2019 9th International Conference on Environmental and Agriculture Engineering (ICEAE 2019)

August 8-10, 2019
Jeju Island, South Korea

Supported and Co-organized by

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Conference Venue

Hotel Sirius Jeju

133, Doryeong-ro, Jeju-si, Jeju-do, Korea

Tel. +82-64-743-1147  Fax. +82-64-743-1148

Email: jbm21c@naver.com

Hotel Sirius Jeju opened in March 2018 and is located five minutes away by car from Jeju International Airport.

The hotel is also equipped with elegant banquet halls, including large, medium, and small, making it an ideal hotel for both tourists and business customers.

As a four-star hotel, you can enjoy a penthouse-style indoor swimming pool with a view of the ocean and airport runway on the 10th floor, a luxurious interior with 280 rooms and premium bedding, and a wide range of bathroom items and amenities, free of charge within the hotel.
# Table of Contents

2019 Jeju Island Conference Introductions 8  
Presentation Instructions 9  
Keynote Speaker Introductions 10  
Schedule for Conference 14  
Oral Presentations 16  
Poster Presentations 35  
Listeners 41  
One Day Visit 42  
Note 44  
Feedback Information 45

## Session 1

**Topic:** Animal Nutrition and Animal Husbandry Production  
**Session Chair:** Prof. Turgut Aygün

### G0005 Presentation 1 (13:30~13:45)
The Live Weight After Shearing and the Greasy Wool Yield of Zom Ewes at Different Raising Conditions in Turkey  
*Tahsin Karakoç and Turgut Aygün*

### G0003 A Presentation 2 (13:45~14:00)
The Effect of Sulfur and Phosphorus Supplementation in the Fermented Palm Oil Fronds Based Complete Feed on the Nutrient Digestibility and Performance of Kacang Goat  
*Tri Astuti and U. Santoso*

### G1008 A Presentation 3 (14:00~14:15)
Linear measurement study of different Boer blood groups raised in Cagayan Valley, Philippines  
*Nayga, Jonathan N., Reyes, Joel L., Marcos, Mark Joker L, Gaffud, Oliva M., Balbin, Aubrey Joy M., and Sotelo, Ellaine O*

### G1005 A Presentation 4 (14:15~14:30)
Growth Performance of Red Hybrid Tilapia fed Palm Kernel Expeller Based Diets  
*Mohd Fadlly Jumadi, Ahmadilfitri Md Noor, Razam Abdul Latip and Chen Wei Li*

### G1007 A Presentation 5 (14:30~14:45)
Urine based pregnancy diagnosis in goat using barium chloride test  
*Balbin, Aubrey Joy M., Nayga, Jonathan N. Marcos, Mark Joker L, Gaffud, Oliva M., and Sotelo, Ellaine O*

### G0025 A Presentation 6 (14:45~15:00)
Nutritive Value and Invitro Digestibility Of Fermented Palm Oil Frond As Ruminant
Feedstuffs

*Nurhaita, Neli Definiati, Nur Hidayah, Tri Astuti dan Syahro Ali Akbar*

**G1010 A Presentation 7 (15:00–15:15)**

Evaluation of goat production practices among smallhold farmers in selected communities at Isabela Province, Philippines

*Nayga, Jonathan N, Andres, Mila R. Balbin, Aubrey Joy M, Quidawen, Rheia S., Mariano, Bryl, O and Castillo, Juvidel Jay P*

**G0020 Presentation 8 (15:15–15:30)**

Pig weight estimation using image processing and artificial neural networks

*Chanwit Kaewtapaee, Choawit Rakangtong and Chaiyapoom Bunchasak*

**Session 2**

**Topic:** Renewable Energy and Environmental Science  
**Session Chair:** Prof. Oon-Doo Baik

**G0035 A Presentation 1 (13:30–13:45)**

Runner Training Angle Affects Internode Length and Number of Runner Plants in Strawberries

*Jin Zhao, Ge Guo, Yali Li, Jiangtao Hu, Dong Il Kang, Yoo Gyeong Park, and Byoung Ryong Jeong*

**G3003 Presentation 2 (13:45–14:00)**

Microbial production of poly (3-hydroxybutyrate) (PHB) from rubber seed oil using Cupriavidus necator H16

*Reddy Prasad D.M., Rajashekar Pendyala, R Senthilkumar, Mohammad Hazwan Bin Azri*

**G2002 Presentation 3 (14:00–14:15)**

Voltage Fluctuation Suppression in a Weak Grid Connected with a Mega Wind Farm

*Aroun Sanelath and Ken Nagasaka*

**G3004 A Presentation 4 (14:15–14:30)**

Assessment of Water and Bioenergy Nexus in Semi-Arid Basins, A case of Tanzania’s Wami Ruvu River

*Mngereza Mzee Miraji, Xi Li, Jie Liu, and Chunmiao Zheng*

**G2021 Presentation 5 (14:30–14:45)**

Application of choice modelling on mangrove forest valuation in West Lombok, Indonesia

*Endah Saptutyningsih and Diswandi Diswandi*

**G2004 Presentation 6 (14:45–15:00)**

Emerging solid waste leachate pollutants and brewing effluent on delta eco-zones; Impact on environmental resources sustainability, a case of Niger Delta Nigeria.

*Okpara Donatus Anayo, Oruche Henry Chukwumma, and Offiong Michael Bassey*

**G2007 Presentation 7 (15:00–15:15)**

Development of an Edutainment Shaft Garden for Integrated Waste Management in the UGM Green Campus
Pita Asih Bakti Cahyanti, Kurnia Widiastuti, Cahyono Agus, Pipit Noviyani, Kemas Ridwan Kurniawan

G2016 Presentation 8 (15:15~15:30)

A PRELIMINARY STUDY ON HOUSEHOLD READINESS TO ENGAGE IN WASTE SEGREGATION BEHAVIOR IN KUANTAN, PAHANG

N. Muslim, S. Hussain, F. Abdul Ghani, M. A Mohd Rasli, S. Mohd Omar, M. F Sharif, A. A Abdul Hamid, M. Majid and N.F Ma’arop

Session 3

Topic: Agriculture and Environmental Technology
Session Chair: Prof. Byoung Ryong Jeong

G8013 Presentation 1 (15:45~16:00)

Development and Performance Evaluation of a Grain Probe Moisture Meter for Paddy

   Arlene C. Joaquin, Maria Elizabeth V. Ramos and Romualdo C. Martinez

G8016 Presentation 2 (16:00~16:15)

Influence of carbon dioxide and nitrogen source on sustainable production of succinic acid from Miscanthus hydrolysates

   Mariusz Kuglarz, Monika Rom

G1009 A Presentation 3 (16:15~16:30)

Development and pilot testing of animal traceability system to improve goat farm performance data collection in Cagayan Valley, Philippines

   Nayga, Jonathan N., Canete, Diosdado C, Marcelo, Edmund Jan D. and Balbin, Aubrey Joy M.

G0012 A Presentation 4 (16:30~16:45)

Wheat quality as influenced by non-chemical method for disinfestation using radio frequency (RF) heating system

   Roland Macana, Tolen Moirangthem, Adedayo Oke and Oon-Doo Baik

G0013 A Presentation 5 (16:45~17:00)

The efficiency of nitrogen-fixing bacteria on growth of purple waxy corn Fancy Muang 111 seedling

   Sirinapa Chungopast

G2005 Presentation 7 (17:15~17:30)

Improving Nutrients in Cattle Manure by Converting It into Biogas Sludge and Compost

   Ambar Pertiwiningrum, M A Wuri, D Setiyana, R Budiarto, C A Dwi Koranto and M Gozan

G0034-A Presentation 8 (17:30~17:45)

Cytokinins Differentially Affect Runner Formation in Strawberry ‘Sulhyang’ and
‘Maehyang’

Yali Li, Jiangtao Hu, Hao Wei, Dong Il Kang, Yoo Gyeong Park, and Byoung Ryong Jeong

G2015 Presentation 9 (17:45~18:00)
Effects of the combinations of 6 materials on the improvements in contaminant removals from surface water: purification mechanisms and adsorption kinetics

ZM Zhao, ZF Wang, Cheng Mengyu and YJ Zhang

Session 4

Topic: Ecology and Hydrogeology
Session Chair: Prof. Khaled M. Bali

G2010 Presentation 1 (15:45~16:00)
Exploring Eco-Friendly Travel towards Sustainable Water Transport in Bangkok

P Iamtrakul and T Wongbumru

G2022 Presentation 2 (16:00~16:15)
Early Warning System Through Sustainability Livelihoods Approach for Volcanic Disaster Management

Diah Setyawati Dewanti, D Ayuwat and S Yongvanit

G2001 Presentation 3 (16:15~16:30)
Assessment of the Mountain orography impact on the formation of precipitation, snow cover and river hydrology

Inom Normatov, Rano Eshankulova, Matlyuba Normatova

G2019 Presentation 4 (16:30~16:45)
Application of handheld X-ray fluorescence spectrometer for major element analysis and characterization of geological samples in Southern Thailand

Sasikarn Nuchdang, J Channuie, O Leelanupat and D Rattanaphra

G2006 Presentation 5 (16:45~17:00)
Engineering and Integrated Bio-cycles Management for Rehabilitation of Degraded Tin Mining land in Tropical Region

Cahyono Agus, Dewi Wulandari, Idi Bantara, Benny P Hutaehaean, Tri Lestari

G2011 Presentation 6 (17:00~17:15)
Effects of plastic film in a loosed powder form of sample preparation on elemental analysis by portable X-ray fluorescence spectrometer

Sasikarn Nuchdang, W Patthaveekongka and D Rattanaphra

G8014 Presentation 7 (17:15~17:30)
Mathematical description of the flows near the bottom of the Ocean

Andrei Giniatoulline

G2020 Presentation 8 (17:30~17:45)
Exploring Spatial and Temporal Distributions of Air Quality in China from 2013 to 2017

Yan Liu and Liming Suo

G3006 Presentation 9 (17:45~18:00)

- 6 -
Methodology of Methane Emission Accounting in Petrochemical and Chemical Industries of China

Ting Zhang, Yujue Zhang, Yanrui Chang, and Duoduo Duan, Xuezhi Liu

Poster Session (13:30~18:00)

G0014 A: Mechanism of hepatic lipid droplet breakdown during hibernation in Chinese Soft-Shell Turtle (Pelodiscus sinensis)

Yufei Huang, Hong Chen, Sheng Yang, Xuebing Bai, Ping Yang, Waseem Ali Vistro, Imran Tarique, Qiusheng Chen

G8003: Finite element modeling and robust control of plant protection machine boom

Jingyang Zhang, Xiangdong Wang and Shuijiang Li

G0016 A: Effect of palmitic acid on insulin resistance and lipid metabolism disorders in BRL-3A cells

Yao Yao, Longlong Li, Zhihao Jiang, Haitian Ma

G8009: Adaptive Backstepping Robust Control of Nonlinear Spray Boom System

Shuijiang Li, Wei Wang

G1014 A: Limit design of sewage permit for livestock farm based on watershed management

Fu Rao, Hu Yu, Wang Li

G2026-A: Responses analysis of typical vegetation of Poyang Lake to water depth and submergence frequency

Ruonan Wang, Xiaobo Liu, Wenqi Peng, Cuiling Jiang, Xuekai Chen

G0015-A: Mechanisms of (-)-Hydroxycitric acid reducing fat deposition in primary liver cells of chicken embryos

Longlong Li, Yao Yao, Zhihao Jiang, Ji Cao, Huihui Zhang, Zhongmiao Yang, Haitian Ma


Hamidreza Ghasemi Damavandi, Reepal Shah, Dimitrios Stampoulis, Yuhang Wei, Dragan Boscovic, and John Sabo

G0017-A: In vivo study on the efficacy of Dehydroepiandrosterone in dextran sulfate sodium-induced murine experimental colitis

Ji Cao, Longlong Li, Yao Yao, Zhihao Jiang, Huihui Zhang, Zhongmiao Yang, Haitian Ma
Welcome to HKCBEES 2019 conference in Jeju Island, South Korea. The objective of the Jeju Island conference is to provide a platform for researchers, engineers, academicians as well as industrial professionals from all over the world to present their research results and development activities in the field of Environmental and Agriculture Engineering.

2019 9th International Conference on Environmental and Agriculture Engineering (ICEAE 2019)

Papers will be published in the following journal:

Journal of Advanced Agricultural Technologies (JOAAT, ISSN:2301-3737),
and all papers will be included in the Ulrich’s Periodicals Directory, Google Scholar, Engineering & Technology Digital Library, Crossref and Electronic Journals Digital Library.

International Journal of Environmental Science and Development (IJESD ISSN: 2010-0264),
and all papers will be indexed by Scopus (Since 2019) and included in the Chemical Abstracts Services (CAS), CABI, Ulrich Periodicals Directory, Electronic Journals Library, Crossref, ProQuest.

Conference website and email: http://iceae.org/index.html; icaaa@cbees.net
Presentation Instructions

Instructions for Oral Presentations

Devices Provided by the Conference Organizer:
Laptop Computer (MS Windows Operating System with MS PowerPoint and Adobe Acrobat Reader)
Digital Projectors and Screen
Laser Sticks

Materials Provided by the Presenters:
PowerPoint or PDF Files (Files should be copied to the Conference laptop at the beginning of each Session.)

Duration of each Presentation (Tentatively):
Keynote Speech: about 35 Minutes of Presentation and 5 Minutes of Question and Answer
Regular Oral Presentation: about 12 Minutes of Presentation and 3 Minutes of Question and Answer

Instructions for Poster Presentation

Materials Provided by the Conference Organizer:
The place to put poster

Materials Provided by the Presenters:
Home-made Posters
Maximum poster size is A1
Load Capacity: Holds up to 0.5 kg

Best Presentation Award
One Best Oral Presentation will be selected from each presentation session, and the Certificate for Best Oral Presentation will be awarded at the end of each session on August 9, 2019.

Dress code
Please wear formal clothes or national representative of clothing.
Keynote Speaker I

Prof. Khaled M. Bali
University of California, San Diego, USA

K. M. Bali is an Irrigation/Water Management Advisor and County Director at the University of California Desert Research and Extension Center in Holtville, California. He holds a Ph.D. Degree (1992) in Soil Science (soil physics) and MS Degree (1987) in Water Science (Irrigation and Drainage) from the University of California at Davis. He holds a Bachelor of Science Degree (1984) in soils and irrigation from the University of Jordan, Amman. His main fields of scientific interest include water resources and management, water quality, irrigation systems, automation of surface irrigation, evapotranspiration, salinity, water quality, and reuse of wastewater for irrigation. Dr. Bali is a member of many professional societies as American Geophysical Union and United States Committee on Irrigation and Drainage. He is a U.S. Fulbright Scholar and served on a number of National and International Scientific Committees.

Topic: “Variable Rate Irrigation Practices on Orchards”

Abstract—Orchard growers in California are under continuous pressure to grow orchards with limited water supplies. In recent decades, pressurized micro-irrigation systems have greatly improved distribution uniformity and water use efficiency of applied water. However, different portions of a field may have varying water and fertilizer requirements due to soil spatial variability, water quality, climate and other factors influencing tree growth across the block. Most irrigation systems have little capacity to differentially irrigate different sections of the field to account for various factors that affect crop water needs. Water applications to the entire field are based on the needs of the ‘weakest’ areas, which may lead to over applications and reduced system efficiency and yield potential. Variable rate irrigation (VRI) systems may improve water use efficiency by tailoring irrigation zones and sets to meet changing tree water requirements. We are testing here VRI system on a 70-acre block to document the impact of using such technology on crop yield, water use efficiency, economic feasibility, and potential improvements in energy and fertilizer use efficiency.

Keynote Speaker II

Prof. Dennis Y.C. Leung
the University of Hong Kong, Hong Kong

Prof. Dennis Y.C. Leung received his BEng (1982) and PhD (1988) from the Department of Mechanical Engineering at the University of Hong Kong. He had worked with the Hongkong Electric Co., Ltd. for five years heading the air pollution section of the company before joining the University of Hong Kong in 1993. Professor Leung is now a full professor and associate head of the Department of Mechanical Engineering specializing in environmental pollution.
control and renewable & clean energy development. He has published more than 420 articles in this area including 260+ peer reviewed top SCI journal papers. He was invited to publish more than 20 review articles in leading energy and environment related journals. His current h-index is 60 and total citations are more than 14000. He is one of the top 1% highly cited scientists in the world in energy field since 2010 (Essential Science Indicators) and named as a Highly Cited Researcher by Clarivate Analytics in 2017 and 2018. Prof. Leung has delivered more than 60 keynote and invited speeches in many conferences as well as public lectures.

**Topic:** “Vacuum ultraviolet light assisted photocatalysis for efficient degradation of air and water pollutants”

**Abstract**—Photocatalytic oxidation (PCO) is one of the fastest developed technologies for the control of environmental pollutants (in both gaseous and aqueous state) as well as for energy production (such as hydrogen generation and dye-sensitized solar cell). The PCO process is normally triggered by the irradiation of UV light. The most widely used UV sources in PCO are 254 nm and 365 nm UV lamp. However, conventional PCO process has disadvantages such as recombination of electron-hole pair in photocatalyst leading to low process efficiency and photocatalyst deactivation. In order to improve the efficiency and stability of the PCO process, UV lamps with small fraction of 185 nm UV irradiation (denoted as VUV lamp) can be used to activate photocatalysts. 185 nm VUV lamps cannot only irradiate photocatalyst but also generate active oxidants such as O and OH radicles, and ozone all of which enhance the oxidation of the organic fraction of the pollutants. These can also kill microbes in the air and water, and therefore have disinfection effect. In this talk, the results of VUV enhanced photocatalytic degradation of common VOCs (such as toluene and benzene) and water pollutants (such as methyl blue and acrylic wastewater) together with its disinfection effect will be presented and discussed. In addition, ozone is a byproduct generated in the process that can enhance the oxidation and disinfection effects but can also cause harmful effects on our health. The removal of the residue ozone using modified catalyst will also be discussed.

### Coffee Break and Group Photo Taking

10:15~10:30

**Keynote Speaker III**

Prof. Koh Hock Lye
Sunway University, Malaysia

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**H.L. Koh** was born in Penang, Malaysia. He received his BSc from University of Malaya in 1970 and MA as wellas PhD in mathematics in 1971 and 1976 respectively from University of Wisconsin, Madison, USA. He was the recipient of Oppenheim Prize of University of Malaysia and Fulbright Scholarship USA and DAAD Fellowship. He served as an Associate Member of the International Centre for Theoretical Physics (ICTP) from 1986 to 1992. He is currently a Professor at Sunway University Business School. He has served for 40 years in Universiti Sains Malaysia before continuing his research at Sunway University. His fields of specialization include environmental and ecologicalsystem modeling and simulations, integrated river basin management andmodeling, numerical modeling of tsunami hazards and numerical simulation of dengue and H1N1 epidemics. Prof. Koh has many journal publications, notably in Water Sciences & Technology, Environmental Monitoring and Assessment, Water Quality Research Journal of Canada, Pollution in the Urban Environment,
Topic: “Smart Sustainable Cities: Reflection on Water, Food Security and Demise of Ancient Civilizations”

Abstract—Empowered with the transformative capability for achieving sustainability that enhances environmental integrity, social justice and economic viability, cities are the optimum strategic scale for action on climate change mitigation and adaptation. Constrained by a highly disrupted water cycle, cities are vulnerable to acute and chronic water crisis. Premised on different motivations and diverse interpretations, aspirational ambitions on “smart” sustainability city (SSC) may result in a disconnect between goals and outcomes. Being smart is closely associated with information communication technology (ICT), which exerts a heavy burden in the financial resources of SSC. SSC campaigns worldwide appears to have been driven in part by branding, with potential consequences that are not anticipated. Emerging economies that are attempting to mimic SSC aspirations of developed economies should pay close attention to the potential disconnect between reality and aspirations. The ultimate goals of SSC are quality of life, good health, vibrant ecosystem services (accessibility to nature, clean water and local food), carbon neutral and zero waste. Deficient in financial capital and human resources, emerging economies are particularly vulnerable to water and food insecurity. Lessons from the demise of ancient civilizations due to water and environmental stresses and food shortage offer opportunity for deep reflection on SSC.

Keynote Speaker Ⅳ
Prof. Byoung Ryong Jeong
Gyeongsang National University, Republic of Korea

Prof. Byoung Ryong Jeong has completed his PhD at the age of 31 years from Colorado State University, USA, and postdoctoral studies from University of Missouri-Columbia, USA, and Chiba University, Japan. He is a professor in Department of Horticulture and the former Dean of College of Agriculture and Life Sciences, Gyeongsang National University, Republic of Korea. He has published more than 250 papers in reputed journals and has been serving as an editor-in-chief of Horticulture, Environment and Biotechnology, and president of the Korean Society for Floricultural Science. His current research is mainly on Climate Change, Conservation Biology, Genetics, Climatology, Ornamental Horticulture, Plant Tissue culture and micropropagation.

Topic: “Feasibility of Producing Flowering Plants in Plant Factories: Quality, Quality Shifting, and Positioning of Night Interruption Light Affect Flowering and Morphogenesis of Photoperiodic Plants”

Abstract—The quality, quality shifting, positioning and supplementary night interruption light (NIL) on morphogenesis, flowering, and photoperiodic gene expressions was investigated in Dendranthema grandiflorum ‘Gaya Yellow’ (qualitative short-day plant, SDP) and other photoperiodic plants. The plants grown in a closed-type plant factory under a light intensity of 100 μmol m−2 s−1 PPFD provided by light emitting diode (LEDs) under four different treatments with different sub-treatments (methodology section). The results propose that morphogenesis, flowering, and transcriptional factors of chrysanthemum were highly
affected by quality and position of the NIL. The morphological and physiological results showed that NI-B light was essential for growth and development. The photoreceptor gene expression analysis (phyA, phyB and cry1) perceived NI-R and NI-Fr in all four treatments by increasing their expression levels for early flower initiation, visually also seen in our morphological results. Further, the results also indicated that the NI-B onto the OL has a potential applicability to use in production of potted SDPs due to subsequent height inhibition. Additionally, the results represented a useful practical technique for flowering control as an alternative method of using the blackout curtains and photoperiodic lighting in different seasons.
Brief Schedule for Conference

**Day 1**

**August 8, 2019 (Thursday)**
10:00~17:00  
**Venue:** Hotel Sirius Jeju (Lobby)  
(Add: 133, Doryeong-ro, Jeju-si, Jeju-do, Korea)

Participants Onsite Registration & Conference Materials Collection

**August 9, 2019 (Friday)**
9:00~18:00  
Arrival Registration, Keynote Speech, Conference Presentation

<table>
<thead>
<tr>
<th>Morning Conference</th>
<th>Venue: Vega Hall</th>
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<tbody>
<tr>
<td><strong>Opening Remarks</strong></td>
<td>9:00~9:05</td>
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<tr>
<td>Prof. Byoung Ryong Jeong</td>
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<td>Gyeongsang National University, Republic of Korea</td>
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| Keynote Speech I         | 9:05~9:45        |
| Topic: “Variable Rate Irrigation Practices on Orchards” |
| Prof. Khaled M. Bali     |                  |
| University of California, San Diego, USA |

| Keynote Speech II        | 9:45~10:25       |
| Topic: “Vacuum ultraviolet light assisted photocatalysis for efficient degradation of air and water pollutants” |
| Prof. Dennis Y.C. Leung  |                  |
| the University of Hong Kong, Hong Kong |

**Coffee Break & Group Photo Taking**
10:25~10:40

| Keynote Speech III       | 10:40~11:20      |
| Topic: “Smart Sustainable Cities: Reflection on Water, Food Security and Demise of Ancient Civilizations” |
| Prof. Koh Hock Lye       |                  |
| Sunway University, Malaysia |

| Keynote Speech IV        | 11:20~12:00      |
| Topic: “Feasibility of Producing Flowering Plants in Plant Factories: Quality, Quality Shifting, and Positioning of Night Interruption Light Affect Flowering and Morphogenesis of Photoperiodic Plants” |
| Prof. Byoung Ryong Jeong|                  |
| Gyeongsang National University, Republic of Korea |
### Afternoon Conference

<table>
<thead>
<tr>
<th>Session 1: 13:30~15:30</th>
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<tbody>
<tr>
<td><strong>Venue:</strong> Vega Hall</td>
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<td><strong>Session Chair:</strong> Prof. Turgut Aygün</td>
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<th>Session 2: 13:30~15:30</th>
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<td><strong>Venue:</strong> Mir Hall</td>
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<tr>
<td>8 presentations-Topic: “Renewable Energy and Environmental Science”</td>
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<tr>
<td><strong>Session Chair:</strong> Prof. Oon-Doo Baik</td>
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### Coffee Break

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<td>15:30~15:45</td>
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### Day 3

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<th>Session 3: 15:45~18:00</th>
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<td><strong>Venue:</strong> Vega Hall</td>
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<tr>
<td>9 presentations-Topic: “Agriculture and Environmental Technology”</td>
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<tr>
<td><strong>Session Chair:</strong> Prof. Byoung Ryong Jeong</td>
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<th>Session 4: 15:45~18:00</th>
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<td><strong>Venue:</strong> Mir Hall</td>
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<tr>
<td>9 presentations-Topic: “Ecology and Hydrogeology”</td>
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<td><strong>Session Chair:</strong> Prof. Khaled M. Bali</td>
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### Poster Session: 9:00-18:00

### Dinner 18:00

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<th>Venue: Restaurant in the Hotel</th>
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**August 10, 2019 (Saturday) 9:00~17:00**

### One Day Visit

**Tips:** Please arrive at the conference to upload or copy PPT into the laptop room 10 minutes before the session begins.

**Note:**
1. The registration can also be done at any time during the conference.
2. The organizer doesn’t provide accommodation, and we suggest you make an early reservation.
3. One Best Presentation will be selected from each presentation session, and the Certificate for Best Presentation will be awarded at the end of each session on August 9, 2019.

Session Chair: Prof. Turgut Aygün

G0005 (Session 1) Presentation 1 (13:30~13:45)

The Live Weight After Shearing and the Greasy Wool Yield of Zom Ewes at Different Raising Conditions in Turkey
Tahsin Karakoç and Turgut Aygün
Van Yüzüncü Yıl University, Faculty of Agriculture, Department of Animal Science, Van, Turkey

Abstract—In this research, the live weight after shearing, the greasy fleece yield, and the clean fleece percentage of Zom ewes a variety of Akkaraman breed in different maintaining conditions were investigated. The animal material consisted of a total of 300 head of Zom ewes in different flocks raised in the villages of Avdalı (n= 60), Gözenek (n= 60), Alatosun (n= 60), Tezhırap (n= 60), and Ziyaret (n= 60) in Diyarbakır city of Turkey. Zom ewes were sheared using shearing scissors at the beginning of June and beginning of July. Each of body weight of ewes after shearing and ewes' greasy fleece was weighed using electronic digital weighing scale with 100 g sensitivity. Fleece samples were taken from area of the last rib on the right shoulder of 12 head of ewes in each flock. Then, analysis of clean fleece percentage was performed in the laboratory. For Zom ewes, the effect of shearing age on greasy wool yield was not significant in Avdalı, Alatosun, Tezhırap, and Ziyaret villages, but it was significant (p<0.05) in Gözenek village. The effect of body weight after shearing on greasy wool yield was significant at (p<0.01) level in Gözenek village, (p<0.05) level in Alatosun and Ziyaret villages, but it was not significant in Avdalı and Tezhırap villages. When all the farms were generally evaluated, the effect of shearing age and the farm on greasy wool yield was found significant (p<0.05), the effect of live weight after shearing was statistically significant (p<0.01).

Least-squares means for greasy wool yield of Zom ewes raised at Avdalı, Gözenek, Alatosun, Tezhırap and, Ziyaret villages were 1.33±0.04, 1.48±0.05, 1.30±0.03, 1.35±0.03, and 1.39±0.04 kg, respectively. When all the farms were generally evaluated, least-squares mean for greasy wool yield of Zom ewes was 1.37±0.02 kg. The effect of age on live weight after shearing in villages of Tezhırap and Ziyaret was significant (p<0.01) but not significant in other farms. For Zom ewes, the average live weight after shearing in all the villages was 13.3±0.04 kg.
found as 56.14±0.32 kg. General mean for clean fleece percentage was found as 64.59±1.76% in all the farms.

**G0003 A (Session 1) Presentation 2 (13:45–14:00)**

The Effect of Sulfur and Phosphorus Supplementation in the Fermented Palm Oil Fronds Based Complete Feed on the Nutrient Digestibility and Performance of Kacang Goat  
**Tri Astuti,** and U. Santoso  
University of Mahaputra Muhammad Yamin

*Abstract*—Background and Objective: This study aimed to evaluate the effect of sulfur and phosphorus supplementation in fermented palm oil fronds based complete feed on the nutrient digestibility, feed consumption, average of daily gain and feed efficiency of Kacang goat.  
Materials and Methods: This study used a completely randomized design with 4 replicates. The complete feed consisted of 40% fermented palm oil fronds + 60% concentrate. The treatments were: (R1), Control (without sulfur and phosphorus supplementation), (R2), a diet supplemented with sulfur (R3), a diet supplemented with phosphorus (R4) a diet supplemented with sulfur and phosphorus. Results: The experimental results showed that the supplementation of sulfur and phosphorus in the complete feed significantly affected the digestibility of dry matter, organic matter, crude fiber (p>0.05), but had no effect on digestibility of crude protein (p<0.05), and performance of goats. Conclusion: It was concluded that supplementation of sulfur and phosphorus in complete feed could increase the digestibility of nutrients, but had no effect on the feed consumption, average daily gain and feed efficiency for Kacang goats.

**G1008 A (Session 1) Presentation 3 (14:00–14:15)**

Linear measurement study of different Boer blood groups raised in Cagayan Valley, Philippines  
Nayga, Jonathan N., Reyes, Joel L., Marcos, Mark Joker L, Gaffud, Oliva M., Balbin, Aubrey Joy M., and Sotelo, Ellaine O  
College of Agriculture, Isabela State University (ISU), Echague, Isabela Philippines, Research Department, ISU

*Abstract*—Upgrading is a common practice in goat production in the Philippines. Because of this, three different Boer blood groups composed of 50%Boer (B)-25% Anglo-nubian (AN)-25 Native (N), 50B-12.5AN-37.5N and 75B-6.25AN-18.75N were produced. Weight from birth and 3-month of age and linear measurement to include withers height, body length, flank girth and rump height from 93 heads of goats were analyzed using one-way ANOVA. On the production performance, there is an improvement on weight of stocks from birth to 3-months age at different Boer blood groups; and a direct relationship was observed. Thus, as the percentage composition of Boer breed increases, body weight at birth and weaning also increases. On the different linear measurement of the stocks at birth, it is noted that flank girth and withers height differ significantly (p<0.05) among the different blood groups under study; while rump height and body length is not significantly different. The record shows that stocks belonging to blood group 50B-12.5AN-37.5N has the least rump height, body length and flank girth. Moreover, stocks under blood group 75B-6.25AN-18.75N recorded the highest in all linear measurement gathered. At weaning stage (at 3-months old), it is noted that body
length and withers height differ significantly in all blood groups under study, while the difference in flank girth and rump height were found to be not significant. The measurement of stocks with 75B-6.25AN-18.75N blood composition recorded the highest measurement in all parameters gathered. In some parameters like withers height and body length, stocks under 50%B-25%AN-25N group had the lowest measurement; while in flank girth, the lowest was recorded under blood group 50B-12.5AN-37.5N and in rump height, both 50%B-25%AN-25N and 50B-12.5AN-37.5N recorded the same measurement. Thus, it suggests that the weight has direct relationship with linear measurement. As the data shows, the heavier the goat become, its linear measurement also increases.

**G1005 A (Session 1) Presentation 4 (14:15–14:30)**

Growth Performance of Red Hybrid Tilapia fed Palm Kernel Expeller Based Diets

Mohd Fadlly Jumadi, Ahmadilfitri Md Noor, Razam Abdul Latip and Chen Wei Li
Sime Darby Research Sdn Bhd

**Abstract**—This study was designed to evaluate effect of different level of palm kernel expeller (PKE) as a dietary ingredient in red hybrid tilapia fish feed. A total of 360 red hybrid tilapia male fingerlings (initial body weight of 20-30g) randomly divided into 4 dietary treatment group (3 replicates per treatment). The dietary treatment were control diet contained no PKE and other three diets were formulated with 10%, 15% and 20% PKE. All fishes were raised in a 12 separate circular fiberglass tank with water circulation system for 12 weeks. Results of this study shows that fish fed with diet containing 10% PKE diet had significantly higher (p<0.05) body weight and weight gain compared to other groups. However, increasing the level of PKE to 20% shows to depress the growth of fish, as shown by the significantly lower final body weight of fish. In conclusion, 15% of PKE can be include in fish diet without adverse effect on fish performance (final body weight, weight gain, feed intake, FCR and SGR) and water quality of tank.

**G1007 A (Session 1) Presentation 5 (14:30–14:45)**

Urine based pregnancy diagnosis in goat using barium chloride test

College of Agriculture, ISU

**Abstract**—The use of artificial insemination has been promoted to upgrade goat that are raised at the backyard level. However, after the execution of insemination, efficient screening of pregnancy should be conducted to ensure that the doe is pregnant, and if not, follow-up insemination will be conducted. In doing this, the raiser can maximize productivity of the does in the herd and can increase rate of production. Moreover, in a herd in which insemination will be first introduced, pregnancy detection must be done to ensure that only dry does will be subjected to the synchronization. With the absence of farm record, detection of pregnant doe became inefficient and chances of missing breeding cycle is high. Although there are available means to detect pregnancy including the use of ultrasound and sound wave analyzer, availability and cost of equipment as well skills in interpreting image and sound prevent utilization. Hence, application of pregnancy detection using non-invasive technique among goats is evaluated using barium chloride solution. In conducting the test, 5mL of urine
is added to 5mL of BaCl2. Samples with precipitation indicate pregnancy; while those that remain clear show that the doe is dry. Using urine samples from 1,020 does effectiveness of BaCl2 as test solution was screened. The result of the diagnosis using Confusion Matrix show that BaCl2 is 72% accurate in classifying pregnant and non-pregnant does at 42 days post breeding with 28% margin of error rate. To confirm result, return of heat and changes in body conformation were noted and used in correlation analysis. Strong inverse correlation was noted between test result and return of heat (p=-0.001) while moderate high positive correlation was observed between test result and change in body appearance (p=0.537). Hence, this study confirms that BaCl2 can be used for non-invasive pregnancy diagnosis in goat.

**G0025 A (Session 1) Presentation 6 (14:45–15:00)**

Nutritive Value and Invitro Digestibility Of Fermented Palm Oil Frond As Ruminant Feedstuffs

**Nurhaita**, Neli Definiati, Nur Hidayah, Tri Astuti dan Syahro Ali Akbar
Muhammadiyah University of Bengkulu- Indonesia

**Abstract**—This study aims to measure the nutritional value and digestibility of fermented palm oil fronds with local microorganisms (MOL) are derived from the rumen content. The study used a completely randomized design two factorial 4x2 with 4 replications for each treatment; factor A MOL dose (A1 = 0 ml /kg substrate, A2 = 5 ml / kg substrate, A3 = 10 ml/kg substrate and A4 15 ml/ kg substrate), and factor B: incubation time ( B1 = 7 days and B2 = 14 days). The parameters were measured the nutritional value of fermented palm oil fronds were content of dry matter (DM), organic matter (OM), crude protein (CP), crude fiber (CF)) and invitro digestibility of dry matter and organic matter. The results showed that fermentation reduced the dry matter, organic matter and crude fiber content (P <0.05), but increased crude protein content, dry matter digestibility and organic matter digestibility (P <0.05). The average content of DM= 35.78%, OM = 88.32%, CF = 25.52% CP = 6.15 % and DM digestibility = 56.77% and the OM digestibility = 54.65%. There was an interaction between the Mol dose and the incubation time to the nutritional value, dry and organic matter invitro digestibility. In conclusion: palm oil frond fermentation with a mol dose of 10 ml/kg substrate and 7 days incubation time produced the highest protein content of 6.72%, while the dry and organic matter digestibility was highest in a combination of Mol doses 10ml/kg substrate with 14 days incubation time respectively 65.71% and 63.32%.

**G1010 A (Session 1) Presentation 7 (15:00–15:15)**

Evaluation of goat production practices among smallhold farmers in selected communities at Isabela Province, Philippines

Nayga, Jonathan N, Andres, **Mila R. Balbin**, Aubrey Joy M, Quidawen, Rheia S., Mariano, Bryl, O and Castillo, Juvidel Jay P.
College of Agriculture, Isabela State University (ISU), Echague, Isabela Philippines

**Abstract**—Goat raising is an integral component of farming in Isabela Province, Philippines. Considered as rural asset, production became attractive due to increasing demand for goat’s meat. However, it is noted that production level below the demand. Thus, detailed study on production practices must be studied to develop intervention to improve productivity. This
The paper presents the goat farming practices adopted by smallhold raisers. Based on the responses of 180 raisers, practices related to breeding, feeding, and husbandry practices were documented. On breeding method, 90% of the respondents follow natural mating, while 10% of them adopted artificial insemination. Majority of the respondents also follow continuous breeding (81%) and most of the raisers also kept their own breeder bucks (47%), while others swap it within the community (37%) or in outside farms (16%). On production management, grazing practices is followed by most of the raisers (43%), although some raisers adopted partial confinement method (33%). Supplements in the form of vitamin-mineral administration and concentrates is also practiced. On husbandry practices, raisers follow deworming, dehorning, hoof trimming, ear tagging, castration and spraying of disinfectants in the pens. Moreover, only 36% of the raisers record the production performance of their stocks. On health management, most raisers encounter pneumonia, parasitism and scouring. Based from these practices, there is a need for improved breeding and feeding management to improve the herd population and sustain growth. Particularly on breeding, although artificial insemination is already introduced as an option to natural mating to upgrade stocks considering that majority of the raisers used their own stocks. Furthermore, in relation with feeding, although partial confinement method is adopted by most of the raisers the use of improved forages should also be introduced. Thus, using the results of these evaluation, raisers must undergo training and science-based production management must be introduced.

G0020 (Session 1) Presentation 8 (15:15~15:30)

Pig weight estimation using image processing and artificial neural networks
Chanwit Kaewtapee, Choawit Rakangtong and Chaiyapoom Bunchasak
Department of Animal Science, Faculty of Agriculture, Kasetsart University, Bangkok, 10900 Thailand

Abstract—The objective of this study was to investigate the method for pig weight estimation by using image processing and artificial neural networks. Eighty-eight crossbred pigs (Large White × Landrace × Duroc Jersey) were used. Pigs were individually weighted, measured heart girth and body length. Thereafter, the top-view images of pigs were captured, and the ratio of pig pixels to total area (image) was analyzed by using Python programming. The data was divided into two groups as training set (n=62) and testing set (n=26). The correlation of body weight and heart girth as well as body length and image was determined by Pearson correlation. The training set was used to develop equations of pig weight by regressing analysis and artificial neural networks (ANN). The mean absolute deviation (MAD) and mean absolute percentage error (MAPE) were used to measure an error of estimation. The results showed that the high positive correlation with body weight was observed in image, heart girth, and body length (0.930, 0.872 and 0.849, respectively). With regard to regression analysis, the equation including image showed a higher accuracy ($R^2 = 0.866$) when compared to the equations including heart girth ($R^2 = 0.760$) or body length ($R^2 = 0.721$) as well as the equation including both heart girth and body length ($R^2 = 0.835$). For ANN analysis, the model including image expressed a better fit ($R^2 = 0.892$) when compared to the equation obtained from regression analysis. Furthermore, ANN analysis showed lower MAD (0.618) and MAPE (6.243) when compared to regression analysis (MAD=0.630 and MAPE=6.410). In conclusion, image processing is a quick method to estimate body weight without casing stress to the pigs. The use of ANN is an alternative method to increase the
Session 2

Tips: The schedule for each presentation is for reference only. In order not to miss your presentation, we strongly suggest that you attend the whole session.

Afternoon, August 9, 2019 (Friday)
Time: 13:30~15:30
Venue: Mir Hall

8 presentations-Topic: “Renewable Energy and Environmental Science”

Session Chair: Prof. Oon-Doo Baik

G0035 A (Session 2) Presentation 1 (13:30~13:45)
Runner Training Angle Affects Internode Length and Number of Runner Plants in Strawberries

Jin Zhao, Ge Guo, Yali Li, Jiangtao Hu, Dong Il Kang, Yoo Gyeong Park, and Byoung Ryong Jeong
Department of Horticulture, Division of Applied Life Science (BK21 Plus Program), Graduate School of Gyeongsang National University, Jinju 52828, Korea

Abstract—Strawberry (Fragaria × ananassa), an herbaceous perennial crop, is a favored fruit crop with high economical and nutritive values. During commercial vegetative propagation using runner plants, excessive extension growth of runner internodes deteriorates growth conditions and thereby reduces the productivity of mother plants. Both suppression of extension growth of internodes and promotion of number of runner plants produced per runner are the keys to the increase propagation efficiency. This study was conducted to investigate the effect of runner training angle (RTA) on length of internodes and number of runners produced in strawberry ‘Sulhyang’ and ‘Maehyang’. Runners were trained for a month to grow at an angle of 0 (vertically upward), 45, 90 (horizontal), 135, or 180° (hanging down) from the vertical axis. The experiment was carried out in a glasshouse with 29/20°C day/night temperatures, an average light intensity of 450 μmol·m⁻²·s⁻¹ PPFD coming from the sun, and a natural photoperiod of 12 hours. For both ‘Sulhyang’ and ‘Maehyang’, the RTA affected number of runners, runner length, and number, fresh and dry weights of runner plants. Training at an angle of 135 or 180° shortened runner length and internode length in ‘Sulhyang’. These RTA also produced runner plants with the least fresh and dry weights in both cultivars. The RTA did not affect runner diameter, but runner morphology in both cultivars. As compared to 135°, 180° RTA increased number of runner plants produced making it the most proliferative RTA.

This study was carried out with support from the Korea Institute of Planning and Evaluation
Microbial production of poly (3-hydroxybutyrate) (PHB) from rubber seed oil using 
*Cupriavidus necator* H16

**Reddy Prasad D.M.,** Rajashekhar Pendyala, R Senthilkumar, Mohammad Hazwan Bin Azri
Universiti Teknologi Brunei, Tungku Highway, Gadong, BE1410, Brunei Darussalam.

**Abstract**—Rubber seed oil is inedible plant oil that is a potential replacement for the 
traditional organic building blocks used in PHB biosynthesis. Herein we describe the 
biosynthesis of PHB by *Cupriavidus necator* H16 grown in media with rubber seed oil and 
urea serving as carbon and nitrogen sources, respectively. The method was optimized over a 
temperature range of 30-50 °C for batch culture studies. A maximized PHB concentration of 
15.4 g/L, and dry well weight of 19.2 g/L was obtained using 20 g/L of rubber seed oil at 
30°C. Experimental results were used to generate a logistic curve, and the Luedeking-Piret 
model was implemented to predict the specific growth rate of *C. necator* at 0.1898 1/h. The 
estimated rate constants were in good agreement with experimental values. This study 
demonstrated that rubber seed oil is a viable alternative to conventional carbon sources for the 
production of PHB using *C. necator* H16.

**Voltage Fluctuation Suppression in a Weak Grid Connected with a Mega Wind Farm**

**Aroun Sanelath** and Ken Nagasaka
Tokyo University of Agriculture and Technology, Japan

**Abstract**—When a wind farm (hereafter, WF) is connected to a weak grid, the linked bus 
voltage of the system rises above the specified value, and the reactive power is consumed, so 
the security and stability of the power system may be affected. In this research, we aim to 
solve the problem of reactive power shortage due to voltage fluctuation when a mega WF is 
linked to a weak grid. First, we investigated the optimal Wind Turbine (hereafter, WT) 
selection on MATLAB/Simulink and designed the WF. Next, we used MATLAB/Simulink 
and IEEE 30 Bus Test System to investigate the penetration limits of WF and its influences on 
weak grid using three cases. As results, Vestas V100:1.8MW (Doubly Fed Induction 
Generator: DFIG) became the optimal for our study and the capacity of mega WF became 
54MW. Therefore, the penetration limits of WF to each case are measured and revealed in this 
paper.

**Assessment of Water and Bioenergy Nexus in Semi-Arid Basins, A case of Tanzania’s Wami Ruvu River**

**Mngereza Mzee Miraji,** Xi Li, Jie Liu, and Chunmiao Zheng
Peking University Beijing, China

**Abstract**—In African nations, national and regional development targets for water and energy
sectors seldom consider the nexus between the two, risking imbalances and inefficiencies in resource allocation and utilization. A typical example is the development and expansion of biofuel in the Wami Ruvu River Basin, Tanzania (WRB). Water Evaluation and Planning (WEAP) model was applied to the WRB to investigate the Water Bioenergy Nexus (WBN), specifically, whether development plan calling for biofuel expansion is a sound approach. Results show that, WBN is much stronger in the biofuel irrigation consuming 69.3% and 61% of total biofuel’s water and energy requirement respectively. By 2035 the nexus continues to be stronger consuming 54.5% and 49% of total biofuel’s water and energy requirement respectively, thus first generation biofuels use much more resources in growing than refining process. Additional 768.2 million m3 of water and 413.4 million kWh of energy are needed for planned biofuel expansion, reallocating water to biofuels in water-scarce regions inherit related problems to other sectors such as increasing water use for industry, agriculture and energy sector by 67%, 45% and 9% respectively, which could further exacerbate stresses on water and energy supplies in the basin. Biofuel generation rely heavily on energy imports, as it consumes substantially more energy than it produces. Policies should promote the development of sustainable biofuel programs that are less water intensive with very low inputs of fossil fuels.

**G2021 (Session 2) Presentation 5 (14:30~14:45)**

Application of choice modelling on mangrove forest valuation in West Lombok, Indonesia  
**Endah Saptutyningsih** and **Diswandi Diswandi**  
Universitas Muhammadiyah Yogyakarta, Indonesia

*Abstract*—A mangrove forest in West Nusa Tenggara is one of tourist destination that attracts many local and domestic tourists thanks to their natural beauty. In addition to its natural beauty, this place is also used as mangrove conservation and education-based tourism. However, there were various critical statuses in West Nusa Tenggara which damaged. The critical status is also spread in various regions on the island of Lombok, among others in the area of West Lombok Regency. The loss of mangrove forest occurs was because mangrove forests often are converted in order to generate directly marketable products, such as aquaculture that might lead to massive economic losses for the surrounding community. To make efficient resource allocation choices, decision makers need a framework to estimate the non-use values that might be held by the community for mangrove forest conservation. Non-market valuation techniques can be used for this purpose, by applying a choice modelling (CM), appears to hold some promise because it can be used to model complex situations and to frame choices consistent with ‘real life’ choices. In this paper, a CM method applied for assessing the values that the community and tourists hold for mangrove forest conservation in West Lombok, Indonesia.

**G2004 (Session 2) Presentation 6 (14:45~15:00)**

Emerging solid waste leachate pollutants and brewing effluent on delta eco-zones; Impact on environmental resources sustainability, a case of Niger Delta Nigeria  
**Okpara Donatus Anayo**, Oruche Henry Chukwumma, and **Offiong Michael Bassey**  
People’s Friendship University of Russia, Russia

*Abstract*—There is no sustainable management of effluent or any form of treatment of MSW
leachates in Nigeria. This complex liquid contains an excessive concentration of biodegradable and non-biodegradable products which includes organic matters, heavy metals, manganese, bacteria and fungi that have a capacity of polluting the plants, soil and water resources. These emerging eco-toxicants find their way onto the eco-zones of the delta resources and cause avoidable harm to the natural ecosystems. Even as biodegradation undergoes natural attenuation, it relies on several mechanisms such as dilutions, sorption, and environmental conditions etc. to proceed without human intervention. But monitoring these reductive natural processes of the concentration is not prioritized. This paper serves as an expository of the current numerical features of bacteria and fungi as well as physico-chemical parameters of current surface water, leachates, and soil samples taken in the study area. Results of microbial analysis of this study showed that microbial and fungi counts varied in all the water samples. Counts of total heterotrophic bacteria were high in samples 1 and 3 for water; samples 1 and 2 for leachate and low in sample 3 for water which served as control. However, we recommend strong environmental monitoring as a remedial solution.

G2007 (Session 2) Presentation 7 (15:00−15:15)

Development of an Edutainment Shaft Garden for Integrated Waste Management in the UGM Green Campus

Pita Asih Bekti Cahyanti, Kurnia Widiastuti, Cahyono Agus, Pipit Noviyani, Kemas Ridwan Kurniawan
Universitas Gadjah Mada, Yogyakarta, Indonesia

Abstract—Biomass productivity and organic cycles in tropical regions are the highest in the world because of increased temperature, rainfall, humidity, and sunlight year-round. Organic waste not only comes from the agricultural sector (agriculture, horticulture, plantation, forest, livestock, and fisheries), but also from non-agricultural entities (cities, market, offices, households, campuses, industries, and other sectors). Organic waste volume from the integrated campus UGM yard reached 30 tons/day, requiring the support of adequate self-managed waste management facilities. Various experimental approaches were used in designing the Waste Management Centre at UGM as part of an edutainment (education and recreation) program. The problems at the Waste Management Centre included (1) an integrated system of recreational functions in biogas and compost processing; (2) high operational costs; and (3) space efficiency for productivity and processing. Development of a ‘Shaft Garden’ was chosen a solution for (1) creating visual attraction and space experiences from biogas and compost management; (2) utilizing gravitational force as a utility distribution system; and (3) creating a sequence of spaces according to the function. Integrated organic-cycle management by empowering the 9R (Reuse, Reduce, Recycle, Refill, Replace, Repair, Replant, Rebuild, Reward) framework with a multi-function and multi-product approach has provided higher value-addition to environmental, economic, socio-cultural, and health aspects.

G2016 (Session 2) Presentation 8 (15:15−15:30)

A PRELIMINARY STUDY ON HOUSEHOLD READINESS TO ENGAGE IN WASTE SEGREGATION BEHAVIOR IN KUANTAN, PAHANG

N. Muslim, S. Hussain, F. Abdul Ghani, M. A Mohd Rasli, S. Mohd Omar, M. F Sharif, A. A Abdul Hamid, M.Majid and N.F Ma’arop
Universiti Tenaga Nasional, Malaysia

Abstract—In Malaysia, two critical issues in waste management are identified: lacking readiness towards recycling and segregating. If not properly managed, it leads to massive waste generation in the landfill. Uncontrollable massive waste generation in landfill has a various negative impact on the community. For this reason, this project aims to investigate the household readiness towards waste segregation in one of the cities in Malaysia, Kuantan. For sampling reasons, 364 houses are selected, but only 283 give the response and willing to participate in this project. This project has two main findings: i) waste generation for each residential area, and statistics on the readiness of household towards waste segregation. In conclusion, this project anticipates that very few numbers of households that are participating in waste segregation. It does reflect the current scenario in Malaysia. This number only came from one of the cities in Malaysia. With this limited study within a limited area of research, this project notes that lacking readiness would not help the government, or related agencies to make it the success of waste segregation project. In fact, this project is crucially needed for sustainable development goals.

Coffee Break 15:30~15:45

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**Session 3**

**Tips:** The schedule for each presentation is for reference only. In order not to miss your presentation, we strongly suggest that you attend the whole session.

**Afternoon, August 9, 2019 (Friday)**

**Time:** 15:45~18:00

**Venue:** Vega Hall

8 presentations-Topic: “Agriculture and Environmental Technology”

**Session Chair:** Prof. Byoung Ryong Jeong

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**G8013 (Session 3) Presentation 1 (15:45~16:00)**

Development and Performance Evaluation of a Grain Probe Moisture Meter for Paddy

**Arlene C. Joaquin,** Maria Elizabeth V. Ramos and Romualdo C. Martinez

Philippine Center for Postharvest Development and Mechanization, Science City of Munoz Nueva Ecija, Philippines

**Abstract**—A frequency-based capacitance type grain probe moisture meter was developed, as a low-cost alternative tool for accurate and rapid moisture content measurement of paddy in bags. The prototype unit consisted of a standard grain probe; a 100-gram capacity test chamber; a grain selector menu panel for control and measurement; and a handle for ease of sampling. Calibration models between frequency and dry oven method moisture contents.
were established and validated with a relatively high coefficient of determination (R2) of 0.94. Laboratory and actual field testing conducted between moisture content readings of grain probe moisture meter and standard reference oven method resulted to mean absolute error of 0.24. Likewise, field testing results conducted revealed a mean percentage error of 3.9 percent, an indication of a highly acceptable level of accuracy based on standards set by the National Institute of Standard and Technology (NIST) and United States Department of Agriculture – Grain Inspection, Packers and Stockyards Administration (USDA-GIPSA). Initial fabrication cost of the prototype unit grain probe moisture meter was approximately US$ 100.00 which is very competitive with existing imported popular brands of grain moisture meters with investment cost ranging from US$ 750.00 to above US$ 4,000.00. The prototype unit grain probe moisture meter has the advantage of simultaneously performing grain sampling and moisture content determination. Likewise, the grain probe meter can potentially save time and effort in moisture assessment and most importantly ensure the procurement of quality grains, ease in MC monitoring of stocks during storage and MC validation before storage and milling.

G8016 (Session 3) Presentation 2 (16:00~16:15)

Influence of carbon dioxide and nitrogen source on sustainable production of succinic acid from Miscanthus hydrolysates

Mariusz Kuglarz, Monika Rom
Silesian University of Technology, Poland

Abstract—This study presents sustainable succinic acid production from lignocellulosic hydrolysates, using A. succinogenes, which consumes CO2 during succinic fermentation. Optimal combination of carbon source (gaseous and/or solid MgCO3, 15-30 g/dm3) and nitrogen source (mixtures of yeast extract and hydrolyzed rapeseed cakes: 100:0, 80:20, 60:40, 50:50 and 40:60 % w/w) were experimentally determined. Obtained results stated that simultaneous addition of gaseous CO2 and MgCO3 (20-30 g/dm3) resulted in the highest sugar conversion (89-95%) and succinic yields (66-74%). Additionally, CH4 content in biogas, used as CO2 source, was increased by 21-22% and reached 91-92% after succinic fermentation with addition of MgCO3 (20 g/dm3). The course of succinic fermentation confirmed that 50% of nitrogen dosage can be added as rich in amino acids rapeseed cakes, originated from biodiesel production. Succinic fermentation with gaseous CO2 as the only CO2 or after replacing more than 50% of nitrogen dosage as rapeseed cakes, resulted in increased acetic and formic acids production (by-products of succinic fermentation). Optimal conditions of succinic fermentation (CO2 source and dosage, waste nitrogen source) identified in this study can pave the way towards sustainable production of succinic acid from lignocellulosic biomass.

G1009 A (Session 3) Presentation 3 (16:15~16:30)

Development and pilot testing of animal traceability system to improve goat farm performance data collection in Cagayan Valley, Philippines

Nayga, Jonathan N., Canete, Diosdado C, Marcelo, Edmund Jan D. and Balbin, Aubrey Joy M.
College of Agriculture, Isabela State University (ISU), Echague, Isabela Philippines
Goat raising activity has become the focus of livestock development in the Philippines due to increasing market demand. Science-based practices were introduced to smallhold raisers to improve farm productivity and to increase the herd population. To gauge the level of improvement, data collection is required. However, considering the number of the raisers, population of stocks to be monitored and the distance from each farm to another, data gathering became a concern. Monitoring the schedule of farms activities is a problem that makes recording of animal performance inefficient. Considering limited manpower, the method by which data are recorded should be innovated. As the herd continues to grow in the rural areas, monitoring of stocks and reporting of data to the project should be fast, reliable and easy on the part of the raisers and technicians. At present, the use of short messaging system (SMS) is widely adopted, as almost everyone has a cellphone. Capitalizing on the stability, access, and cost of this widely-used messaging system, an SMS-capable data transmission system from farm to the Project’s central database unit will be developed for easy monitoring of stocks. At present, different production data were coded for data transmission. Each farm under this system is enrolled to the central data-base system and farm identification was assigned. Each stock was also provided with proper identification. Codes for different production performance including birth, weaning and mature weights were developed and activities related to breeding, health management and husbandry practices were established. Movement of the animal including selling, transferring and even death can also be monitored. Today, more than 200 smallhold raisers in Cagayan Valley were mentored and enrolled in the system, and currently using SMS-based data submission. With the developed system, data gathering became more efficient, thus evaluation of farm production performance became consistent.

G0012 A (Session 3) Presentation 4 (16:30–16:45)
Wheat quality as influenced by non-chemical method for disinfestation using radio frequency (RF) heating system
Roland Macana, Tolen Moirangthem, Adedayo Oke and Oon-Doo Baik
Department of Chemical and Biological Engineering, University of Saskatchewan, 57 Campus Dr., Saskatoon, SK, Canada S7N 5A9

Radio frequency (RF) disinfestation is based on electromagnetic wave application and chemical free. It has been studied as an alternative to chemical methods for disinfestation. The 50-ohm RF heating system is an advanced type of RF technology and offers many advantages over the traditional methods for disinfestation. This paper investigated the quality of the host material (stored wheat grains) after 50-ohm RF disinfestation. The following qualities were assessed before and after RF treatment: germination of the wheat kernels, baking qualities of the flour (FN, MDT, PKH, and PBW), milling qualities of the bulk wheat grains (bran, shorts, and total yield of flour), and the physicochemical properties of the grains (moisture content, bulk and particle density, porosity, and color). The infested bulk wheat samples at different moisture content levels (12%, 15%, and 18%) were heated up to three different target temperatures (60°C, 70°C, and 80°C). The results showed that the germination of wheat kernels was not significantly affected by RF energy at 12% MC of the wheat samples. However, it was slightly affected at 15% MC and significantly affected at 18% MC. The baking qualities (falling number (FN), mixing development time (MDT), peak to height (PKH), and peak-bandwidth (PBW)) were not degraded. The FN was not significantly
affected by RF energy at all moisture content levels. The MDT, PKH, PBH were significantly affected but their values were still in the desirable range for baking. Furthermore, the physicochemical qualities of the host wheat grains were significantly affected by RF energy after disinestation for moisture content, bulk and particle density, and porosity. These changes were not negative for disinestation of stored grains at higher MCs. The changes were advantageous for drying the grains at the same time. The color and milling qualities of the wheat kernels were not changed significantly after RF treatment.

Therefore, disinestation of stored grains was possible without degrading the important qualities of the host wheat grains using 50-ohm RF energy. However, non-uniform heating was a big challenge for keeping the quality of the host materials. Thus, it is suggested to design an applicator with uniform heating of RF energy to reduce the temperature difference between the hottest spot and the coldest spot in the applicator.

G0013 A (Session 3) Presentation 5 (16:45–17:00)

The efficiency of nitrogen-fixing bacteria on growth of purple waxy corn Fancy Muang 111 seedling

Sirinapa Chungopast
Department of Soil science, Faculty of Agriculture Kamphaeng-saen Kasetsart University. Kamphaeng-saen campus. Nakorn Pathom 73140 Thailand.

Abstract—This research is intended to isolation and identification an effective nitrogen-fixing bacteria from soil and plant root, and test for plant growth in pot. The study was 6 isolates of nitrogen-fixing bacteria with different colonies on Burk's N-free medium. Morphology of each isolates was also studies. The identification of effective one isolate by 16S rRNA gene found that it was member of the genus Paraburkholderia. The comparison of effective nitrogen fixation by ammonia releasing method in Burk's N-free broth for 4 weeks showed that the highest efficiency of Paraburkholderia caribensis for nitrogen fixation within 3 weeks after culture. The selected bacteria had not only able to nitrogen fixation but also ability of indole acetic acid (IAA) production. The efficiency these bacteria on growth of purple waxy corn Fancy Muang 111 was examined. There was inoculum production of the six nitrogen-fixing bacteria then take them to seed inoculation for purple waxy corn culture. The completely randomized design (CRD) was assigned consists of 8 treatments 5 replications: T1 control, T2 peat, T3 isolate N1, T4 isolate N2, T5 isolate N3, T6 isolate N4, T7 isolate N5 and T8 isolate N6. The experimental result found that the each inoculum affected significantly different purple waxy corn growth. The root length, stem length, number of roots, chlorophyll and nitrogen content in T2–8 were significant difference when compared to the control. The high chlorophyll a was 8.79 μg/ml and the highest percentage of nitrogen content in the corn was 2.77 of Paraburkholderia caribensis. This bacteria is able to be biofertilizer for enrichment growth of purple waxy corn Fancy Muang 111 seedling.

G1002 (Session 3) Presentation 6 (17:00–17:15)

Mineral Oil Saturated Hydrocarbon in Crude Palm Oil - Current Status in Sime Darby Palm Oil Mills

Haniza Ahmad, Ahmadilfitri Md Noor, Maizatul Putri Ahmad Sabri, Rahmat Ngteni, Syed Mohd Hadi Syed Hilmi
Sime Darby Research Sdn. Bhd., Carey Island, Selangor, Malaysia
Abstract—A pilot study on mineral oil saturated hydrocarbon (MOSH) status in the crude palm oil (CPO) was conducted. Two Sime Darby Plantation Palm Oil Mills located in East and West of Malaysia respectively were selected for this study. Samples of CPO from production oil and processing lines were collected from the palm oil mills for 6 consecutive weeks. CPO samples were taken from production oil line after vacuum dryer. Processing lines samples were taken at its processing points. All samples were collected by trained personnel. Samples were analyzed using test method based on ISO17780:2015 – Determination of Aliphatic Hydrocarbons in Vegetable Oils Hydrocarbon (as Mineral Oil Saturated Hydrocarbon). Results revealed that mineral oil hydrocarbon in HACCP certified palm oil mill is at the range of 10-17ppm while non-HACCP certified mill has an average 44.81ppm MOSH. In the processing lines, samples were taken from 3 points namely, samples at the vibrating screen, clarifier underflow and decanter light phase for both premium and standard CPO line. Highest MOSH found in clarifier underflow in standard CPO line at 55.53ppm. In CPO comparison, premium CPO showed lower MOSH at 10.7ppm compared to standard CPO at 21.9ppm. There is no correlation between oil quality (FFA%) and MOSH level. In conclusion, HACCP certified mill showed lower MOSH even though the mill is producing standard CPO. Comparison between premium and standard CPO showed that premium CPO production oil has lower MOSH compared to standard CPO production oil as well as in the processing parameters as shown in samples taken from vibrating screen, clarifier underflow and decanter light phase.

G2005 (Session 3) Presentation 7 (17:15~17:30)

Improving Nutrients in Cattle Manure by Converting It into Biogas Sludge and Compost
Ambar Pertiwiningrum, M A Wuri, D Setiyana, R Budiarto, C A Dwi Koranto and M Gozan
Universitas Gadjah Mada, Indonesia

Abstract—In recent years, livestock sector in Indonesia grows rapidly. As a consequence, organic waste will increase and cause environmental pollution and health problem if it is not managed. The recycling of cattle manure for agricultural purpose can solve the waste problem. Previous studies have suggested that the use of organic waste as bio-fertilizer is good for soil. The objective of this study was to investigate the difference between untreated and treated cattle manure on their chemical properties, especially nutrient elements. Untreated cattle manure, treated cattle manure by anaerobic digesting, and treated cattle manure by composting were analyzed for their chemical properties such as pH value, water and organic content, N-content, P$_2$O$_5$, and K$_2$O concentration. The pH value of fresh cattle manure, buried cattle manure, biogas sludge, and compost were 6.8; 5.4; 6.8; and 6.9 respectively. The C organic content in treated cattle manure was lower than the one in untreated cattle manure. On the other hand, N-content, P$_2$O$_5$, and K$_2$O concentration of treated manure were higher than the ones in untreated manure. The highest N-content, P$_2$O$_5$, and K$_2$O concentration were performed by compost from cattle manure.
Cytokinins Differentially Affect Runner Formation in Strawberry ‘Sulhyang’ and ‘Maehyang’

Yali Li, Jiangtao Hu, Hao Wei, Dong Il Kang, Yoo Gyeong Park, and Byoung Ryong Jeong
Department of Horticulture, Division of Applied Life Science (BK21PlusProgram), Graduate School of Gyeongsang National University, Jinju 52828, Korea

Abstract—Strawberry (Fragaria×ananassa) is an economically important fruit crop contributing to human nutrition and agricultural output. The commercial success of this crop is due in part to it asexual propagation through runners. Almost all strawberry plants are propagated through runners instead of seeds. This study was conducted to investigate the effect of two cytokinins namely 6-benzyladenine (6-BA) and kinetin on runner formation in strawberry ‘Sulhyang’ and ‘Maehyang’. These cytokinins were applied as foliar sprays for every 10 days at a concentration of 0, 25, 50, 75 or 100 mg·L-1. The experiment was carried out in a glasshouse with 29/20℃ day/night temperatures, an average light intensity of 450 μmol·m-2·s-1 PPFD coming from the sun, and natural photoperiod of 12 hours. The results showed ‘Sulhyang’ produced more runners than ‘Maehyang’, while ‘Maehyang’ produced comparatively more inflorescences. The 6-BA increased the number of runners and daughter plants in ‘Sulhyang’ at a concentra of 50 mg·L-1 and increased the number of inflorescences in ‘Maehyang’ at a concentration of 100 mg·L-1. Both 6-BA and kinetin increased the length and diameter of the runners in ‘Maehyang’, but they had limited effect on length of first two internodes in both cultivars. In conclusions, the two cytokinins affected runner formation differently and it was cultivar-dependent. The best concentration to induce runners in ‘Sulhyang’ was 50 mg·L-1 6-BA. Kinetin did not increase number of runners, but improved length and diameter of runners in ‘Maehyang’.

This study was carried out with support from the Korea Institute of Planning and Evaluation for Technology in Food, Agriculture, Forestry and Fisheries (Project No. 118078-2). Yali Li, Jiangtao Hu, Hao Wei, and Dong Il Kang were supported by a scholarship from the BK21 Plus Program, the Ministry of Education, Republic of Korea.
Effects of the combinations of 6 materials on the improvements in contaminant removals from surface water: purification mechanisms and adsorption kinetics

ZM Zhao, ZF Wang, Cheng Mengyu and YJ Zhang
Shanghai Ocean University, Shanghai 201306, China

Abstract—The study aims to improve the pollution control and eutrophication reduction in surface water by adding various materials and explore corresponding purification mechanisms. Methods: Six materials (H2O2, NaClO, persulfate, polyacrylamide, zeolite, and montmorillonite) were added into surface water. Different dosage combinations and treatment periods were arranged in the experiments. After the treatment, the contaminant removal performance was determined the water quality and toxic effects were analyzed. Results: The optimal dosages of the 6 materials were experimentally confirmed as follows: 0.3 mg/L H2O2, 0.03 mg/L NaClO, 5 g/L persulfate, 0.4 mg/L polyacrylamide, 20 mg/L zeolite, and 10 mg/L montmorillonite. The purification mechanisms involve chemical reactions and material adsorption. Conclusion: The combination of the 6 materials can be applied in surface water treatment as a green option.

Tips: The schedule for each presentation is for reference only. In order not to miss your presentation, we strongly suggest that you attend the whole session.

Afternoon, August 9, 2019 (Friday)

Time: 15:45~18:00

Venue: Mir Hall

9 presentations-Topic: “Ecology and Hydrogeology”

Session Chair: Prof. Khaled M. Bali

Exploring Eco-Friendly Travel towards Sustainable Water Transport in Bangkok
P Iamtrakul and T Wongbumru
Rajamangala University of Technology Thanyaburi, Pathumthani, Thailand

Abstract—While traffic congestion issues has not be solved in Bangkok, Thailand, an intervention in order to improve air quality and reduce greenhouse gas emissions is required for sustaining the continuation of this urban problematic. Greening mobility in term of “Eco-Friendly Travel” is therefore the ultimate transport challenge towards sustainability that will significantly reduce greenhouse gas emissions of existing unsolved land transport. Facing this global sustainability challenge arises the need to adopt an environmental friendly mobility
culture by using participatory approach to integrate with technologies and fuel options for water transport system. This study was conducted based on a concise analysis of the current geography of canal network in Bangkok along with an introduction of “canal transit” to ask respondent of 1,200 sets from residents around the Lat Phrao canal which is one of the most potential canal in Bangkok. The results revealed its feasible option for local transport in terms of urban connectivity improvement and community-owned resources. However, it needs various improvements such as accessibility, transit services, urban activities spaces, and community activities and value-added transportation services which would be the keys to success to increase local economic competencies and sustaining water transport in Bangkok.

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<th>G2022 (Session 4) Presentation 2 (16:00~16:15)</th>
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<tr>
<td>Early Warning System Through Sustainability Livelihoods Approach for Volcanic Disaster Management</td>
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<tr>
<td>Diah Setyawati Dewanti, D Ayuwat and S Yongvanit</td>
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<td>Universitas Muhammadiyah Yogyakarta, Indonesia</td>
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*Abstract*—The main objective of this study is to analyse the early warning system of volcanic disaster management through sustainable livelihoods approach. The early warning system is the most important phase on disaster management as to reduce the risk of hazard during the eruption appear. Active volcano in Indonesia has been spread since it is located in the ring of fire. This study uses sequential mixed methodology, start with qualitative-quantitative methodology. The study area are Mt. Slamet and Mt. Merapi where located in Java island. The first phase of the research uses exploratory qualitative methodology to identify the term of indicators for Sustainability Livelihoods Approach (SLA), hereafter quantitative is to calculate the path of each variable supported to volcanic disaster management. The qualitative approach took 31 key informants spread in two village surround Mt. Slamet and 19 key informants spread in two village surround Mt. Merapi. The sample of quantitative research on Mt. Slamet is 538 respondents and 137 respondents in Mt. Merapi. SLA is supported to the early warning system. Household networking for social capital directly effect to early warning phase both volcanoes. Nevertheless, human capital, natural capital, physical capital and financial capital is indirectly effect to early warning capacities through transformation of process and structure.

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<th>G2001 (Session 4) Presentation 3 (16:15~16:30)</th>
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<td>Assessment of the Mountain orography impact on the formation of precipitation, snow cover and river hydrology</td>
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<tr>
<td>Inom Normatov, Rano Eshankulova, Matlyuba Normatova</td>
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<td>Institute of Water problems, Hydropower and Ecology, Dushanbe, Tajikistan</td>
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*Abstract*—The monitoring results of the accumulation processes of snow cover on upstream of the Transboundary Pyanj River of the Central Asia are presented. It is found that the formation of the snow cover and the spatial distribution of atmospheric precipitation in the Pamir mountain is determined by the orography of the terrain. The temperature regime and the altitude of the terrain determine the ratio of atmospheric precipitation to the depth of the snow cover. The existence of the effect of the orography influence on the promotion of air masses in mountain areas contributes to the fact that there is a shift in periods of falling out of
the snow maximum amount in different climatic zones. Assessment of the climate change impact on the formation of the Gunt River water flow was made by comparing the trend in the runoff change in the two observation periods – 1940-1970 and 1986-2016. Corresponding calculations show that the Gunt river water runoff decreases by 5% for more than 70 years. The influence of climate warming on the runoff is indicated by comparison of water values in two periods – 1940-1970 and 1986-2016. The hydrograph of the Vanch River in the relevant periods shows a shift in the maximum value of the water flow to the left, indicating an early period of melting snow cover and glaciers on the upstream of the river and a significant increase runoff in the period 1986-2016.

**G2019 (Session 4) Presentation 4 (16:30–16:45)**

Application of handheld X-ray fluorescence spectrometer for major element analysis and characterization of geological samples in Southern Thailand

**Sasikarn Nuchdang**, J Channuie, O Leelanupat and D Rattanaphra
Research and Development Division, Thailand Institute of Nuclear Technology, Phathumtani, Thailand

**Abstract**—The handheld X-ray fluorescence spectrometer (hXRF) was applied to major element analysis in the geological samples and the results were compared with the results of the wavelength dispersive X-ray fluorescence spectrometer (WDXRF). In addition, the analytical compositions were confirmed by X-ray diffractometer (XRD) and scanning electron microscopy with energy dispersive X-ray spectroscopy (SEM-EDX). In the case of pXRF analysis, eight geological reference materials were used to calibrate the analytical method and four known concentration samples were used to prove the method. In research, ten geological samples from Phuket province, Thailand were collected with different depths corresponding to O horizon (0-0.1 m), A horizon (0.1-0.3 m), B1 horizon (0.3-1.0 m), B2 horizon (1.0-2.0 m), C1 horizon (2.0-3.0 m), C2A horizon (3.0-5.0 m), C2B horizon (5.0-8.0 m), C3 horizon (8.0-12.0 m), D horizon (12.0-20.0 m) and RK horizon (> 20.0 m). The elemental analysis results showed that the pXRF results were matched well with that WDXRF results. The concentration range in ten samples were Si (18-22 wt%), Al (12-15 wt%), Fe (1-4 wt%), K (0.4-3.2 wt%) and Ti (0.2-0.4 wt%). The concentration of some elements such as Ca and Mg on those ten samples are low and they are unable to analysed by hXRF. The XRD patterns revealed that all samples consisted of quartz, kaolinite, halloysite, illite, vermiculite and biotite.

**G2006 (Session 4) Presentation 5 (16:45–17:00)**

Environmental Site Engineering and Integrated Bio-cycles Management for Rehabilitation of Degraded Tin Mining land in Tropical Region

**Cahyono Agus**, Dewi Wulandari, Idi Bantara, Benny P Hutahaean, Tri Lestari
Universitas Gadjah Mada, Yogyakarta, Indonesia

**Abstract**—Indonesia is known as the emerald of equator that has high values of natural resources although it also has a huge disaster risk. It is because Indonesia is located in the strategic areas, namely: (i) the equator, (ii) ring of fire, and (iii) earth plates of Eurasian, Pacific & Indo Australia. Mining activities of natural resources in tropical region exposes carbon and heavy metals and thus are the main cause of severe local, regional, and global
environmental damage. The change of national economic development from extraction to empowerment of natural resource will facilitate shifting paradigm from red & green economic to blue economic concept that more smart, global, focus, and futuristic. Site engineering on critically degraded land through land preparation, soil amendment & biofertilizer could facilitate a better rehabilitation of mining land and have added value on environment, economy, sociocultural and health aspect. Synergism to genetic engineering using fast-growing species (indigenous and exotic) will improve success rate of land rehabilitation. An integrated bio-cycle management for managing land resources (i.e., soil, water, mineral, air, and microclimate) and biological resources (i.e., fauna, flora, and human) is an important strategy for sustainable productivity in protective tropical ecosystems.

### G2011 (Session 4) Presentation 6 (17:00–17:15)

Effects of plastic film in a loosed powder form of sample preparation on elemental analysis by portable X-ray fluorescence spectrometer

**Sasikarn Nuchdang**, W Patthavee Kongka and D Rattanaphra  
Research and Development Division, Thailand Institute of Nuclear Technology, Phathumtani, Thailand

**Abstract**—The aim of this research was to study the effects of plastic film types and film thickness on elemental analysis by portable X-ray fluorescence spectrometer (pXRF). Mylar polyester film with 3.6 µm and 6.0 µm thickness, and 4.0 µm Prolene thin film were used in this study. Five rock samples were prepared by loosed powder method. The pXRF analysis of each plastic films was calibrated and evaluated the method with seven reference materials. The calibrated curves of three films were strongly correlated to referenced values (R² > 0.95) for Al, Ca, Fe, K, Mn, Si, Sr, Th, Ti, V, Y, Zn and Zr, except for Cu, Nb, Ni, P, U, V and W. The results showed that the pXRF could be used to determine some elements in rock samples and the thickness and types of the analyzed film influenced on the analysis. The element determination using each film required the developed method by calibration curve construction (linear regression of measured values obtained by the pXRF instrument against their certified values). In addition, the results after the recalibration of each film (both Prolene thin film and Mylar polyester film) agreed well.

### G8014 (Session 4) Presentation 7 (17:15–17:30)

Mathematical description of the flows near the bottom of the Ocean

**Andrei Giniatoulline**  
Los Andes University, Colombia South America

**Abstract**—We construct an explicit solution for a boundary value problem for a system of partial differential equations which describes small linearized motions of three-dimensional stratified flows in the half-space. For large values of t, we obtain uniform asymptotical decompositions of the solutions on an arbitrary compact in the half-space. In the vicinity of the boundary plane, we establish the asymptotical properties of the boundary layer type: we can observe a worsening of the decay in the approximation to the bottom. The results can be used in the meteorological modelling of water flows near the bottom of the Ocean, as well as Atmosphere flows near the Earth surface.
Exploring Spatial and Temporal Distributions of Air Quality in China from 2013 to 2017

Yan Liu and Liming Suo
University of Electronic Science and Technology of China, China

Abstract—In recent years, severe and persistent air pollution episodes in China have drawn wide public concern. It is necessary to analyse and evaluate the current status of air quality of China, which is significant for sustainable urbanization and environment protection. In this study, we investigate the air quality of the key 74 cities in China from 2013 to 2017 based on the data from the Ministry of Environmental Protection of the People’s Republic of China. With the use of ArcGIS and Stata, we identify the spatial correlation and agglomeration of the air quality. The significant value of Moran’s I test shows positive autocorrelation between the cities and verifies the spatial spill over effect of the air pollution. From the temporal dimension, we find the seasonal variations and an overall better-off trend of air quality. This improvement over the past year benefits from the strict regulations and governance from both central and local government. Our research provides an updated measurement and detailed illustration of the air condition in China. With the exploration of spatial and temporal distributions of air quality, the research findings facilitate the future governance and guidelines for sustainable environmental development.

Methodology of Methane Emission Accounting in Petrochemical and Chemical Industries of China

Ting Zhang, Yujue Zhang, Yanrui Chang, and Duoduo Duan, Xuezhi Liu
Beijing University of Chemical Technology, Beijing, China.

Abstract—Nowadays, the whole greenhouse effect is becoming more and more serious. It is the common mission of mankind to curb global warming. As the world's second largest greenhouse gas (GHG), the warming potential caused by methane (CH₄) is not negligible, so it is imperative to calculate and reduce its emissions. For the lack of CH₄ accounting methodology in China's petrochemical and chemical industries, this paper proposes a CH₄ accounting methodology based on the enterprise's accounting boundary. Emission sources include CH₄ emissions from fuel combustion, CH₄ emissions from flare gas combustion, CH₄ emissions from escape, CH₄ emissions from anaerobic treatment of sewage, CH₄ emissions from accidental venting. The research results are an important exploration for the accurate measurement of CH₄ emissions from enterprises in China's petrochemical and chemical industries, and also complement the research on China's greenhouse gas accounting methodology.
Mechanism of hepatic lipid droplet breakdown during hibernation in Chinese Soft-Shelled Turtle (*Pelodiscus sinensis*)

Yufei Huang, Hong Chen, Sheng Yang, Xuebing Bai, Ping Yang, Waseem Ali Vistro, Imran Tarique, Qiusheng Chen

MOE Joint International Research Laboratory of Animal Health and Food Safety, College of Veterinary Medicine, Nanjing Agricultural University, Nanjing, Jiangsu Province, 210095, China

**Abstract**—Hibernation is an adaptive survival strategy in response to cold and foodless winter. To determine the underlying mechanisms of seasonal adaptions, transcriptome sequencing studies have been conducted in bears, ground squirrels and bats. Despite advances in identifying differentially expressed genes involved in metabolism, the precise mechanisms of these physiological adaptions remain unclear. In the present study, we examined liver of Chinese Soft-Shelled Turtle (*Pelodiscus sinensis*) and found that the contents of lipid droplet (LD) and triglyceride (TG) were significantly decreased during hibernation. Increases in mRNA expression levels of lipolysis-related genes and decreased levels of lipogenesis-related genes during hibernation indicated that LD hydrolysis was stimulated during hibernation. Adipose triglyceride lipase (ATGL) was recruited and accumulated on the surface of LDs via activation of Cyclic Adenosine monophosphate (cAMP)/protein kinase A (PKA) signaling. Meanwhile, increased phosphorylation of the LD-associated protein, perilipin-5, activated the enzyme activity of ATGL via interaction between comparative gene identification-58 (CGI-58) and ATGL. These results indicated that ATGL accumulation on the LD surface and its induced enzyme activity during hibernation promoted lipolysis in the liver of Chinese Soft-Shelled Turtle (*Pelodiscus sinensis*). Besides, we also found that LDs were sequestered and enwrapped by autophagic-like vesicles and autophagic flux (LC3-II, p62) was significantly elevated during hibernation in the liver of Chinese Soft-Shelled Turtle (*Pelodiscus sinensis*). Taken together, our results indicated that lipolysis and lipophagy synergistically promoted LD breakdown during hibernation in the liver of Chinese Soft-Shelled Turtle (*Pelodiscus sinensis*), thereby enhancing mitochondrial β-oxidation to maintain energy hemostasis. The findings of the present study will therefore provide valuable insight toward the survival of Chinese Soft-Shelled Turtle (*Pelodiscus sinensis*) during hibernation.
Finite element modeling and robust control of plant protection machine boom

Jingyang Zhang, Xiangdong Wang and Shujiang Li  
School of information science and engineering, Shenyang University of Technology, Shenyang, China

Abstract—In order to reduce the horizontal deformation caused by the sprayer rigid frame of the plant protection machine, this paper establishes the structural dynamics model of the spray boom rigid frame based on the rigid frame structure commonly used in the plant protection machine spray boom, and transforms it into state space form. A robust controller based on state observer is designed. The boom frame with vibration deformation due to disturbance is controlled. Simulation results show that the method is effective in restraining the horizontal vibration deformation of the spray rod frame. The research results provide a method for restraining the vibration deformation of the spray rod frame structure of plant protection machine.

Effect of palmitic acid on insulin resistance and lipid metabolism disorders in BRL-3A cells

Yao Yao, Longlong Li, Zhihao Jiang, Haitian Ma  
Key Laboratory of Animal Physiology and Biochemistry, College of Veterinary Medicine, Nanjing Agricultural University, Nanjing, Jiangsu Province, 210095, China

Abstract—Rat liver stromal cells play important roles in lipid, glucose and energy metabolism. In order to develop a cell model of insulin resistance in rats, the BRL-3A cells (rat liver stromal cells) were treated with different doses of palmitic acid (PA; 0, 0.05, 0.10, 0.15, 0.20, and 0.25 mmol·L⁻¹). The cell viability, triglyceride content and glucose consumption were determined by a commercial kit. Western blot was used to detect insulin signaling pathway associated proteins expression and lipid metabolism-related gene expression were measured using the RT-qPCR method. In the present study, 0.25 mmol·L⁻¹ PA treatment significantly reduced cell viability and enhanced the cell mortality from 12 to 48 h. In addition, the triglyceride content and lipid droplet accumulation were significantly increased after 0.15-0.25 mmol·L⁻¹ PA treatment; 0.15-0.25 mmol·L⁻¹ PA treatment significantly reduced glucose consumption, lipolysis related factors mRNA level and insulin resistance related proteins level in BRL-3A cells. In conclusion, 0.15-0.25 mmol·L⁻¹ PA treatment caused the insulin resistance and lipid metabolism disorder in a concentration-dependent manner. Considering the cytotoxicity caused by 0.25 mmol·L⁻¹ PA, 0.20 mmol·L⁻¹ PA treated with BRL-3A cells for 24 h as the most suitable condition for building the cells model, which can be used as a follow-up to explore the optimal conditions for the construction of an ideal model for the study of insulin resistance mechanisms in rats.
Adaptive Backstepping Robust Control of Nonlinear Spray Boom System
Shujiang Li, Wei Wang
School of information science and engineering, Shenyang University of Technology, Shenyang, China

Abstract—in this paper, a two-asymmetric hydraulic cylinder electro-hydraulic servo system model is established for the spray boom. Because of spray boom vibration and tilt, which are caused by boom sprayer during its walking, and hydraulic cylinder parameter drift due to environmental changes, an adaptive backstepping control algorithm with an integral-type Lyapunov function is designed to ensure the balance of the boom and a certain height with the ground. Moreover, a higher performance nature of the proposed nonlinear adaptive robust control approach was presented in comparison to the proposed control without adaptation laws. A simulation results showed that the nonlinear algorithm has an excellent performance for the specified tracking task and strong robustness.

G1014 A Poster 5 (9:00~18:00)

Limit design of sewage permit for livestock farm based on watershed management
Fu Rao, Hu Yu, Wang Li
Research Center for Rural Economy, Ministry of Agriculture and Rural Affairs of the People’s Republic of China

Abstract—in 2015, the emissions of COD and ammonia nitrogen from livestock and poultry farming in China accounted for 46% and 24% of the total emissions of the year, and 95% and 76% of the total emissions from agricultural sources. Large-scale livestock and poultry farming is the largest source of agricultural non-point source emissions, but also an important source of environmental pollution in China. It is a major difficulty to formulate scientific emission standards in emission permits. In this paper, the discharge management of livestock and poultry farming in the watershed is taken as the research object. The pollutant discharge of livestock and poultry farms is calculated according to the watershed scale, and the response relationship between the watershed and the pollutant discharge of livestock and poultry is determined. In order to regulate the pollution control and control measures of livestock and poultry farming under different water environmental capacity targets, the emission limits of pollutants were put forward. Based on the calculation method of the optimal control technology, the technology-based limit value is obtained. According to the background value of river basin pollution, the discharge limit value based on water quality is deduced, and the most stringent one is selected to be put into the permit. The standardization of emission limits makes the emission management of livestock and poultry breeding more scientific. It is an important tool to establish a long-term management mechanism of pollution sources and promote the work of pollution reduction.

G2026-A Poster 6 (9:00~18:00)

Responses analysis of typical vegetation of Poyang Lake to water depth and submergence frequency
**Abstract**—Hydrological process is the main driving factor that controls the development and succession of wetland ecological process. Wetland vegetation communities are the significant components of wetland ecosystem. In this paper, taking Nanji Wetland National Nature Reserve, Poyang Lake as an example, the authors analyzed the tolerances and sensitivities of the five typical wetland vegetation communities to hydrological features using histogram and sensitivity index. The results showed that the tolerances and sensitivities of different vegetation communities to water depth and submergence frequency were different: (1) *Phalaris* and *Polygonum criopolitanum* had the strongest tolerance to water depth with 0.2-1.0 m and 0.8-1.6 m, respectively, on the contrary, *Triarrhena lutariae* was the weakest; *Carex* was the most tolerant to the submergence frequency with 0-69.1%, while *Polygonum criopolitanum* was the weakest; (2) compared with submergence frequency, these five typical vegetation communities were more sensitive to water depth; and (3) *Triarrhena lutariae* was most sensitive to water depth and submergence frequency, and the sensitivity indices were 5.32 and 1.79, respectively. While the sensitivities of *Polygonum criopolitanum* to hydrologic features were the lowest. The findings of this study can be used for guiding the eco-hydrological process regulation and wetland restoration.

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**G0015 A Poster 7 (9:00~18:00)**

Mechanisms of (-)-Hydroxycitric acid reducing fat deposition in primary liver cells of chicken embryos

**Longlong Li**, Yao Yao, Zhihao Jiang, Ji Cao, Huihui Zhang, Zhongmiao Yang, Haitian Ma
Key Laboratory of Animal Physiology and Biochemistry, College of Veterinary Medicine, Nanjing Agricultural University, Nanjing 210095, China

**Abstract**—Hydroxycitric acid (HCA) can reduce fat accumulation in animals, while the underlying regulatory mechanism is still not understood. This study aimed to investigate the effect and its mechanism about (-)-HCA regulating on lipid metabolism in primary liver cells of chicken embryos. Primary chicken hepatocytes were separation and purification from 9-day-old chicken embryos, and then exposed to different doses of (-)-HCA. Oil red staining was used to detect the accumulation of lipid droplets in hepatocytes; the triglyceride content and the glucose metabolism activity were determined in hepatocytes. Our results showed that (-)-HCA markedly inhibited lipid droplets accumulation and observably decreased ACLY, FAS and SREBP-1c mRNA expression levels; in addition, (-)-HCA reduces ATP-citrate lyase activity, and acetyl-CoA content in cytosol, whereas PPAR α mRNA level was significantly enhanced after (-)-HCA treatment. Furthermore, (-)-HCA treatment promotes the activities of glucokinase, phosphofructokinase-1, pyruvate kinase, pyruvate dehydrogenase (E1), citrate synthase, aconitase, succinate dehydrogenase and malate dehydrogenase remarkably in primary chicken hepatocytes. Thus, (-)-HCA decreased lipid droplet accumulation by reducing the acetyl-CoA supply, which mainly achieved via inhibition of ACLY activity, and accelerating glucose metabolism in primary chicken hepatocytes.
G8010 Poster 8 (9:00~18:00)

Accurate Prediction of Streamflow Using Long Short-term Memory Network: A Case Study in the Brazos River Basin in Texas

Hamidreza Ghasemi Damavandi, Reepal Shah, Dimitrios Stampoulis, Yuhang Wei, Dragana Boscovic, and John Sabo
Future H2O, Office of Knowledge Enterprise Development, Arizona State University, USA

Abstract—Accurate prediction of streamflow plays a pivotal role for effective reservoir system operations. Specifically, streamflow forecasting provides valuable information for reservoir operators to make critical decisions on water release amount to maximize reservoir storage benefits considering tradeoffs among flood control, municipal water supply, irrigation, hydropower etc. This task, however, has posed daunting challenges due to the complex mechanisms of the physical-based processes as well as the influence of uncontrollable factors. Hence, developing a robust mathematically driven model - in tandem with the supervision of proficient hydrologists for validation purposes - to ensure an accurate forecasting of discharge flows could be of paramount importance. To this end, a deep learning framework using a variation of recurrent neural networks called Long Short-term Memory (LSTM) network, for an accurate prediction of streamflow is presented and evaluated - without losing any generality - for a watershed outlet at the United States Geological Survey (USGS) gauge station neighboring Hempstead within the poorly-gauged region of Brazos basin in Texas with temporal coverage of 2007-2010. In this work, the antecedent precipitation observations and the climate variability indices have been utilized as the potential predictors. Our model is, however, scalable and transferable to be deployed across variant basins with various drainage areas. We, herein, assessed the performance of our predictive model via the Pearson correlation (\(r\)) and the Nash–Sutcliffe model efficiency (\(E\)) coefficients between the predicted and observed streamflow, achieving and of 0.9542 and 0.8859, respectively.

G0017 A Poster 9 (9:00~18:00)

In vivo study on the efficacy of Dehydroepiandrosterone in dextran sulfate sodium-induced murine experimental colitis

Ji Cao, Longlong Li, Yao Yao, Zhihao Jiang, Huihui Zhang, Zhongmiao Yang, Haitian Ma
Key Laboratory of Animal Physiology and Biochemistry, College of Veterinary Medicine, Nanjing Agricultural University, Nanjing 210095, China

Abstract—The purpose of this study was to investigate the protective effects and mechanisms of the Dehydroepiandrosterone (DHEA) on dextran sulfate sodium (DSS)-induced experimental colitis in mice. DHEA decreased DSS-induced body weight loss, disease activity index (DAI), colon length shortening, colonic pathological damage, oxidative stress parameters (MDA and SOD) and myeloperoxidase (MPO) activities. The production of pro-inflammatory mediators (iNOS and COX-2) were significantly alleviated by DHEA. Interestingly, DHEA could enhance the proliferative activities of peripheral blood and spleen lymphocytes in the DSS-induced mice. Further mechanism analysis showed that DHEA inhibited inflammation through regulating NF-κB pathway. DHEA also inhibited NLRP3
activation in colitis mice. In addition, DHEA contributed to the maintenance of tight junction (TJ) architecture by regulating the expression of zonula occludens-1 (ZO-1) during colitis. These results suggested that the supplement of DHEA might provide an effective dietary strategy for the prevention of ulcerative colitis (UC).
Listeners

MUHAMMAD SHAFIQ
PIONEER ENTERPRISES

LINCOLN AWUAKYE
PRINHAG AGENCY

HUDU HALARU
PRINHAG AGENCY

LWANDO MGOJO
GKA LIVING COMPANY LIMITED

Hanwu Liu
Yuncheng University
One Day Tour
August 10, 2019 (Saturday) 9:00~17:00

(Tips: Please arrive at the Hotel Sirius before 8:50 a.m. The following schedule is only for participants who registered the visit & tour. The following places are for references, and the final schedule should be adjusted to the actual notice.)

1. (9:00) Assemble at Hotel Sirius.

2. Visit Geumleung Beach

The largest beach in Jeju, the coastline is 9 kilometers long, and blue water and green pine forest can be seen everywhere. The scenery is very pleasant. The white sand is full of shell powder, and there is a flying island in the former sea. The beach here is slower and the sea is shallower, which is very suitable for the whole family to enjoy the sea bath, camping in the pine forest. In addition, there are many lovers who come here to watch the sunset!

3. Visit Udo Island

An outlying island in the eastern part of Jeju, named after a cow, is a great place to relax.

• The only coral sand beach in Korea is known for its colorful and clear waters.

• There are representative scenery such as East Coast Whale Cave, Night Sailing Fish Sail, and Xiben White Sand. It is called the Eight Views of Niu Island.

• Visit Niu Island to drive by yourself, or take a coach or ride a bicycle. The cycling route of the coach is very popular.

4. Lunch (at own expense)

5. Visit Chengshan Sunrise Peak

Seongsan Ilchulbong, located at the eastern end of Jeju Island, is a towering rock with a huge crater at the top. The southeast and north are cliffs, only the northwest is the lawn ridge, connected to the
Chengshan Village, opposite the sea is the location of Niu Island. Because of the lawn on the ridge, you can take a walk or ride a horse.

In addition, the sunrise on the top of Mount Seongsan Peak is breathtaking, because it is surrounded by the sea on three sides and the lawn on one side. The view is very wide. The rising "salty egg yolk" is very different from the seaside sunrise.

6. Visit Mountain

The mountain is not separated (산굽부리) is the unique smoldering crater without volcanic lava on Jeju Island. It is about 100 meters high, about 2 kilometers from Zhouyan, and has a total area of 298,000 square meters. It is a treasure trove of more than 420 kinds of temperate, subtropical and alpine plants.

The mountain is not a crater with a circumference of more than 2 kilometers, which is a natural protection object. Located on the flat land in the southeast of Jeju City, it is 650 meters in diameter, 100 meters deep and 2070 meters in circumference. Looking at the mountains from the air, it is like a man-made circular stadium. There are many kinds of plants here, and there are temperate trees (red thorn trees, red nan) and precious plants winter strawberries in the north. The southern part of the crater is a typical temperate forest (western wood, maple, four flowers, etc.). Trees of different natures are also grown in the limited space of the crater, which is highly regarded academically. Shanjun does not leave many of the entrances, stone pools, craters and many other places where you can see the stones.

7. (17:00) Back to Hotel Sirius
Note
# Feedback Information

(Please fill this form and return it to conference specialist during the conference days.)

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Thank you for taking time to participate in this conference evaluation. Your comments will enable us to execute future conferences better and tailor them to your needs!