TRI-U2022

28th

empowering young researchers for a better future

The 28th Tri-U
International Joint Seminar & Symposium

PROGRAM BOOK

November 7th-11th, 2022
IPB International Convention Center
Bogor – Indonesia

Organized by:

Sekolah Vokasi College of Vocational Studies

ditmawapk
go further than you ever dreamed

Contents

Preface

It is an honor for the College of Vocational Studies, Directorate of International Program, and Directorate of Student Affairs and Career Development of IPB University to conduct the 28th Tri-U International Joint Seminar and Symposium. This year, the topics of the event are Population, Food, Energy, Environment, and Technosociopreneurship.

Tri-U International Joint Seminar and Symposium is an annual event that is conducted to expose young scientists to have international experiences while enriching their knowledge and widening their views through information exchanges of scientific and cultural experiences. This event is founded by three universities, i.e., Mie University Japan, Chiang Mai University Thailand, Jiangsu University China. Due to consistent participation and good achievement, IPB University was accepted as the 4th founder university in 2010. The participants of the 28th Tri-U IJSS consist of delegates from nine universities from five countries.

On behalf of the committee, I would like to thank all honorable speakers, judges, moderators, and participants for their participation and contribution in making this event a success. I also would like to extend my gratitude to the steering committee who have given directions and to all the committees who have worked hard for the last months for this event. Lastly, may the various ideas, information, and insight that is shared in the 28th Tri-U International Joint Seminar and Symposium can contribute to development of science and eventually, our life.

Bogor, November 2022

Ima Kusumanti, S.Pi., M.Sc.

Opening Speech

Prof. Dr. Arif Satria, SP, M.Si.

IPB University

Assalamualaikum Wr Wb,

Good afternoon and Good Morning

Honorable Presidents/Rectors of the Tri-U partner universities

Vice rectors, deans and heads of departments

All keynote speakers and invited speakers

Judges, moderators and lecturers

Chairperson and members of the organizing committees

Participating students

Ladies and Gentlemen, first of all, we would like to welcome you all to IPB University for 28th Tri-U International Joint Seminar and Symposium 2022. We really appreciate your participation both virtually and physically.

Since the emergence of COVID-19 in early 2020, all human life and business sectors have continued to be affected, including the higher education sector, both in cities and in remote areas. Over the past year, IPB university has worked hard, even in the middle of COVID-19, to carry out internationalization both at home and overseas. During difficult times of COVID-19, the activities are focused on keeping the following activities such as mobility of students and staff, the effective links between education, research and innovation and also promotion of industrial research and private-public partnership. Indeed, this unusual year has forced us to adapt into new working methods. We have had a glimpse into a future work modality where work becomes more multi-local and remote working increases. A hybrid mode is now becoming usual without sacrificing the quality of delivery.

Ladies and Gentlemen, from the perspective of Education, IPB University harmonizes the substances of all academic activities (teaching, research, community outreach including business and innovation) in order to support the vision of IPB Future to become "techno-socio-preneurial university". We need to translate this vision into something more detail in the era of uncertainties due to CCC (covid-19, climate change and conflicts). Moreover, currently we are still facing new developments with respect to global market and economy such as high inflation rate, strong US dollar, EU energy crisis, high production and logistic costs, growing biofuel market etc. Therefore, the resiliency of higher education sector becomes an important pre-condition showing the quality. In this case, it is crucial that universities look at building resilience in their students too. Resilience can be defined as the ability to 'bounce back' from challenging situations, failures or trauma which is currently on the rise as an in-demand quality in both education and the workplace.

Ladies and Gentlemen, Tri-U International Joint Seminar and Symposium is an annual event, conducted to expose young scientists to have international experiences while enriching their knowledge and widening their views through information exchanges of scientific and cultural experiences. Through intensive interaction and friendly atmosphere, the participants representing young scientists from various countries are expected to be able to create peace in the world by having mutual respect and understanding (culture, religion, and custom/behavior). The three universities – Mie University, Japan; ChiangMai University, Thailand; and JiangSu University, China – are the founder universities of Tri-U IJSS; and therefore, the event was named "Tri-University International Joint Seminar and Symposium". IPB University started to join this event in 2003 and has been participating continually since then. Due to this consistent participation and its good achievement the participating students have shown, IPB was accepted as the 4th founder university in 2010 and first hosted the 19th Tri-U IJSS in 2012. This year IPB will become the host for the second time for the 23rd Tri-U IJSS in October.

Ladies and Gentlemen, the theme for this year's Tri-U IJSS is Empowering Young Researches for A Better Future. This year's topics covered in the Tri-U International Joint Seminar & Symposium are: (1) Population, (2) Food, (3) Energy, (4) Environment, and (5) Techno-socio-preneurship. These topics are strongly related to each other and are all important for sustainable harmonious development and the survival of human beings. Technologies and social understanding can be the keys to achieve such development and sustain better survival. They play an important role for improved situation, and better future. Since the 21st century is expected to be the era of Asia, it is a good and invaluable opportunity to promote the mutual understanding and collaboration in preparing the counter measures for the forthcoming era.

Ladies and Gentlemen, the 28th Tri-U program is composed of some keynote speeches from the Tri-U founder universities and invited speakers, several keynote lectures from distinguished scholars, as well as oral presentations from students in parallel sessions. Students from different universities collaborate and share their innovative and original ideas to solve some challenging problems through active participation and intensive discussion.

I wish all participants enjoy the program. I encourage you all to use this opportunity to establish a common understanding of the issue at hand, to initiate activities in line with an effective strategy for the implementation of education. I would also like to extend my gratitude to Director of International Program, Directorate of Student Affairs & Career Developments IPB, College of Vocational Studies IPB University and organizing committee for their hard work, so that this event can run well.

By saying Bismillahirrohmanirrohim, herewith, I officially open 28th Tri-U International Joint Seminar and Symposium 2022.

Thank You.

General Information

Accommodation

IPB Convention Hotel

Botani Square Complex, Jl. Pajajaran Raya, RT.04/RW.05, Tegallega, Kecamatan Bogor Tengah, Kota Bogor, Jawa Barat 16127, Indonesia

+62 251 8345698

Emergency Contact Numbers

Mr. Suhendi Irawan, S.T., M.Sc. (+62 877 9896 7321)

Oral Presentation

1. Keynote speech   : 30 minutes
2. Keynote lecture   : 20 minutes followed by 10 minutes of questions and answers.
3. Student presentation: 12 minutes followed by 3 minutes of questions and answers.

Technical Requirement for Participants Online

We use Zoom Meeting to support hybrid event. We strongly recommend participants to download the apps during the event and make sure your internet connection is stable. Participants are required to join their parallel room at least 15 minutes before the session start.

Tri-U Tote Bag

All participants who attend Tri-U in person will receive tote bag on the 1st day at the registration desk in the venue. Participants who attend online shall receive tote bag, certificates, and other materials by post.

Internet Access

Wireless internet connection is available at IPB International Convention Center (venue) and IPB Convention Hotel (hotel). The Wi-Fi ID and password will be provided at the location.

Dress Code

Nov 6th Casual

Nov 7th University Uniform

Nov 8th Formal

Nov 9th Formal

Nov 10th Event t-shirt/casual

Nov 11th Smart Casual

TRI-U2022

empowering young researchers for a better future

Delegates

Mie University (MU) – Japan

Chiang Mai University (CMU) – Thailand

Jiangsu University (JSU) – China

IPB University – Indonesia

Guangxi University – China

Maejo University – Thailand

Kolej Felcra - Malaysia

Mapena Agriculture and Animal Husbandry Polytechnic – Indonesia

State Polytechnic of Jember – Indonesia

Guidelines

1. The 28th Tri-U International Joint Seminar & Symposium will be held both offline and online on 7-11th November 2022. This event consists of Plenary and Parallel Sessions. We provide Zoom meeting link as follow:

   Meeting ID : 898 4616 4755
   Passcode : 28triu-202

   One-click link and QR:
   https://ipb.link/28triu

2. Plenary and parallel sessions are arranged according to the schedule in this book. The Main Room is intended for opening, plenary (keynote speakers and invited speakers) and closing sessions. Parallel room is intended for presenting scientific papers, which is divided into five sessions with two rooms each session. Each presenter will be assigned to a room as seen in the schedule.

3. **Offline presenters** could go directly to the room assigned on the venue. **Online presenters** could join into the breakout room. Since the beginning of joining the Main Room, presenters and participants are required to use formatted user name by adding a code of conference "Tri-U" and presenter ID (presenters only). For example, Anisa will deliver her presentation with presenter ID 06, then her user's name should be written **as Tri-U FOD9_Anisa**. Meanwhile, non-presenter participants name should be written as **Tri-U_Name**.

4. In parallel session, offline presenters will deliver their presentation directly at the venue, while online presenters can deliver their presentation directly at Zoom meetings in their assigned parallel room or with pre-recorded video that will be replayed during the conference. Author presenters that using pre-recorded video, have to be available online after their videos are played to answer Q&A from conference participants guided by the moderator. Here is the meeting guideline for presenters or participants:

PREPARATION
The duration of a presentation is as follow:

Total Duration	Presentation	Q&A
15 minutes	10 minutes	5 minutes

Please observe the duration of the session when you using pre-recorded video for your presentation.

INSTRUCTION FOR PRE-RECORDED VIDEO PRESENTATION (ONLINE PRESENTER)
Video should contain a prominent view of the presentation slides along with audio of the spoken presenter. Optionally video may contain a shot of the speaker's head for increased engagement (thumbnail-sized and overlayed on the slide image). Many presentations software can be used, such as Power Point or Zoom allows recording audio and video directly in the application and can export appropriate video files. The video presentation requirements are as follows:

File format : MPEG-4 (.mp4)
Video size : HD or other "720p" settings
Audio quality : make sure the audio is clear enough and can be heard properly
Video duration : 10 minutes

INSTRUCTION FOR SUBMITTING PRESENTATION SLIDE AND/OR VIDEO

Your file (slide and/or video) title should be in the following format:

presenter ID_presenter's name, for example: FOD9_Anisa

Please upload the presentation file via https://ipb.link/28triuvideosubmission *one day before your presentation*.

Please, check the accessibility of the file before submitting, make sure the file can be read and downloaded

Q&A SESSION

Q&A session will follow each presentation, guided by moderator:

During the presentation, participants will be muted and will need to submit question via chat box in zoom meeting.

Moderator will select the question that listed and ask it during Q&A session. There may not be enough time answer all question, so moderator will make sure to ask related question in the approximate order that they were first submitted.

Moderator can unmute participants, if it is needed to ask a question directly (please note; due to limited duration, participants may discuss further with author-presenter offline).

ZOOM TIPS

Each session will have a host/timer, a moderator, presenter, and participants

Host/timer will be the user with special icon by the side of the profile. This person facilitates the use of the technology and counting duration-time. (Host_name)

Moderator will attend to coordinate the session and manage Q&A. (Moderator_name)

Seminar and Symposium Schedule

Program at a Glance

Date	Time (GMT+7)	Event		Venue
Sunday, November 6th	13.00 - 23.59	Arrival in Bogor - IPB Hotel		Soekarno Hatta Airport
	18.30 - 20.00	Welcome Dinner		Restaurant
Day 1				
Monday, November 7th	7.30 - 08.00	Breakfast		IPB Hotel, 1st Floor
	08.00 - 08.15	Meet at the lobby and walk to the venue for the Opening Ceremony		Lobby IPB Hotel
	08.15 - 09.00	Registration		Ballroom IICC
Opening Ceremony				
	09.00 - 09.10	1. Performance by Gema Nusantara		
	09.10 - 09.20	2. National Anthem 'Indonesia Raya' & Hymne IPB (D'Voice)		
	09.20 - 09.35	3. Video Congradulatory Message from Tri-U consortium		Ballroom IICC
	09.35 - 09.45	4. Announcing Opening by Rector IPB		
	09.45 - 09.50	Photo Session		
	09.50 - 10.00	Coffee Break		
Keynote Speech Session				
	10.00 - 10.30	Speaker 1 : **Prof. Dr. Arif Satria, M.Si** (*IPB University*)		
	10.30 - 11.00	Speaker 2 : **Prof. Nobutaka Ito** (*Chiang Mai University - Visiting Professor Maejo University*)		
	11.00 - 11.30	Speaker 3 : **Prof. Dr. Ir. Arief Darjanto, M.Ec** (*Dean of College of Vocational Studies, IPB University*)		Ballroom IICC
	11.30 - 11.45	Performance by D'Voice		
	11.45 - 13.00	Lunch Break		
	13.00 - 13. 30	**Keynote Lecturer 1** **Topic: Food (Prof. Ujang Sumarwan, M.Sc.)** **Topic: Food (Assoc. Prof. Dr. Andi Early, MS)** *IPB University*		Meeting Room B-C, IICC
	13.30 - 16.00	Parallel Presentation Session 1 - FOOD 1	Parallel Presentation Session 1 -FOOD 2	
	16.00 - 16.10	Closing Day-1 (Introduction for day-2)		
Day 2				
Tuesday, November 8th	09.00 - 09.30	Registration		
	09.30-10.00	**Keynote Lecturer 2** **Topic: Environment (Prof. Dr. Ir. Arief Sabdo Yuwono, M.Sc)** *IPB University*		Meeting Room B-C, IICC
	10.00 - 12.00	Parallel Presentation Session 2- ENV 1	Parallel Presentation Session 2- ENV 2	

Date	Time (GMT+7)	Event		Venue
	12.00 - 13.00	Lunch Break		
	13.00 - 13.30	Keynote Lecturer 3		
		Topic: Population (Prof. drh. M. Rizal M Damanik, M.Rep.Sc. Ph.D)		
		Deputy for Training Research and Development National Population and Family Planning Board		
	13.30 - 16.00	Parallel Presentation Session 3- POP 1	Parallel Presentation Session 3- POP 1	
	16.00 - 16.10	Closing Day-2 (Introduction for Day-3)		
Day 3				
Wednesday, November 9th	09.45 - 10.00	Registration		Meeting Room B-C, IICC
	10.00 - 10.30	**Keynote Lecturer 4**		
		Topic: Energy (Dr. Ir. Meika Syahbana Rusli, M.Sc.Agr)		
		Director of Bioenergy and Surfactant Research Center, IPB University		
	10.30 - 11.00	**Topic: Energy (Dr. Ir. Dadan Kusdiana, M.Sc.)**		
		Director General of New and Renewable Energy and Energy Conservation		
	11.00 - 12.30	Parallel Presentation Session 4- ENR 1	Parallel Presentation Session 4- ENR 2	
	12.30 - 13.00	Lunch Break		
	13.00 - 13.30	**Keynote Lecturer 5**		
		Topic: Technosociopreneur (Dr. Idha Widi Arsanti, S.P., M.P.)		
		Head of Agricultural Education Center Ministry of Agriculture Indonesia		
	13.30 - 16.00	Parallel Presentation Session 5- TEC 1	Parallel Presentation Session 5- TEC 2	
	16.00 - 16.10	Closing Day-3 (Introduction for Day-4)		
Day 4				
Thursday, November 10th	08.45 - 09.00	Registration		Hotel/IICC
	09.00 - 10.00	Key Person Meeting (Tri-U Members)		Meeting Room, Delta Building, IPB Bogor
	10.00 - 12.00	Judge Meeting		
	07.00 - 16.00	Study Excursion (Student)		Safari Park
Day 5				
Friday, November 11th	09.45 - 10.00	Registration		Ballroom, IICC
	10.00 - 12.00	Closing Ceremony		
		1. Award and appreciations		
		2. Hand over the Tri-U flag to the host of the 29th Tri-U		
		3. Closing Speech		
	12.00 - 13.00	Lunch Break		
	18.30 - 20.00	Farewell Party		Sahira Hotel, Bogor

Date	Time (GMT+7)	Event	Venue
Saturday, November 12th	7:30	Check-out and Departure	IPB Hotel

Day 1 – 7th November, 2022 – Session 1

Session 1	Room B/Break Out Room 1			Room C/Break Out Room 2		
Time	Presenter ID	Name	Title	Presenter ID	Name	Title
13.30 - 13.45	FOD1	Sanae Hori and Fumiyoshi Okazaki	Identification and Characterization of Xyn26B, a Highly Active β-1,3-xylanase from the Human Gut Bacterium Bacteroides cellulosilyticus	FOD7	Xiaoyan Tian	The Research and Development of Plant-based Biotechnology Foods for Human Benefits
13.45 - 14.00	FOD2	Salwa Nurisanti Maulidina, Rahmat Asy'Ari and Nur Rochmah Kumalasari	The Best Apllication of 3S (Sorgum-Sawit-Sapi) as Silvopastoral System Integrates with Oil Palm Plantations in Bogor Regency	FOD8	Devon Adyuta Puspohusodo, Kudang Boro Seminar and Sudradjat Sudradjat	Development of Potassium Detection System on Peat Soil Oil Palm Plantation Using Sentinel-1 Satellite Imagery
14.00 - 14.15	FOD3	Jiayi Kong, Gui-hua Xia	Analysis of Detection Technology of Aflatoxin in Food Crops	FOD9	Anisa Eka Nur Syahfitri, Pria Sembada, Gilang Ayuningtyas	Feeding Management and Performance of IPB D-1 Chickens Fed with The Inclusion of Black Soldier Fly (BSF) Larvae (Hermetia illucens) Meal
14.15 - 14.30	POP11	Yue Cai and Zhongqun Wang	Precision medicine: advances in the diagnosis and treatment of diabetic cardiovascular diseases	FOD10	Yang Tingting	Insight of Food Security from China's Experience
14.30 - 14.45	FOD5	Yayuan Peng	Food security and Punitive damages Over New Plant Variety in China	ENV15	Charles Okoye, Jianzhong Sun and Jianxiong Jiang	Identification and characterization of organic acid-producing lactic acid bacteria strains and their application in corn straw silage production
14.45 - 15.00	FOD6	Nur Rohman and Endang Giri Purnama	Analysis and Design of Rice Supply Chain Technology Infrastructure Using Blockchain Method	ENV16	Yinyi Fu, Jun Liu and Jianzhong Sun	Green extraction of bioactive polysaccharide from the green tide algae Enteromorpha (Ulva) prolifera for potential biomedical application

Day 2 – 8th November, 2022 – Session 2

Session 2	Room B/Break Out Room 1			Room C/Break Out Room 2		
Time	Presenter ID	Name	Title	Presenter ID	Name	Title
10.00 - 10.15	ENV1	Jiatong Lv	Research Progress of Graphene Oxide Based Materials for Treating Heavy Metals in Wastewater	ENV7	Xiaolan Chen	The Impact of Climate Change on China's Forest Resources in the 21st Century
10.15 - 10.30	ENV5	Nutthawat Tonnoi, Parin Khongkrapan, Nigran Homdoung, Kittikorn Sasujit and Yingrak Auttawaitkul	Solar-Photovoltaic Waste Management Using Induction Heating Technique	ENV8	Mengyao Lv	Research on the Legal Issues of Ecological Protection in the Coastal Zone of Guangxi Beibu Gulf under the Background of Sea and Land Co-ordination
10.30 - 10.45	ENV3	Kankanit Pholporton, Aukarawat Sansri and Tanakrit Phasaenthoen	Factor Analysis of The Concentration of PM 2.5	FOD15	Braja Manggala, Malinny Debra, Chatchawan Chaichana, Wahyu Nurkholis Hadi Syahputra and Wasin Wongwila	Effects of Various Hydroponic Systems in Increasing Caisim (Brassica sinensis L.) Production Under LED Grow Light
10.45 - 11.00	ENV4	Jiaqian Wang	What a university can do on combating climate change and achieving net zero	ENV10	Lalita Petchaihan, Pakamon Pintana and Tanate Chaichana	Study of the conditions for carbonization production
11.00 - 11.15	ENV2	Rungnapa Turongruang	Life cycle greenhouse gas emissions of ethanol production from maize waste in northern of Thailand	ENV11	Nutthawat Tonnoi, Parin Khongkrapan, Nigran Homdoung, Kittikorn Sasujit and Yingrak Auttawaitkul	Development of an Induction Reactor for Solar-Photovoltaic Waste Management
11.15 - 11.30	FOD14	Nichakarn Morakote, Warut Timprae and Damrongsak Rinchumphu	Influential Environmental Factor to Photosynthetic Active Radiation in Greenhouse Planting	ENV12	Anny Nila Syauqiyyah, Nia Imaniar, Muhammad Zaidan Ahsan and Muhammad Aries	Low Carbon Diet Education to Support Climate Change Management: A Systematic Review

Day 2 – 8th November, 2022 – Session 3

Session 3	Room B/Break Out Room 1			Room C/Break Out Room 2		
Time	Presenter ID	Name	Title	Presenter ID	Name	Title
13.30 - 13.45	POP1	Ziyan Liang	Research on the HeForShe Social Movement from the Perspective of Feminism Theory——Take China and Indonesia as Examples	POP6	Sofiani Anamy, Lufty Nurfauzi Somaoputra, Angger Pribadi Wibowo and Annisa Ramadanti	Design Thinking Application to Decrease Type 2 Diabetes Mellitus Risk in West Java
13.45 - 14.00	POP2	Ziyi Liu and Zhihong Li	Population Aging and High-Quality Economic Development	ENV14	Qianhui Xu	Study on the Role of Developing Green Finance on Environmental Quality in Guangxi, China
14.00 - 14.15	POP3	Shahnaz Badriyana	The Correlation Between Household Size and Water Consumption in Gunung Walat Educational Forest (HPGW) Using Chi-Square Analysis Method	POP8	Han Wang and Zhenhan Yu	Willingness of Vulnerable Groups in the Coastal Zone to Accept Offshore Wind Power in the Framework of Sustainable Livelihood Analysis
14.15 - 14.30	POP4	Swietenia Putri Purhadi	The Impact of Service Quality on Customer Satisfaction and Customer Loyalty of Health Insurance Users (Case Study: Health Insurance Users of Jabodetabek Area)	POP9	Han Wang, Youyu Luo	How Sheep Became a Dragon King? Adopting Psychological Distance Framework into Field Experiment to Assess Public Acceptance towards NIMBY Facilities
14.45 - 15.00	TEC13	Muhammad Luqmanul Hakim Razali, Muhamad Nazarwin Zainal Abidin	Implementation of Personal Protective Equipment (PPE) Innovation Suit for Harvester in Oil Palm Industry	POP10	Mia Andiani	Optimizing the Potential of Minangkabau Germplasm for the Early 1000 Days of Human Life: A Study on the Analysis of Dadih Food on the Health of Pregnant Women and Children in Indonesia

Day 3 – 9th November, 2022 – Session 4

Session 4	Room B/Break Out Room 1			Room C/Break Out Room 2		
Time	Presenter ID	Name	Title	Presenter ID	Name	Title
11.00 - 11.15	ENR1	Mizuki Eto, Yasuhiro Utsumi, Kengo Shimamoto and Peper Ferdinand	Neuron-Brownian Element Circuit Using Petri Nets	ENR7	Wenlong Yang, Lantian Hu, Yang Wu, Yulong Fan and Gege Dong	Analysis on heat transfer technology of Internet data center
11.15 - 11.30	POP12	Yanavut Chawaphanth, Chatchawan Chaichana and Ramnarong Wanison	Photosynthetic Photon Flux Density Prediction Using Multiple Linear Regression	ENR8	Saridpong Rangsaritaphiban and Paramet Wirasanti	Design and Analysis of Khun Huay Haeng Microgrid Using HOMER Pro
11.30 - 11.45	ENR3	Nur Ayu Fatimah and Lilis Sucahyo	Performance of Hydroponic Based on Photovoltaic and IoT Monitoring System for Pakcoy (Brassica Sinesis L.) Towards Sustainable Agriculture	ENR9	Tao Liu, Gaogao Shang, Jiangyi Han, Xiulun Wang	Power System and Energy Saving Strategy of an Electric Tractor for Agriculture
11.45 - 12.00	ENR4	Bihe Hu and Zhixia He	The Cavitation Flow and Spray Characteristics of Gasoline-diesel Blends in Real-size Optical High-Pressure Common Rail Injector Nozzle	ENR10	Ryosuke Ozaki, Kenji Nawa and Kohji Nakamura	Computational Design of Magnetic-based Materials for Terahertz Technology
12.00 - 12.15	ENR5	Koki Taniguchi and Shuichi Karita	The synergistic effect of plant biomass by xylanolytic enzymes from Paenibacillus xylaniclasticus strain TW1	ENR11	Ling Zhou, Ling Bai, Yong Han, Zhenjiang Zhao and Lei Jiang	Design, Simulation and Application of Compact Solar Energy Pump
12.15 - 12.30	ENV13	Zhaozhan Chi, Qiancheng He and Yuanpeng Wang	Research on Robot for Assisted Tree Planting Based on ROS	ENR12	Passawan Boonsri, Parin Khongkrapan, Thongchai Maneechukate and Chawaroj Jaisin	Plasma Sputtering Technique for Thin Film Coating on Plastic Sheet

Day 3 – 9th November, 2022 – Session 5

Session 5	Room B/Break Out Room 1			Room C/Break Out Room 2		
Time	Presenter ID	Name	Title	Presenter ID	Name	Title
13.30 - 13.45	TEC1	Jianing Dong	SWOT Analysis of the International Influence of Chinese Entrepreneurial Enterprises	TEC7	Techatorn Chaiwong, Pakamon Pintana and Tanate Chaichana	Improvement of Humidifier System in Smart Greenhouse For Straw Mushroom Cultivation
13.45 - 14.00	TEC2	Youxin Tian	Technosociopreneurship of Language Service Providers in a Post-Pandemic World: Crisis to Chance	TEC8	Abednego Victor	Application of Refused Paper and Plastic Fuel (RPF) in Paper Recycling Industry
14.00 - 14.15	TEC3	Kang Liu and Weidong Wang	Portfolio Risk Investment Strategy Model based on ARIMA and LSTM	ENV17	Kamonchanok Lekmoon and Damrongsak Rinchumphu	A Feasibility Study of Green Building toward Thai's Rating of Energy and Environmental Sustainability
14.15 - 14.30	FOD16	Wahyu Nurkholis Hadi Syahputra, Chatchawan Chaichana, Ramnarong Wanison, Braja Manggala and Wasin Wongwilai	Above-canopy Measurement of Paddy Plant using Mobile-phone Camera for Chlorophyll Assessment Under Natural Light	ENR13	Jiwei Chen	Nexus between Green Finance and Energy Consumption in Countries within RCEP Region
14.30 - 14.45	TEC5	Binxin Zhu and Peng Gao	Research on green innovation strategy of supply chain considering government subsidies and carbon emissions regulation	FOD13	Eisuke Abe, Makoto Kondo and Noriaki Nagahaka	Association of Mid-Infrared-predicted Milk Fatty Acids and Blood Constituents with Early-lactation Disease in Holstein Cows
14.45 - 15.00	TEC6	Silvia Zalda Putri, Feby Abelina, Muhammad Rafly Ikhsan, Rafli Arya Fahrezi, Gustri Handayani and Muhammad Find	Dynamite Wash: Eco-Friendly Detergent from Lerak Fruit with Water Soluble Paper	TEC12	Tianhong Yang	Prospect of New Energy Vehicles in Small- and Medium-sized Cities

Abstracts

How Sheep Become a Dragon King?
Adopting Psychological Distance Framework into Field Experiment to Assess Public Acceptance towards NIMBY Facilities

Han Wang [1, 2, 3] and Youyu Luo [1*]

[1] School of Public Administration, Guangxi University, No. 100, Da Xue Road, Nanning 530004, China; hanwang@gxu.edu.cn (H.W.)

[2] Department of City and Regional Planning, University of North Carolina at Chapel Hill, Chapel Hill, NC 27599, USA

[3] China Center for Agricultural Policy (CCAP), School of Advanced Agricultural Sciences, Peking University, No. 5, Yi He Yuan Road, Beijing 100871, China
e-mail: 2022310243@st.gxu.edu.cn

Abstract: NIMBYism is a popular explanation for the obstruction of most energy facilities. This study measures the public acceptance towards different NIMBY facilities and their change patterns from the perspective of psychological distance, which quantifies public perception and improves the explanatory power of the NIMBYism. In this study, psychological distance dimensions such as time, space, social distance and hypothetical distance were incorporated into a field experiment design, and two types of new energy facilities such as wind farms and nuclear power plants, as well as two types of living facilities such as waste incineration plants and ecological cemeteries were selected as experimental comparisons. The real motives of NIMBYism could be extracted from the differences in the acceptance of such facilities. This study reveals that the periodic increase and decrease of psychological distance with the changes of various dimensions above, showing that assumption bias is the main cause of NIMBYism, which provides coping strategies for new energy facilities.

Keywords: *field experiment, new energy facility, NIMBYism, psychological distance and public acceptance*

SWOT Analysis of the International Influence of Chinese Entrepreneurial Enterprises

Jianing Dong[1*]

[1]School of Foreign Languages, Guangxi University, Guangxi, China
e-mail: 515999015@qq.com

Abstract: Technosociopreneurship is a term coined by the organizing committee representing a combination of technological innovation and entrepreneurship, which is of great importance to the survival of a company, as well as to the whole society. With the rapid development of Chinese companies, there exists a greater need for them to go global. In this connection, a slew of new entrepreneurial enterprises mushroomed in pursuit of profits overseas. However, opportunities always come with challenges. Based on this, this paper analyzes the status quo facing these companies from the dimensions of strength (S), weakness (W), opportunities (O) and threats(T) in the international business world.

Keywords: *entrepreneurial enterprises, marketing, SWOT analysis*

Insight of Food Security from China's Experience

Yang Tingting[1*]

[1]*Jiangsu University, China*
e-mail: 2045918080@qq.com

Abstract: Food security is not only an economic issue, but also a political issue. It is the foundation of people's life all over the world and the anchor of national development. As the world enters a period of turbulence and change, food security faces many new challenges. A series of emerging problems require efforts from all parties to reduce the crisis and losses. This paper will analyze the current situation of world food security and the reasons behind it by means of literature research method and descriptive research method, and summarize the experience and countermeasures to deal with the current world food security crisis from the practice of China in dealing with food security.

Keywords: *chinese experience, food, security*

Neuron-Brownian Element Circuit Using Petri Nets

Eto Mizuki[1*], Yasuhiro Utsumi [1], Kengo Shimamoto[1], Peper Ferdinand[2]

[1]*Mie University, Japan*
[2]*National Institute of Information and Communication Technology*
e-mail: 422M603@m.mie-u.ac.jp

Abstract: Computer performance has improved drastically year by year. However, with these ongoing advances, the heat generated has also increased accordingly. In one example, Fugaku, the world's fastest supercomputer developed by RIKEN (a Japanese research institute), generates heat as much as 100 kW per square meter. It amounts to the power consumption of 100 electric stoves per square meter. Ideally, it is preferable to perform computations without heat generation. A human brain performs computations by consuming power much smaller than that of a supercomputer's power consumption. A brain is a neural network consisting of mutually connected multiple neurons. These neuron models have been studied for over 100 years. Recently, neural networks have been applied to artificial intelligence: Since the 2010s, the deep-learning has been actively studied. The token-based Brownian circuit is a potentially promising candidate for implementing the neuron model as it applies to computer performance. In this research, the goal is to design a neuro- morphic module using Hub and Cjoin, which are the circuit elements of the Brownian circuit. We will present the results of the examination on a preliminary neuro-morphic module and numerical input and output signals using path integrals and Gillespie's algorithm by modeling the Brownian circuit with Petri nets.

Keywords: *neuron, brownian circuit, petri net*

Identification and Characterization of Xyn26B, a Highly Active β-1,3-xylanase from the Human Gut Bacterium *Bacteroides cellulosilyticus*

Sanae Hori[1*] and Fumiyoshi Okazaki[1]

[1]*Graduate school of Bioresources, Mie University, 1577Kurimamachiya Tsu, 514-8507, Japan*
e-mail: 521M322@m.mie-u.ac.jp

Abstract: β-1,3-xylan is a homologous polymer of β-1,3-linked D-xylose units that are found only in the cell walls of red algae and green algae. β-1,3-xylanases (1,3-β-D-xylan xylanohydrolase; EC 3.2.1.32) catalyze hydrolysis of β-1,3-glycosidic linkages of β-1,3- xylan to produce several short-chain β-1,3-xylooligosaccharides. To date, the only functionally characterized β-1,3-xylanase are those from marine bacteria. In this study, we characterized the enzymatic properties of putative β-1,3-xylanse (*Bc*Xyn26B) from the human gut bacterium, *Bacteroides cellulosilyticus* strain WH2. The *Bc*Xyn26B gene has been cloned and expressed as a soluble protein in *Escherichia coli*. The recombinant *Bc*Xyn26B was purified using immobilized metal affinity chromatography and anion exchange chromatography. This enzyme showed specific hydrolytic activity against β-1,3-xylan and released various β-1,3-xylooligosaccharides with β-1,3-xylobiose as the main product. It displayed maximum activity at 50 °C during a 10 min incubation at pH 6.0. Its catalytic properties ($k$cat = 61.33 sec^{-1}) suggested that *Bc*Xyn26B is one of the most active β-1,3-xylanase described to date. This is the first report of the expression and characterization of β-1,3-xylanase from human gut microbes, and the substrate specificity of *Bc*Xyn26B implies that the human gut *Bacteroides* species have an unknown β-1,3-xylan utilization system.

Keywords: *Bacteroides cellulosilyticus, β-1,3-xylanase, enzyme, human gut bacterium, seaweed*

Development of an Induction Reactor for Solar-Photovoltaic Waste Management

Nutthawat Tonnoi[1], Parin Khongkrapan[1]*, Nigran Homdoung[1], Kittikorn Sasujit[1], and Yingrak Auttawaitkul[1]

[1]School of Renewable Energy, Maejo University, Chiang Mai, Thailand
e-mail: parin.khongkrapan@gmail.com

Abstract: The purpose of the research is to develop an induction reactor for solar- photovoltaic waste management. The induction reactor is used to generate heat that is used to melt the components of the PV waste, such as copper, lead, and glass. The product of this melting process can be used as a renewable material in construction work. This reactor is equipped with an induction coil made of a 5 mm diameter copper tube. The copper tube was coiled into a coil with an internal diameter of 750 mm, a pitch of 1 mm, and a number of 20 coils for mounting a melting chamber made of graphite with internal and external diameters of 45 mm and 65 mm, respectively. The power supply consists of an AC to DC transformer with a maximum power input of 5 kW. When power is supplied to the induction coil, the temperature at the center of a melting chamber can be higher than 2,000°C. According to experimental results with maximum input power, the induction reactor utilized in this study can melted stainless steel and copper with a melting rate of about 2 kg/h (SEC 6.30 MJ/kg) and 3 kg/h (SEC 4.20 MJ/kg), respectively. The surface temperature of the melting chamber was above 2,000 °C during the process.

Keywords: *solar-photovoltaic waste, induction reactor, renewable material*

Technosociopreneurship of Language Service Providers in a Post-Pandemic World：Crisis to Chance

Youxin Tian[1*]

[1]School of Foreign Languages, Guangxi University, China
e-mail: miatn199@gmail.com

Abstract: The covid-19 Pandemic has posed a grave challenge to global language service providers, and to transform strategies is the only way out. Technosociopreneurship is a business principle combining application of technology instruments with focus on social values. In other words, enterprises with technosociopreneurship tend to be more technology-intensive and creates more social benefits. This research, based on a techno-socio perspective, adopts case study method and analyzes secondary data from literature studies. By citing three major translation corporations as examples, the paper is to fully present technosociopreneur strategy and explore its feasibility in language service enterprises. The results of the study show that: 1) Technosociopreneurship is the appropriate strategy for language servers to survive the epidemic crisis. 2) To be more technology-oriented, language service operators should invest more in computer-aided translation and proof-reading tools such as Trados, Dejavu, etc. as well as embrace artificial intelligence properly. 3) To be more society- oriented, these enterprises should yield positive influences on the society in various situations and take their own share of social responsibilities in face of global public health emergencies. In a post-epidemic period, to recover from the gloom is what matters. To be technosociopreneur means being more adaptable to new techniques and also more down-to-earth in solving problems. It is suggested that language service enterprises operate in a technosociopreneur way.

Keywords: *language service, pandemic, social benefits, technosociopreneurship*

Design Thinking Application to Decrease Type 2 Diabetes Mellitus Risk in West Java

Sofiani Anamy[1*], Lufty Nurfauzi Somaputra[1], Angger Pribadi[1], and Annisa Ramadanti[2]

[1]Undergraduate Student of School of Business IPB, Jl. Raya Pajajaran RT03/RW06, Bogor 16128, Indonesia
[2]School of Business IPB, Jl. Raya Pajajaran RT03/RW06, Bogor 16128, Indonesia
e-mail: sofianisofiani@apps.ipb.ac.id

Abstract: Type 2 Diabetes Mellitus (T2DM) is one of the major non-communicable diseases and it is currently on the rise in Indonesia. One of the causes of the trend is consumption of sweetened beverages. Indonesia took third place as the country with the highest consumption of sweetened beverages in Southeast Asia in 2020. This study applied design thinking method to find the solution for the society in West Java to decrease the risk of Type 2 Diabetes Mellitus. The data were collected from 106 respondents located in West Java area to analyze the market potential of the product and for the design thinking steps of empathize and define. The data were processed using all stages of design thinking. The results show that sweetened beverage may increase blood sugar levels significantly as they have high glycemic index (GI) and calories, which lead to T2DM. To deal with the trend of sweetened beverages and T2DM cases, the development of low GI and calorie beverages is deemed important. Robusta (*Coffea canephora*) leaf is one of the natural sources of bio- active compounds which possess an anti-diabetic effect and was confirmed with in vivo test. This study aimed to develop Goodboost, an instant powdered robusta leaf tea as a beverage to prevent T2DM. Goodboost's production is conducted by using extraction followed by foam-mat drying method. Local community will be involved as material suppliers to provide them an economic impact.

Keywords: *design thinking, robusta leaf, type 2 diabetes mellitus*

Above-canopy Measurement of Paddy Plant using Mobile-phone Camera for Chlorophyll Assessment Under Natural Light

Wahyu Nurkholis Hadi Syahputra[1,2], Chatchawan Chaichana[1*], Ramnarong Wanison[1], Braja Manggala[1,2], Wasin Wongwilai[3]

[1]Renewable Energy and Energy Conservation Laboratory Department of Mechanical Engineering, Chiang Mai University, Chiang Mai, 50200, Thailand.
[2]Graduate Student in Agricultural Engineering, Department of Mechanical Engineering, Chiang Mai University, Chiang Mai, 50200, Thailand.
[3]Science and Technology Research Institute, Chiang Mai University, Chiang Mai, 50200, Thailand.
*email: c.chaichana@eng.cmu.ac.th

Abstract: Chlorophyll is one of the important factors indicating fertilizer overuse. Generally, chlorophyll content can be assessed using laboratory analysis, and remote sensing techniques (i.e., SPAD chlorophyll meter, unmanned aerial vehicles (UAVs), spectrometers) are still expensive and require special skills to operate. So that the use of mobile phone cameras can be an alternative for non-scientific end users. This study aims to evaluate the use of the mobile camera for assessing chlorophyll content in the paddy field. In this study, there are three primary phases: capturing leaf images, leaf image processing, and vegetation indices (VIs) analysis. Image processing is carried out to analyze the image of the leaves of rice plants and the selection of ROI to determine the focus of the image to be processed. Furthermore, the results of the RGB image extraction were analyzed using the vegetation indices equation. The estimation results using the ground- based remote sensing technique are then compared with the measurement results using the SPAD chlorophyll meter. This research demonstrated that the mobile camera has a possibility as a tool for measuring chlorophyll content from the above- canopy measurement techniques. In addition, the coordinates generated by GPS feature on each data provides the chlorophyll distribution zoning map.

Keywords: *above-canopy measurement, chlorophyll, mobile-phone camera, paddy, remote sensing*

Research Progress of Graphene Oxide Based Materials for Treating Heavy Metals in Wastewater

Jiatong Lv[1*]

[1]School of Resources, Environment and Materials, Guangxi University, China
e-mail: 1747440856@qq.com

Abstract: Because of today's increasingly serious pollution of heavy metals, how to treat with heavy metal ions in wastewater has become a significant problem which is urgent to be solved. Adsorption methods has been taken into account among all kinds of ways because of its advantages of environmental protection, high efficiency and simple operation, while graphene oxide (GO) has also attracted people's attention in the field of adsorption materials because of its excellent physical and chemical properties. In this paper, the research status of GO synthetic materials in the direction of typical heavy metal ion (Hg^{2+}, Pb^{2+}, Cr^{2+}, Cu^{2+}) adsorption in wastewater was described. Through the research status, the feasibility of GO as a heavy metal adsorption material was expounded, and the prospect of related research directions was put forward.

Keywords: *heavy metal, wastewater, GO*

Study of the Conditions for Carbonization Production

Lalita Petchaihan[1], Pakamon Pintana[1*], and Tanate Chaichana[1]

[1]School of Renewable Energy, Maejo University
e-mail: p.pintana@gmail.com

Abstract: Thailand has resources that use renewable energy continually because of renewable energy. Development policy that aims to increase the use of renewable energy in all sectors. Increase the proportion of renewable energy production in the country and high-efficiency technology. Reduce impact on environment and the community. Encourage community to participate in the production and use of renewable energy widely. The objective of this research is to study the optimum conditions of oil palm leaves for the carbonization production. The variables and conditions affected by production of biochar were studied in carbonization process. Based on the properties results of the oil palm leaves test, the heating value of 17.27 MJ/kg, ultimate analysis showed that carbon 45.39%, hydrogen 6.68%, nitrogen 1.61%, oxygen 41.43%, and sulfur 0.08%, respectively and proximate analysis showed that moisture content 8.69%, volatile matter 70.31%, fixed carbon 12.73%, and ash content 8.68%. The regression equation and R^2 ranges 0.8132 to 1 will be obtained, indicating that heating value and amount of raw material affect bio-oil content (40.53-63.69%), biochar content (43.82-51.44%) and gas content (52.11-54.43%) respectively. Many factors affect the production of bio-oil, biochar, and gas. To achieve high efficiency, the properties of raw materials should be studied before experimenting with various processes, chemical, and physical properties. It can be a guideline for improving production process.

Keywords: *carbonization, biomass properties, biomass conversion production*

Green Extraction of Bioactive Polysaccharide from the Green Tide Algae *Enteromorpha (Ulva) prolifera* for Potential Biomedical Application

Yinyi Fu[1*], Jun Liu[1], Jianzhong Sun[1]

[1]*Biofuels Institute of Jiangsu University, School of the Environment and Safety Engineering, Jiangsu University, 301 Xuefu Road, Zhenjiang, 212013, China*
e-mail: fyy7778@163.com

Abstract: Efficient valorization of waste algae that caused green tide remains a challenge from the perspective of environmental pollution control and biomass utilization. In the present study, crude polysaccharide (UP) was extracted from *Enteromorpha (Ulva) prolifera (E. prolifera)* with the green ultrasound-assisted enzymatic extraction (UAEE) with a high yield of 23.3%. The UP was further purified using the chromatography column (DEAE-52) separation to yield the purified polysaccharide (UP1). The structural characteristics of the polysaccharides were analyzed using the high-performance size-exclusion chromatograph and FT-IR spectroscopy. The bioactivities of both the UP and UP1 were evaluated in terms of the ABTS radical, superoxide anion, DPPH, and hydroxyl radical scavenging activities. Results showed that UP1 is a sulfated polysaccharide that mainly consists of glucose, xylose, and mannose with an Mw of 1.2kDa. A variety of bioactivities assessments confirmed that the UP1 possesses competitive anti-oxidant capability, suggesting the application potential as an antioxidant agent in biomedicine and pharmacy.

Keywords: *green tide, ultrasound-assisted enzymatic extraction, bioactive polysaccharide, structural characterization, antioxidant*

Life Cycle Greenhouse Gas Emissions of Ethanol Production from Maize Waste in Northern of Thailand

Rungnapa Turongruang[1*], Tanate Chaichana[1], Nattannicha Sukasame[1] and Patcharee Intanoo[2]

[1] School of Renewable Energy, Maejo University, Chiang Mai, Thailand.
[2] Industrial Chemistry and Textile Technology, Faculty of Science, Maejo University, Chiang Mai, Thailand.
e-mail: rungnapatur111@gmail.com

Abstract: The aim is research to evaluate the potential environmental impact of ethanol production from corn waste in northern Thailand. Maize waste consists of leaves and stalks in farmland. The study was according to the projected life cycle of greenhouse gas emissions based on different stages, using a method "gate-to-gate" of the ethanol production process, Including grinding, pretreatment, enzymatic hydrolysis, fermentation, filtration, and distillation. The life cycle was developed using preliminary data from laboratory experiments and supplemented by literature. The results showed that the greenhouse gas emission was 243.17 kg carbon dioxide equivalent per liter of anhydrous ethanol. Another result is One ton of dry maize waste can produce 223.7 liters. Therefore, maize waste can be used as a raw material for bioenergy. And reduce the amount of greenhouse gas emissions into the atmosphere. Moreover, it also helps with smog and PM 2.5 caused by burning biomass in Northern Thailand.

Keywords: GHGs, bioethanol, maize waste

Study on the Role of Developing Green Finance on Environmental Quality in Guangxi, China

Qianhui Xu[1*]

[1]International College, Guangxi University, China
e-mail: 18878712116@163.com

Abstract: The goal of green finance is to pursue coordinated development in financial activities while caring for environmental protection and ecological balance. In the context of carbon peaking and carbon neutrality goals are proposed, the investment and development of green finance are of great significance to protect the environment. Green finance is a new financial development model that takes environmental protection as its core, and effectively promotes the sustainable development of the environment, the economy, and society while maintaining its sustainable development. By establishing time series data of Guangxi from 2007 to 2020 and using the Granger causality test model to examine the role of developing green finance in Guangxi on environmental quality, this paper shows that the development of green finance in Guangxi can improve environmental quality. In a comprehensive view, the government level should promote the development and improvement of the green financial system. The financial institutions level should innovate the types of green financial products and strengthen the cooperation with environmental protection departments, and the enterprises level should focus on the improvement of the production technology level and speed up the transition to greening.

Keywords: *China, environmental quality, economic development, green finance*

Factor Analysis of the Concentration of PM 2.5

Kankanit Pholporton[1], Thanakrit Phasaenthane[1], Akkarawat Sarnsri[1] and Damrongsak Rinchumphu[1*]

[1]Department of Civil Engineering, Faculty of Engineering, Chiang Mai University, 50200, Thailand
e-mail: damrongsak.r@cmu.ac.th

Abstract: As the city with the worst weather in the world, Chiang Mai has been listed due to the severe air pollution conditions caused by PM 2.5 particles. When breathed in high numbers, PM 2.5 dust has very negative impacts. Therefore, led to research on Factor Analysis of The Concentration of PM 2.5 by using sensors to measure the concentration of dust from uniform traffic areas, areas with dense tree cover, and areas with regular human traffic. The DEVIO NB-SHIELD I and Arduino MEGA 2560 R3 are linked as the primary receiver. As a receiver, use the NRF24L01 to receive data when using the SDS011 Nova PM Sensor with the Arduino UNO R3 as a dust detector. Send the measured values using the NRF24L01 as a transmitter to the Arduino Mega 2560 R3. To send data every 10 minutes, provide a command using the Arduino ICE program's written code. The average PM 2.5 dust value for each sensor's test period is computed via https://magellan.ais.co.th. presented as a graph Analyze the dust data. The results of the F-test and T-test statistical tests revealed that factors put out in the hypothesis had an impact on the concentration of PM 2.5 dust.

Keywords: *PM 2.5, arduino*

A Feasibility Study of Green Building toward Thai's Rating of Energy and Environmental Sustainability

Kamonchanok Lekmoon[1*], Pawares Tarwonprasert[2] and Damrongsak Rinchumphu[3]

[1]Department of Civil Engineering, Faculty of Engineering, Chiang Mai University, 50200, Thailand
[2]Faculty of Architecture and Planning, Thammasat University, 10200, Thailand
[3]Assistant Professor, Department of Civil Engineering, Faculty of Engineering, Chiang Mai University, 50200 Thailand
e-mail: damrongsak.r@cmu.ac.th

Abstract: This paper aims to study the impact of variables, differences in energy, financial feasibility studies, and proposed investment guidelines for office buildings that participated in the Thai's Rating of Energy and Environmental Sustainability (TREES). Using a simulation program with Building Energy Code Software (BEC) and Energy Plus (Version 8.0) to compare the differences in energy use in buildings. Case studies divided alternative buildings into four based on variables from the TREES and a survey of 211 office buildings in Thailand, then studied the feasibility of an investment based on financial indicators such as NPV, IRR, and Payback Period. Finally, to compare the value and the return rate on investment. The results show that alternative buildings use 12.84-22.9% less electrical energy and 25.89-72.32% less water usage than reference buildings. However, investment was higher than reference by 2.09-3.75%. It found that the IRR increased by 0.09-1.79% and the payback period was faster by 0.15-2.92 years. From research, it can conclude that green building projects should be invested accordingly to alternative building 4th, which has an IRR increase of 2.92% and a faster payback of 2.92 years.

Keywords: *TREE-NC criterion, office building, physical feasibility*

Photosynthetic Photon Flux Density Prediction Using Multiple Linear Regression

Yanavut Chawaphanth[1], Chatchawan Chaichana[1*], and Ramnarong Wanison[1]

[1]Department of Mechanical Engineering, Faculty of Engineering, Chiang Mai University, Chiang Mai, Thailand 50200
e-mail: c.chaichana@eng.cmu.ac.th

Abstract: One viable strategy for making the most of land and property is the use of agrivoltaic systems. With the help of elevated solar panels, this study tries to forecast the averaged Photosynthetic Photon Flux Density (PPFD). In order to allow sunshine to get through, 20 south-facing solar panels were set up roughly 1.8 m above ground and 0.5 m apart. Each has a surface area of 0.74 m^2, can produce up to 1.48 kWh per day. In order to maximize output of the land area, certain plants could be cultivated underneath these solar panels. During December 2021 to January 2022, the PPFD was collected using five Photosynthetically Active Radiation (PAR) light sensors placed beneath the solar panels in five different places. The data in 2 months were analyzed and then used to predict the average PPFD from 7am to 6pm from February to December 2022 by utilizing multiple linear regression. It was discovered that each unique place has a unique PPFD value. Furthermore, a straightforward technique could be given some parameters. According to the results of predictions, the maximum, average, and minimum PPFD values are 8,507, 7,564, and 6,225 $\mu\text{mol}\cdot\text{m}^{-2}\cdot\text{s}^{-1}$, respectively.

Keywords: *agrivoltaic, multiple linear regression, photosynthetic photon flux density or PPFD, solar panel*

Nexus between Green Finance and Energy Consumption in Countries within RCEP Region

Jiwei Chen[1*]

[1]School of Economics, Guangxi University, Guangxi, 530004, China
e-mail: JadeChenxx@outlook.com

Abstract: Green finance has been valued and promoted by RCEP countries for its attribute of supporting green and sustainable development. However, the existing literature is inadequate and widely divergent on the relationship between green finance and sustainable economic development. An in-depth understanding and empirical examination of the nexus between green finance development and fossil energy consumption in the RCEP region is the key to success in policy making to enhance the sustainability of the economies. The study investigates the relationship between green finance and fossil energy consumption in RCEP countries based on cross-country panel data. The findings show that the development of green finance can significantly reduce the intensity of fossil energy consumption. The results of the heterogeneity test show that green finance plays a more significant role in reducing energy consumption in countries with higher levels of financial development. By presenting evidence on the effect of green finance on fossil energy consumption, the study contributes to a growing literature on financial implications for sustainable development strategy.

Keywords: *fossil energy consumption, green finance, RCEP, sustainable economic growth*

Research on Green Innovation Strategy of Supply Chain Considering Government Subsidies and Carbon Emissions Regulation

Zhu Binxin[1*], Gao Peng[2]

[1] School of Management, Jiangsu University, Zhenjiang, P.R. China
[2] School of Management, Jiangsu University of Technology, Changzhou, P.R. China
e-mail: zhubinxin44@163.com

Abstract: Green innovation can help achieve lower carbon emissions but higher customer value in the entire product life cycle, and has always been the focus point of the government and the whole society. Game theory is used to discuss green innovation strategies of supply chain enterprises when there are both government subsidies and carbon emissions regulation. The government subsidy models under the manufacturer's independent innovation (MI) and joint innovation (MJ) are established and solved respectively. The study found that (1) The carbon emissions regulation is only effective when it exceeds a certain threshold; (2) When government subsidies are considered only, joint innovation improves the carbon emissions reduction level; (3) If both government subsidies and the carbon emissions regulation are taken into consideration, a higher carbon emissions reduction level and the product demand can be achieved; but it is not conducive to improving manufacturer's profits. The government and enterprises should strengthen the publicity of green products and improve consumers' green and low-carbon awareness; Enterprises in the supply chain should devote themselves to joint innovation by establishing a reasonable profit distribution and price transfer mechanism; The government should pay attention to the comprehensive use of various environmental regulation tools.

Keywords: government subsidies, carbon emissions regulation, green supply chain, green innovation

Plasma Sputtering Technique for Thin Film Coating on Plastic Sheet

Passawan Boonsri[1], Parin Khongkrapan[1]*, Thongchai Maneechukate[1] and Chawaroj Jaisin[1]

[1]School of Renewable Energy, Maejo University, Chiang Mai, Thailand
e-mail: parin.khongkrapan@gmail.com

Abstract: The objective of this research is to study the plasma sputtering process in order to coat the thin copper film on the plastic sheet with a 0.5 mm thickness that is used as the flexible electrical circuit. In this research, a DC plasma sputtering reactor was operated at the pressure in the range of 10^{-5} to 10^{-6} mbar. The copper plate was placed at the cathode and the plastic sheet at the anode of the reactor. The effects of coating time of 10 to 30 min, coating voltage of 448 to 887 VDC, and the distance of the coating material to the target of 5 to 15 mm on thin film characteristics, electrical conductance and resistance, transmission, and reflection of light of the thin films were studied. According to the experimental results, it was found that the longer coating time and the higher input power affect the higher thickness, electrical conductivity, and light reflection of the copper film. On the other hand, when the distance between the coating material and the target extended, the film's advantageous characteristics diminished. The generated copper film on plastic sheet has the finest surface at the coating time, coating voltage, and distance of the coating material to the target were equal to 30 min, 5 mm, and 887 VDC, respectively. Under these plasma sputtering conditions, the reactor created the highest-thickness copper layer with an electrical conductance of 1.667 S, light transmission and light reflection average of 4.73%, and 36.78%, respectively. With these physical properties, it can be used as a flexible electrical circuit for small sensors.

Keywords: *plasma sputtering, thin film coating, flexible electrical circuit*

Association of Mid-Infrared-predicted Milk Fatty Acids and Blood Constituents with Early-lactation Disease in Holstein Cows

Eisuke Abe[1*], Makoto Kondo[1], Noriaki Nagahaka[2]

[1] *Mie University, Japan*
[2] *Mie Prefecture Livestock Research Institute*
e-mail: 522M101@m.mie-u.ac.jp

Abstract: Analyzing milk constituents using mid-infrared spectroscopy (MIR) has shown to be a possible method for monitoring early-lactation excessive energy deficiency in dairy cows. Our objective was to calibrate milk de novo fatty acids, analyzed by MIR, and to determine the association of MIR-analyzed de novo fatty acids with the energy deficiency and disease occurrences within the first 8 weeks after calving. Firstly, we calibrated the values of de novo fatty acid (FA) determined by MIR (Milkoscan, FOSS) based on the reference values acquired by gas-chromatography. Milk and blood samples were collected from 18 Holstein cows every week during first 8weeks after calving, and we analyzed milk de novo FA using MIR and serum non-esterified fatty acids (NEFA) by enzymatic assay. Diseases were recorded by the on-farm personnel. As a result, the developed model showed the wide range and good correlation to gas-chromatography. Cows experiencing hypocalcemia or hyperketonemia showed higher blood NEFA concentration and lower milk de novo FA ratios within 0~4weeks after calving compared to cows with no disease. We concluded that de novo FA would be a possible indicator to monitor energy deficiency in early-lactation of dairy cows.

Keywords: *infrared milk analysis, fatty acid composition, energy deficiency*

What a University Can Do on Combating the Climate Change and Achieving Net Zero?

Jiaqian Wang[1*]

[1]School of the Environment and Safety Engineering, Jiangsu University, 301 Xuefu Road, Zhenjiang, Jiangsu Province, P.R.China. 212 013.
e-mail: jiaqian-wang@foxmail.com

Abstract: Many institutions have declared a climate emergency, but few institutional carbon management plans consider the terrestrial carbon store of the estate in a quantitative or qualitative way. This work firstly discusses the diverse implementations from different universities globally on managing carbon budget, giving the inspiration about the responsibility of higher educations should take for maintaining an environmental-friendly Earth. Additionally, this work used a university in England- Newcastle University, as a case study, and demonstrated ways to quantify and potentially augment the soil and tree carbon stocks of institutional estates by changing land management. Also, the application of wheat straw and its biochar to urban soil was investigated for carbon sequestration. The total terrestrial carbon stock of Newcastle University's estate was 17 times greater than the annual institutional CO_2 equivalents-C emissions in 2019-20. Other measure such as doubling the number of free-standing trees on the farms, converting all lawns on the central campus into urban woodland, or amending the Newcastle Helix brownfield reclamation site soil with 2% biochar would off-set less than 3% of institutional emissions over 40 years. These discussions can aid in rational operation of carbon management plan of higher educations that endeavor to alleviate global warming.

Keywords: *biochar, carbon sequestration, soil and tree carbon, university*

Performance of Hydroponic Based on Photovoltaic and IoT Monitoring System for Pakcoy (Brassica Sinesis *L.*) Towards Sustainable Agriculture

Nur Ayu Fatimah[1*], Lilis Sucahyo[2]

[1]Undergraduated Student of Agricultural and Biosystem Engineering Department, Agricultural Engineering and Technology Faculty, IPB University, Bogor, 16680, Indonesia
[2]Lecturer of Agricultural and Biosystem Engineering Department, Agricultural Engineering and Technology Faculty, IPB University, Bogor, 16680, Indonesia
*e-mail: nurayu_fatimah@apps.ipb.ac.id

Abstract: Indonesia as an agricultural country has high potential in agricultural sector. Pakcoy (Brassica rapa L.) is one of the higher horticultural crop productions in Indonesia. Based on BPS RI data (2022), pakcoy has produced 727.467,00 tons in 2021. On the other hand, Indonesia is currently facing rural to urban land conversion which can threaten the agricultural productivity. On the other hand, Indonesia is currently having energy crisis and has only reached an NRE mix of 11.5% (ESDM, 2022). Therefore, this research is present as hydroponic integrating with solar panel and monitoring system for pakcoy plants. The purpose of this research to analyze the performance of prototype to improve the cultivating methods to be sustainable agriculture. This research method is based on quantitative and qualitative methods. The main subsystems of prototype are photovoltaic, hydroponic, monitoring system, and PV control panel. Photovoltaic can fulfill pump energy requirement and operating hydroponic continuously until plant harvesting. On the other hand, IoT monitoring system working properly and helpful as early warning if happening unwillingness of plant, nutrition, and environment condition.

Keywords: *hydroponic, pakcoy, photovoltaic, monitoring system, internet of things*

Analysis of Detection Technology of Aflatoxin in Food Crops

Kong Jia-yi[1*], Xia Gui-hua[1]

[1] College of Pharmacy, Jiangsu University (Zhenjiang 212013)
e-mail: 404947627@qq.com

Abstract: Aflatoxin (AFT) is a common mycotoxin in crops, and its metabolites have strong infectivity to rice, corn, wheat and other food crops. AFT is the most toxic and carcinogenic of all mycotoxins, which poses a great threat to people's life and health. It is of great significance to take effective technologies for the detection of aflatoxin in food. In this paper, a variety of detection technologies for aflatoxin will be explored.

Keywords: *aflatoxin, detecting technique, surface enhanced fluorescence*

The Cavitation Flow and Spray Characteristics of Gasoline-Diesel Blends in Real-size Optical High-Pressure Common Rail Injector Nozzle

Bihe Hu[1], Zhixia He[1*]

[1]Institute for Energy Research of Jiangsu University, Jingkou District, Zhenjiang City, Jiangsu Province, 212013, China
e-mail: zxhe@ujs.edu.cn

Abstract: In compression-ignition engines, gasoline-diesel blends have been widely concerned for its potential to reach 50% thermal efficiency and ultra-low emissions. Due to physical property difference between the two fuels, the spray atomization characteristics of the blended fuels are different from that of a single fuel, and the cavitation flow characteristics of the blends in the high-pressure nozzle and their impact on the spray are not well understood. In this paper, the visualization of cavitation flow and spray characteristics of five different proportion blended fuels (D100G0, D80G20, D60G40, D40G60, D20G80) was carried out. The influence of fuel properties corresponding to the gasoline-diesel mixing ratio on the initial generation of vortex-induced cavitation, the development of transient cavitation flow process，the injection rate and spray characteristics were studied respectively. For the tapered orifice nozzle investigated, string cavitation is captured mainly concentrating in the needle opening initial period and closing end period, which is the main factor of spray instability and fluctuations. At the injection starting, the addition of gasoline into the diesel fuel resulted in a significant increase in string cavitation strength and larger injection rate compared to the pure diesel, even if the percentage of gasoline added is small. However, the different gasoline addition ratios have little effect on the maximum intensity of string cavitation and the duration of string cavitation in the nozzle. Accordingly, the addition of gasoline increased the overall spray cone angle and spray fluctuations throughout the injection process. Meanwhile, as the injection volume increased, the injection rate curve in the initial process is flat at first and then become steep which was precisely related to the cavitation of the vortex line in the nozzle. The findings of this paper are important guidelines to the determination of fuel injection strategies and spray analysis of gasoline-diesel blends for compression- ignition engines.

Keywords: *gasoline-diesel blends, cavitation, spray atomization characteristics*

The Synergistic Effect of Plant Biomass by Xylanolytic Enzymes from *Paenibacillus xylaniclasticus* Strain TW1

Koki Taniguchi[1*], Shuichi Karita[1]

[1]*Graduate School of Bioresources, Mie University, Japan*
e-mail: 522m309@m.mie-u.ac.jp

Abstract: Biofuel has attracted great interest as a sustainable energy source. Lignocellulosic biomass, one of the feedstocks for biofuel production, has a strong structure composed of xylan and cellulose, which are barriers to its efficient conversion to fermentable sugars. Therefore, synergistic degradation of lignocellulose by multiple enzymes is important for efficient biofuel production. The *Paenibacil- lus xylaniclasticus* strain TW1, a xylanolytic-cellulolytic Gram-positive bacterium, was found to have various genes of carbohydrate hydrolase enzymes. In this study, a newly reducing end xylose-releasing exo-oligoxylanase (*Px*Rex8A) was characterized. The gene encoding *Px*Rex8A was cloned, and heterologously expressed in *Escherichia coli*. Biochemical analysis showed that *Px*Rex8A has activity only on corn core xylan and releases xylobiose and xylose from soluble xylan. We also evaluated the degradation of oat spelt xylan (OSX) with an enzyme cocktail combining *Px*Rex8A with endo-β-1,4-xylanase (*Px*Xyn11A) and/or β-xylosidase (*Px*Xyl43A). The combination of *Px*Rex8A and *Px*Xyn11A showed the increase of released reducing sugars and achieved about 1.37 degree of synergy for the addition of all three enzymes. These synergistic effects of *Px*Rex8A and *Px*Xyn11A and/or *Px*Xyl43A on branched- chain xylan could be responsible for the high xylanolytic ability of the TW1 strain, which may be applied for efficient degradation of lignocellulosic biomass.

Keywords: *biofuel, lignocellulose, Paenibacillus xylaniclasticus, reducing end xylose-releasing exo-oligoxylanase,*

Solar-Photovoltaic Waste Management Using Induction Heating Technique

Nutthawat Tonnoi[1], Parin Khongkrapan[1]*, Nigran Homdoung[1], Kittikorn Sasujit[1], and Yingrak Auttawaitkul[1]

[1]School of Renewable Energy, Maejo University, Chiang Mai, Thailand
e-mail: parin.khongkrapan@gmail.com

Abstract: This research aimed to study the feasibility of solar-photovoltaic waste management using an induction heating technique. A 5-kW induction reactor was used to melt the disassembled PV waste in order to produce a material that could be recycled and utilized in construction. The PV waste used in the experiment was the damaged monocrystalline solar panel. The mashed PV waste, with a size of 1 to 10 mm, consisted of 80 %w/w glass and 20 %w/w PV cell materials. According to operating temperatures between 1,400 and 1,600 °C, the reactor can transform the PV waste at a rate in the range of about 0.96 to 1.24 kg/h. The density and the compressive strength of melted PV waste were about 2,680 kg/m^3 and 23,380 N/mm^2, which were higher than pure glass by 7.20 % and 11.33 %, respectively. With these physical properties, it can be used as a material in construction work.

Keywords: *solar-photovoltaic waste, induction reactor, renewable material*

Low Carbon Diet Education to Support Climate Change Management: A Systematic Review

Anny Nila Syauqiyyah[1], Nia Imaniar[1], Muhammad Zaidan Ahsan[1], Muhammad Aries[2*]

[1]Undergraduated Student of Department of Community Nutrition, Faculty of Human Ecology, Bogor Agricultural University, Bogor 16680, Indonesia
[2]Department of Community Nutrition, Faculty of Human Ecology, Bogor Agricultural University, Bogor 16680, Indonesia
e-mail: ariesulaeman@apps.ipb.ac.id

Abstract: Currently, the food system contributes 33% of total greenhouse gas emissions. Consumers are an essential key in the food system. Changes in consumption patterns and Low Carbon Diet (LCD) will increase the food system's contribution to tackling climate change. This study aims to analyze research trends in LCD education. The method used is a systematic study that refers to the Preferred Reporting Items for systematic and Meta-Analysis (PRISMA) system. This method has three stages: literature study, data extraction, and data analysis and synthesis. The results showed that three out of 24 scientific articles discussed the LCD educational intervention. LCD education began to develop in California and Sweden in the last five years. Intervention results in several developed countries show that LCD education significantly reduces carbon footprint. The study results show that LCD education is starting to receive attention in many countries. In addition, LCD education is one of the approaches to handling change; not much has been made in Indonesia. However, some institutions and community groups have started to pay attention to this. LCD education is essential to be implemented in Indonesia. The implication of this study is the potential of LCDs to develop as a new approach to dealing with climate change in Indonesia.

Keywords: *carbon footprint, climate change, dietary, education intervention, low carbon diet*

Influential Environmental Factor to Photosynthetic Active Radiation in Greenhouse Planting

Nichakarn Morakote[1], Warut Timprae[2], and Damrongsak Rinchumphu[3*]

[1] Undergraduate student, Department of Civil Engineering, Faculty of Engineering, Chiang Mai University, Thailand
[2] Researcher, City Research and Development Center, Faculty of Engineering, Chiang Mai University, Thailand
[3] Assistant Professor, Department of Civil Engineering, Faculty of Engineering, Chiang Mai University, Thailand
e-mail: damrongsak.r@cmu.ac.th

Abstract: Nowadays, smart farming has become more famous because it can control production and environmental factors. Smart farming has many factors to control which one is light. For these reasons, lighting requires artificial light from the artificial incandescent lamps with the correct light value suitable for cultivation. Many types of light values are used in agriculture, such as light intensity, luminous power, and luminous intensity. Nevertheless, an essential value is Photosynthetic Active Radiation (PAR) because it is a value that can indicate the ability of plants to photosynthesize. Thus, PAR sensor is expensive and difficult to acquire, so this research focuses on creating a statistic model to analyze factors that are suitable for PAR by using linear regression analysis. Three variables are temperature, humidity, and light intensity (Lux). For linear regression analysis results using a stepwise technique for selecting variables, the results are R2 equal to 96.92%, and PAR influences all variables. The most influential variable is the Lux value, with a coefficient of 2.46. Then, the temperature with a coefficient of 1.41, and the humidity with a coefficient of -0.68. Therefore, this research can be applied as an alternative to selecting a replacement device for measuring PAR.

Keywords: *photosynthetic active radiation (PAR), IoT, greenhouse, planting, luminous lighting*

Prospect of New Energy Vehicles in Small- and Medium-sized Cities

Tianhong Yang[1*]

[1]School of Foreign Languages, Guangxi University, China
e-mail: 1576202077@qq.com

Abstract: To cope with the energy shortage, countries around the world are vigorously developing and promoting new energy vehicles. However, the new energy vehicle market in small- and medium-sized cities seems to have insufficient momentum, mainly due to the decreasing government subsidies year by year, inconvenient charging, as well as range anxiety. Outnumbering big cities to a great extent, small- and medium-sized cities have a huge market and great consumption potential. Therefore, the research into the prospect of new energy vehicles market in these cities is of significance for China's economic development and national energy strategy. This paper will adopt the method of comprehensive analysis to study the dilemma of the new energy market in small- and medium-sized cities and explore future solutions to it.

Keywords: *customers' preferences and misgivings, new energy vehicle, small- and medium-sized cities*

Research on Robot for Assisted Tree Planting Based on ROS

Zhaozhan Chi[1*], Qiancheng He[1], Yuanpeng Wang[2]

[1]School of Mechanical Engineering, Guangxi University, China
[2]School of Computer, Electronics and Information, Guangxi University, China
e-mail: 2320150556@qq.com,

Abstract: At present, China's afforestation is still dominated by traditional artificial methods. We design and build an assisted tree planting robot based on non-holonomic constrained mobile robot. And the navigation algorithm of path planning is studied. The main work of this project is as follows:
Firstly, the software control system is based on ROS (Robot Operating System). On this basis, the Gmapping algorithm based on 2D lidar is used to create a 2D SLAM grid map of the surrounding environment. At the same time, AMCL adaptive Monte Carlo algorithm is used to locate itself and YOLO target detection model is used to monitor the surrounding environment in real time to determine the best planting position. Secondly, an intelligent navigation framework based on ROS is used in assisted tree planting robot in this paper. The improved hybrid A* algorithm, is selected as the global path planning algorithm, to plan the global path according to the known map. T h e navigation algorithm is simulated on rviz platform in ROS. Finally, we carry out experiments in MATLAB and experimental field. The results show that the navigation failure rate is obviously reduced, which meets the working needs and kinematic characteristics of the assisted tree planting robot.

Keywords: *assisted tree planting, hybrid A* algorithm, mobile robot, path planning*

Dynamite Wash: Eco-Friendly Detergent from Lerak Fruit with Water Soluble Paper

Silvia Zalda Putri[1*], Feby Abelina[2], Muhammad Rafly Ikhsan[2], Rafli Arya Fahrezi[2], Gustri Handayani[3] and Muhammad Findi[4]

[1]Undergraduate Student of Department of Geophysic and Meteorology, Faculty of Mathematics and Natural Science, IPB University, Dramaga Street IPB Dramaga Campus, Bogor, 16680, Indonesia
[2]Undergraduate Student of Department of Mechanical and Biosystem Engineering, Faculty of Agricultural Engineering and Technology, IPB University, Dramaga Street IPB Dramaga Campus, Bogor, 16680, Indonesia
[3]Undergraduate Student of Department of Agronomy and Horticulture, Faculty of Agriculture, IPB University, Dramaga Street IPB Dramaga Campus, Bogor, 16680, Indonesia
[4]Department of Islamic Economics, Faculty of Economics and Management, IPB University, Dramaga Street IPB Dramaga Campus, Bogor, 16680, Indonesia
e-mail: silviazaldaputri@apps.ipb.ac.id

Abstract: The use of detergents continues to increase every year. Detergent waste that is disposed of directly is very harmful to the environment because it contains alkyl benzene sulfonate, phosphate, sodium carbonate, and foaming agents. Dynamite Wash is an environmentally friendly detergent product made from natural raw materials of lerak fruit that does not cause pollution and does not damage clothes. The purpose of writing this scientific article is to produce environmentally friendly detergent products and to find out the level of consumer interest in this product. The method used consists of the product manufacturing process, literature study, trial phase, and evidenced by customer testimonials. The manufacturing process starts from the preparation of tools and materials, the production process, quality control, and packaging. In one package of Dynamite Wash, there are 8 sheets of paper measuring 7 x 5 cm which are equipped with an information card containing product composition, explanation of lerak fruit, product benefits, product advantages, and contact person. This product is equipped with three aroma variants including lemon, strawberry, and apple which are packaged in ivory packaging. This product has several advantages such as an affordable price, has a variety of aroma choices, does not have a negative impact on the environment, is easy to carry anywhere, and is easy to use. Based on the results of customer testimonials, Dynamite Wash products are effective in removing stains and odors on clothes.

Keywords: *detergent waste, environmentally friendly, environmental pollution, saponins, washing clothes*

Analysis on Heat Transfer Technology of Internet Data Center

Wenlong Yang, Lantian Hu, Yang Wu, Yulong Fan, Gege Dong

e-mail: 3280107183@qq.com

Abstract: In the context of "Internet+", artificial intelligence, AR/VR, and IoT are developing rapidly, and data traffic is growing at a hundred times faster. Internet Data Center (IDC) is developing in the direction of "high performance, high density and high energy consumption". Seeking high efficiency, high reliability, low material consumption, low energy consumption (energy saving), low pollution emission (emission reduction) and easy maintenance of heat dissipation has become an important issue in the context of "double carbon". In recent years, major domestic and foreign manufacturers, universities and research institutions have explored a lot in thermal control. We briefly introduce the causes of heat generation in data centers, and analyze the traditional mature heat transfer methods and the emerging heat dissipation methods.

Keywords: *high energy consumption, high efficiency, double carbon, internet data center*

Willingness of Vulnerable Groups in the Coastal Zone to Accept Offshore Wind Power in the Framework of Sustainable Livelihood Analysis

Han Wang[1,2,3], Zhenhan Yu[1*]

[1]School of Public Administration, Guangxi University, No. 100, Da Xue Road, Nanning 530004, China
[2]Department of City and Regional Planning, University of North Carolina at Chapel Hill, Chapel Hill, NC 27599, USA
[3]China Center for Agricultural Policy (CCAP), School of Advanced Agricultural Sciences, Peking University, No. 5, Yi He Yuan Road, Beijing 100871, China
e-mail: 15977768676@163.com

Abstract: With the goal of achieving carbon neutrality by 2060, expansion of offshore wind power plays a significant role in China energy policy. However, offshore wind farms lead to changes of coastal vulnerable group's livelihood capital. In this paper willingness to accept for influencing the livelihood capital from future offshore wind farms is elicited using the economic valuation method Choice Experiments. The 4 attributes considered here are distance from the land, tourist variation, electricity price, and decrease in marine life. Data were analyzed using the mixed logit model to understand how changes in livelihood capital affect the acceptability of coastal vulnerable group. Findings indicate that compensations vary from different types of vulnerable group, with fishing-dependent vulnerable groups being the largest, followed by tourism and fishing part-time groups, and tourism-dependent and working groups being the least willing to be compensated. Findings from this study provide valuable insights into the potential impacts of the growing offshore wind industry on different types of coastal vulnerable group and potential compensation and management strategies for addressing these impacts in the China.

Keywords: *carbon neutrality, offshore wind farms, choice experiments, livelihood capital, energy*

Precision Medicine: Advances in The Diagnosis and Treatment of Diabetic Cardiovascular Diseases

Yue Cai[1], Zhongqun Wang[1*]

[1]Department of Cardiology, Affiliated Hospital of Jiangsu University, Zhen Jiang, China
e-mail: wangtsmc@126.com

Abstract: With the high incidence of diabetes worldwide, more and more attention has been paid to its complications. In the course of a clinical treatment, different people may have the same diagnosis, but they may respond very differently to the same therapeutic intervention. Therefore, precision medicine to prevent or treat diseases according to the characteristics of each patient is bound to usher in a new era of medicine. In this review, from the perspective of NFAT, PI3K, related signaling pathways and pericytes, the possible roles of NFAT, PI3K and their related signaling pathways in the pathogenesis and precision treatment of diabetic cardiovascular diseases were studied at the molecular and cellular levels, so as to bring new ideas for the precision treatment of diabetic cardiovascular diseases.

Research on the HeForShe Social Movement from the Perspective of Feminism Theory —Take China and Indonesia as Examples

Ziyan Liang[1*]

[1]*School of Foreign Languages, Guangxi University, China*
e-mail: ziyanliang@st.gxu.edu.cn

Abstract: UN Women has supported the HeForShe social movement (hereafter referred to as HFSSM) since its launch in 2014. Females are an important part of the world's population. However, females still earn enough attention and rights in some sectors of the world which is always a heated issue. This research paper is conducted to remind society to truly ensure the rights of women instead of sharing empty talks of the experts. The author selects Family, Structural, and Education Oppression to analyze this issue. The research will mainly use case studies as a method and feminism as a theory to analyze some HFSSM examples in China and Indonesia. There are three main outcomes. (I) The main cause of women's oppression is patriarchy. (II) Domestic violence has a severe influence on females' definition of their character and purity. (III) Educated females are more aware of their rights and they can make themselves resilient. Regarding the outcomes, it can be concluded that both law and thought-changing can transform society into a more equal one. With the participation of males and the changing thoughts of males, progress and peace in society are soon. Through celebrity speeches, articles, challenges in TikTok, and news, females together with males are determined to achieve equal goals.

Keywords: *domestic violence, feminism, HeForShe social movement, patriarchy society*

Design and Analysis of Khun Huay Haeng Microgrid Using HOMER Pro

Saridpong Rangsaritaphiban[1] and Paramet Wirasanti[1*]

[1]Department of Electrical Engineering, Faculty of Engineering, Chiang Mai University
e-mail: paramet.w@cmu.ac.th

Abstract: Khun Huay Haeng is a royal agricultural research institute for a highland agriculture, which is located at Doi-Inthanon Chiang Mai, Thailand. An important problem for this research institute is power outages for several hours. Because the institute is supplied by a 22 kV distribution line across the fertile forest of Doi-Inthanon National Park. According to mentioned reason, the microgrid is considered as a solution. This paper introduces HOMER Pro software for microgrid design and analysis to achieve an optimal solution. The main components in this study are the battery energy storage system, photovoltaics system, load profile of the village, and research institute. The research institute consists of 3 buildings: a plant tissue culture building, a flower packing building, and a flower collection building. To evaluate the microgrid system, the case study is calculating a scheduled rates grid with an outages model, the cost of energy, and the electrical energy management are focused. Conclusively, the study results will be discussed in terms of system sizing, energy consumption, net present costs, grid purchases, and solving power outages.

Keywords: battery energy storage system, energy management, homer, microgrid

Food Security and Punitive Damages Over New Plant Variety in China

Yayuan Peng[1*]

[1]*Jiangsu University, China*

Abstract: The punitive damages for new plant varieties have become more and more important for stimulating innovation in the seed industry and ensuring food security in China. China has formed a certain consensus on the issue of punitive damages for new plant varieties. Firstly, the two major elements of punitive damages, "intentional infringement" and "seriousness of the circumstances", have been unified. Secondly, the application of the calculation base and the general scope of punitive multipliers were initially clarified. Thirdly, a certain consensus has been formed on the procedural issues of applying punitive damages. However, there are many problems in judicial practice, such as less punitive damages and more statutory damages; less application of comparable license rates and more discretionary judgements; and low amount of punitive damages and too much reliance on "infringers' profits". China will make separate legislation for new plant varieties in the next step. On the one hand, the rules of proof for punitive damages of new plant varieties should be improved. On the other hand, the application of punitive damages for new plant varieties should be refined to crack the low amount of compensation awarded and other problems.

Keywords: *punitive damages, new plant variety, food security*

Analysis and Design of Rice Supply Chain Technology Infrastructure Using Blockchain Method

Nur Rohman[1*], Endang Giri Purnama[2]

[1]Undergraduate Student of Department of Computer Science, Faculty of Mathematics and Natural Science, IPB University, Dramaga Street IPB Dramaga Campus, Bogor, 16680, Indonesia
[2]Department of Computer Science, Faculty of Mathematics and Natural Science, IPB University, Dramaga Street IPB Dramaga Campus, Bogor, 16680, Indonesia
e-mail: rohman23nur@apps.ipb.ac.id

Abstract: The war between Russia and Ukraine affects global markets. This has an impact on prices at the consumer level which can be doubled compared to prices at the farm level due to the long distribution chain of agricultural commodities. Price changes between the farm level and the retail level are not symmetrical. The research aims to determine an infrastructure model for rice distribution monitoring technology that controls prices using the blockchain method. Developing an infrastructure model for rice supply technology will impact sustainable rice production and distribution, making rice readily available to all communities, both in quantity and price. Advances in technology facilitate different goals. Blockchain technology is one way to determine food availability. Blockchain has various technical advantages that can be applied and used in the field of supply chain management.

Keywords: *blockchain, control prices, food systems, rice, supply chain*

The Research and Development of Plant-based Biotechnology Foods for Human Benefits

Xiaoyan Tian[1*]

[1]Department of Horticulture, College of Agriculture, Guangxi University, China
e-mail: xiaoyantian2022@163.com

Abstract: Over the past 50 years, the world population has nearly doubled while the amount of land available for agriculture has increased by a scant 10%. In fact, hunger continues to plague much of the world, so it is vital to feed so many people with only a marginal increase in available land. Most of improved productivity has depended on crossbreeding methods developed hundreds of years ago to provide animals and plants with specific traits. Recently, however, the development of new, more productive crops has been accelerated by the direct transfer of genes including protoplasm fusion, antisense technology, gene gun and the broad use of Ti plasmid with Agrobacterium induced and tissue culture. Based on the methods mentions above, this paper outlines several ways that biotechnology might reduce hunger and malnutrition around the world and list some crops improved by genetic engineering which can protect from disease, reduce the need for pesticides, and improve the nutritional value of foods. The plant-based biotechnology foods play a key role in our society and the future research and development in these areas is especially bright but we also consider the potentially environmental and health concerns surrounding genetically modified food.

Keywords: *application, biotechnology, concern, foods, transgenesis*

The Impact of Global Warming on China's Forest Resources in the 21st Century

Chen Xiaolan[1*]

School of Foreign Languages, Guangxi University, China
e-mail: cxiaolan2022@163.com

Abstract: Since the 21st century, the greenhouse effect caused by human activities and the resulting global climate change and ecological environment have attracted more and more attention. Among them, forest resources, as an important component of the global ecosystem, are the focus of people's attention. The author discusses various impacts of climate change on forest ecosystems in the 21st century, such as the frequency and extent of forest fires, forest biodiversity, forest distribution area, etc. Forest resources bring challenges and risks that may exist in the future, such as the destruction of several forest phenology, the reduction of future growth rates of forest productivity, and the frequent occurrence of forest disasters. Finally, in response to the various risks and challenges mentioned above, through preventive measures such as adjusting the length of the rotation period, improving forest disaster monitoring technology, and compensatory measures such as afforestation, it is expected that the future climate and forest ecosystem will be affected. develop better strategies.

Keywords: *forest ecosystem, forest disaster, global warming*

TR-U2022
empowering young researchers for a better future

Improvement of Humidifier System in Smart Greenhouse for Straw Mushroom Cultivation

Techatorn Chaiwong[1], Pakamon Pintana[2*] and Tanate Chaichana[1]

[1]Department of Renewable Energy Engineering Maejo University, Chiang Mai, Thailand
[2] Department of Energy Conservation Engineering Maejo University, Chiang Mai, Thailand
e-mail: p.pintana@gmail.com

Abstract: This research aimed to study, design, and build humidification systems for cultivating straw mushrooms in a smart greenhouse. Compare humidification using the ultrasonic mist maker and spray nozzles humidifier that affects the production of straw mushrooms. The main equipment in the experiment was a humidity sensor BME280 to control the humidity in the greenhouse to not less than 80%. Using the 6 ultrasonic mist makers, misting capacity is 5 kg/h. and 2 nozzles spray with 0.1 mm. of diameter. The operation of the automation has other configurations as follows: on days 1-5 temperature ranges from 35-38 °C, when the mushroom begins to release, the temperature is adjusted to the range of 30-32 °C and the carbon dioxide in the greenhouse does not exceed 2,000 ppm. The fan ventilation control system will send the fan to work by detecting the conditions as scheduled when starting the 4th day of mushroom cultivation. The test results showed that the ultrasonic mist maker can humidify the greenhouse faster than the humidification system with the spray nozzles. However, both humidification systems can increase the humidity to the desired range within a period of less than 1 minute. The yield from the humidification system with an ultrasonic mist system is greater than a spray nozzles system.

Keywords: *smart greenhouse, humidifier system, mushroom cultivation*

Development of Potassium Detection System on Peat Soil Oil Palm Plantation Using Sentinel-1 Satellite Imagery

Devon Adyuta Puspohusodo[1], Kudang Boro Seminar[1] and Sudradjat[1]

[1]Department of Mechanical and Biosystem Engineering, Faculty of Agricultural Engineering and Technology, IPB University

Abstract: Palm oil play an important role in the Indonesian economy because it is the largest Indonesian export commodities. Sufficient soil nutrients will result in maximum production and better oil yield quality. One of the nutrients that is very influential on productivity is potassium. Soil samples and location coordinates taken from peat soil oil palm plantation were then adjusted to the Sentinel-1 imagery. Sentinel-1 image obtained processed through preprocessing steps. Sentinel-1's image preprocessing steps are applying orbit file, thermal noise removal, border noise removal, calibration, speckle filtering, terrain correction, and convert to dB. The satellite image parameters used are, sigma naught, gamma naught, beta naught, local angle of incidence, projected local incidence angle, elevation, and incidence angle from ellipsoid. These parameters used as model's independent variables. The actual soil nutrition from the lab results used as model's dependent variable. The data was divided into two groups of training data with 90% data and test data with 10% data. Prediction model is made using Neural Network Regressor (NN). All models that were built were assessed for the quality of the model using MAPE. NN modeling is built using hyperparameter tuning so that the model quality is better. The NN model has a MAPE of 25,85%, meaning that the correctness is 74,15%.

Keywords: *neural network regressor, palm oil plantation, soil nurtirent, sentinel-1, soil potassium level and synthetis aperature radar*

Research on the Legal Issues of Ecological Protection in the Coastal Zone of Guangxi Beibu Gulf under the Background of Sea and Land Co-ordination

Mengyao Lv[1*]

[1]School of Public Administration, Guangxi University, China
e-mail: lmy20021101@163.com

Abstract: As a complex unit connecting the ocean and the land system, the coastal zone provides abundant natural resources, is the most sensitive area of human economic activity, and is also a key area for the coordination and sustainable development of ecological environment and social economy. Although the coastal zone of Guangxi Beibu Gulf has a relatively low degree of development and good ecological environmental protection nationwide, with the rapid development of economic activities, the ecological damage of the coastal zone is increasing, posing a serious threat to the sustainable development of the local area. There are a series of problems in the laws related to the ecological protection of the coastal zone of Guangxi Beibu Gulf, such as lagging special legislation, uncoordinated sea and land legal systems, and imperfect legal systems, thus it is difficult to form a strong synergy. Therefore, this paper takes the overall planning of sea and land as the perspective, based on the current legal situation of the coastal zone of the Beibu Gulf of Guangxi, and provide suggestions for the formulation of relevant laws and regulations through literature analysis, empirical analysis and other methods, so as to promote the sustainable development of the region.

Keywords: *coastal zone, ecological protection, land and sea co-ordination, legal issues*

Power System and Energy Saving Strategy of an Electric Tractor for Agriculture

Liu Tao[1*], Shang GaoGao[2], Han JiangYi[2] and Wang XiuLun[1]

[1] *Graduate School of Bioresources, Mie University, Japan*
[2] *School of Automotive and Traffic Engineering, JiangSu University, China*
e-mail: 521D2S2@m.mie-u.ac.jp

Abstract: The ongoing modernization of agricultural methods has led to an increase in the demand for clean energy sources and greater environmental sustainability. Regarding agricultural machinery, specifically, research into the development of an electric tractor is becoming more and more significant. In this paper, we have included a proposal based upon our investigation into a new design of an electric tractor chassis, and a dual-motor coupling power system structure. The dual-motor coupling power system can properly combine the power output between the two motors. We propose a method to couple the power of two motors, in which two motors can always work in the high-efficiency area for different working modes. We use a hydraulic clutch to accomplish the coupling function. Then, we used the parametric design method to design the dual-motor coupling power system and used a computer to build a 3D model. In our study, the electric tractor chassis was designed and a coupled gearbox system was manufactured for the chassis. Here, this electric tractor with the dual-motor driving system is demonstrated.

Keywords: *electric tractor, power system, parametric design*

Feeding Management and Performance of IPB D-1 Chickens Fed with The Inclusion of Black Soldier Fly (BSF) Larvae (*Hermetia illucens*) Meal

Anisa Eka Nur Syahfitri[1*], Pria Sembada[2], and Gilang Ayuningtyas[2]

[1]Undergraduate Student of Livestock Technology and Management, College of Vocational Studies, IPB University, Bogor, 16128, Indonesia
[2]Livestock Technology and Management, College of Vocational Studies, IPB University, Bogor, 16128, Indonesia
e-mail: anisaekan@gmail.com

Abstract: This study evaluated the feeding management and the performance of IPB D-1 chickens on three dietary treatments. The diets used were formulated by Maggnesia research team, namely P0, P1, and P2. P0 is feed without a mixture of Black Soldier Fly (BSF) larvae flour, P1 with a mixture of 5% BSF larvae flour, and P2 with a mixture of 7,5% BSF larvae flour. The three dietary treatments were fed separately to three replicate groups. IPB D-1 chickens were reared intensively in an open house cage system and carried out manually. The chickens were raised for 12 weeks. The feeding method is point feed, the feed was given and leftover feed was weighed and recorded each day. Recording data also includes feed intake, body weight, body weight gain, Feed Conversion Ratio (FCR), mortality, and uniformity. The type of treatment that showed the best rearing results was P2 because the FCR was smaller than other treatments. Nevertheless, the P2 feed was less palatable than other feeds. The uniformity of IPB D-1 chickens showed not uniform results because the uniformity value was generally less than 80%. Mortality is caused by improper maintenance techniques and environmental adaptation periods.

Keywords: *black soldier fly, feeding management, IPB D-1 chickens, local chicken*

Computational Design of Magnetic-based Materials for Terahertz Technology

Ryosuke Ozaki[1*], Kenji Nawa[1], Kohji Nakamura[1]

[1]Department of Physics, Faculty of Engineerling, Mie University, Tsu, Mie 514-8507, Japan
e-mail: 421M607@mie-u.ac.jp

Abstract: The terahertz (THz) technology is essential in the field of next-generation high-frequency communication and electronic device technologies, in which antiferromagnetic (AFM) materials with a magnetic resonance frequency in THz have been attracting attention in order to achieve THz-wave passive components. It has been further shown that the resonance frequency in antiferromagnetic NiO is modulated by impurity dopants. By using first-principles calculations, in the present work, we investigated how the resonance frequency, i.e., the magnetic exchange interaction constants and magnetic anisotropic energy in NiO, are affected by the dopants. We found that there is a simple relationship between the exchange interaction constants and the valence electron numbers of dopants, and that the magnetic anisotropic energy varies depending on the dopants where the magnetic moments of the dopants play a role.

Keywords: *NiO, role of impurity, magnetic exchange interaction constants, magnetic anisotropy energy, first-principles calculations*

Portfolio Risk Investment Strategy Model based on ARIMA and LSTM

Kang Liu[1], Weidong Wang[2]

[1] School of Energy and Power Engineering, Jiangsu University, Zhenjiang, Jiangsu, 212013, China
[2] School of Finance and Economics, Jiangsu University, Zhenjiang, Jiangsu, 212013, China
e-mail: 3190212083@stmail.ujs.edu.cn

Abstract: Market trading is often fraught with uncertainty. It is often possible to build a model to predict future market movements in gold and bitcoin prices based on historical data, and then design a reasonable trading strategy that achieves the expected returns. A market forecasting model based on ARIMA and LSTM neural networks was first built to obtain a set of price change series that reflect both future trends and observed recent increases to support the design of a market trading strategy. Next, a portfolio investment model combining return and risk is constructed. Combining commissions at the time of trading with investment returns avoids the need to consider the impact of commissions at the time of decision making. In the investment decision, each holding is determined individually and the weighting of each investment is adjusted by planning the weighting of each investment against the expected risk. The acceptance of different risks, the R-value of the ARIMA prediction results and the stage evaluation of the LSTM are combined to adjust the weighting of the risks, resulting in three different risk portfolios: low, medium and high.

Keywords: *ARIMA, LSTM, price estimation, investment strategy*

Design, Simulation and Application of Compact Solar Energy Pump

Ling Zhou [1*], Ling Bai [2], Yong Han [1], Zhenjiang Zhao [1], and Lei Jiang [1]

[1] National Research Center of Pumps, Jiangsu University, Zhenjiang, Jiangsu 212013, China
[2] School of Energy and Power Engineering, Jiangsu University, Zhenjiang 212013, China
e-mail: lingzhou@ujs.edu.cn

Abstract: Pump is one of the most energy consuming devices widely used with general machinery in industrial applications. Solar energy pump could operate without electricity system, which is the best water supply method for remote arid regions. Due to the complex three-dimensional geometries of the impellers and diffusers, their design is a challenging task. Small changes in the design can result in significant changes in the internal flow structures affecting the hydraulic performance. In this study, the internal flow fields in a compact return diffuser has been investigated both numerically and experimentally under multi-conditions. Three-dimensional steady Reynolds Averaged Navier–Stokes equations are solved on high-quality structured grids with the DES (Detached Eddy Simulation) turbulence model by using the CFD (computational fluid dynamics) code ANSYS-Fluent. Furthermore, a special Particle Image Velocimetry (PIV) test rig is designed, and the two- dimensional PIV measurements are successfully conducted in the diffuser midplane to capture the complex flow and to validate the CFD results. The analysis of the obtained results has been focused on the flow structure in diffuser, especially under part-load conditions. In addition, the comparison between CFD and PIV results has also been carried out. This work offers a reference for optimal design of compact solar energy pumps.

Keywords: *pumps, experiments, numerical simulation, turbulence model*

Population Aging and High-Quality Economic Development

Ziyi Liu[1*], Zhihong Li[2]

[1] International college, Guangxi University, Nanning 530004, China
[2] School of Resources, Guangxi University, Nanning 530004, China
e-mail: GX_LZY1121@163.com

Abstract: The 21st century is an age of population aging, especially for relatively developed countries and regions, the birth rate has decreased and the life expectancy has increased. With the increase of aging population, the labor force needed for social and economic development will be insufficient, thus hindering the high-quality economic development. The change of the age structure of the population is a necessary and spontaneous process for the development of most countries. The aging of the population will lead to the disappearance of the population dividend, and the change of the labor supply will affect the industrial structure. Therefore, it is an important link to adapt to the new situation to promote industrial transformation and build a new driving force of economic growth. This paper will use a hierarchical linear model to analyze the impact of population aging and industrial transformation on the high-quality economic development. Actively responding to the aging population is a necessary choice for achieving high- quality economic development.

Keywords: *aging of population, labor force, economic development, industrial transformation*

Identification and Characterization of Organic Acid-Producing Lactic Acid Bacteria Strains and Their Application in Corn Straw Silage Production

Charles Obinwanne Okoye[1,2,3], Jianzhong Sun[1,2], Jianxiong Jiang[1,2*]

[1]Biofuels Institute, Jiangsu University, Zhenjiang 212013, China
[2]School of Environment & Safety Engineering, Jiangsu University, Zhenjiang 212013, China
[3]Department of Zoology & Environmental Biology, University of Nigeria, Nsukka 410001, Nigeria
e-mail: jxjiang@ujs.edu.cn

Abstract: Lactic acid bacteria (LAB) are widely exploited in fermented foods and are gaining attention for novel uses due to their safety for human and animal consumption. In this study, several organic acid-producing LAB strains were isolated from fermented vegetables for their potential application in silage production. We identified nine strains belonging to four genera and five species, *Lactobacillus plantarum* PC1-1, YCI-2 (8), YC1-1-4B, YC1-4 (4), and YC2-9, *L. buchneri* PC-C1, *Pediococcus pentosaceus* PC2-1 (F2), *Weissella hellenica* PC1A, and *Enterococcus* sp. YC2–6. Based on the results of organic acid content, acidification, antibiotic and antimicrobial properties, and growth in the culture medium, four unique strains, PC1-1, YC1-1-4B, PC2-1(F2), and PC-C1, showed exceptional biopreservative potential. Additionally, three strains (YC1-1-4B, PC2-1(F2), and PC-C1) significantly increased silage organic acids, aerobic stability, LAB counts, and crude protein, and lower levels of silage pH and ammonia nitrogen. Also, four strains (PC1-1, YC1-1-4B, PC2-1(F2), and PC-C1) showed a strong positive correlation between several biopreservative properties and silage quality which ascertained their remarkable performance in silage production.

Keywords: *biopreservation, corn straw silage, ensiling, lactic acid bacteria (LAB), organic acids*

Effects of Various Hydroponic Systems in Increasing Caisim (*Brassica sinensis L.*) Production Under LED Grow Light

Braja Manggala[1,2], Malliny Debra[3], Chatchawan Chaichana[2*], Wahyu Nurkholis Hadi Syahputra[1,2], and Wasin Wongwilai[4]

[1]Department of Mechanical Engineering, Chiang Mai University, Chiang Mai, 50200, Thailand [2]Renewable Energy and Environment Conservation Laboratory, Department of Mechanical Engineering, Faculty of Engineering, Chiang Mai University, 50200, Thailand
[3]Departement of Agricultural Engineering and Biosystem, Brawijaya University, Malang City, Indonesia
[4]Science and Technology Research Institute, Chiang Mai University,
e-mail: c.chaichana@eng.cmu.ac.th

Abstract: The hydroponic system has been shown to have a strong relationship with greatly enhancing crop yield, particularly for leaf vegetable groupings. Furthermore, the hydroponic systems help with the inefficiency in land and water resource usage in conventional farming. In this study, three hydroponic methods, wick technique, Nutrient Film Technique (NFT), and Deep Flow Technique (DFT), was utilized to examine their influence on caisim (*Brassica sinensis L.*) production. Those hydroponic systems were installed on a single shelf to maximize land utilization. Caisim's growing condition was under blue-red LED light for 35 days with a 16-hour illumination time at a distance of 15 and 20 cm. As a result, each hydroponic system was compared for morphology (number of leaves, plant height, leaf width, weight of wet roots, and fresh weight). Caisim morphology using the NFT method had a more significant ($P < 0.05$) result than the wick and DFT methods in harvest time. Moreover, the LED at 15 cm outperformed the wick, DFT, and NFT at 20 cm by 20%, 47%, and 33% on fresh weight, respectively. Based on the results, the NFT method coupled with a 15 cm LED grow light was superior and remarkably affected caisim morphology.

Keywords: *hydroponics, caisim (Brassica sinensis L.), wick technique, nutrient film technique (NFT), and deep flow technique (DFT)*

Application of Refused Paper and Plastic Fuel (RPF) in Paper Recycling Industry

Abednego Victor[1*]

[1]Undergraduate Student of Faculty of Economics and Management, IPB University, Bogor, 16680, Indonesia
e-mail: abednego11victor@apps.ipb.ac.id

Abstract: Indonesia is one of the world's producers of pulp and paper. Currently, the national capacity of the pulp industry is 12.3 million tons/year, placing Indonesia in 8th place in the world. Meanwhile, the national capacity for the paper industry is 18.56 million tons/year, making Indonesia the 6th largest in the world. The development of pulp and paper production in Indonesia is accompanied by increased waste from the pulp and paper industry and waste from using products made from pulp and paper. Problems arise from this condition where the results of the waste are not managed properly after the company selects their raw materials by machine. This study aims to analyze the technology recommendations for processing rejected waste and the application of RPF (Refused Paper and Plastic Fuel) in Indonesia. This research is a literature study using analytical techniques with qualitative and descriptive approaches. From the analysis results, it is found that in Indonesia, there are still little application of RPF in the pulp and paper industry only 2% out of 100% of the industry applied RPF as their waste management method. Out of the ten methods of waste management for rejected waste, it is found that RPF provides great benefits, such as in terms of economy, environment, quality, and utilization. The implementation of the RPF contributes to at least 5 Sustainable Development Growth (SDGs) out of seventeen goals: SDG 3, SDG 6, SDG 9, SDG 12, and SDG 13.

Keywords: *pulp and paper, recycling paper industry, reject waste, RPF, waste management*

The Best Apllication of 3S (Sorgum-Sawit-Sapi) as Silvopastoral System Integrates with Oil Palm Plantations in Bogor Regency

Salwa Nurisanti Maulidina[1*], Rahmat Asy'ari[2], Nur Rochmah Kumalasari[3]

[1]Undergraduate student, Department of Nutrition and Feed Technology, Faculty of Animal Science, IPB University, Bogor, 16680, Indonesia
[2]Undergraduate student, Department of Forest Management, Faculty of Forestry and Environment, IPB University, Bogor, 16680, Indonesia
[3]Department of Nutrition and Feed Technology, Faculty of Animal Science, IPB University, Bogor, 16680, Indonesia
e-mail: salwanurisanti8@gmail.com

Abstract: The fact that climate change causes various kinds of impacts on the environment can be a challenge in realizing sustainable agriculture to harmonize various aspects of interest while maintaining environmental sustainability. Indonesia is not only pledged to grow its agricultural sector and production of several major commodities, but also vulnerable to climate change impacts. Palm oil is one of the high-yielding agricultural commodities with a 26.50% contribution to the agricultural sector. The production in 2019 was 47.12 million ton with the area of oil palm plantation in 2019 was 14.46 million hectares and there was an expansion in 2020 by 0.9%. The synergy between climate change and productivity in the agricultural sector makes it possible to adapt an effective and applicable system in the tropics region such as silvopastoral systems (SPS). Recently there has been the introduction of sorghum as an intercrop in oil palm plantations that integrates cattle, oil palm, and sorghum or better known as 3S (Sapi-Sawit-Sorgum). Based on land suitability estimates, sorghum can be grown on oil palm plantations in Bogor Regency covering an area of 1233.58 ha. Sorghum is a crop that grazed or turned into silage or hay to be fed to livestock. Sorghum cultivation in oil palm plantations by alley-crop system combination with grass shows the existence of harmony between the silvopastoral components.

Keywords: *alley-crop system, oil palm plantation, shorgum, silvopastoral*

The Correlation Between Household Size and Water Consumption in Gunung Walat Educational Forest (HPGW) Using *Chi-Square* Analysis Method

Shahnaz Badriyana[1*]

[1]*Undergraduate Student of Faculty of Forestry and Environment, IPB University, Bogor, 16680, Indonesia*
e-mail: shahnazbadriyana@apps.ipb.ac.id

Abstract: The local community living around the forest tends to depend on their daily activities or income from the forest. This research aims to discover the correlation between the local community or each household and water consumption in Gunung Walat Educational Forest, Sukabumi, West Java, Indonesia. This research was initiated from August 8th to 14th, 2022, and was undertaken in Gunung Walat Educational Forest, Sukabumi, West Java, Indonesia. In the implementation, the method in this paper is data collecting through a structured questionnaire survey of 36 respondents. Some parameters, such as dependents in each family, daily water consumption, and purposes, can analyze the correlation between variables, such as household size and water consumption. The collected data were managed using a category data analysis method where the response variable has been grouped into a set of mutually exclusive ordered or unordered categories. This study's results show the correlation between household size and water consumption in Gunung Walat Educational Forest, Sukabumi, West Java. That result revealed that household size correlates with water consumption in Gunung Walat Educational Forest (HPGW) due to many local communities that utilize water as a necessity in daily life activities such as drinking, bath, washing, et cetera. This also applies, especially if the family has three or more dependents or family members.

Keywords: Chi-square, correlation, household size, HPGW, water consumption.

The Impact of Service Quality on Customer Satisfaction and Customer Loyalty of Health Insurance Users (Case Study: Health Insurance Users of Jabodetabek Area)

Swietenia Putri Purhadi[1*], Dhea Hadi Riskita[1], Silviana Anggraini[1], Nada Farhanah[1]

[1]Undergraduate Student of Department of Management, Faculty of Economics and Management, IPB University, Bogor, 16680, Indonesia
e-mail: pswietenia@apps.ipb.ac.id

Abstract: Covid-19 pandemic has made many people place an important attention on health and make it a top priority, especially in obtaining health services. Companies that are able to provide good quality insurance services will certainly attract customers to use their insurance products. This study aims to determine the impact of service quality on customer behavior, specifically customer satisfaction and loyalty, of health insurance services in the Jabodetabek area during the pandemic. The research method used is a quantitative method with a descriptive statistical approach and this study involved 30 respondents. The results show that the quality of health insurance services goes hand in hand with customer satisfaction and loyalty. It means, a good level of service quality will have an impact on high customer satisfaction and loyalty

Keywords: *service quality, customer loyalty, customer satisfaction, health insurance, pandemic period*

Optimizing the Potential of Minangkabau Germplasm for the Early 1000 Days of Human Life: A Study on the Analysis of Dadih Food on the Health of Pregnant Women and Children in Indonesia

Mia Andiani[1]

[1]Undergraduate Student of Forestry and Environment, IPB University, Bogor, 16680, Indonesia
e-mail: miaandianimia@apps.ipb.ac.id

Abstract: Humans have several rights that must be fulfilled, one of which is in the health sector, which is written in Article 25 Universal Declaration of Human Rights (UDHR) which states: Everyone has the right to a standard of living adequate for the health and well-being of himself and his family. including the right to food, clothing, housing and health services, necessary social services, as well as the right to security when unemployed, sick, disabled, abandoned by their spouse, elderly, or other conditions that result in a decline in the standard of living that occurs in the community. beyond his control. Our role as the nation's next generation should participate in several projects in any field, especially health. The author is very aware that he has an obligation to participate in finding solutions to health problems that exist in Indonesia in accordance with the 3rd SDGs point, namely, "Good Health and Prosperity". Therefore, this paper was created as a solution in explaining health problems through the use of germplasm of traditional food typical of Minangkabau yogurt derived from buffalo milk, namely Dadih is a typical food of the West Sumatra region which will be described further in the next chapter.

Keywords: *health, SDGs, dadih*

Implementation of Personal Protective Equipment (PPE) Innovation Suit for Harvester in Oil Palm Industry

Muhammad Luqmanul Hakim Razali[1*], Muhamad Nazarwin Zainal Abidin[1]

1Kolej FELCRA, Perak, Malaysia
e-mail: nazarwin.kfsp@edidik.edu.my

Abstract: Palm oil is a versatile product and its demand has been increasing rapidly. The usage of palm oil not just limited to cooking oil but also used in industrial applicant such as detergent, soap, cosmetic and also can be used as biofuel for transport. Malaysia and Indonesia are the top leading for palm oil export worldwide where there were 72 million tonnes of oil palm produced globally in 2018. Malaysia generated 27% of this and Indonesia produced 57% of the total output. (Ritchie & Roser, 2021). Harvester and the fruit loader were considered the most important task on the oil palm plantation. In recent years, there were many concerns toward ergonomic hazard that this worker faces in their job routine. The primary daily tasks performed by oil palm plantation employees typically include cutting fresh fruit bunches (FFBs), gathering, loading, and unloading FFBs for delivery to the processing plant. Therefore, ergonomics issues and hazardous tasks are inevitable given the nature of the work requirement. The most common injury for harvester and FFB loader is work related musculoskeletal disorders (WMSDs) mostly due to frequent heavy lifting and poor posture (Myzabella et al., 2019). This problem is also corresponding with MSPO's requirements, Principle 4: Social responsibility, health, safety and employment condition (MS2530-4 Principle and Criteria, n.d.). Hence, this problem must be resolve to prevent any unnecessary problem for oil palm industry. The objective of this paper is to design a proper PPE suit for harvester worker and to implement the innovation of the PPE suit in the plantation. Through this innovation, it can greatly reduce the ergonomic risk toward oil palm's harvester while fulfilling the MSPO's requirement.

Keywords: *harvester, PPE, oil palm*

Organizing Committees

Steering Committees	:	Prof. Dr. Ir. Drajat Martianto, M.Si.
		Prof. Dr. Ir. Arief Daryanto, M.Ec.
		Prof. Dr. Ir. Iskandar Z. Siregar, MForSc
		Dr. Alim Setiawan Slamet, S.T.P., M.Si.
		Dr. Ir. Bagus P. Purwanto, M.Agr.
		Dr. Ir. Wawan Oktariza, M.Si.
		Dr. Ujang Suwarna, S.Hut, M.Sc.F.Trop
		Dr. Sintho Wahyuning Ardie, S.P., M.Si.

Organizing Committees

Chairman	:	Ima Kusumanti, S.Pi., M.Sc.
Vice Chairman	:	Dr. Pria Sembada, S.Pt., M.Si., M.Sc.
Secretary	:	Rianti Dyah Hapsari, S.T.P., M.Sc.
		Vieta Annisa Nurhidayati, S.Gz., M.Sc.
		Indri Hapsari, S.P., M.Si.
Finance	:	Ai Imas Faidoh Fatimah, S.T.P., M.P., M.Sc.
		Karyawati, S.E.
		Heni Taryani, S.E, M.M.
Events and Protocols	:	Silvia Dewi Sagita Andik, S.Si., M.Si.
		Antonya R. Sinaga, S.E., MM.
		Gilang Ayuningtyas, S.Pt., M.Si.
		Intani Dewi, S.Pt., M.Si., M.Sc.
		Nada Rifda Putri, S.Si.
		Puput Puput N. Muzzayyanah, S.P.
		Restu Rahmana Putra, S.E.
		Azhari Ridha Darmawan, S.Hut.
		Adira Diva Rahima
Information and Technology	:	Faldiena Marcelita, S.T., M.Kom.
		Dr. Shelvie Nedya Neyman, S.Kom., M.Si.
		Imam Ramadhan, S.T.
		Ahmad Kurnia
		Cyntia Oktaviana, A.Md.
Public Relations	:	Willy Bachtiar, S.Ikom., M.Ikom.
		Rici Tri Pranata, S.Si., M.Si.
Logistics	:	Suhendi Irawan, S.T., M.Sc.
		Ratu Anna Nazla Laila, S.P., MM.
		Ernawati

28th

TRI-U2022

empowering young researchers for a better future

The 28th Tri-U
International Joint Seminar & Symposium