety (129.23±4.57 mg/gm). Lowest amount was recorded in the mature stage of BARI (79.74±2.74 mg/gm). Amount of total flavonoids was found highest in the mature stage of BARI (27.43±4.27 mg/gm) and lowest amount was recorded in the ripen stage of local variety (17.16±1.33 mg/gm).

Satkara (Citrus macroptera) fruit peels ethanol extracts have shown promising value for having antimicrobial properties. In the disc diffusion method, 400 µg/disc concentration showed the maximum antimicrobial activity followed by 250 µg/disc and 500 µg/disc concentration.

Cytotoxicity satkara (Citrus macroptera) fruit peels ethanol extracts using brine shrimp lethality bioassay have proven to be very high toxicity. Highest toxicity was seen in the BARI at ripen stage having LC50 value of 6.11 µg and lowest toxicity was observed in local variety at mature stage having LC50 value of 19.46 µg. Toxicity was seemed to increase significantly with the change of maturity.

LS-04: Molecular and immunological Characterization of local Naked Neek (Na*/Na*) and Aseel Chicken and evaluation of growth performance of F1 Cross progeny to development meat production traits

Md. Javed Foysal and Mohammad Jahangir Alam

Department of Genetic Engineering and Biotechnology, SUST

Abstract

Not Presented in the Conference

LS-05: Isolation, Characterization and Molecular Cloning of Genes Encoding Cellulose and Protease Enzymes from Fungal and Bacterial Isolates Obtained from Municipal Solid Wastes

Dr. Md. Abul Kalam Azad & Dr. Mozammel Haque

Department of Department of Genetic Engineering and Biotechnology, SUST

Abstract

Proteases and cellulase enzymes have wide range of applications in numerous industries such as leather processing, detergent industries, textile and paper industries, bioremediation, food industries etc. The ultimate purpose of the project is "Bioconversion of organic muncipal solid wastes (MSW) into bioresources through production of industrially important protease and cellulase enzymes. With these views, we had isolated and identified (16S rDNA sequencing for bacteria and 18S rDNA sequencing for fungi) some bacterial and fungal species that can produce significant level of protease and cellulase enzymes (Azad et al. 2013, Daud 2011, Ahmed 2013 and 2016, Sohag et al. 2013). The project of the fiscal year 2016-2017 was proposed for (i) genome-wide characterization cellulase genes in the pertinent species of the fungal isolates, (ii) isolation and characterization of the open reading frame (ORF) of cellulase encoding genes from the fungal isolates, (iii) Production of alkaline protease enzyme from bacterial isolates using organic MSW as raw materials, and (iv) purification and characterization of protease enzymes. Genome-wide analysis in the pertinent species of fungal isolates revealed that the genomes of *A. oryzae, A. fumigatus* and *A. flavus* had 23, 25 and 22 cellulase genes, respectively. A full-length open reading frame of Endo-(1,4)-β-Glucanase gene was isolated from the genomic DNA of the fungal isolates by PCR and characterized with boinformatics analysis. Protease from the bacterial isolates was produced by fermentation of organic municipal solid wastes, partially purified and characterized, which dehaired cow skin and degraded raw protein. Cellulase of fungal isolates produced with cellulosic waste material of municipal solid wastes was characterized, which could successfully degraded cellulosic papers.

LS-06: Study the toxicological effect of heavy metals (arsenic and lead) on early embryonic development using a zebra fish model

Dr. Mohammad Jakir Hosen & Md. Hammadul Hoque

Department of Genetic Engineering and Biotechnology, SUST

Abstract

AIM: To get insights the toxicological effect of heavy metal arsenic (As) on early embryonic development using Zebrafish as a vertebrate model.

METHODS: Controlled breeding followed by comprehensive microscopy was conducted to compare the embryonic development after exposed to different ranges of As from 4-120 hours post fertilization with control.

RESULT: Zebrafish embryoes exposed to 12mM As displayed comparable developmental delay compared to control. At 3 day post fertilization, a distinct phenotype appears in As treated embryos which can be characterized by decorianated embryos, bigger eggmass, pericardial edema, abnormal heart rate, and abnormal head development. Remarkably, death rate of the treated embryos were higher compared to control.

CONCLUSION: The overall results suggested that exposure to As may cause abnormal embryonic development. These results will not only give new insights for the management of pregnant mother in the As exposed area but also explain increased miscarriage/ abortion rate in As water drinker pregnant mother.

Key Words: Arsenic, Embryonic development, Heavy metals.

LS-07: Molecular Characterization and Identification of plant Parasitic nematodes in the soils of Malnichara Tea State, Sylhet

Dr. Md. Kamrul Islam & Md. Shahadat Hussain Chowdhury

Department of Genetic Engineering & Biotechnology, SUST

Abstract

Tea is one of the leading cash crops in Bangladesh and makes significant contribution to the economy. It is with this reason that intensive studies are needed for a proper maintenance and sustainable tea production. Nematodes are roundworms in the phylum nematoda; in the soil they are a very diverse group of organisms and are represented in most soil types. The extent of diversity of microorganisms in soil is seen to be critical to the maintenance of soil health and quality since nematodes play a critical role in decomposition of organic matter, nutrient cycling and also cause serious damage to crops. This study aims to identify groups of nematodes that are associated with soil in Lakkatura tea garden, Sylhet sadar, Bangladesh. Nematodes were extracted and recovered from soil samples using a modified Baermann funnel method and Baermann funnel method. The isolated nematodes were identified and characterized under a light microscope based on their morphological features. Ten nematode genera belonging to plant feeding, and fungivores nematodes were identified. Nematodes recovered included Helicotylenchus spp., Rotylenchus spp., Aphelenchus spp., Longidorus spp., Ditylenchus spp., Hoplolaimus spp., Filemchus spp., and Meloidogyne spp. The study showed that there is diversity of soil nematodes inhabiting tea soils in Lakkatura tea garden. It was also observed that the tea soils in Lakkatura tea garden had a very high occurrence of fungal feeding nematodes and the pH of tea soil in range from 4.5-6.0.

This research also finds out the phylogenetic relationship of above mentioned identified species. Phylogenetic analysis of nematode spices showed that Longidorous kuiperi were closely related to Helicotylenchus and Ditylenchus which clustered with Aphelenchus avenae. While Filuenchus filiformis are clustered with Hoploaimus columbus and Meloidogyne incognita were closely related to Rotylenchus robustus. The relentless were shown in all eight species. Phylogenetic study demonstrates that above mentioned eight species and their related species were genetically as well as evolutionally related to existing well recognized virulent nematodes. The diversity and effect of pathogenic and nonpathogenic nematodes against tea plant requires should be studied and documented and host parasites molecular crosstalk between nematodes and plant should be studied thoroughly.

LS-12: Development of novel, antibiofilm and anti-virulence approaches to combat against biofilm Producing multi-drug resistant pathogenic microorganisms

Dr. S. M. Abu Sayem & Ziaul Faruque Joy

Department of Genetic Engineering & Bio-Technology, SUST

Abstract

Not Presented in the Conference

LS-10: Study of Dengue Serotype Distribution in Bangladesh using Ed-III As a Detection Tool

Dr. Shamim Ahmed & Payal Barua

Department of Bio-chemistry & Molecular Biology, SUST

Abstract

Bangladesh has the highest population density with rapid and large demand of urbanization, the emergence of dengue after the year of 2000 generated huge number of cases along with morbidity and mortality. The prevalence trend to show upward trend twice a year; once during May-June and the other Sept-Oct. Cases are found in other months of the year too. Though a goal set by the Communicable Disease Control (CDC), Bangladesh to contribute to the reduction in morbidity and mortality from dengue fever/ DHF to such an extent that they are no longer major public health problems in Bangladesh by 2016, Bangladesh lacks the serotype distribution data as well as immunological studies of severity. Moreover non-specific yet expensive diagnostic procedure poses another burden in disease management. This study contributes to the understanding of Dengue disease path physiology at molecular level and helps to find out a simple, cost effective way of serotype diagnosis in Bangladesh context and found that Purified ED-III is non-toxic and could evoke protective immunity and antibody response was serotype specific with minimal or no cross reactivity with other serotype. EDIII ELISA can detect the anti EDIII antibody in naturally infected patients' sera and the detected antibody response is significantly high in Den4 ED-III. Therefore, it is recommended that the EDIII ELISA for early confirmation of Dengue can be used as a diagnostic tool

LS-11: Association of Angiotensin Converting Enzyme Gene Insertion / Deletion Polymorphism with Risk of Cardiovascular Disease in Bangladesh population

Khandaker Atkia Fariha & Dr. Ajit Ghosh

Department of Bio-chemistry & Molecular Biology, SUST

Abstract

Angiotensin converting enzyme (ACE) plays an essential role in two physiological systems, one leading to the production of angiotensin II and the other to the degradation of bradykinin. The wide distribution and multifunctional properties of these peptides suggest that ACE gene could be involved in development of myocardial infarction (MI) in various populations. In previous studies, ACE insertion/ Deletion (I/D) polymorphism has been reported to be associated with MI in various population. However, some studies have presented conflicting results. In this study, we aim to explore the association between ACE I/D polymorphisms and the risk of MI in Bangladeshi population. For this, a total of 15 subjects; 13 with MI & 2 healthy controls were recruited. Whole blood genomic DNA was extracted using Thermo Scientific GeneJET Genomic DNA purification Kit, #K0721. Polymorphisms in the ACE gene were detected using Polymerase Chain Reaction (PCR) method. Data were analyzed using Statistical Package for the Social Sciences (IBM SPSS Statistics for Windows, IBM Corp., Armonk NY, USA) version 17. Unpaired students 't' test & Chi-square test were performed where appropriate. The comparison of the two groups revealed no difference regarding gender, age, height, weight & conventional risk factors including smoking, family history of diabetes mellitus, hypertension. In our study we found a distinctly different allelic pattern of ACE gene polymorphism between the patient and control group. Our results show that the ACE DD genotype (p= 0.01) is significantly more prevalent among controls than in MI patients. Interestingly, in all the MI subjects, the genotype was found to be homozygous insertion (II) or heterozygous insertion/deletion (I/D) and all the controls were found to have homozygous deletion (DD) polymorphisms. This study found strong association of ACE polymorphisms with risk of MI. The study therefore suggests that the II genotype of ACE might be involved in increasing the susceptibility to development of MI in Bangladeshi population. However the recruited study subjects were very small. Further study is required with large volume of population to find out more accurate outcome.

Technical Session 06

Day 2 (23.01.2018); Time: 9:30 - 1:00 pm; Venue: SUST Research Centre

Session Chair: Professor Dr. Md. Nazrul Ialam, Dept. of BUS, SUST

SS-13: "মাজার সাংস্কৃতির আর্থ-সামাজিক প্রভাব: সিলেট ভিত্তিক সমীক্ষা

ড. মোঃ আশ্রাফুল করিম এবং ড. মোঃ রিজাউল ইসলাম
বাংলা বিভাগ, শাবিপ্রবি, সিলেট।

Abstract

বাংলাদেশের মানুষের ধর্মীয় জীবনে মাজার একটি গুরুত্বপূর্ণ স্থান দখল করে আছে। সাধারণ মানুষের বিশ্বাস মাজারে শায়িত সাধুপুরুষ পার্থিব জীবনের নানা সমস্যা সমাধানের ক্ষেত্রে বিশেষ ভূমিকা পালন করে থাকেন। উপরন্তু সিলেটকে বলা হয় পূণ্যভূমি বা ৩৬০ আউলিয়ার দেশ কিংবা আধ্যাত্মিক রাজধানী। ১৩০৩ খ্রি. হযরত শাহজালাল (রহ.) কর্তৃক বিনা রক্তপাতে সিলেট বিজয়কে ভিত্তি হিসেবে বিবেচনা করলে আজ প্রায় আটশত বছর ধরে হজরত শাহজালাল (রহ.) ও হজরত শাহপরান (রহ.) ৩৬০ আউলিয়ার সমাধিস্থল অর্থাৎ মাজারকে কেন্দ্র করে এক বিশাল ও বৈচিত্র্যধর্মী সংস্কৃতি গড়ে উঠেছে যাকে বলা যায় মাজারসংস্কৃতি। যাকে আমরা বলতে পারি বাঙালি সংস্কৃতির একটি প্রাগ্রসর রূপ। কেননা এখানে বিভিন্ন ধর্মের কৃষ্টি কালচারের মিলিত রূপ পরিলক্ষিত। মাজারে যিনি শায়িত আছেন তিনি নিঃসন্দেহে ইসলাম ধর্মের অনুসারী। কিন্তু তাকে কেন্দ্র করে তার মাজারে যে সমস্ত কর্মকাণ্ড যুগ যুগ ধরে চলে আসছে তাতে মিশেছে বিভিন্ন ধর্মের মানুষের রীতি-রেওয়াজ। মাজারে যেসমস্ত কর্মকাণ্ড আচারিত হয়ে আসছে তা মূলত বাঙলার লোকধর্ম থেকে উদ্ভুত।

ফিল্ডওয়ার্ক ভিত্তিক এই গবেষণাকর্মটিতে বাঙালি সংস্কৃতি আর মাজারসংস্কৃতি তুলে ধরে দেখানো হয়েছে মাজারসংস্কৃতি বাঙালি সংস্কৃতির একটি পরিশীলিত ও পরিমার্জিত প্রাগ্রসর রূপ। যা বাংলার সামাজিক, অর্থনৈতিক, সাংস্কৃতিক, রাজনৈতিক প্রভৃতি ক্ষেত্রে প্রভাব বিস্তার করে চলেছে। বিশেষ করে অর্থনীতি ও সংস্কৃতিতে। সিলেটে মাজার দর্শনার্থীদের সমাগম সারা বছরই লেগে থাকে। মাজারের উরসের সময়ে দর্শনার্থীদের সংখ্যা কয়েকগুণ বেড়ে যায়। যার ফলে সিলেটের অর্থনীতিতে তাদের অংশগ্রহণ উল্লেখ করার মতো। এতে করে সিলেটের অর্থনীতি সমৃদ্ধ হলেও সাময়িক ক্ষতিগ্রস্ত হচ্ছে মাজারভক্তরা। আজকের মাজারসংস্কৃতি রূপে আমরা যাকে অবহিত করছি তা একদিনে গড়ে উঠেনি, কালের পরিক্রমায় আজকের রূপ পরিগ্রহণ করেছে। এই মাজারসংস্কৃতি মূল ইসলাম ধর্মে না থাকলেও বাংলার লৌকিক ধর্মে এর শিকড় বহুদূর বিস্তৃত। তাই বাংলার লৌকিক ইসলামে মাজারকে দেখা হয় ধর্মীয় জ্ঞানে। এর ফলে মাজার সমাজজীবনের প্রতিটি ধাপে অর্থাৎ সামাজিক-সাংস্কৃতিক-অর্থনৈতিক-রাজনৈতিক প্রভৃতি ক্ষেত্র প্রভাব বিস্তার করে চলেছে।

SS-14: Project on Sustainable Solid Waste Management: An Ecocritical Approach

Md. Mizanur Rahman & Md. Abu Hena Pohil
Department of English, SUST

Abstract

Nature has been treated with painstaking attention in literature—starting from Geoffrey Chaucer, the first established poet in English literature, to recent key figures in literary boulevard Margaret Atwood, Thomas King, Rebecca Solnit, et.al. To a great magnitude, all literary works—be it European or North American—address environment and environmental activism. In *The Country and the City* (1973), Raymond Williams, the British cultural studies expert, explains English literature's contribution to nature at great length. But dejectedly, now, mankind is committing ecocide, and making the planet inhospitable for humans and more-than-humans life (*Contemporary Literary and Cultural Theory* Nayar 241). From a quintessential perspective, ecocriticism is a critical mode that looks at the representation of nature and landscape in a cultural text, paying particular attention to attitudes towards "nature" and the rhetoric employed when speaking about it (Nayar 241-42). Taking ecocritical discourses as a key theoretical framework, this community facing project seeks to answer some questions—for example, in what way/s we can develop a household waste management through community engagement and what role environmental humanities play on that front—about household waste management. While examining and investigating the existing procedure of managing household waste, this community facing project attempts to aware community members from selected areas about the hazards of waste; in addition, the project also attempts to raise consciousness about environmental and health benefits—not commercial benefits as it accelerates more waste, among the community members.

Key-Words: apocalypticism; environmental humanities; waste; garbage; toxic discourse

SS-21: Using Bloom's Taxonomy to Evaluate the Cognitive Levels of the Term Final Questions of the Department of English, SUST from 2001 to 2016

Md. Ishrat Ibne Ismail & Talukdar Mohammad Mishbah Uddin
Department of English

Abstract

Not Presented in the Conference

SS-22: Indigenous Students at SUST: Opportunities and Challenges

Dr. Himadri Sekhar Roy & Muhammad Alamgir Toimoor
Department of English, SUST

Abstract

Indigenous students of our country are no different from any other student and their ethnic identity should not be a bar to create a bond with the mass body of the mainstream students. There is no denying the fact that the indigenous population forms a very small portion of our total population and hence the number of indigenous students shall not be a very big figure. However, given the fact that they are discharging a valuable contribution to our culture by creating diversity and thus enhancing our economic development, it is our responsibility to address the issues and challenges, which they face when they come out of their communities and start socializing with the mainstream population on campus. Indigenous students' languages and cultural practices are remarkably different from those of the mainstream and it is likely that these differences may cause discomfort and marginalization at the outset of their campus life. Campus not only ensures education for its students but it also is supposed to make sure that its students learn how to cohabit in a culturally diverse situation. While the mainstream students commonly get an advantage being the majority, the indigenous ones often find themselves falling short of it. It is therefore our responsibility to make sure that the problems and challenges that our indigenous students usually face are properly and timely addressed. This research work mainly focuses on finding out the challenges that they face and how to resolve them.

SS-15: Anthropological Study on Tanguar Haor: Ecological Change and its Impact on Haor Area Population

Amina Khatun & Sk. Nasrin Haque
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Abstract

Bangladesh is a country of vast wetland resources and has been estimated to have at seven to eight million hectares, which is about fifty percent of the land surface. The greater part of the northeast region consists of wetland basins and is characterized by the presence of numerous large, deeply flooded depressions, known as haors, baors and beels between the rivers. According to World Resource Institute Sylhet basin covers a large number of haors and wetlands like Hakaluki haor, Tanguar haor, Hail haor etc. Major natural disaster and multiple use of haor wetland resources tremendously affected the haor ecology and also affect the population who are dependent on those haor. Tangua is the core of the northern haor which held 40% of all waterfowl recorded during the February/March 1992 survey. Tangua Haor has also been identified as the single most important major fish production and dispersal centre in the region. Many researchers have been conducted about the biodiversity of haor and its impact on ecology. Those studies show that huge use and waste of those resources how affect the environment. This is very important that degradation of biodiversity will be endangered the natural flora, fauna, fishs, birds, aquatic resources. Although human is the main actor in those resources and their betterment and livelihood development can make the earth sustainable but few research was conducted about this. It is very important to study the effects of environmental degradation on human population. This study is undertaken to understand the current situation of haor wetland-dependent area population and habitat in the region.

SS-16: Impact of Schooling incentive programs on female education: A Study on Kulaura Thana

Korima Begum & Sumena Sultana
Department of Anthropology, SUST

Abstract

This study attempts to examine the impact of schooling incentive program specifically, female secondary stipend program on female education. In this regard, 90 respondents of different categories like students, teachers and parents were selected as sample through stratified random sampling and in-depth interview was used as a method of data collection. Data indicates that this program has significant, positive impact on the enrollment of girls despite the fact that amounts of money are not adequate enough to meet up the educational expenditure. Moreover, student selection procedure is not appropriate. Besides, conditional cash transfers have negative impact on child labour and child marriage and school drop-out. In fact, findings indicate that parents want to

educate their girls but poverty is their main obstacle

SS-17: An Application of Structured Decision Making Process in Approaching Deforestation of Bangladesh

Abul Fozol Muhammod Zakaria & M. Javed Kaisar Ibne Rahman
Department of Anthropology, SUST

Abstract

Deforestation is a global phenomenon with a critical recognition. It is very visible mostly in developing countries in Asia and Southern America. In many regions where forest loss is significant, so much effort has been garnered towards protecting the natural forest and promoting sustainable forest management (SFM). Evidence of such efforts includes the various policies, principles, and frameworks put in place both at the international and domestic levels. Despite these efforts, forest depletion continues to thrive at alarming rates particularly in developing countries like Bangladesh. This paper brings out a plethora of complex causes and consequences of deforestation in Sylhet, Bangladesh, with the principal objective of using a structured decision-making (SDM) approach to address deforestation in Sylhet through a pluralistic stakeholder engagement that represents all the objectives of the various groups in a very understandable manner. Mainly deploying FGD to consult different stakeholder groups, representing different interests working through the steps of SDM, the exercise developed a SDM framework with suggested alternative approaches towards addressing deforestation in Sylhet, Bangladesh. Based on the judgments of the exercise, suitable policy options for addressing deforestation in Sylhet, Bangladesh should focus on maximizing forest management, minimizing dependence on forest resources, and Alternative 'A' (Safe guarding forest by improving forest management). This case study provides insights on how SDM can be implemented for SFM in the real world, as well as some challenges and opportunities encountered during the process.

SS-18: Causes of Drug Addiction and Challenges to Rehabilitation: A Study in Sylhet City

Sanjay Krishno Biswas & Md. Safiqul Islam
Department of Anthropology, SUST

Abstract

The study investigated the causes of drug addiction and challenges to rehabilitation in context of Sylhet city. Drug abuse and addiction is a complex social problem that is linked with multiple social crimes, family violence and loss of healthy life. Drug addiction is denoted as "Hot Cake". Hot Cake as meaning drug business is increasing, addiction and drug dependence is increasing as increasing drug dependence disorders. According to the Department of Narcotics Control (2013) there are 47 lac people are drug addicted and around 80% are adolescent. The study reveals that from different classes and age's people are using drugs and youth are the major part among them. Problematic drug users are increasing but drug trafficking control, treatment and rehabilitation is very insufficient. There are misconceptions and misguiding about drug addiction and drug dependence. The study reveals that for rehabilitation we need a comprehensive and integrated policy and management measures. We need to be include relevant stakeholders in the process and to create a social space for recovery of drug addiction in a multiple way such as skill development, employment opportunity, family bonding and care, school based counselling, motivation etc. Reducing inflow of drug trafficking and business, monitoring drug markets and business are crucial. Data was collected by using structured questionnaire, in-depth interview, FGD and case history. Finally, it emphasized on three fold preventive and curative measures for drug free society are community readiness, service readiness and data and information management and dissemination. The readers of the report will be known about the instigator causes of drug addiction and major challenges towards the rehabilitation of drug addiction.

Keywords: Causes, Rehabilitation, Drug Addiction, Sylhet City, Drug Market

SS-28: Unmaking, Making, and remaking identities of the Bihari peoples of Saidpur

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Abstract

A relatively large number of Pakistanis known as the Bihari community that have been stranded in Bangladesh

since its independence in 1971. The objective of this study is to analyze the unmaking, making and remaking identities of the Biharis of Saidpur, specifically, the stateless and identity crisis status and different socio-political problems among camp based Bihari community in Bangladesh. The study has been conducted in Saidpur district, where a large number of Bihari people are concentrated. Bihari camps have selected purposively and convenient of communication. In-depth interviews and Focus Group Discussion (FGD) have been taken to collect data. Verbal and written consent has been taken from respondents, community leaders and local authority. The study shows that unmaking-making and remaking identities process of the Biharies has not been ended and stateless and identity crisis causes violation of humanity in their daily lives including violation of social rights, sexual harassment, denial of citizenship etc. Moreover, political and local influential leaders were the common sources of insecurity to their lives that exacerbated the poverty situation of the community. The study was revealed that large number of younger generation now desire to be treated as Bangladeshi. However, in practice, very little has changed for this community and effective citizenship rights are far from achieving. In conclusion, peoples' consciousness as well as the state can take proper actions to ensure the human rights of the Bihari peoples in Bangladesh.

Keywords: Bihari community, Stateless, Identity crisis, Socio-political problems, Human rights.

SS-29: Body, Behavior, and Meaning during Child Birth in Sylhet, Bangladesh

A K M Mazharul Islam & Md. Shahgahan Miah

Department of Anthropology, SUST

Abstract

Not Presented in the Conference

SS-30: A Partial Ethnography of CHT Ethnic Communities in Bangladesh

Choudhury Farhana Jhuma & Dr. Md. Abdul Awal Biswas

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Abstract

Structural formation of society and community is the long standing interest of anthropology from its holistic perspective. Over the period, social organization of local communities has been studied mostly as self-sustaining entity where traditional family formation pattern and community relation found sufficient and functional to maintain community need and securing identity issues. From the beginning of twentieth century it has been clear that this idea of isolation and homogenous feature of community have been fully interrupted in practical and intellectual genre. Polarization of economic and political system has influences the social environment of local community and in the macro level social integrity. This paper concerned with the fact that the polarization and heterogeneous community formation brings new question of survival in terms of securing identity and facing challenges of marginalization. This process have been considered here mostly in the visible emergence of new pattern of co-operative unity through social organization. Beyond homogenous ethnic identity, these social organization place light through common need and integrity in small issues which believe to find an effective interactive mechanism in coping isolation and identity crisis. The interest based social organization is micro level unit in identifying social problem and people's effort to mitigating their own limitations. Here global and national concern of CHT has made the research issue relevant to draw the research focus on CHT. The historical emphasis on the dispute and crisis over the identity of ethnic communities in CHT have been evidenced in different initiative from government and non-governmental organization. The singing of the peace accord on 2nd December 1997 has legalized the long standing expectation of sovereignty of ethnic peoples of CHT. But the development issue of CHT has gained the importance of government and global interest in CHT afterward. Various social organization continued their effort in mitigating poverty and finding other issues relating to global concern. Financed by global and local political and economic authority, these social organization has represent the changing need of the ethnic community of CHT. Here the function and need of these new pattern of social organization has been presented through the ethnographic description of social organization working on different issues of the ethnic communities of CHT.

SS-19: Problems in the Digitalization process of public sector in Bangladesh: A study of Sylhet Head post office

Mohammad Samiul Islam & Dr. S. M Hasan Zakirul Islam
Department of Public Administration, SUST

Abstract

Digitalization is generally understood as the use of Information and Communication Technology (ICT) at all levels of the Government Offices. It has been introduced to provide services to the citizens, interaction with business enterprises and communication and exchange of information between different agencies of the Government. Through digitalization, it is possible to deliver services in a speedy, convenient, efficient, and transparent manner and thus making digital Bangladesh. It makes management and administrative process more accountable, responsive and transparent. This study aims to explore the present situation of digitalization at public sector service delivery and find out the main loopholes of slow processing of digitalization. In order to clarify this study; Sylhet Head Post Office is taken as a study area. Data has been collected from the officials and service recipients by interview schedule as well as different research findings, articles published in newspaper is taken to prepare this research paper.

Keywords: Digitalization, Bangladesh Post Office, Digital Bangladesh, A2I, E-services

SS-31: Mental Health Education Program and Prevention of Antisocial Personality Disorder of Students: Vision for the future

Fakhrul Islam & Chowdhury Abdullah Al-Hossienie
Department of Public Administration, SUST

Abstract

Mental disorders account for a large proportion of the disease burden in young people during 12–24 years of age. It is estimated that at least as many as one in six adults with mental ill health will be the leading cause of disability by 2020. Undeniably, it is a serious concern in our daily life that requires attention particularly to the well-being of our children. This project investigated the leading factors of mental illness of students and the knowledge and attitude on various aspects of mental health and stress. Both quantitative and qualitative research approaches have been used followed by the objectives and three categories of respondents have been interviewed based on the survey method covered various factors such as teaching-learning methods at school, behaviors of teachers, perceptions of the guardian and the opinion on how to reduce the problems. However, children at school are facing stresses in their class works, home works and in peer interaction and most of the students at secondary school are unfamiliar with the mental illness. The students who have mental health problems can be complex and making a difference really in their everyday life, particularly in behavior, attitude and attention in the study. It is imperative to revise and improve the secondary curriculum incorporating mental health necessary.

SS-20: Political Participation of Khasi People: An analysis

Dilara Rahman & Md. Mahbub Alam
Department of Political Studies, SUST

Abstract

Political participation is a vital role for the development of a community and democracy. It is that activity which affects, shapes, changes and rebuilds the political sphere. Such activity may ranges from voting to attending a rally to committing an act of the government. People take part in politics for their strong idealism, responsibility, self-interest or merely for enjoyment. Political participation occurs in conventional, unconventional and illegal ways. There are levels of participations. Depending on the involvement, political participation may be subject, participatory or parochial (Finer: 62). Depending on the nature of political institution, political participation may be regarded as low, medium or high (Huntington: 79). Huntington creates a link between political participation and political modernization. He argues that 'political modernization involves creating of new structures, participation and secularization (Huntington: 32).' In the view of scholars, political modernization indicates political development where political participation is an inseparable part.

In Bangladesh, around 35,000 Khasi live in different parts of the country. Most of them live in different border areas around Sylhet division. In the project background chapter it has been mentioned that since 1988 to 2006 Khasi people took part in local pools for three times only and those participation occurred in a particular area of

Moulvibazar district. A major portion of them lives in different border areas of Sylhet. However, political participation of Khasi people, except some areas of Moulvibazar, is rarely seen. This work reveals the level of political participation of Khasi people and supportive or restraining elements to the trend of participating in politics in different ways.

Keywords**:** political participation, Khasi people, political culture political development