SAFE 2025

BOOK OF PROGRAM AND ABSTRACT

11th International Seminar on
Sustainable Agriculture, Food, and Energy (SAFE2025)
Hanoi (Vietnam), June 26-28, 2025

Prof. Dr. Nguyen Huy Bich
Country Coordinator of SAFE-Network (Vietnam)
Nonglam University Ho Chi Minh City, Vietnam

Welcome Remarks from the Country Coordinator of SAFE-Network (Vietnam)*

It is with great pleasure and heartfelt enthusiasm that I welcome all participants to the SAFE2025 Seminar.

Since the early days of SAFE-Network, I have had the honor of being part of the journey as one of its founding members. From the very beginning, I believed in the vision of building a collaborative community that transcends borders and institutions—united by a shared commitment to sustainability, academic excellence, and regional partnership. Over the years, I have never missed a single SAFE Conference, as each gathering reaffirms the value and impact of our collective efforts.

SAFE-Network has grown into more than just an academic platform—it has become a vital bridge that connects scholars, researchers, and institutions across the Asia-Pacific region. What makes SAFE truly unique is not only its focus on advancing science and sustainability, but also its strong spirit of friendship, mutual support, and growing together. Through the years, we have built a community that learns from each other, supports one another, and strives to become better together.

I would like to extend my warmest congratulations to all participants of SAFE2025. I also wish to express my sincere gratitude and appreciation to the National Economics University (NEU) Vietnam, our co-host, for their dedication and commitment in organizing this important event. Your efforts have made it possible for us to come together once again in a spirit of collaboration and shared purpose.

May SAFE2025 be a fruitful and inspiring experience for everyone, and may our network continue to flourish for many years to come.

With warm regards,

Prof. Dr. Nguyen Huy Bich
Country Coordinator, SAFE-Network (Vietnam)

Prof. Dr. Novizar Nazir
Asia Pacific Coordinator of SAFE-Network
Andalas University, Indonesia

Welcome Remarks from the Asia Pacific Coordinator of SAFE-Network

Dear distinguished guests, partners, and participants of SAFE2025,

It is both an honor and a heartfelt pleasure to welcome you to the SAFE2025 Conference. Each year, our gathering reaffirms the spirit and strength of the SAFE-Network—an academic and professional community built upon friendship, collaboration, and shared aspirations.

Since the founding of SAFE-Network, we have grown together, connecting scholars, researchers, and institutions from across the Asia-Pacific region and beyond. This journey, which began with a vision of cooperation and mutual support, has blossomed into a vibrant platform that transcends borders. It is a place where ideas flourish, partnerships are forged, and dreams are turned into collective action.

Many of our members have never missed a SAFE Conference, demonstrating the unwavering commitment that defines this network. SAFE has become more than just an event or organization; it is a bridge of trust, a home fsor academic collaboration, and a shared path toward a better, more sustainable future.

"Alone we can do so little; together we can do so much."
— Helen Keller

Product Innovation Competition (Innovation2025)

Over the past three years, alongside our annual conference, we have proudly hosted the **Product Innovation Competition** — first launched at Innovation2023 in Chiang Mai (Thailand), continued at Innovation2024 in Jeju (Korea), and now here in Hanoi (Vietnam)for **Innovation2025.**

This competition is more than just a showcase of creative ideas. It reflects the core mission of SAFE-Network — to foster sustainability, academic collaboration, food and energy innovation, and community empowerment across the Asia-Pacific region. Through this initiative, we aim to encourage young scientists, students, and professionals to turn their innovative thinking into real solutions that contribute to the Sustainable Development Goals (SDGs) and the well-being of our societies.

SAFE-University

As we look to the future, I am pleased to announce an exciting new initiative: the development of ***SAFE University***—an online-based academic institution that embodies the core values of our network. Designed as a global and inclusive learning platform, SAFE University will offer interdisciplinary Master's programs focused on:

Circular Economy
Sustainable Development
Digital Marketing
Social Entrepreneurship*

Structured around a three-semester model, students will begin with strong theoretical foundations and continue into applied research and capstone projects in collaboration with industries, NGOs, and partner institutions. This flexible, hybrid program will harness the collective expertise of our member universities, bringing together academic excellence and real-world impact.

"Education is the most powerful weapon which you can use to change the world."
— Nelson Mandela

In the coming months, we aim to establish **a consortium of SAFE-Network universities** to support the foundation and development of SAFEs University. We believe that, with your partnership and commitment, this initiative can become a transformative force in international education and sustainable development.

Acknowledgement

On behalf of the SAFE-Network, I would like to express my deepest appreciation to all invited speakers, participants, and extend my sincere congratulations to our co-host, the *National Economics University (NEU) Vietnam*, for their remarkable leadership and hospitality in making SAFE2025 a reality.

May this seminar inspire us all to deepen our collaboration, expand our vision, and continue building a stronger, more connected, and sustainable academic community.

Warm regards,

Prof. Dr. Novizar Nazir
Asia Pacific Coordinator, SAFE-Network

TENTATIVE AGENDA

Introduction

The 11th International Seminar on Sustainable Agriculture, Food, and Energy (SAFE2025) continues its mission to promote collaboration, innovation, and global awareness on sustainability issues. This year, SAFE2025 expands its scope by integrating academic dialogue with hands-on community engagement through meaningful activities across Northern Vietnam.

On **June 26, 2025**, the program will begin with an **International Community Service** initiative at the iconic **Halong Bay**, aiming to raise environmental awareness and encourage local engagement in preserving natural heritage.

On **June 27, 2025**, the focus shifts to academic exchange and innovation during the **SAFE2025 Seminar and Product Innovation Competition**. Scholars, students, and practitioners will gather to present research findings, discuss strategic insights, and showcase innovative solutions in agriculture, food, and energy sustainability.

The program will conclude on **June 28, 2025**, with a second **International Community Service** in the culturally rich and ecologically significant region of **Sapa–Fansipan**. This activity will emphasize sustainable rural development and intercultural collaboration, reinforcing the spirit of shared responsibility in building a more sustainable future.

Together, these activities reflect the core values of SAFE2025: integrating science, society, and nature to achieve a better tomorrow.

Thursday. June 26, 2025

International Community Service

A global environmental awareness campaign engaging the local community in Halong Bay to promote Earth preservation. The activity includes distributing the "Save the Planet" booklet to residents and tourists in the Halong Bay tourist area. The aim is to raise awareness among the community to take action in protecting the Earth, while fostering friendship and mutual respect across differences—whether in nationality, race, skin color, culture, or beliefs.The International Community Service activity will be carried out in conjunction with the Halong Bay Tour. The activity takes the form of a "SAVE THE PLANET" campaign, which involves distributing the "SAVE THE PLANET" booklet to the local community in Halong Bay.

https://safe2025.safe-network.org/halong-bay SAFE-Network offers participants the option to either arrange their trip to Halong Bay or use a travel agent. The link above is the registration link in case participants would like assistance from the committee in organizing their trip to Halong Bay **The registration deadline is June 15, 2025.**	

Friday, June 27, 2025:

Auditorium A – Cultural Hall, National Economics University,
Live: on **SAFENETWORK TV** Chanel on youtube.com

AGENDA		
Time	**Content**	**Lead**
8:00 - 8:30	Registration and guest welcome	**Prof. Dr. Widyatmani Sih Dewi,** UNS, Solo (Indonesia) **DR. EKO RINI INDRAYATIE,** Universitas Lambung Mangkurat,. Indonesia
Opening and Welcome Ceremony **PIC: Prof. Dr. Hanilyn Hidalgo**, CBSUA. The Philippines		
08:30 - 08:35	Vietnam National Anthem	
08:35 - 08:40	Indonesia National Anthem	
08:40 – 08:45	Introduction of the Seminar	**Prof. Dr. Hanilyn Hidalgo**, CBSUA. The Philippines. SAFE-Network Program Coordinator
08:45 – 08:55	Welcome Speech	**Prof. Dr. Bui Duc Tho** Chairman of the University, National Economics University
08:55 – 09:00	SAFE-Network Message	**Prof. Dr. Novizar Nazir,** SAFE-Network Coordinator. Andalas University. Indonesia.
09:00 – 09:05	Remarks from the Ambassador of Indonesia to Vietnam	**Ms. Ance Maylany Napitupulu** Counsellor, Embassy of the Republic of Indonesia
09:05 – 09:10	Remarks and official opening	**Prof. Dr. Dinh Duc Truong** Dean of the Faculty of Environment, Climate Change and Urban Studies National Economics University Local Conference Coordinator
09:10 – 09:15	**Song :"Tanah Airku"** The Memorandum of Agreement (MoA) **was signed simultaneously with the singing of the song** *"Tanah Airku"*, performed by all participants while standing. *Tanah Airku"* conveys a **universal message** that transcends national boundaries: the longing for home, the beauty of one's country, and the unbreakable bond between individuals and the land where they belong. It speaks to the idea that every person carries the soul of their homeland wherever they go,	**MoA signing** **1- SAFE-Network** and Philippine Association of Agriculturists, Inc. – Tamarind Chapter **2-SAFE-Network-***Faculty of Environmental, Climate Change and Urban Studies, National Economics University* *3*-**Universitas Khairun** with **Univeriti Malaysia Trengganu (Maaysia)**

	and that true love for one's country lies not in material wealth, but in emotional and spiritual attachment. By sharing this song in an international setting, SAFE2025 celebrates national identity and **our shared humanity**, reminding us that love for the earth and the places we call home is a common value that unites us all in the pursuit of a sustainable future	
09:20 – 09:30	PHOTO SESSION	
09:30 – 10.00	**Comfort break**	
Plenary Session **PIC: Dr. Rovina Kobun,** *Universiti Malaysia Sabah (UMS) Malaysia* ***Annisyia Zarina Putri, PhD**. Universitas Ibnu Khaldin, Bogor. Indonesia*		
10.00-11.15	Plenary Session 1	
11:55 – 12:15	Plenary Session 2	
12:30 – 13:30	**Lunch**	
13:30 – 14:00	**MoU Signing Ceremony**	**Prof. Dr. Pham Hong Chuong** President, National Economics University **Dr. Drs. M. Ridha Ajam, M.Hum** Rector of Khairun University, Indonesia
Breakout sessions PIC: **DR. AIDA FIRDAUS BINTI MUHAMMAD NURUL AZMI, UiTM (Malaysia** **Dr. Yulmira Yanti,** Andalas University. Indonesia **Aldo Erianda,** State Polytechnic of Padang. Indonesia **Amelia Hariry,** Universitas Padjadjaran. Indonesia **Arsyad Hamidy**, Metamedia University. Indonesia		
14:00 - 16:00	Parallel Session 1 Plenary Session 2	
Closing sessions PIC: **Dr. Helen F. Martinez** **Dr. Rovina Kobun,** Universiti Malaysia Sabah. (UMS) Malaysia		
16.00-16.15	**Announcement of Medal Winner of Product Innovation Competition Awards**	**Dr. Helen F. Martinez**, Philippines **Dr. Rovina Kobun,** Universiti Malaysia Sabah. (UMS) Malaysia
16:15 - 16:30	**Conclusions & Closing Remarks**	Prof. Dr. Dinh Duc Truong Dr. Ravindra Joshi

PLENARY SESSION (Friday, June 27, 2025)

PIC: Dr. Rovina Kobun, *Universiti Malaysia Sabah (UMS), Malaysia*
***Annisyia Zarina Putri, PhD**. Universitas Ibnu Khaldin, Bogor. Indonesia*

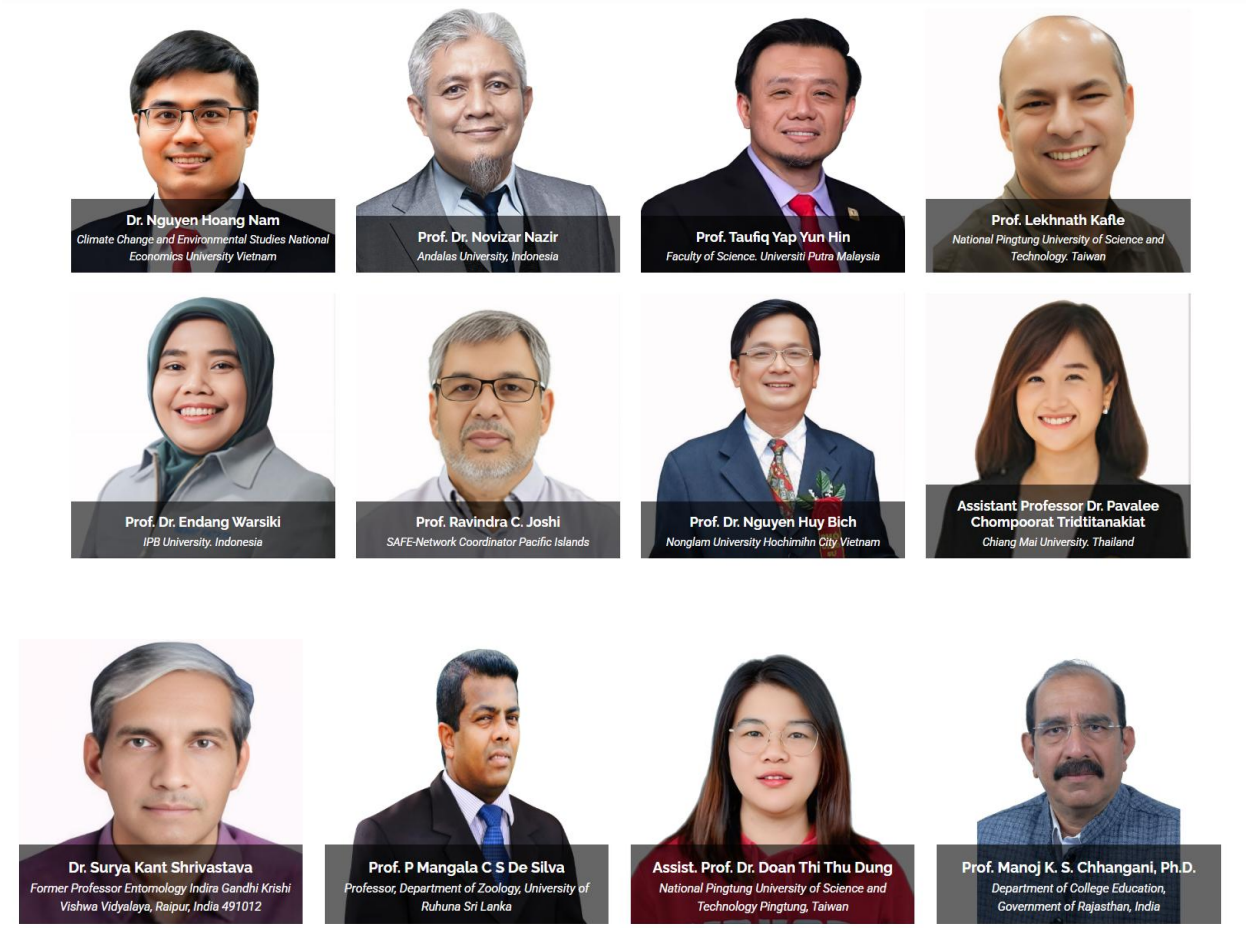
PLENARY SESSION 1

Chairperson: Dr. Ravindra C Joshi, Philippines

Time	Name	Affiliation	Country	Title of Presentation
10.00-10.10	**Prof. Taufiq Yap Yun Hin**	Faculty of Science. Universiti Putra Malaysia	Malaysia	Empowering Sustainability and Advancing Innovation: University Role
10.10-10.20	**Dr. Nguyen Hoang Nam**	Faculty of Urban, Climate Change, and Environmental Studies, National Economics University, Vietnam	Vietnam	Net Zero target and the Climate Compatible Growth
10.20-10.30	**Prof.Dr. Nguyen Huy Bich**	Nonglam University, Ho Chi Minh City	Vietnam	Development of Solar Radiation Collectors for Agricultural Products Drying
10.30-10-40	**Prof.Dr. Mangala C.S. de Silva**	Department of Zoology, University of Ruhuna	Sri Lanka	Whispers in the tropical islands: Climate change and environmental health challenges in rural farming communities
10,40-10.50	**Dr. Surya Kant Shrivasta**	Indira Gandhi Krishi Vidyalaya. Raipur. India	India	Insect and Climate Interaction
10.50-11.05	Discussion			
11.05-11.15	Book Launching **"Insect and Climate Interaction (Shrivasta et al).** Presentation of Appreciation			

PLENARY SESSION 2 (Friday, June 27, 2025)

Chairperson: Dr. Nurul Huda



Time	Name	Affiliation	Country	Title of Presentation
11.15-11.25	**Prof. Dr. Lekhnath Kafle**	National Pingtung University of Science and Technology.	TAIWAN	Honeybees for Sustainable Agriculture, Food Security, and Biodiversity Conservation
	Prof.Dr. Endang Warsiki	IPB University	INDONESIA	Smart Packaging for a Sustainable Future
11.25-11.35	**Dr. Pavalee Chompoorat Tridtitanakiat**	Chiang Mai University. Thailand	THAILAND	Innovation in Gluten-Free and High Protein Plant-Based Food Products: Enhancing Nutrition and Sustainability
11.35-11.45	**Assist.Prof. Dr. Doan Thi Thu Dung**	National Pingtung University of Science and Technology	TAIWAN	Green Nanotechnology for Animal Vaccines: A Sustainable Approach to Disease Prevention

11.45-11.55	**Prof. Dr, Manoj K.S Chhangani**	Government Meera Girls ' College. Udaipur	INDIA	Mapping Sustainability and Circular Economy Approach in India: A Data-Driven Survey Analysis
11.55-12.05	**Discussion**			
12.05-12.15	Book Launching **"Sustainable Food Practices from Indian Culture and Heritage: Reviving Ecological Wisdom through Food (Manoj K.S Chhangani)"** Presentation of Appreciation			

Saturday. June 28, 2025

International Community Service

The third day of SAFE2025 is dedicated to an International Community Service program in Sapa's culturally rich and environmentally significant region. This activity continues the environmental awareness campaign initiated earlier in the program, now shifting focus to community-based sustainability efforts. This immersive experience not only strengthens the impact of the SAFE2025 mission but also reinforces the idea that true sustainability begins with local engagement and global solidarity.

The **International Community Service activity** will be carried out in conjunction with the **Sapa-Fansipan Tour**. The activity takes the form of a "SAVE THE PLANET" campaign, which involves distributing the "SAVE THE PLANET" booklet to the local community in Sapa

https://safe2025.safe-network.org/sapa-pansifan SAFE-Network allows participants to either arrange their trip to the Sapa-Fansipan or use a travel agent. The link above is the registration link in case participants would like assistance from the committee in organizing their trip to Sapa-Fansipan. **The registration deadline is June 15, 2025.**	

BREAKOUT SESSION (June 27, 2025)

PIC: **DR. AIDA FIRDAUS BINTI MUHAMMAD NURUL AZMI, UiTM (Malaysia**
Dr. Yulmira Yanti, Andalas University. Indonesia
Aldo Erianda, State Polytechnic of Padang. Indonesia
Amelia Hariry, Universitas Padjadjaran. Indonesia
Arsyad Hamidy, Metamedia University. Indonesia

	TIME	Room 1	Room 2	Room 3	Room 4	Room 5	**Virtual Room 6*** Breakout Room 1	**Virtual Room 7*** Breakout Room 2
		Chair:: **Prof. Hermogenes M. Paguia** (Bataan Peninsula State University, Philippines	**Chair: Amelia Nicolas:** CBSUA (Central Bicol State University of Agriculture (CBSUA), Philippines	**Chair: Ameilia Zuliyanti Siregar.** Universitas Sumatra Utara, Indonesia	**Chair: Dr. Aida Firdaus Binti Muhammad Nurul Azmi** (Universiti Teknologi MARA, UiTM (Malaysia)	**Chair: Dr Vivek Mandot** Department of College Education, Jaipur. India)	**Chair: Daimon Syukri, PhD** Andalas University, Indonesia	**Chair: Prof.Dr. Tuty Anggraini.** Andalas University, Indonesia
		Technical Support: Aisyah Shakira Putri. Chiang Mai University. Thailand	**Technical Support: Le Phan Hoai Ngoc** - Student of An Giang University. Vietnam	**Technical Support: Nguyen Trinh Thu Tuyet** - Student of An Giang University. Vietnam	**Technical Support: Nguyen Pham Tuan Kiet**- Student of An Giang University. Vietnam	**Technical Support: Nguyen Hoang Bup** - Student of An Giang University. Vietnam	**Technical Support: Amelia Hariry,** Universitas Padjadjaran, Indonesia	
1	14.05-14.10	ISAFE-01	SFST-03	SDM-07	AE-22	SDGs-09	ISAFE-01	AE-08
2	14.10-14.15	ISAFE-02	SFST-04	SDM-08	AE-23	SDGs-10	ISAFE-02	AE-09
3	14.15-14.20	ISAFE-03	SFST-05	AE-01	AE-24	SEAFE-01	ISAFE-03	AE-10
4	14.20-14.25	ISAFE-04	SFST-06	AE-02	SPD-01	SEAFE-02	ISAFE-04	AE-11
5	14.25-14.30	ISAFE-05	SFST-07	AE-03	SPD-02	SEAFE-03	SFST-01	SPD-01
6	14.30-14.35	ISAFE-06	SFST-08	AE-04	SPD-03	SEAFE-04	SFST-02	SPD-02
7	14.35-14.40	ISAFE-07	SFST-09	AE-05	SPD-04	SEAFE-05	SFST-03	SPD-03
8	14.40-14.45	ISAFE-08	SFST-10	AE-06	SPD-05	SEAFE-06	SFST-04	SPD-04
9	14.45-14.50	ISAFE-09	SFST-11	AE-07	SPD-06	SEAFE-07	SFST-05	SDGs-01
10	14.50-14.55	ISAFE-10	SFST-12	AE-08	SPD-07	SEAFE-08	SFST-06	SDGs-02

11	14.55-15.00	ISAFE-11	SFST-13	AE-09	SPD-08	SEAFE-09	SFST-07	SDGs-03
12	15.00-15.05	ISAFE-12	SFST-14	AE-10	SPD-09	SEAFE-10	AE-01	SDGs-04
13	15.05-15.10	ISAFE-13	SFST-15	AE-11	SPD-10	SEAFE-11	AE-02	SEAFE-01
14	15.10-15.15	ISAFE-14	SFST-16	AE-12	SPD-11	SEAFE-12	AE-03	SEAFE-02
15	15.15-15.20	ISAFE-15	SFST-17	AE-13	SPD-12	SEAFE-13	AE-04	SEAFE-03
16	15.20-15.25	ISAFE-16	SFST-18	AE-14	SDGs-01	IT-01	AE-05	SEAFE-04
17	15.25-15.30	ISAFE-17	SFST-19	AE-15	SDGs-02	IT-02	AE-06	IT-01
18	15.30-15.35	ISAFE-18	SDM-01	AE-16	SDGs-03	CAFÉ-01	AE-07	IT-02
19	15.35-15.40	ISAFE-19	SDM-02	AE-17	SDGs-04	CAFÉ-02		
20	15.40-15.45	ISAFE-20	SDM-03	AE-18	SDGs-05	CAFÉ-03		
21	15.45-15.50	ISAFE-21	SDM-04	AE-19	SDGs-06	CAFÉ-04		
22	15.50-15.55	ISAFE-22	SDM-05	AE-20	SDGs-07	CAFÉ-05		
23	15.55-16.00	SFST-01	SDM-06	AE-21	SDGs-08	CAFÉ-06		
24	16.00-16.05	SFST-02	ISAFE-23					

***Join Zoom Meeting**

https://zoom.us/j/98616980180?pwd=lthb2EOq1TMyqvetjHRhRMmHXD3EWf.1

Meeting ID: 986 1698 0180

Passcode: 511605

Presentation Guidelines – SAFE2025

Dear Presenters,

Thank you for your participation in the SAFE2025 International Conference. To ensure smooth and effective sessions, please follow the presentation guidelines below:

1. **Presentation Duration**
   Each presenter is allocated **5 minutes**, which includes both the presentation and the question-and-answer session.
2. **Time Allocation**
   - Presentation: **3–4 minutes**
   - Q&A: **1–2 minutes**
     Please manage your time accordingly. Session Chairs will notify you when your time is almost up.
3. **Presentation Format**
   - Please prepare your slides in **PowerPoint (.ppt/.pptx)** or **PDF** format.
   - The recommended number of slides is **3–5 slides** maximum.
   - Use concise and clear visuals to highlight key points of your research or innovation.
4. **Language**
   - All presentations must be delivered in **English**.
5. **Presentation Submission**
   - Please submit your presentation file to the assigned committee or upload it to the designated folder (as informed by the organizer) at least **1 day before your session**.
6. **Technical Setup**
   - A laptop, projector, and pointer will be provided.
   - Arrive at your session room **10–15 minutes before** the session starts to check your slides and meet the Session Chair.
7. **Respect and Professionalism**
   - Be respectful of time and fellow presenters.
   - Actively engage in Q&A but keep your questions brief and relevant.

We appreciate your cooperation in adhering to these guidelines. Let's make SAFE2025 a dynamic and meaningful academic experience for all participants!

Warm regards,
SAFE2025 Organizing Committee

Closing Ceremony

PIC: **Dr. Helen F. Martinez**
Dr. Rovina Kobun, Universiti Malaysia Sabah. (UMS) Malaysia

	16.05-16.20	Announcement of Medal Winners of Product Innovation Competition (Innovation2024) PIC: *Dr. Helen Martinez, Philippines* *Dr. Rovina Kobun, Universiti Malaysia Sabah. (UMS) Malaysia*
	16.20-16.30	**Closing** Prof. Dr. Dinh Duc Truong, *National Economic University, Vietnam* **Summary**: *Prof. Dr. Novizar Nazir, Andalas University. Indonesia*

ABSTRACTS TITLE

PHYSICALLY ATTEND

No	Kode	Title Abstract	Name
Innovation in Sustainability Related to Agriculture, Food, and Energy			
1	ISAFE-01	Development of Smart Technology for Rainwater Harvesting in Green Buildings Using Solar Cells and IoT	**Agung Wahyudi Biantoro[1*], Roshida Binti Abdul Majid[2], Desiana Vidayanti[1], Acep Hidayat[1], Syarif Hidayat[3] and Zel Citra[1]** 1Civil Engineering Department, Universitas Mercu Buana, Jakarta, Indonesia 2Faculty of Built Environment & Surveying, Universiti Teknologi Malaysia, Malaysia 3Architecture Department, Universitas Mercu Buana, Jakarta, Indonesia
2	ISAFE-02	Leprosy Epidemiological Trends in a Remote Island Setting: Lessons from Ternate City, 2019–2023	**Liasari Armaijn1, Wahyunita Do Toka2** [1]Department of Public Health, Medical and Health Faculty, Khairun University, Ternate, Indonesia [2]Department of Biomedical Science, Medical and Health Faculty, Khairun University, Ternate, Indonesia
3	ISAFE-03	The Level of MTHFR Gene mRNA Expression in Non-syndromic Cleft Lip with or without Cleft Palate Indonesian Deuteromalay Tribe Patients	**Ani Melani Maskoen[1,2], Reny Adiarni Nurhayati3, Saskia Lenggogeni Nasroen4** Department of Oral Biology, Faculty of Dentistry, University of Jenderal achmad Yani,Cimahi, Indonesia. Department of Oral Biology, Faculty of Dentistry, University of Padjadjaran, Bandung, Indonesia. Molecular Biology Laboratory, Faculty of Dentistry, University of Padjadjaran, Bandung, Indonesia. Department of Oral Surgery, Faculty of Dentistry, University of Jenderal achmad Yani,Cimahi, Indonesia.
4	ISAFE-04	Irrigation Intensification through Farm Electrification: Implications for Food Security in Eastern India	**Anurag Ajay** *Leibniz-Institut für Agrarentwicklung in Transformationsökonomien (IAMO) · Theodor- Lieser-Str. 2 · 06120 Halle (Saale), Germany*
5	ISAFE-05	Production of Xylitol and Ethanol from Pineapple Waste through Fermentation and Hydrolysis Processes	**Efri Mardawati, Agus T Hartono, Natasha Putri Siahaan, Sarifah Nurjanah, Bambang Nurhadi** *Department of Agricultural Industrial Technology, Faculty of Agricultural Industry Technology, Padjadjaran University,* *Jl. Bandung - Sumedang Km.21, Cileunyi, West Java 45363*
6	ISAFE-06	Risk Management of Electricity Financing for Lifts in Khairun	**Endah Harisun1*, Suparman2**

		University Integrated Lecture Building: Efficiency Strategy and Renewable Energy Solutions	*1Faculty of Engineering, Khairun University, Ternate, Indonesia* *2Faculty of Engineering, Khairun University, Indonesia suparmanunkhair@gmail.com*
7	ISAFE-07	Planning and Fulfillment of North Kalimantan Province Energy Needs	*Joel* Theodorus Damanik 1, ***Humiras*** **Hardi Purba***1, *Sawarni* Hasibuan1, *Choesnul* Jaqin1 *1Industrial Engineering Department, Universitas Mercu Buana, West Jakarta, Indonesia*
8	ISAFE-08	Sustainable Nanopriming: Banana Peel-Derived Zinc Oxide Nanoparticles for Enhanced Chili Seed Germination	Khairil Ammar Khairilanwar[1], Sia Jing Yi[1], Muhammad Danial Izzat Bakri[1], **Iffah Hazirah Mohd Nawi[1]***, Alyza Azzura Abd Rahman Azmi[2], Chua Kim Aik[3] *[1]University Malaysia Terengganu, Department of Crop Science, Faculty of Fisheries and Food Science, 21030 Kuala Nerus, Terengganu, Malaysia.* *[2]University Malaysia Terengganu, Faculty of Science and Marine Environment, 21030 Kuala Nerus, Terengganu, Malaysia.* *[3]Green World Genetics Sdn Bhd, No. 40, Jalan KIP 10, Taman Perindustrian KIP, Kepong, 52200, Kuala Lumpur, Malaysia.* **Corresponding author: iffahhazirah@umt.edu.my*
9	ISAFE-09	Sulfonated SPG20 Silica–Fe_2O_3 Hybrid for Superior Methylene Blue Degradation	**Maria Ulfa[a]*** and Pramesta Rosa Salsabilaa aChemistry Education Study Program, Faculty of Teacher Training and Education, Sebelas Maret University, Jl. Ir. Sutami 36A, Surakarta 57126, Indonesia Corresponding author. E-mail addresses: ulfa.maria2015@gmail.com, mariaulfa@staff.uns.ac.id (M. Ulfa).
10	ISAFE-10	Development and Assessment of Zeolite Nanoparticles as a Delivery System for Helicoverpa armigera Nucleopolyhedrovirus (HaNPV) in Controlling Spodoptera litura (Fabricius, 1775) Larvae	**Mia Miranti[1,2,*]**, Camelia Panatarani2,3, I Made Joni2,3, Maharani Erawan Ossa Putri1, Hikmat Kasmara1, Melanie Melanie1,2, Desak Made Malini1, Wawan Hermawan1,2 1Department of Biology, Faculty of Mathematics and Natural Sciences, Universitas Padjadjaran, Sumedang 45363, West Java, Indonesia, 2Functional Nano Powder University Center of Excellence, Universitas Padjadjaran, Sumedang 45363, West Java, Indonesia, 3Department of Physic, Faculty of Mathematics and Natural Sciences, Universitas Padjadjaran, Sumedang 45363, West Java, Indonesia

11	ISAFE-11	Hight quality bioethanol characteristics of rice straw raw materials	**Muhaji**[1], R S Hidayatulloh2 [1,2] The Department of Mechanical Engineering, Universitas Negeri Surabaya, Campus Ketintang, Surabaya, 60213, Indonesia
12	ISAFE-12	The Potential Of Moringa Oleifera Leaf Extract To Repair Meloxicam-Induced Kidney Histological Damage In Male White Rats	**N M R Suarni, N G A M Ermayanti, A A.SG A Sukmaningsih** Study Program of Biology, Faculty of Mathematic and Natural Sciences
13	ISAFE-13	Liver histology of mice exposed to Cd and treated with vitamin C	**N.W..Sudatri[1]**, N.M. Rai Suarni,2, N. Petrima3 1Denpasar-Indonesia, Animal Physiologi Laboratory, Biology Deartement Universitas Udayana 2Denpasar-Indonesia, Zoology Laboratory, Biology Deartement Universitas Udayana 3Student of Biology Departement Universitas Udayana
14	ISAFE-14	Ultra-stable Porous Yolk-Shell Al Catalysts for Transformation of Fatty Acid into Green Diesel	**N. Asikin-Mijan1***, N.A.A Othaman1, M. Sulaiman1, Nur Athirah Adzahar1,2, G. AbdulKareem- Alsultan2 1Department of Chemical Sciences, Faculty of Science and Technology, Universiti 2Catalysis Science and Technology Research Centre, Faculty of Science, Universiti Putra Malaysia, 43400 UPM Serdang, Selangor, Malaysia
15	ISAFE-15	Design and Analysis of Pulsed Electric Field Laboratory-Scale for Non-Liquid Sample Applications	**Rani Anggraeni**[1,2], Eko Hari Purnomo[1]*, Purwiyatno Hariyadi[1], Feri Kusnandar[1], Anto Tri Sugiarto[3] Dewi Indriati Hadi Putri[4] and Bayu Purnomo[4] [1*]Department of Food Science and Technology, IPB University, Kampus IPB Dramaga, Bogor 16680, Indonesia [2]Department of Food Technology, Sahid University, Jakarta, Indonesia [3]National Research and Innovation Agency, Bandung, Indonesia [4]Department of Mechatronics & Artificial Intelligence, Universitas Pendidikan Indonesia, Purwakarta, Indonesia
16	ISAFE-16	The Study Assessed The Chronic Toxicity Effects Of Sappan Wood (Caesalpinia Sappan L.) Extract On Cardiac Structure And Lipid Profiles In Both Male And Female Rats (Rattus Norvegicus)	**Ratu Safitri** 1Zildjian M. Krisnamurti1, Yasmi Purnamasari Kuntana1, Mas Rizky A.A. Syamsunarno2 1Department of Biology, Faculty of Mathematics and Natural Sciences, Universitas Padjadjaran, Jatinangor, West Java, Indonesia 2Department of Biomedical Sciences, Faculty of Medicine, Universitas Padjadjaran, Jatinangor, West Java, Indonesia

17	ISAFE-17	Unveiling the Bioalcohol-Producing Potential of Bacillus paramycoides SB3	**Rosamond Chan**, Nia Rossiana, Abdullah Bilal Ozturk, Kah-Ooi Chua, Nurul Shamsinah Mohd Suhaimi, and Febri Doni Department of Biology, Faculty of Mathematics and Natural Sciences, Universitas Padjadjaran, Jatinangor 45363, West Java, Indonesia
18	ISAFE-18	Optimization Efficiency of Calcium Based Catalyst in Coconut Oil Transesterification via Box-Behnken Design	**Aisyah Fathiah Ahmad1**, Salmiah Jamal Mat Rosid2,3*, Nursyamimi Zulkurnain1, Azman Azid1, Susilawati Toemen4, Salwani Ismail5, Wan Nazwanie Wan Abdullah6, Sarina Mat Rosid1 1Faculty of Bioresources and Food Industry, Universiti Sultan Zainal Abidin, Besut Campus, 22200 Besut, Terengganu, Malaysia 2UniSZA Science and Medicine Foundation Centre, Universiti Sultan Zainal Abidin, Gong Badak Campus, 21300 Kuala Nerus, Terengganu, Malaysia 3East Coast Environmental Research Institute (ESERI), Universiti Sultan Zainal Abidin, Gong Badak Campus, 21300, Kuala Terengganu, Malaysia 4Department of Chemistry, Faculty of Science, Universiti Teknologi Malaysia, 81310 UTM Skudai, Johor, Malaysia 5Department of Basic Medical Sciences, Faculty of Medicine, Universiti Sultan Zainal Abidin, Kuala Terengganu, Terengganu, Malaysia 6School of Chemical Science, Universiti Sains Malaysia, 11800 Minden, Pulau Pinang, Malaysia
19	ISAFE-19	Optimization of Bioethanol Yield from Liquid Pineapple Waste using Immobilized Saccharomyces cerevisiae var. ellipsoideus in PVA-Alginate-Sulfate Matrix	**Sarina Mat Rosid[1]**, Nor Azimah Mohd Zain[2*] *1*School of Agricultural Science and Biotechnology, Faculty of Bioresources and Food Industry, Universiti Sultan Zainal Abidin, Besut Campus, 22200 Besut, Terengganu, Malaysia. 2Department of Biosciences, Faculty of Science, Universiti Teknologi Malaysia, Skudai, 81310 Johor Bahru, Johor, Malaysia *Corresponding author:*azimah @utm.my*
20	ISAFE-20	Utilization of Banana Peel Extract Rich in Bioactive and Mineral Compounds for Sustainable Management of Fusarium and Growth Promotion in Green Mustard (Brassica juncea)	**Suhaizan Lob**1,*, Fauziah Tufail Ahmad1, Fatin Izzati Nor Jita1, Sarvin Nair K S Sukamaran1, Nurul Faziha Ibrahim1 1Faculty of Fisheries and Food Science, Universiti Malaysia Terengganu, 21030 Kuala Nerus, Terengganu, Malay
21	ISAFE-21	MESOPOROUS BIFUNCTIONAL K_2O CATALYST USING CHITOSAN TEMPLATE FOR BIODIESEL PRODUCTION	**Susilawati Toemen[1*]**, Nor Badariah Talib1, Ong Hui Shan1, Khairil Juhanni Abd Karim1, Nurrulhidayah Salamun1 and Salmiah Jamal Mat Rosid2

			[1]Department of Chemistry, Faculty of Science, Universiti Teknologi Malaysia, 81310 UTM Skudai, Johor, Malaysia [2]UNISZA Science and Medicine Foundation Centre, Universiti Sultan Zainal Abidin, Besut Campus, 22200 Besut Terengganu, Malaysia
22	ISAFE-22	Effect Pulsed Electric Field-Assisted Germination of Oat to Enhance Germination and Functional Properties of Oat: Antioxidant Capacity, β-Glucan, and GABA Content.	**Aisyah Shakira Putri,** Jitlada Na Lamphun, Wannaporn Klangpetch Food Science and Technology, Faculty of Agro-Industry, Chiang Mai University
23	ISAFE-23	Neem Leaf (Azadirachta indica A. Juss) Water Extract on the Function and Kidney Histology of Chicken	**Dwi Ariani Yulihastuti** Biology Department, Faculty of Mathematic and Natural Sciences, Universitas Udayana Bali, Indonesia
Sustainable Food Science and Technology			
23	SFST-01	Exploring Microencapsulation of Postbiotic Using Different Types of Wall materials	**Aida FMNA1***, A Abzar,2,3, Rasyiqah Nabihah Binti Roslli,2Ahmad Zahin Ilman O,2 and Nor Ashikin Z **1***Food Science and Technology Department, Faculty of Applied Sciences, Universiti Teknologi MARA, 40450 Shah Alam, Selangor 2*Superfood Biotech Sdn Bhd, No 26, Jalan Astana 4A/ KU2, Bandar Bukit Raja, 41050 Klang Selangor 3*Department of Crop Science, Faculty of Agriculture, University Putra Malaysia, 43400 UPM, Serdang, Selangor, Malaysia.
24	SFST-02	Determination of the Isoelectric Point of Protein Isolate Derived from Snakehead Fish (Channa striata) Using the pH Shift Method	**Ainul Mardiah**1,3, Azis Boing Sitanggang1, Mala Nurilmala2, and Sedarnawati Yasni1* 1*Department of Food Science and Technology, IPB University, Kampus IPB Dramaga, Bogor 16680, Indonesia 2Department of Aquatic Product Technology, IPB University, Kampus IPB Dramaga, Bogor 16680, Indonesia 3Faculty of Science, Nahdlatul Ulama University of West Sumatera, Padang, 25136, Indonesia
25	SFST-03	Utilization of novel food technologies on plant-based beverages production to improve its quality and sustainability	**Angela Wulansari[1,2]** 1Faculty of Agriculture, Universitas Khairun, Ternate, Indonesia 2Department of Food Science, University of Otago, Dunedin, New Zealand
26	SFST-04	Bioactive Compounds in Peanut Tempeh	**Erni Sofia Murtini***, Elok Waziiroh, Ni'mah Afiyah, Nadiah Amalia

			Food Science and Biotechnology, Agricultural Technology, Universitas Brawijaya. Malang, Indonesia 65145
27	SFST-05	Antimicrobial Activities Of Essential Oil Extracted With Water Steam Distilaltion From Leaves, Peel, And Twigs' Kefir Lime	**Merkuria Karyantina1**, Vivi Nuraini1, Irvia Resti Puyanda1, Ching Lik Hii2, Susilowati1 1 Food Technology Program, Faculty of Technology and Food Industry, Slamet Riyadi University, Sumpah Pemuda Street No 18, Joglo, Banjarsari , Surakarta, Indonesia 2 Department of Chemical and Environmental Engineering, University of Nottingham Malaysia
28	SFST-06	Rapid Detection of Organophosphate Pesticides in Vegetables Using Dispersive Liquid-Liquid Microextraction and pH-Dynamic Junction Capillary Electrophoresis-Diode Array Detection	**Nadhiratul-Farihin Binti Semail** Universiti Kebangsaan Malaysia. Malaysia
29	SFST-07	The Effect of Drying Temperature on The Characteristics of Instant Red Bean Powder Drink (Phaseolus vulgaris L.)	**Ni Wayan Wisaniyasa*,** I Gede Arie Mahendra Putra, Vanessa Setiawan Food Technology Study Program, Faculty of Agricultural Technology, Udayana University
30	SFST-08	Screening Safer Alternative Surface Sterilization Methods for In Vitro Propagation of Gac (Momordica cochinchinensis)	**Ramisah Mohd Shah**, Nurul Syaffina Mohd Baharim and Rudiyanto Program of Crop Science, Faculty of Fisheries and Food Science, Universiti Malaysia Terengganu, 21030 Kuala Nerus, Terengganu, Malaysia
31	SFST-09	Sensory, Nutrient, And Shelf Life of Moringa Yogurt	**Rita Ismawati1,** Muhaji2, Raisya3, Amalia Ruhana4, Yuni Nurwati5, Ita Fatkhur Romadhoni6, Qory Aina7 Aprilia Nurcahyaning Rahayu8 1, 3,4,5,6Lecture of Nutrition Department, Faculty of Sport Science and Health, Universitas Negeri Surabaya, Indonesia 2Lecture of Engineering Department, Faculty of mechanical engineering, Universitas Negeri Surabaya, Indonesia 6,7 Lecture of Culinary Department, Faculty of Vocational, Universitas Negeri Surabaya, Indonesia 8Lecture Politeknik Bintan Cakrawala, culinary Program, 29152 Kepulauan Riau, Indonesia
32	SFST-10	Evaluation of Homemade Bio-desinfectant Solution Based on Lactobacillus (Lactobacillus casei, Lactobacillus paracasei) and	**Roostita L. Balia,** Daniswara Danindra Darmesti, Lilis Suryaningsih, Wendry Setiyadi Putranto, Tuti Widjastuti, Ratu Safitri, Gemilang Lara Utama

		Baker's Yeast Applied to Broiler Litter	Universitas Padjadjaran. Indonesia
33	SFST-11	Sustainable Agricultural Practices: Enhancing fruits and vegetables quality based natural coatings	**K. Rovina**, L.W.X. Felicia, S. Sarifah Food Security Research Lab, Faculty of Food Science and Nutrition, Universiti Malaysia Sabah, Kota Kinabalu 88400, Malaysia
34	SFST-12	Influence of Extraction Methods on Ulvan Water Holding Capacity and Rheological Properties: A Systematic Review	**Suci Istiqlaal1**, Taufik Djatna2, Sukarno1, Uju3, Azis Boing Sitanggang1, and Christofora Hanny Wijaya1* 1Department of Food Science and Technology, Faculty of Agricultural Engineering and Technology, IPB University, Bogor, 16680. Indonesia 2Department of Agro-Industrial Technology, Faculty of Agricultural Engineering and Technology, IPB University, Bogor, 16680. Indonesia 3Department of Aquatic Product Technology, Faculty of Fisheries and Marine Science, IPB University, Bogor, 16680. Indonesia
35	SFST-13	Analysis Of Trace Metal Elements in Indigenous Fruits and Vegetables in Borneo	**Nurul Asyiqin Mijun**[1], Tengku Sharifah Marliza[1*], Nozieana Khairuddin[2] and Shahrul Razid Sarbini[3] 1Department of Science and Technology, Universiti Putra Malaysia Bintulu Campus, 97008 Bintulu, Sarawak, Malaysia 2Ethnic Borneo Laboratory, Institute of Ecosystem Science Borneo, Universiti Putra Malaysia Bintulu Campus, 97008 Bintulu, Sarawak, Malaysia 3Department of Crop Science, Faculty of Agricultural and Forestry Sciences, Universiti Putra Malaysia Bintulu Campus, 97008 Bintulu, Sarawak, Malaysia
36	SFST-14	In Vitro Antagonistic Study of Symbiotic Fungal Isolates from Taiwan Against Rhizoctonia solani Kühn, the Causal Agent of Sheath Blight Disease in Rice (Oryza sativa L.)	**Thomas Argyarich Jefferson**[1],*, Dedat Prismantoro1, Mia Miranti1, and Febri Doni1,2 1Department of Biology, Faculty of Mathematics and Natural Sciences, Universitas Padjadjaran, Jatinangor 45363, West Java, Indonesia; 2Department of Global Development, Cornell University, Ithaca, NY 14853, USA
37	SFST-15	Selecting Leaf Harvest Stage in Bitter Melon (Momordica charantia L.) for Minimal Impact on Fruit Yield and Maximum Bioactive Compound Retention	**Nguyen Van Thuan**[1,4], Tuty Anggraini2, Duong Van Nha[3], Vo Thi Cam Thi4, Doan Nhat Linh3 and Musliar Kasim2* 1Doctoral program in Agricultural science, Faculty of Agriculture, Andalas university, 2Faculty of Agriculture, Andalas University, Padang, Indonesia,

			3Faculty of Agricultural and Natural resources, Kien Giang University, Kien Giang, Vietnam. 4Faculty of Food science and Health, Kien Giang University, Kien Giang, Vietnam.
38	SFST-16	Effect of Different Preparations of Moringa Leaves in a Complete Ration Based on Fermented Lemongrass Waste on Nutrient Content	1*Tri Astuti, 1Syahro A. Akbar, 1Nurhaita, 2Fajri Basyirun, 1Rica M. Sari., and 1Fiki Alfajri 1Department of Animal Science, Faculty of Agriculture, Universitas Mahaputra Muhammad Yamin, Solok city, Indonesia. 2Department of economic education, Faculty of Education, Universitas Mahaputra Muhammad Yamin, Solok city, Indonesia
39	SFST-17	Utilization of Gambier (Uncaria gambir Roxb) Leaves Fermented in The Ration on The Performance , Blood Lipid Profile and Meat of Broiler Chicken	**Tuti Widjastuti,** Athaya Faadhilah, Lovita Adriani Department Production Livestock, Faculty Animal Husbandry, Padjadjaran University, Sumedang Department Physiology and Biochemistry Cattle Faculty Animal Husbandry, Padjadjaran University, Sumedang
40	SFST-18	Impact Of Drying On The Quality Of Japonica (Ds1) And Dai Thom 8 (Dt8) Rice Varieties	Khang Nghia Tran (1), Dao Thi Thanh Vu(1), Duy Thanh Trinh (1), Cuong Quoc Tran (1) and Binh Thanh Ho(2) 1 An Giang University, Vietnam National University Ho Chi Minh City, Vietnam. 2 Department of Agriculture and Environment of An Giang province, Vietnam.
41	SFST-19	Identification of Chemical Components in Namo-Namo Fruit (Cynometra cauliflora L.) from Halmahera Island and its Potential as a Feed Additive for Broiler Chickens	Yusri Sapsuha[1*], Abd Wahab Hi. Rajab[1], Nur Sjafani[1] 1)Department of Animal Science, Faculty of Agriculture, Universitas Khairun, Ternate, North Maluku, Indonesia.
Sustainability Development and Management			
42	SDM-01	Identification of Land Use Affected by Tidal Floods using Unmanned Aerial Vehicles in Coastal Medan City, North Sumatra, Indonesia	**Achmad Siddik Thoha1** dan Muhammad Arifky2 1Doctoral Program in Regional Planning, Postgraduate School, Universitas Sumatera Utara 2 Faculty of Forestry, Universitas Sumatera Utara
43	SDM-02	Sustainable Land Use And Ecotourism Development Prospects: Agroforestry Approaches In The Laguna Ternate Volcanic Lake Area	**Abdul Kadir Kamaluddin**[1,3*], Abd. Wahab Hasyim[2], Lily Ishak[1], Sulfi Abdul Haji[2], Andy Kurniawan[1], Hamidin Rasulu[1] [1]Faculty of Agriculture, Khairun University, Ternate, Indonesia [2]Faculty of Economics and Business, Ternate, Indonesia

			[3]Doctoral Program in Management, Faculty of Economics and Business, Ternate, Indonesia
44	SDM-03	Integrated Farming System: Urgency, Role, And Practices In Agro-Edutourism Attaqie Farm	**Inanpi Hidayati Sumiasih*** and Mutiara Dewi Puspitawati Faculty of Science, Engineering, and Design, Trilogi University, Jakarta, Indonesia.
45	SDM-04	Landslide Preparedness Among Residents In Highly Susceptible Barangays In Tangub Misamis Occidenal, Philippines	**Renalyn T. Paica**[1] & Jeolena M.. Managing[2], and Lariza T. Ebeo[3] Northwestern Mindanao State College of Science and Technology Labuyo, Tangub City. Philippines
46	SDM-05	Flood Vulnerability Assessment in Cirasea Sub-Watershed: Spatial Analysis for Agricultural Risk Management and Food Security Planning	**Linasari Putri Bangun1**, Hayati Sari Hasibuan1, Ivan Syamsurizal2 School of Environmental Science, University of Indonesia Coordinating Ministry for Human Development and Culture
47	SDM-06	Unlocking Lake Toba's Agricultural Potential: Navigating Regulatory Overlaps and Traditional Practices for Sustainable Food Security	**Samuel Evan Firdaus Sitanggang,1**,2*, Djoko Mulyo Hartono1 , Hayati Sari Hasibuan1 1School of Environmental Science, Universitas Indonesia, Indonesia 2Directorat of Facilitation and Monitoring Research and Innovation Regency, National Research and Innovation Agency (BRIN), Tangerang Selatan, Indonesia
48	SDM-07	Dynamics of Changes in Land Conversion from Paddy Fields to Non-paddy Fields in South Minahasa Regency and Its Implications for Local Food Security	**Wiske Rotinsulu1**, Sandra Pakasi1 and Nordy Waney1 [1]Faculty of Agriculture, Sam Ratulangi University, Indonesia
49	SDM-08	Strengthening Customary-Based Nagari Forest Management and Sustainable NTFP Business in Nagari Salibutan, West Sumatra-Indonesia	**Yulinda** Andalas University . Indonesia
Agriculture and Environment			
50	AE-01	Enhanced Leaf Area and Pigment Accumulation in Stevia rebaudiana Under Elevated CO_2 Conditions	**AAbzar[1], Siti Zaharah Sakimin,[*1,2] Hawa ZE Jaafar,[2] and Nor ElizaTajidin[1,2]** [1]Department of Crop Science, Faculty of Agriculture, University Putra Malaysia, 43400 UPM, Serdang, Selangor, Malaysia. 2 Institute of Tropical Agriculture, University Putra Malaysia, 43400 UPM, Serdang, Selangor, Malaysia.

51	AE-02	Ecological Management of Insect Pests in Rice (Oryza sativa L.) Using Refugia Plants and Biopesticides: A Case Study in Northern Sumatera, Indonesia	**Ameilia Zuliyanti Siregar1*, Ravindra C. Joshi2*, Lia Dwi Sri Hastuti3** [1]Faculty of Agriculture, University Sumatera Utara, Jl. Dr. A. Sofyan No 3 Medan 20155, Sumatera Utara, Indonesia. Email: ameilia@usu.ac.id [2]College of Agriculture and Related Sciences, University of Southeastern Philippines, Tagum City, Davao del Norte, Philippines. Email: rcjoshi@usep.edu.ph; rcjoshi4@gmail.com [3]Faculty of Mathematics and Natural Sciences, University Sumatera Utara, Jl. Biotechnology Medan 20155, Sumatera Utara, Indones
52	AE-03	Growth, Production and Quality of Basil (Ocimum basilicum L.) Accession at Various Composition of Urea Fertilizers and Cattle Urine	**A Rahayu[1], N Rochman[1], W Nahraeni[1], L Yulyaningsih[1]** [1]Department of Agrotechnology, Agriculture Faculty, Djuanda University, Bogor, Indonesia [1]Department of Agribusiness, Agriculture Faculty, Djuanda University, Bogor, Indonesia
53	AE-04	Bioencapsulation Formulation of Phosphate-Solubilizing Bacteria to Improve soil P Availability, and Yield of Maize	**Betty Natalie Fitriatin*, Nabila Syifa Ariani. , Pujawati Suryatmana** Department of Soil Science and Land Resources, , Agriculture Faculty, Universitas Padjadjaran Indonesia
54	AE-05	Caste Dimorphism and its influence on Nechrophoric Behavior in Minor and Major workers of Weaver Ants (Oecophylla smaragdina)	**Duru P.T.1,2, Thevan K.3 & Salim H.1*** 1School of Biological Sciences, Universiti Sains Malaysia, 11800, Penang, MALAYSIA 2Department of Biological Sciences, Federal College of Education (Technical), P.M.B. 0189, Umunze Anambra State. NIGERIA 3Faculty of Agro Based Industry, Universiti Malaysia Kelantan, 17500 Jeli, Kelantan Malaysia
55	AE-06	In Vitro Inhibitory Mechanisms of Trichoderma yunnanense TM10 Against Pyricularia oryzae and Rhizoctonia solani, the Causal Agents of Rice Blast and Sheath Blight	**Febri Doni1,2,*, Mia Miranti1, Thomas Argyarich Jefferson1, and Dedat Prismantoro1** 1Department of Biology, Faculty of Mathematics and Natural Sciences, Universitas Padjadjaran, Jatinangor 45363, West Java, Indonesia; 2Department of Global Development, Cornell University, Ithaca, NY 14853, USA
56	AE-07	Laying Performance of Japanese Quail (Coturnix coturnix japonica) Supplemented with Different Levels of Squash Meals	Gabrien Angelo ALOa, Michael CARRIAGAb, **Gemma M. GUIGUE[c]*** [a]Northwestern Mindanao State College of Science and Technology. Tangub City, Philippines

			[b] Northwestern Mindanao State College of Science and Technology. Tangub City, Philippines [C]Northwestern Mindanao State College of Science and Technology. Tangub City, Phippines
57	AE-08	Potential of Local Resources Ameliorant Formulation from Nagari Banuhampu, Agam to Increase Paprika (Capsicum annuum L.) Production on Inceptisols	Herviyanti Herviyanti1,*, Esti Aprilia Nursyam2, Yulnafatmawita Yulnafatmawita1, Amsar Maulana3, and Irwan Darfis1 [1]Department of Soil Science and Land Resource, Agriculture Faculty, Andalas University, Limau Manis, Padang City, 25164, Indonesia [2]Bachelor Program of Soil Science, Agriculture Faculty, Andalas University, Limau Manis, Padang City, 25164, Indonesia [3]Post-Doctoral Program of Agriculture Faculty, Andalas University, Limau Manis, Padang City, 25164, Indonesia
58	AE-09	Evaluation of Mineral Composition, Physical Properties, and Nutritional Value of Local Rock Flours as Feed Supplements for Laying Quails	**Khalil**[1], Dwi Ananta[2], Ridho Kurniawan Rusli[3], Andri[4] and Yan Heryandi[5] [1]Department of Animal Nutrition and Feed Technology, Faculty of Animal Science, Andalas University, Campus II Payakumbuh, West Sumatra, Indonesia 2Department of Animal Production and Technology, State Agricultural Polytechnic of Payakumbuh, Payakumbuh, West Sumatra, Indonesia 3Department of Animal Nutrition and Feed Technology, Faculty of Animal Science, Andalas University, Padang, West Sumatra, Indonesia 4Department of Livestock Business and Development, Faculty of Animal Science, Andalas University 5Department of Animal Production and Feed Technology, Faculty of Animal Science, Andalas University, Padang, West Sumatra, Indonesia
59	AE-10	Effects of the Mount Marapi Eruption on Plant Diversity and Mineral Status of Soil and Forage in West Sumatra, Indonesia	**Khalil**[1*], Dwi Anata[2], Hermon[3] dan Hendri[4] 1Department of Animal Nutrition and Feed Technology, Faculty of Animal Science, Andalas University, Campus II Payakumbuh, West Sumatra, Indonesia 2Department of Animal Production and Technology, State Agricultural Polytechnic of Payakumbuh, Payakumbuh, West Sumatra, Indonesia 3Department of Animal Nutrition and Feed Technology, Faculty of Animal Science, Andalas University, Padang, West Sumatra, Indonesia

			4Department of Animal Production and Feed Technology, Faculty of Animal Science, Andalas University, Padang, West Sumatra, Indonesia
60	AE-11	Impact of Shading and Cultivation Methods on Black Turmeric Growth and Yield	**Norhidayah Che Soh** and Siti Zafirah Mohd Akhir Faculty of Fisheries and Food Science, Universiti Malaysia Terengganu, 21030 Kuala Nerus, Terengganu
61	AE-12	Impact of Different Compost Ratios on the Growth, Yield, and Post-Harvest Quality of Brinjal	**Nurul Faziha Binti Ibrahim** Faculty of Fisheries and Food Science, Universiti Malaysia Terengganu, 21030 Kuala Nerus, Terengganu
62	AE-13	Sustainable Use Of Gibberellic Acid And Proline To Improve Sweet Potato Growth	**Razifah bt Mohd Razali** Faculty of Science and Marine Environment University Malaysia Terengganu
63	AE-14	The Effect of The Use Of Molasses In Ruminant Livestock Rations On The Digestion Of Dry Matter, Organic Matter And Crude Protein In Vitro	**b), Tri Astuti1**) , Syahro Ali Akbar1) , Nurhaita1) , Rani Rahamdina2) 1)Department of Animal Science, Faculty of Agriculture, University of Mahaputra Muhammad Yamin Solok, West Sumatera, Indonesia 27321 2)Student Department of Animal Science, Faculty of Agriculture, University of Mahaputra Muhammad Yamin Solok, West Sumatera, Indonesia 27321
64	AE-15	Evaluation of Oil Palm Fronds As Small Ruminant Feed: A Meta-Analysis	**Samadi**[1,4],Fenda Alvionita Fhonna2, Anuraga Jayanegara3, Sitti Wajizah1,4, and Anjas Asmara Samsudin5 1 Department of Animal Husbandry, Faculty of Agriculture, Universitas Syiah Kuala, Darussalam-Banda Aceh 23111, Indonesia 2 Doctoral Program of Agricultural Science, Universitas Syiah Kuala, Darussalam-Banda Aceh 23111, Indonesia 3 Department of Nutrition and Feed Technology, Faculty of Animal Science, IPB University, Dramaga-Bogor 16680, Indonesia 4 Research Center for Innovation and Feed Technology, Universitas Syiah Kuala, Darussalam- Banda Aceh 23111, Indonesia 5 Institute of Tropical Agriculture and Food Security, Universiti Putra Malaysia, Serdang 43400, Malaysia
65	AE-16	Potential Of Ficus Septica Leaf Extract As A Botanical Fungicide To Control Of Aspergillus Flavus	**Sang Ketut Sudirga** and Ni Putu Adriani Astiti Program Study of Biology, Faculty of Mathematics and Natural Sciences, University of Udayana
66	AE-17	Efficiency Of Organic Fertilizer From Chicken Manure Compost Enhancing Nitrogen Uptake In	**Rasyiqah Mustamin1**, Jessica Augustinos**2** , and Siti Suliza Salamat**1***

		Green Mustard (Brassicca Juncea) Cultivation	1Department of Crop Production, Faculty of Sustainable Agriculture, Universiti Malaysia Sabah, Bag No. 3. 90509 Sandakan, Sabah, Malaysia. 2 Department of Agrotechnology & Bio Industry, Sandakan Polytechnic Education Hub, Mile 10, Jalan Sungai Batang, 90000 Sandakan
67	AE-18	Enhancing Nitrogen Uptake and Rice Productivity in Inceptisols Through Moringa oleifera and Golden Snail-Based Liquid Organic Fertilizers	**Widyatmani Sih Dewi**1*, Rani Rahmawati2, Okta Loveana2, Sudadi1, Ongko Cahyono1, and Srie Juli Rachmawatie3 1Soil Science Department, Faculty of Agriculture, Universitas Sebelas Maret, Surakarta, Indonesia 2Undergraduate Program of Soil Science Department, Faculty of Agriculture, Universitas Sebelas Maret, Surakarta, Indonesia 3Agrotechnology Study Program, Faculty of Agriculture, Islam Batik University, Surakarta, Indonesia
68	AE-19	Utilization Of Bacillus Thuringiensis Strain Mrtlrz2.1 Liquid Waste to Control Xanthomonas Axonopodis Pv. Allii And Improve Shallot Plant Production in Alahan Panjang	**Yulmira Yanti** 1, *), Nurbailis Nurbailis1, Widya Fitriyanti2, Khomisatul Ahdaniah3 1Department of Plant Protection, Agriculture Faculty, Universitas Andalas, Padang, West Sumatra, Indonesia 2Department of Social economi, Agriculture Faculty, Universitas Andalas, Padang, West Sumatra, Indonesia 3Student in Plant Protection Department, Agriculture Faculty, Universitas Andalas, Limau Manis, Padang, Indonesia 25163
69	AE-20	Growth and physiological responses of oil palm seedlings (Elaeis guineensis Jacq.) to Trichoderma asperellum SL2 inoculation	**Fathurrahman** Universitas Islam Riau . Indonesia
70	AE-21	Impact of soil tillage and organic amendment on some chemical and biological characteristics of Entisol and sweet potato production on Maitara Island of Indonesia	**Erwin Ladjinga**[1], Lily Ishak1*, Tri Mulya Hartati1, Rasif Marsudin1, Nurhasni Soamole1 1Soil Science Study Program, Faculty of Agriculture, Khairun University, Ternate, North Maluku, Indonesia
71	AE-22	Correlation Study of Rhizobium Bacteria and Legume Cover Crops (LCC) As Nutrient Providers and Bioremediators on Post-Mining Land at PT. Agincourt Resources	**Yasmine Anggia Sari1**, Ade Gustina Hazar Nasution1, Syaiful Anwar2,3, Randyka Nugraha3 [1]Faculty of Environmental Engineering Universitas Sumatera Utara [2]School of Biological Sciences, Universiti Sains Malaysia, Penang, Malaysia [3]PT. Agincourt Resources, Martabe Gold Mine, JL. Merdeka Aek Pining, Batangtoru, North Sumatra 22738, Indonesia
72	AE-23	Earthworm Population and Diversity in Smallholder Oil Palm Plantations under Conventional	Andri Abdi[1], T.Sabrina[1,2]*, Mariani Sembiring1 1Department of Agrotechnology, Faculty of Agriculture, Universitas Sumatra Utara, Padang Bulan, Medan

		and Semi-Organic Systems in Labuhan Batu Regency	20155, Indonesia 2Natural Resource and Environment Management, Postgraduate School, Universitas Sumatra Utara, Padang Bulan, Medan 20155, Indonesia
73	AE-24	Effectiveness of Cinnamon Leaf Extract (Cinnamomum Burmanni Blume) 'Pupuan' Bali in Controlling Blast Disease Attacking Rice Plants	**Anak Agung Ketut Darmadi**, Khamdan Khalimi, I Ketut Ginantra, Fainmarinat S.Inabuy Biology Doctoral Study Program, fFaculty of Mathematics And Natural Sciences, Udayana University, Bali
Sustainable Product Development			
74	SPD-01	Computer-Assisted Semen Analysis in Indonesian Buffalo: Correlations with Plasma Membrane Integrity, DNA Fragmentation, and Acrosome Integrity	Syahruddin Said1, Athhar Manabi Diansyah2*, Tulus Maulana1, Hikmayani Iskandar1, Ekayanti Mulyawati Kaiin1, Fuad Hasan3, Siti Farida4, and Raden Iis Arifiantini5 1Research Centre for Applied Zoology, National Research and Innovation Agency, Jl. Raya Bogor Km.46 Cibinong, Bogor 16914, Indonesia 2Faculty of Animal Science, Hasanuddin University 3Faculty of Agriculture, Sumatera Utara University 4Regional Artificial Insemination Center, South Sulawesi, Indonesia 5Department of Clinic, Reproduction, and Pathology, Faculty of Veterinary Medicine, IPB University, Jl. Agatis, Dramaga Campus, Bogor 16680, Indonesia
75	SPD-02	Development of Institutional Batik Design Based on Water Spinach and Institutional Visual Elements: Sustainability and Visual Identity Representation	Deny Arifiana1, Inty Nahari2, Mein Kharnolis3 123Bachelor of Fashion Education Study Program, Surabaya State University, East Java, Indonesia
76	SPD-03	Nature's pH Palette: Eco-Friendly Extraction and Spectroscopic Insights into Red Cabbage Anthocyanins as Freshness Sensors	Elysa Grace Edward[2,] Kobun Rovina[1] 1Faculty of Sustainable Agriculture, Universiti Malaysia Sabah, Locked Bag No. 3, 90509 Sandakan, Sabah, Malaysia 2Food Security Research Lab, Faculty of Food Science and Nutrition, 88400 Universiti Malaysia Sabah, Kota Kinabalu, Sabah, Malaysia
77	SPD-04	Development of Ethylene-Adsorbing Active Packaging to Extend the Shelf Life of Cavendish Bananas	**Endang Warsiki1**, Aulia Mardhatillah1 1Department of Agroindustrial Technology, Faculty of Agricultural Technology and Engineering, Bogor Agricultural University (IPB University), Bogor, Indonesia
78	SPD-05	Physicochemical Properties Evaluation of Mix Extracts Toothpaste for Dental Health	**Euis Reni Yuslianti[1]***, Agus Susanto2, Afifah Bambang Sutjiatno3, Wahyu Widowati4, Tichvy Tammama1, Raezita Sanjaya1 [1]Faculty of Dentistry, Universitas Jenderal Achmad Yani, Cimahi, 40531, Indonesia [2]Faculty of Dentistry, Universitas Padjadjaran, Sumedang,

			45363, Indonesia 3Faculty of Pharmacy, Universitas Jenderal Achmad Yani, Cimahi, 40531, Indonesia 4Faculty of Medicine, Maranatha Christian University, Bandung, 40164, Indonesia
79	SPD-06	Cavendish Banana Pseudostem and Blitar Honey Pineapple Leaves as Fiber Sources for Tapestry Weaving Featuring the Lung-Lungan Pattern	**N. Inty**[1], A. Deny2, K. Mein3, CA. Indah4, P.Mita5 [123]Fashion Education Department, University State Surabaya, East Java, Indonesia [4]Fine Art Department, University State Surabaya, East Java, Indonesia [5]Visual Communication Design, Binus University, Jakarta, Indonesia
80	SPD-07	The Effectiveness of Nanocoating-Porang as A Natural Preservative to Maintain the Quality Of Kintamani Siam Oranges	Luh Suriati*1, Anak Agung Sagung Manik Chindrawati1, Ni Luh Putu Sulis Dewi Damayanti2, dan I Putu Ajus Raditya Putra1 [1] Food Technology and Agricultural Products, Warmadewa University, Indonesia. [2] Agrotechnology, Warmadewa University, Indonesia. Corresponding author: suriati@warmadewa.ac.id
81	SPD-08	Cellulose Obtained from Sea Grass (Enhalus acoroides) Leaf and Sago Pith Waste (Metroxylon sagu Ro5b.) Through Hydrogen Peroxide Citric Acid Treatment	Nanang Masruchin[1,2,3,*], Maghfirah Jayalaksmana[1,4], Advent Tri Yanti Halawa[1,5], Marenda Pandu Rizqi[6], Riska Surya Ningrum[1], Bora Jeong[7], Efri Mardawati[3,8], Arif Nuryawan[9,10], Makhmudun Ainuri[4] [1]Research Center for Biomass and Bioproducts, National Research and Innovation Agency (BRIN), KST Soekarno, Cibinong, 16911, Indonesia [2]Research Center for Nanocellulose between BRIN and Universitas Andalas, Padang, 25163, Indonesia [3]Research Center for Biomass and Biorefinery between BRIN and Universitas Padjadjaran, Jatinangor, 45363, Indonesia [4]Department of Agro-industrial Technology, Universitas Gadjah Mada, Yogyakarta, 55281, Indonesia [5]Department of Chemistry, Universitas Sari Mutiara, Medan, 20124, Indonesia [6]Research Center for Oceanography, BRIN, Manado, North Sulawesi, Indonesia [7]Central Research Institute, Dongwha Enterprise, Incheon 22300, Republic of Korea

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82	SPD-09	Preparation and Characterization of Chitosan Nanoparticles of Sea Urchin (Tripneustes Gratilla) using Beads-Milling Method for Biodegradable Edible Film Fillers	**Hamidin Rasulu1**,*, Ramisah Mohd Shah2, Abdul Kadir Kamaluddin3 [1]Department Agricultural Product Technology, Faculty of Agriculture, Khairun University, Ternate 9717, Indonesia [2]Faculty of Fisheries and Food Science, Universiti Malaysia Terengganu, 21030 Kuala Terengganu, Terengganu, Malaysia [3]Department of Forestry, Faculty of Agriculture, Khairun University, Ternate 9717, Indonesia
83	SPD-10	Effect of carrier combination on microencapsulation efficiency and physicochemical properties of Citrus latifolia peel essential oil by spray drying	**Vu Thi Thanh Dao**[1,4,5], Tuty Anggraini3, Tran Nghia Khang4,5, Le Phan Hoai Ngoc4,5, Truong Minh Nam4,5 and Aswaldi Anwar2* 1Doctoral program in Agricultural science, Faculty of Agriculture, Andalas university, Indonesia 2 Faculty of Agriculture, Andalas University, Indonesia 3 Faculty of Agricultural technology, Andalas University, Indonesia 4 An Giang University, Ho Chi Minh city, Vietnam 5 Vietnam National University, Ho Chi Minh city, Vietnam
\ 84	SPD-11	Smart Colorimetric Film For Monitoring Freshness of Chicken	**Wan Nazwanie binti Wan Abdullah1***, Nur Adriana binti Mohd Nor Azam1, 1 School of Chemical Sciences, Universiti Sains Malaysia, 11800 USM Penang, Malaysia
85	SPD-12	Agriculture-based biomass as an Efficient Absorbent for Chemical Spill	W.N.A.Wan Mokhtar1,2*, R. Othaman1,2, D.T. Veeran1, N.A. Pinjaman1, N.S., Azman1 1Department of Chemical Sciences, Faculty of Science and Technology, Universiti Kebangsaan Malaysia 43600 UKM, 43600 Bangi, Selangor 2Polymer Research Center, Faculty of Science and Technology, Universiti Kebangsaan Malaysia 43600 UKM, 43600 Bangi, Selangor

Sustainable Development Goals (SDGs)			
86	SDGs-01	A bibliometric study on the use of Ganoderma species in mycoremediation: A critical assessment	Anggita Rahmi Hafsari1,2,3, Zul Ilham3, Wan Abd Al Qadr Imad Wan-Mohtar1, Febri Doni4,5 1Functional Omics and Bioprocess Development Laboratory, Institute of Biological Sciences, Faculty of Science, Universiti Malaya, Kuala Lumpur 50603, Malaysia 2Department of Biology, Faculty of Science and Technology, Universitas Islam Negeri (UIN) Sunan Gunung Djati Bandung, West Java 40614, Indonesia 3Biomass Energy Laboratory, Faculty of Science, Institute of Biological Sciences, Universiti Malaya 50603 Kuala Lumpur, Malaysia 4Department of Biology, Faculty of Mathematics and Natural Sciences, Universitas Padjadjaran, Jatinangor, West Java 45363, Indonesia 5Department of Global Development, Cornell University, Ithaca, New York 14853, USA Corresponding Email : anggitarahmi@uinsgd.ac.id, S2168396@siswa.um.edu.my
87	SDGs-02	Practice-Based Ecofeminism: Women's Ecological Knowledge In Sustainable Food Systems	Ayu Anastasia1, Herdis Herdiansyah1, Ernoiz Antriyandarti2 1School of Environmental Sciences, University of Indonesia, Jakarta, Indonesia 2Faculty of Agriculture, Universitas Sebelas Maret, Jawa Tengah, Indonesia
88	SDGs-03	Analysis Of Milk Consumption Habits And Nutritional Status Of Toddlers As A Basis For Preparing A Free Milk Program In The Namorambe Community Health Center Area, Deli Serdang Regency	**Evawany Aritonang[1]**, Sarah Patumona Manalu2, Samuel MH Manalu3 1Faculty of Publich Health Universitas Sumatera Utara 2Faculty of Environmental Engineering Universitas Sumatera Utara 3Health Polytechnic Sumatera Utara
89	SDGs-04	Traditional Indian knowledge system – A Significant Way to Maintain Sustainability	**Dr. Harbir Singh Dagur** Mahatma Gandhi Institute of Governance and Social Sciences Jaipur. India
90	SDGs-05	Traditional Knowledge System and Environmental Sustainability	**Dr. Harbir Singh Dagur** Mahatma Gandhi institute of Governance and social sciences Jaipur. India
91	SDGs-06	The Environmental Crisis or Relevance of Indian way for sustainable development and management	**Lakshki Choudhary** Mahila samnavya Jaipur INDIA

92	SDGs-07	Decoding India's SDG Implementation: Stakeholder Insights on Barriers, Priorities, and Regional Disparities	**Meenakshi Mahur** Government Meera Girls' College, Udaipur-(Rajasthan) *INDIA*
93	SDGs-08	Willingness of Public Duty Bearers to Pay and Adopt Ecosystem-based Disaster Risk Reduction: A Policy Implication for Climate Resilience	**Wilma C. De Los Santos** Mindoro State University. Philippines
94	SDGs-09	Do University Students Recognize and Understand the SDGs?	**Vivek Mandot** Professor & Nodal Officer ITCommissionrate of College Education, Rajasthan, Jaipur, INDIA
95	SDGs-10	The Influence Of Fast Fashion Awareness On Clothing Disposal And Management Habits	**Sarah Patumona Manalu1, Dewi Sartika Br. Ginting2, Ronald Leonardo Siregar1, Yasmine Anggia Sari1, Maicel Ria Debora Sinaga1, Ade Citra Nadhira1** 1Department of Environmental Engineering, Universitas Sumatera Utara, Medan, Indonesia 2Department of Computer Science and Technology Information, Universitas Sumatera Utara, Medan, Indonesia
Socio-Economic Related to Agriculture, Food, and Energy			
96	SEAFE-01	Development Potential of Bali Cattle in South Sulawesi: A Study on Population Structure and Management System	**Ahmad Alfaruqi Syahrandi Adam1, Muhammad Yusuf2*, Sahiruddin Sahiruddin2, Athhar Manabi Diansyah2, Andi Muhammad Alfian2, Masturi Masturi2, Syahruddin Said3** 1Graduated Student of Agricultural System, Graduated School, Hasanuddin University, Jl. Perintis Kemerdekaan Km. 10 Tamalanrea Makassar, South Sulawesi, 90245, Indonesia. 2Faculty of Animal Science, Hasanuddin University, Jl. Perintis Kemerdekaan Km. 10 Tamalanrea Makassar, South Sulawesi, 90245, Indonesia. 3Research Center of Applied Zoology, National Research and Innovation Agency, Cibinong Science Center, Jl. Raya Jakarta-Bogor, West Java, Indonesia.16915

97	SEAFE-02	Diamond Porter Analysis to Measure the Competitiveness of Coffee Agribusiness in the Karo Regency Highlands, North Sumatra Province	**Aisyah Amira Ginting1, Satia Negara Lubis2, Achmad Siddik Thoha3, Tengku Callysta Mauditrice4** 1Alumni Master of Agribusiness, Faculty of Agriculture, University Sumatera Utara 2Doctoral Program in Regional Planning, Postgraduate School, University Sumatera Utara 3Doctoral Program in Regional Planning, Postgraduate School, University Sumatera Utara 4Alumni Business Administration, Faculty of Business and Economics, University of Malaya
98	SEAFE-03	Rooted Resilience: Women's Dual Agency and Epistemic Empowerment in Food Diversification Strategies in Manggarai Barat, Indonesia	**Ayu Anastasia1**, Herdis Herdiansyah1, Ernoiz Antriyandarti2 1School of Environmental Sciences, University of Indonesia, Jakarta, Indonesia 2Faculty of Agriculture, Universitas Sebelas Maret, Jawa Tengah, Indonesia
99	SEAFE-04	Analysis of the Impact of Flash Floods on Socio-Economic, Food Security, and Farmer Adaptation in Tanah Datar District-West Sumatra Province	Abdul Aziz Nasta1, Bambang Istijono1*, Abdul Hakam2, Fauzan2, Rudi Febriamansyah3, and Vonny Indah Mutiara3 1 Graduate School, Universitas Andalas, Padang, Indonesia 2 Departement of Civil Engineering, Universitas Andalas, Padang, Indonesia 3 Departement of Agriculture, Universitas Andalas, Padang, Indonesia
100	SEAFE-05	Analysis Of Indonesian Sustainable Palm Oil (Ispo) Perception for Palm Oil Farmers In Ensuring Sustainability of Palm Oil Supply in West Sumatera	Lisa Nesti1, Ester Edwar2, Radna Ningsih3, Ridha Luthvina4, Rizaldi Sardani5 [1,2,3,4,]5Politeknik ATI Padang . Indonesia
101	SEAFE-06	Bridging Islands: A Supply Chain Study of Agricultural and Plantation Commodities in North Maluku	**Muhammad Ridha Ajam[1]**, Pavalee Chompoorat Tridtitanakiat2, Erni Sofia Murtini3, Abdullah W. Jabid4, Abdul Kadir Kamaluddin5, Hamidin Rasulu5*, Reyna Ashari5, Hayun Abdullah5, Siti Nurjannah5, Mila Fatmawati5, Zuhud Rozaki6 1Faculty of Humanities, Khairun University, North Maluku, 97719, Indonesia 2Faculty of Agroindustry Chiang Mai University, Thailand3 3Faculty of Agricultural Technology, Brawijaya University, Malang, Indonesia. 4Faculty of Economy, Khairun University, North Maluku, 97719, Indonesia 5Faculty of Agriculture, Khairun University, North Maluku, 97719, Indonesia.

			6Department of Agribusiness, Universitas Muhammadiyah Yogyakarta, Yogyakarta 55183, Indonesia.
102	SEAFE-07	Determinants of Hybrid Rice Technology Adoption in Camarines Sur, Bicol Region, Philippines	**Mae Lustre** Central Bicol State University of Agriculture (CBSUA) Philippines
103	SEAFE-08	A Comparative Profitability Analysis of Hybrid and Inbred Rice Farming in Bicol Region, Philippines	**Ma. Victoria P. Balderas** Central Bicol State University of Agriculture (CBSUA) Philippines
104	SEAFE-09	Financial Literacy Mediation: Digital Payment Systems and Financial Satisfaction	**Muhsin N. Bailusy1*** Putri Ekawati Darma2, Irfandi Buamonabot3 1Faculty of Economics and Business, Universitas Khairun 2Faculty of Economics and Business, Universitas Khairun Email: 3Faculty of Economics and Business, Universitas Khairun
105	SEAFE-10	Work-family conflict and turnover intention of SME employees: The role of psychological well-being and burnout	**Abdullah W. Jabid**[1], Dudi Amarullah2 1Faculty of Economics and Business, Khairun University, Ternate, Indonesia 2Faculty of Economics and Business, Khairun University, Ternate, Indonesia
106	SEAFE-11	Economics Of Production And Marketing Of Small-Scale Sakurab (Allium Chinense G. Don) Farms In Bangsamoro Re- Gion In Muslim Mindanao (Barmm), Philippines	**Rasmiah Datu Macabalang-Mama** Doctor of Philosophy (Agricultural Economics), Central Mindanao University, University Town, Musuan, Bukidnon, December 2024.
107	SEAFE-12	Farm machinery breakdowns: Causal Factors and Preventive Measures (Case study of using small farm machines in Riau Province, Indonesia)	**Ujang Paman** Department of Agribusiness, Faculty of Agriculture, Islamic University of Riau, Pekanbaru, Riau, Indonesia.
108	SEAFE-13	Legal and Agricultural Perspective on the Importance of Farm Roads in Ternate City	**Jamal Hi. Arsad[1]**, Robert Lengkong Weku2 1Department of Law, Faculty of Law, Khairun University, North Maluku 2Department of Law, Faculty of Law, Khairun University, North Maluku
Information Technology			
109	IT-01	Evaluating Knowledge Creation in Smart Container-Based Monitoring and Prediction of Fresh Fruit Quality: A Systematic Literature Review	**Encik Eko Rifkowatya***, Endang Warsikia, Taufik Djatnaa, Sri Yulianib aDepartment of Agroindustrial Technology, Faculty of Agricultural Technology and Engineering, Bogor Agricultural University (IPB University), Bogor 16880 bIndonesia National Research and Inovation Agency, BRIN, Indonesia

110	IT-02	Utilization of Spatial Technology in Provision for Land of Food Crop (Corn) in the Kora Kora Watershed, Minahasa Regency	Sandra E. Pakasi, Wiske Rotinsulu, Melisa P. Todingan, Marciano A. Tambuwun PS Agroteknologi Universitas Sam Ratulangi Manado, Indonesia
Circularity in agriculture, food, and energy			
111	CAFÉ-01	Environmental management adaptation in palm oil mills across biophysical land types: A systematic review and bibliometric analysis	Dessy Maulidya Maharania*, Suprihatina, Nastiti Siswi Indrastia, Arief RM Akbarb aDepartment of Agroindustrial Technology, Faculty of Agricultural Technology and Engineering, Bogor Agricultural University (IPB University), Bogor 16880 Indonesia bDepartment of Agroindustrial Technology, Faculty of Agricultur (Lambung Mangkurat University), Banjarbaru 70714 Indonesia
112	CAFÉ-02	Green synthesis: harnessing Eco-friendly processes to drive the nanocircular economy	**Dr. Himani Bhoi** V.K.B. Govt. Girls College, Dungarpur, Rajasthan-313002, India
113	CAFÉ-03	Combination Of Inorganic Fertilizer And Starfruit Waste Compost On Butter Nut (Cucurbita Moschata) To Support Sustainable Agriculture	**Mutiara Dewi Puspitawati*** and Inanpi Hidayati Sumiasih Faculty of Science, Engineering, and Design, Trilogi University, Jakarta, Indonesia.
114	CAFÉ-04	Greening the Growing Medium: Sustainable Alternatives to Peat Moss Using Mushroom Waste, Biochar, and Coffee Grounds	Nor Idzwana Mohd Idris Universiti Malaysia Terengganu
115	CAFÉ-05	Sustainable Biomass Energy Supply Chain in Indonesia: A Circular Economy Approach for Resource Optimization	Sawarni Hasibuan, Juliza Hidajati, Humiras Hardi Purba Universitas Mercu Buana
116	CAFÉ-06	Financial Risk Management Strategy to Encourage Growth and Sustainability of Rumah Dangke Business in Local Industry	Sri Wira Utami Hasanuddin University . indonesia

ABSTRACT TITLE

VIRTUALLY ATTEND

No.	Kode	Tittle of Abstract	Name
Innovation in Sustainability related to Agriculture, Food, and Energy			
1	ISAFE-01	Prospects and Challenges of Space-Based Energy	Guliev Igbal1*, Rusnak Anastasiia2, Sharapova Ulyana3 1MGIMO University, 119454 Moscow, Russia, *Email : guliyev@miep-mgimo.ru 2MCS British School, 127473 Moscow, Russia 3Pine Crest School, 119454 Moscow, Russia
2	ISAFE-02	Application Of Magnetized Water For Cotton Irrigation In The Conditions Of The Republic Of Karakalpakstan	Matyakubov B.1*, Ergashova D2, Kasymbetova S3 1Doctor of agricultural sciences, professor, Tashkent Institute of Irrigation and Agricultural Mechanization Engineers" National Research University, Tashkent city, Uzbekistan. 2PhD student, Tashkent Institute of Irrigation and Agricultural Mechanization Engineers" National Research University, Tashkent city, Uzbekistan. 3Associate Professor, Candidate of technical sciences, Tashkent Institute of Irrigation and Agricultural Mechanization Engineers" National Research University, Tashkent city, Uzbekistan.
3	ISAFE-03	Biodiesel production using CaO catalyst modified with oxalic acid activated palm oil mill fly ash	D. Desniorita[1*], Resi Levi Permadani, Rita Youfa[2], Dyah Nirmala, Elda Pelita[3], Regna Tri Jayanti[1], Anang Baharuddin Sahaq 1Renewable Energy Bioprocess Engineering Technology Phytochemistry Engineering, ATI Padang Polytechnic, West Sumatra, Indonesia 2Chemical Analysis, ATI Padang Polytechnic, West Sumatra, Indonesia 3Phytochemistry Engineering, ATI Padang Polytechnic, West Sumatra, Indonesia
4	ISAFE-04	The Identification Biomass and Calorific Value Bamboo (Bambusoideae) and Its Use as Briquettes	Aisman, Sahadi Didi Ismanto, and Engla Widiya Chandra

			Departemen of Food Technology and Agricultural Products,, Faculty of Agricultural Technology, Andalas University. Indonesia 25163
Sustainable Food Science and Technology			
5	SFST-01	Effect Of Pressing Temperature On The Shelf Life And Quality Of Linoleic And Oleic Compounds In Sesame Oil	Luluk Sulistiyo Budi1, Ma'ruf Pambudi Nurwatara1 dan Dian Ardifah Iswari 1Faculty of Agriculture, Agrotechnology Studies Program, Merdeka Madiun University,East Java, Indonesia 2Faculty of Economics, Economic Studies Program, Muhammadyah Madiun University, East Java, Indonesia dianardifahiswari@gmail.com E-mail: luluksb@unmer-madiun.ac.id ; makrufpambudinurwantara@unmer-madiun.ac.id
6	SFST-02	Development of cricket flour-fortified crackers as a novel protein-enriched snack	**Fionny Widjaja and Reggie Surya*** Food Technology Department, Faculty of Engineering, Bina Nusantara University, Jakarta 11480, Indonesia * Corresponding author: reggie.surya@binus.edu
7	SFST-03	Physicochemical and Sensory Characteristics of Globe Amaranth (Gomphrena globosa L) Gummy Candy with Addition of Betel Leaf Extract (Piper betle L)	**Vania Salsabila Anjani and Reggie Surya*** Food Technology Department, Faculty of Engineering, Bina Nusantara University, Jakarta, 11480, Indonesia
8	SFST-04	The Level of Utilization of Larvae (BAF) In Feed On Kub Chicken	**Tertia Delia Nova,1 Kusnadidi Subekti2 Fichri Ananta Putra3** 1Departement of Technology Animal Production, Animal Science, Universitas Andalas, Padang Indonesia 2Departement of Technology Animal Production, Animal Science, Universitas Andalas, Padang Indonesia 3 Alumni of Departement of Technology Animal Production, Animal Science, Universitas Andalas, Padang Indonesia
9	SFST-05	The development of functional jelly drinks incorporating red yeast rice (Angkak) extract: an evaluation of physicochemical and organoleptic characteristics	**Wiwit Amrinola[1*], Paula Natalia[1]** 1 Food Technology Department, Faculty of Engineering, Bina Nusantara University, Jakarta, 11480, Indonesia

10	SFST-06	Physical and sensory characteristics of cascara water kefir with the addition of butterfly pea (Clitoria ternatea) flowers	**Murna Muzaifa[1,3], Yusya Abubakar[1,3], Cut Nilda[1], Yuliani Aisyah[1], Faidha Rahmi[2], Juanda[1] and Alya Fithriyyah[1]** [1]Agricultural Product Technology, Universitas Syiah Kuala, 23116Banda Aceh, Indonesia [2]Agricultural Faculty, University of Gajah Putih, 24560 Blang Bebangka Aceh Tengah, Indonesia [3]Research Center for Aceh Coffee and Cacao, Universitas Syiah Kuala, 23116 Banda Aceh, Indonesia
11	SFST-07	Quality characterization of arabica coffee soaked at different fruit maturity levels	Reta1*, Husna Ansari2, Zaimarr3, Sitti Nurmiah4, Nadiah Nur5 1 Pangkep State Polytechnic of Agroculture, Department of Agriculture Technology, Pangkajene Kepulauan, 90655, South of Sulawesi, Indonesia 2Pangkep State Polytechnic of Agroculture, Department of Agriculture Technology, Pangkajene Kepulauan, 90655, South of Sulawesi, Indonesia 3Pangkep State Polytechnic of Agroculture, Department of Agriculture Technology, Pangkajene Kepulauan, 90655, South of Sulawesi, Indonesia 4Pangkep State Polytechnic of Agroculture, Department of Agriculture Technology, Pangkajene Kepulauan, 90655, South of Sulawesi, Indonesia 5Department of Food Science, Hasanuddin University, 90245, Makassar, South Sulawesi, Indonesia Corresponding authora: retariskinapolitani@gmail.com, reta@polipangkep/ac.id,
Agriculture amd Enviroment			
12	AE-01	The Invitro Digestibility and Rumen Fermentation Characteristics of Cattle Diet made from Ammoniated Palm Fronds and Fermented Solid	Irma Badarina1*, Jarmuji1, Hidayat1, and Fajri Agung Mulyono1 1Animal Husbandry Faculty of Agriculture University Bengkulu
13	AE-02	The Effect of Climate Anomalies on Oil Palm Productivity: A Quantitative Analysis	Mohammad Juremi Suhartono1*, Maria Theresia Sri Budiastuti2, Mujiyo3, Sri Gunawan4

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14	AE-03	Scientifically Substantiated Irrigation Regimes For Cotton And Winter Wheat In The Tashkent Region Of The Republic Of Uzbekistan	Munisakhon Burkhonova_1Matyakubov, B[1], Gadaev, N[1], Khasanov M[2], Tajiyev Z[3], Razzakov Q[3]. [1]"Tashkent Institute of Irrigation and Agricultural Mechanization Engineers" National Research University, Tashkent, Uzbekistan; [2]Research Institute of Selection, Seed Production and Cotton Cultivation Technology, Tashkent, Uzbekistan; [3]Urgench state university. *Corresponding author: Munisakhon Burkhonova, munisaburxonova1998@gmail.com
15	AE-04	Pedogeochemical Barriers in Hydromorphic Soils and Their Influence on Cotton	Turdaliev Avazbek1, Zakirova Sanoatkhon1, Kamoliddin Askarov1, Iskandar Musaev1, Gaybullo Mamajonov1, Avazbek Akhmadjonov1, Anvarjon Esanov2, Abror Khalilov3, Shavkat Botirov4 [1]Fergana State University, Uzbekistan [2]Tashkent State Pedagogical Universitynamed after Nizami, Tashkent, Uzbekistan [3]Kokand State University, Kokand, Uzbekistan [4]"Tashkent Institute of Irrigation and Agricultural Mechanization Engineers" National Research University, Tashkent, Uzbekistan Corresponding author: Munisakhon Burkhonova munisaburxonova1998@gmail.com
16	AE-05	Evaluation of Nutritional Regime in Sandy Soils Based on Fertilizer Application Rates	**Sanoatkhon Zakirova1**, Avazbek Turdaliev1, Khusnidakhon Abdukhakimova1, Guzalkhon Sotiboldieva1, Akmaljon Urinov1, Rahmatillo

			Akbarov1, Muhabba Diyorovat2, Dilnoza Raimova2, Adkham Mamataliev3 1Fergana State University, Fergana, Uzbekistan 2Karshi State University, Karshi, Uzbekistan 3"Tashkent Institute of Irrigation and Agricultural Mechanization Engineers" National Research University, Tashkent, Uzbekistan Corresponding author: Munisakhon Burkhonova munisaburxonova1998@gmail.com
17	AE-06	Factors Of Soil Protection, Abundant and Quality Harvesting Of Crops	Sabirjan Isaev1, Sunnat Tajiev1, Munisakhon Burkhonova1*, Sanoatkhan Zakirova2, Ghulam Yuldashev2, Bijan Dauletbayev3, Yusuf Ashirov4 1"Tashkent Institute of Irrigation and Agricultural Mechanization Engineers" National Research University, Tashkent, Uzbekistan; 2Fergana State University, Uzbekistan 3M.Auezov South Kazakhstan University, Kazakhstan 4Tashkent State Agrarian University, Uzbekistan *Corresonding author: Munisakhon Burkhonova, munisaburxonova1998@gmail.com
18	AE-07	Leveraging Nickel Micro-Nutrient to Improve Root Development of Sugarcane Single Bud Chips in the Face of Climate Change Challenges	**Sri Hartatik,** Falahudin Zamzami, Ahmad Zaki Naufal and Abdul Imam Dwi May Department of Agronomy, Faculty of Agricultural, University of Jember, Jl. Kalimantan 37 Jember, 68121 – Indonesia
19	AE-08	Translocation of N, P, and K in Mentik Wangi Rice (Oryza sativa L.) with the Application of Liquid Organic Fertilizer from Moringa Leaves (Moringa oleifera)	**Srie Juli Rachmawatie1,** Abdul Ghaffar Amiruddin Zaki2 1Department of Agrotechnology, Faculty of Agriculture,Universitas Islam Batik, Surakarta. Surakarta, Indonesia, 57126 2Department of Agrotechnology, Faculty of Agriculture, Institut Pertanian Stiper, Yogyakarta, Indonesia 55281
20	AE-09	The Effect of Vermicompost on the Growth, Yield, and Anthocyanin Content of Local Black Rice	**Ummi Sholikhah1*,** Puji Rahayu1, Ahmad Ilham Tanzil1, Tri Ratnasari1, Wahyu Indra Dwi Fanata1 1Program Studi Agroteknologi Fakultas Pertanian Universitas Jember, Indonesia
21	AE-10	Application of PGPR (Plant Growth Promoting Rhizobacteria) To Two Potato Varieties	**Warnita*1 and Imbratul Hilma2** 1Department of Agronomy, Faculty of Agriculture, Universitas Andalas

			2Program Study of Agrotechnology, Faculty of Agriculture, Universitas Andalas
22	AE-11	Exploring phosphate-solubilizing bacteria in paddy rhizospheres across varied management systems	**Sella Mukmina1, Widyatmani Sih Dewi2*, Retno Rosariastuti2** 1Magister of Soil Science, Faculty of Agriculture, Universitas Sebelas Maret, Jl. Ir. Sutami 36A, Central Java, Surakarta, 57126, Indonesia 2Department of Soil Science, Faculty of Agriculture, Universitas Sebelas Maret, Jl. Ir. Sutami 36A, Central Java, Surakarta, 57126, Indonesia Corresponding author: widyatmanisih@staff.uns.ac.id
Sustainable Product Development			
23	SPD-01	Application of FTIR-ATR Spectroscopy for Quality Mapping and Authenticity Verification of Coffee from Traditional Markets in Padang City Indonesia	**Daimon Syukri*1, Fitria Indah Permata Sari1, Novizar Nazir1, Ario Betha Juanssilfero2, Rini1, Faldiyo Alghifari1 and Riyana Sunardi1** 1Department of Food and Agriculture Product Technology, Universitas Andalas, Padang, Indonesia 2Research Center for Environmental and Clean Technology, National Research and Innovation Agency, Banten, Indonesia Corresponding author at email: dsyukri@ae.unand.ac.id
24	SPD-02	Formulation and Evaluation of Corn Silk Extract Lozenges as a Source of Bioactive Compounds	**Haslina,** 1Dewi Larasati, 1Aldila Sagitaning Putri, 1Erwin Nofiyanto 1Faculty of Agricultural Technology, Semarang University, Semarang 50196, Central Java, Indonesia
25	SPD-03	Slayers: Harnessing Green-Extracted *Moringa oleifera* to Boost Fruit Longevity	**Mat Jauilah Nuraqilah Syamimi 2 , Kobun Rovina** 1 1Faculty of Sustainable Agriculture, Universiti Malaysia Sabah, Locked Bag No. 3, 90509 Sandakan, Sabah. 2Food Security Research Laboratory, Faculty of Food Science and Nutrition, Universiti Malaysia abah, Kota Kinabalu 88400, Malaysia
26	SPD-04	Preliminary Study on the Effectiveness of Sun Protection Factor capacity in Lotion Formulated with Secang, Stevia, and Breadfruit Extracts on Wistar Rats: A Comparative Dermal Evaluation	**Rini1, Daimon Syukri1, Aurel Amaliyah Tarumiyo2, Fitria Indah Permata Sari1, Yasmin Azzahra2**

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Sustainable Development Goals (SDGs)			
27	SDGs-01	The Impact Of Sustainable Development On An Inclusive Labor Market In The Context Of Digitalization And Its Management In Kazakhstan	**Bekzhanova Toty Kalzhanovna** Associated Professor, Head of "Account and Audit" Department, Esil University, Astana, Kazakhstan. Cell phone: +7 778 704 29 45 e-mail: toty_bekzhanova@mail.ru Dinara Yeshpanova Associated Professor, Almaty Humanitarian and Economic University, Almaty, Kazakhstan. Cell phone: +7 705 960 5951 e-mail:eshpanova@list.ru,
28	SDGs-02	Increasing the ecological efficiency of training in higher education	**Hudayberganov Dilshod Tuxtabaevich**1, Umirova Dilnoza Safarovna2, Matkarimova Intizor Atabaevna3, Rakhimova Sadokat Mamutovna3, Kadirov Sanat Yuldashevich3,Sapaeva Barno Shanazarovna3, [1]Urgench state university, Urgench city, Khamid Alimjan Street, House 14, 220100, Uzbekistan [2]Tashkent State University of Economics, Tashkent city, Islam Karimov street, 49, 100063, Uzbekistan [3]Ma'mun University, Khiva city, Bal-Havuz street, 2, 220900, Uzbekistan dilshod.x@urdu.uz
29	SDGs-03	The Implementation of Climate Village (Program Kampung Iklim: PROKLIM) in Karanganyar Regency, Central Java, Indonesia	Eny Lestari1, Retno Setyowati1, **Eksa Rusdiyana1,** Widiyanto1, and Sugihardjo1 [1]Faculty of Agriculture, Universitas Sebelas Maret, Jl. Ir Sutami 36 A, Kentingan, Jebres,Solo, Jawa Tengah, Indonesia
30	SDGs-04	The Influence of Motivation on the Impact of the Climate Village Program Implementation (Study Case of Thematic Community Service Program in Climate Villages)	**Eksa Rusdiyana1***, Eny Lestari1, Retno Setyowati1, Sugihardjo1, Feri Wibowo1, Juna Fatimatuz Az Zahra1, Micell Lovinia Ardwiyanti1

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Socio-Economic Related to Agriculture, Food, and Energy			
31	SEAFE-01	Analysis of the Work Posture of the Malay Songket Weaving Craftsman Wan Syamsinar Dumai	**Fitra*1**, N J Marbun1, Yusrizal1, T Mesra1, Azmi1, M Arif1, Juni S1, and F Anggraeni1 [1]Industrial Engineering Study Program, Sekolah Tinggi Teknologi Dumai Riau - Indonesia
32	SEAFE-02	Techno-economics of Coconut Oil Extraction Using Wet, Dry and Fermentation Methods	**Nurma Handayani**[a,b*], Tri Agus Siswoyo[c], Hardian Susilo Addy[c], Nurhayati Nurhayati[d], Yuli Wibowo[e] [a] Doctoral Student at Department of Biotechnology Doctoral, Universitas Jember, Indonesia bLecturer at Department of Agribusiness, Faculty of Agriculture, Universitas Lumajang, Indonesia [c] Lecturer at Department of Biotechnology Doctoral, Universitas Jember, Indonesia dLecturer at Department of Agricultural Products Technology, Faculty of Agricultural Technology, Universitas Jember, Indonesia [e] Lecturer at Department of Agroindustrial Technology, Faculty of Agricultural Technology, Universitas Jember, Indonesia
33	SEAFE-03	An Analysis of Household Food Consumption and Desirable Dietary Pattern (DDP) Score Among Extremely Poor Households (Decile 1) in the Coastal Area of Demak Regency	**Yovita Aryani1*. Mukson2. dan Anang M Legowo3** [1]Department of Agribusiness, Faculty of Animal and Agricultural Sciences, Diponegoro University 2Department of Agribusiness, Faculty of Animal and Agricultural Sciences, Diponegoro University 3Department of Food Technology, Faculty of Animal and Agricultural Sciences, Diponegoro University *Email: yovitaaryani@students.undip.ac.id
34	SEAFE-04	Communicative Experiences and Business Sustainability: How Interpersonal Strategies Influence	**Sri Fatimah[1*] & P.Pradono[2]**

		Customer Retention in Bandung'sCoffee and Art Spaces	1)Dept of Socioeconomics, Faculty of Agriculture, Universitas Padjadjaran, Indonesia 2)SAPPD, Institut Teknologi Bandung, Indonesia E-mail: sri.fatimah@unpad.ac.id
Information Technology			
35	IT-01	Profiling Condition of MSME As An Initial Step In Improving Business Processes To Increase Competitiveness Agricultural MSMEs	**Diah Ayu Retnani Wulandari** Faculty of Computer Science, Jember University, East Java, Indonesia
36	IT-02	Literature Review: Sustainable Balanced Scorecard in the Organic Fertilizer Industry Based on Palm Oil Biomass	**Ricky Wilastra**, Sawarni Hasibuan Master of Industrial Engineering, Universitas Mercu Buana, Jl. Meruya Selatan No.1, West Jakarta, DKI Jakarta 11650, Indonesia

Development of Smart Technology for Rainwater Harvesting in Green Buildings Using Solar Cells and IoT

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Abstract: Currently, the modern era continues to develop, the government continues to support the development of infrastructure and building construction sustainably. One of them is by utilizing technology in Rainwater harvesting and renewable energy in supporting Green Building in residential buildings, government buildings, private, and manufacturing. So far, Green Building research has been partial, and has not used integrated technology. In fact, if using integrated technology including renewable energy, it will produce environmentally friendly, efficient buildings and reduce dependence on fossil resources. The purpose of this study is to create a design and design of integrated rainwater harvesting equipment using solar cells in building structures and calculate the Green Building value of the building. This study uses the VDI 2221 method (Verein Deutscher Ingenieure), which is a systematic design method needed in the process of designing a product to meet several aspects such as comfort, practicality and ease of use, maintenance, repair and security/safety. This study also uses the Greenship Version 1.1 analysis method for existing buildings. The data used are through field observations and surveys. This study is located at the Mercu Buana University Building, West Jakarta, Indonesia. By integrating renewable energy-based IoT into Green Buildings, it is hoped that we will enter an era of more effective and sustainable use of water resources, utilizing the latest technology and supporting the government to make buildings environmentally friendly and efficient in the use of water and energy.

Keyword: Green Building, Rain water harvesting, IoT, Greenship, VDI 2221

Leprosy Epidemiological Trends in a Remote Island Setting: Lessons from Ternate City, 2019–2023

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Abstract: Leprosy is a chronic infectious disease that remains a public health issue in Indonesia, particularly in remote areas such as Ternate City. Despite the availability of free multidrug therapy (MDT), the incidence of leprosy continues to fluctuate in certain regions. This study aims to analyze the trend of leprosy incidence in Ternate City over the past five years (2019– 2023), focusing on prevalence, incidence, child cases, and clinical types. This is a descriptive retrospective study using secondary data collected from cohort registers of leprosy patients at all public health centers (Puskesmas) in Ternate. The analyzed variables include annual new cases, prevalence rate, incidence rate, type of leprosy, and demographic characteristics. There were fluctuations in the number of leprosy cases from 2019 to 2023, with a decline observed until 2022, followed by a sharp increase in 2023 (156 cases). The highest prevalence was recorded in 2023 at 6.30 per 10,000 population. Incidence also rose significantly in 2023, reaching 56.6 per 100,000 population. Cases in children and women showed a notable increase in 2023. Multibacillary (MB) cases remained dominant over paucibacillary (PB) types and showed a resurgence after a prior decline. The fluctuating trend of leprosy in Ternate is influenced by various factors, including healthcare service disruptions during the COVID-19 pandemic, enhanced early detection efforts, and socioeconomic conditions. Strengthening health services, promoting public awareness, and ensuring consistent early detection programs are essential strategies to control leprosy transmission in island communities like Ternate.

Keywords: Leprosy, Epidemiological, Trends, Remote Islan

The Level of *MTHFR* Gene mRNA Expression in Non-syndromic Cleft Lip with or without Cleft Palate Indonesian Deuteromalay Tribe Patients

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Abstract: Non-syndromic Cleft Lip and/or Palate (NSCL/P) constitutes the most common form of Orofacial Cleft (OFC). The methylene tetrahydrofolate reductase (MTHFR) encoding gene has been reported to have a vital role in the pathogenesis of NSCL/P. PCR analysis of MTHFR A1298C and C677T polymorphisms were performed using DNA of NSCL/P patients Deuteromalay Indonesian with significant association results. However, the mRNA expression level of this gene has not been determined, therefore in this study the MTHFR gene mRNA expression level was examined. The method used was relatively

quantitative RT-PCR, analyzed using the Livak formula. The number of samples analyzed were 20 NSCL/P patients and 30 healthy controls. RNA was extracted from epithelial cells of oral rinse of all the samples.The results of this study showed that *MTHFR* gene mRNA expression in NSCL/P patients decreased when compared with healthy controls (0.93). The conclusion of this study is the *MTHFR* mRNA expression has a decreasing trend, meaning that it is revealed that the MTHFR enzyme involved in folate metabolism plays a role in the failure of palatal shelves fusion during orofacial development.

Keyword : NSCL/P, Gene Expression, MTHFR gene, qRT-PCR, deuteromalay

ISAFE-04

Irrigation Intensification through Farm Electrification: Implications for Food Security in Eastern India

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Abstract: Higher irrigation cost due to costly diesel-operated pumps restricts farmers to apply optimal number of irrigations in field crops, leading to yield penalties. In the recent years, the irrigation infrastructure in eastern India has been transitioning to a cheaper electricity-based system mainly with Government interventions, aiming to intensify the irrigation. This study assesses the impact of transition towards electricity-powered irrigation pumps on the yields of rice and wheat, two key cereal crops that govern food security in the region. Using observational data of 602 farmers consisting of users and non-users of electric pumps in equal proportion, we applied the inverse probability of treatment weighting (IPTW) method, a propensity score- based technique. Our findings showed a positive overall impact on yields of both the crops which was marginally more pronounced in rice (8%) compared to wheat (6%). In the case of rice, we observed differential impacts geographically while the impact on wheat yield was uniform. Rice yields in areas with shallow groundwater levels (2 -3 meter below ground) increased by 16% compared to 6% in areas with deeper groundwater depths. With equitable access to electricity-powered irrigation facility, the state could produce an additional 0.54 million tons of rice and 0.39 million tons of wheat, contributing remarkably towards food security of the region.

Keywords: Irrigation, Propensity score, Rice, Wheat, Yields

ISAFE-05

Production of Xylitol and Ethanol from Pineapple Waste through Fermentation and Hydrolysis Processes

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Abstract: Pineapple is a good alternative raw material for the production of bioethanol and xylitol because Indonesia is one of the top 10 pineapple-producing countries in the world, leaving 0.62 million tons of pineapple waste annually. The production of ethanol and xylitol from lignocellulosic materials such as pineapple cores involves hydrolysis and fermentation processes. The hydrolysis process can be carried out enzymatically and with acid, while the fermentation process uses microorganisms. This research aims to determine the best yeast that can produce ethanol and xylitol with the highest concentration among *S. cerevisiae, D. hansenii*, and *C. tropicalis*. Characterization of pineapple cores using the van Soest method yielded hemicellulose content of 36.06%, cellulose 14.20%, and lignin 10.05%. The relatively high hemicellulose and cellulose content makes it a potential raw material for ethanol and xylitol production. The production process uses Simultaneous Saccharification and Fermentation (SSF) for ethanol and separated hydrolysis fermentation (SHF) with enzymatic and acid hydrolysis for xylitol. The purification process is carried out through a two-stage distillation process. In ethanol production, the use of *D. hansenii* yeast and a single purification process resulted in the highest ethanol concentration of 4.32 g/L. Double purification reduced the existing ethanol concentration, making it unsuitable as an alternative in ethanol production. In xylitol production, *C. tropicalis* yeast is the best microbe for converting xylose into xylitol, resulting in a xylitol concentration of 4.29 g/L.

Keywords : Ethanol; Xylitol; Pineapple; SSF; dan SHF

ISAFE-06

Risk Management of Electricity Financing for Lifts in Khairun University Integrated Lecture Building: Efficiency Strategy and Renewable Energy Solutions

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Abstract: This study evaluates the energy consumption of elevators in the Joint Lecture Building of Khairun University and analyzes its impact on electricity cost risk. Elevators are one of the largest components in terms of energy use in high-rise buildings, which significantly impact operational costs. This study uses a quantitative approach with empirical data analysis and technical simulations. Primary data were obtained through direct observation, while secondary data were collected from technical planning documents and electricity tariff information. The simulation results indicate that factors such as lifting capacity, elevator speed, duration of use, and round-trip travel time significantly impact elevator energy efficiency. This study also explores the use of solar panels (PLTS) as a

solution to reduce dependence on conventional electricity. The implementation of energy-saving technologies, such as inverters, and the use of renewable energy can significantly reduce energy consumption and reduce the risk of electricity costs. This study provides strategic recommendations to improve elevator energy efficiency and manage electricity cost risk, supporting the operational sustainability of Khairun University.

Keywords : Cost Efficiency, Lift Energy, Risk Management, Solar Power Generation

ISAFE-07

Planning and Fulfillment of North Kalimantan Province Energy Needs

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Abstract: Along with population and economic growth, increasing energy requirements require careful planning. Based on LEAP modeling, final energy requirements in North Kalimantan Province in 2025 are estimated to reach 975 thousand TOE, with the industrial sector as the largest user (39%), followed by other sectors (34%), transportation (14%), household contents (11%), and commercial (2%). In 2034, final energy requirements are expected to increase to 1,454 thousand TOE, dominated by the industrial sector (46%). The primary energy mix in 2030 consists of oil (29.4%), renewable energy (10.8%), coal (34.2%), and gas (20.9%), while in 2034 it is recommended that renewable energy will increase to 25.4%. Electrical supply is estimated to reach 892 MW in 2030 and 2,242 MW in 2034, with increases in renewable energy levels.

Keywords : Energy mix, Energy needs, Leap, Fulfillment of energy needs

ISAFE-08

Sustainable Nanopriming: Banana Peel-Derived Zinc Oxide Nanoparticles for Enhanced Chili Seed Germination

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Abstract: Seed germination is a critical process in agriculture, directly influencing using crop quality and yield, and it plays a vital role in determining the quality of crops. Nanopriming is a seed treatment method that use nanoparticles characterized by their small dimensions, broad surface area, and increased reactivity to improve the process of germination. Zinc oxide nanoparticles (ZnO-NPs) have great stability and thus can be stored longer than other materials, as they do not aggregate. This study aimed to synthesize ZnO-NPs using banana peel extract, a sustainable approach and evaluate its effects on pepper seeds. ZnO-NPs with 59.41 nm size were successfully synthesized from banana peel extracts. Then, the chili seeds were primed with different concentrations of ZnO-NPs (10, 50, 100, 200, 500, and 600 ppm). The results indicated the highest germination percentage (97%) and rate (12.26), seedling length (6.35 cm), seedling fresh weight (1.86 g), and seed vigor (616.25) when treated with 50 ppm ZnO-NPs. Finding suggest that ZnO-NPs enhances seed vigor with cost-effective, environmentally sustainable strategy to advance agriculture and support energy-efficient for production.

ISAFE-09

Sulfonated SPG20 Silica–Fe_2O_3 Hybrid for Superior Methylene Blue Degradation

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Abstract: This study aims to synthesize and evaluate the photocatalytic performance of a modified mesoporous silica-based composite material, namely SPG20-SO_3H impregnated with Fe_2O_3, for the degradation of methylene blue. The synthesis was carried out using a soft-template approach involving P123 surfactant and gelatin as dual templates. The material was activated using hydrochloric acid, while sulfonation was performed with sulfuric acid (H_2SO_4) under reflux conditions in a three-neck flask for 12 hours with a solution volume of 10 mL and variable reaction temperatures. The Fe_2O_3 metal oxide was incorporated via a wet impregnation method into the pre-sulfonated SPG20-SO_3H structure. The resulting product was a white, finely textured photocatalyst powder.Characterization results showed that Fe_2O_3 formed the largest crystallites at 2.14 nm with a crystallinity of 90.85%. FTIR analysis revealed the presence of – COOH, Si–O–Si, Si–OH, and –OH functional groups. However, the sulfonate-related bands (– SO_3H, O=S=O) were not observed in the XRD patterns, suggesting their amorphous nature or low crystallinity. The catalyst morphology, as observed under microscopy, resembled rod-like structures.Photocatalytic testing revealed that the highest methylene blue degradation efficiency was achieved by SPG0 at 95.01%, followed by SPG20-SO_3H(5) at 91.50%, and the lowest by pure Fe_2O_3 at 73.03%. The degradation kinetics generally followed a gradual increase across samples, although some fluctuation occurred during specific irradiation periods. These findings indicate that SPG20 modification via sulfonation and Fe_2O_3 impregnation significantly enhances the photocatalytic performance compared to single metal oxide systems.

Keywords: mesoporous silica, sulfonation, Fe_2O_3 impregnation, methylene blue, photocatalysis, soft-template synthesis.

SAFE-10

Development and Assessment of Zeolite Nanoparticles as a Delivery System for *Helicoverpa armigera* Nucleopolyhedrovirus (*Ha*NPV) in Controlling *Spodoptera litura* (Fabricius, 1775) Larvae

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Abstract: Synthetic insecticides frequently cause pest resistance and destroy non-target organisms. Thus, virus formulation is an issue that deserves considerable attention in developing virus-based insecticides. The hindrance of using nucleopolyhedrovirus alone as a virus-based insecticide is due to slow lethal time, though its mortality remains high (100%). This paper reports the formulation of zeolite nanoparticles as a delivery system to accelerate lethal time in controlling *Spodoptera litura* (Fabr.). Zeolite nanoparticles were prepared using the beads-milling method. The statistical analysis was carried out by a description exploration method with six replications. The occlusion bodies' concentration in the virus formulation was 4×10^7 OBs in 1 mL medium. Zeolite nanoparticles formulation sped up the lethal time significantly (7.67 days) compared to micro-size zeolite (12.70 days) and only nucleopolyhedrovirus (8.12 days) and received acceptable mortality (86.4%). The zeolite nanoparticles delivery system provides an alternative formulation for nucleopolyhedrovirus with a significantly improved speed of killing the virus while maintaining suitable efficacy of the virus preparation in terms of the prevalence of mortality.

Keywords : Delivery system, nucleopolyhedrovirus, Spodoptera litura (Fabr.), zeolite nanoparticles

ISAFE-11

Hight Quality Bioethanol Characteristics of Rice Straw Raw Materials

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Abstract: Bioethanol is a renewable alternative fuel produced from agricultural products. The purpose of this study was to analyze the characteristics bioethanol of rice straw (concentration ethanol, concentration methanol, water content, Cu content, CI content, gum content, pH value, heating value, density, viscosity, flash point, and octan number). This study used experimental method. The process of producing bioethanol through four stages namely; the preparation, saccharification, fermentation was carried out for 3 days and 25 grams saccharomyces cerevisae and stratified distillation up to 4 levels at a temperature of 78°C with zeolite rock adsorbent measuring 70 mesh with a weight of 10 grams. Tested methods of characteristics bioethanol with standardized ASTM (concentration ethanol D5501, concentration methanol D550, water content D1744, Cu content D1688, Cl content D1613, gum content D381, pH value D4806, heating value D240, density to 20°C D1298, viscosity to 20°C D445, flash point D93, and octan number D2699). The analysis of chemical properties shows that concentration ethanol 99.75%, concentration metanol 0.0024%, water content 0.0019 % vol, Cu content 0.002 mg/kg, CI content 15.73 mg/l and gum content 1.3 mg/100 ml. The analysis of physical properties shows that pH value 6.1mg/l, heating value 6975 kcal/kg, density 0.781% g/cm3, viscosity 1.26 cSt, flash point 15°C and octan number 105. Generally, bioethanol of rice straw raw material, the characteristics that physical properties and chemical properties approaching with standardized SNI..

Keywords : bioethanol, saccharification. fermentation, distillation, rice straw

ISAFE-12

The Potential of Moringa Oleifera Leaf Extract To Repair Meloxicam-Induced Kidney Histological Damage in Male White Rats

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Abstract: This study investigates the potential of *Moringa oleifera* leaf extract to repair meloxicam- induced kidney histological damage in male white rats. This study used Completely Randomized Design (CRD) experimental design with 5 treatments where K- was given only aquadest, K+ was given 8.4 mg/kgbw of meloxicam, P1 was given 8.4mg/kgbw of meloxicam and 200 mg of moringa leaf extract, P2 was given 8.4mg/kgbw of meloxicam and 400 mg of moringa leaf extract and P3 was given 8.4 mg/kg BW of meloxicam and 600 mg of moringa leaf extract and each treatment consisted of 5 replications. The treatment was carried out for 35 days. The parameters observed were hydropic degeneraration, sinusoidal dilatation, venous congestion, fatty degeneration, necrosis and inflammatory cell infiltration. The data obtained were analyzed by One Way Anova analysis and continued with Duncan's test. The results showed that there was a significant effect ($P<0.05$) of the extract of moringa leaves on kidney histopathology white rats induced by meloxicam. It can be concluded that the ethanol extract of moringa leaves in this study can repaired kidney cell damage of white rat induced by meloxicam

Keywords : histopatology, kidney, meloxicam, moringa leaf, white rat

Liver Histology of Mice Exposed To Cd and Treated With Vitamin C

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Abstract: Cadmium (Cd) is one of the heavy metals found in the Earth's crust or as a result of volcanic activity. In addition, cadmium can also come from human activities such as fuel use, forest fires, industrial waste disposal, and fertilizer and pesticide applications. The liver is an organ that plays a role in detoxifying and removing foreign substances from the body, so that the liver is one of the main organs that is targeted for Cd to enter the body. The purpose of this study was to look at the liver histology of mice exposed to Cd and treated with vitamin C. The study used a complete randomized design with 5 treatments (K-, K+, P1, P1, P3) and 25 experimental animals. Histological preparations are made by the paraffin method and Hemaxoxylin-Eosin staining. The results showed that liver damage caused by Cd exposure became better after being treated with vitamin C. The higher the dose of vitamin C used, the more tissue that improved.

Keywords *:* rats; liver histology; heavy metals, vitamin C

Ultra-stable Porous Yolk-Shell Al Catalysts for Transformation of Fatty acid into Green Diesel

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Abstract: Eco-friendly and economically viable green diesel is emerging as an alternative to fossil fuels and can be produced from raw materials such as fat, oil, and grease (FOG). In this study, green diesel was produced from FOG using a deoxygenation (DO) treatment process in the presence of Ni10@Al2O3 and Ni10Mnx@Al2O3 (x=5,10,15,20%) Yolk-shell catalysts. All the core- shell catalysts were characterized using XRD, BET, TPD-NH3 and HRTEM. The hydrocarbon products obtained from the DO reaction were analyzed using GCFID and GCMS to determine the types of hydrocarbon chains involved. It was found that at 340°C for 3 h, with 0.03 wt% of the Ni10Mn5@Al2O3 Yolk-shell catalyst, the highest green diesel yield of 77.7% was achieved, with a selectivity of 71.91% towards n(C15+C17). The high selectivity towards n(C15+C17) confirms the successful synthesis of green diesel from FOG feedstock using the deoxygenation method.

Design and Analysis of Pulsed Electric Field Laboratory-Scale for Non-Liquid Sample Applications

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Abstract: Pulsed Electric Field (PEF) is a non-thermal technology that applies electrical pulses from a high-voltage electric field to a sample between two electrodes. It can increase membrane permeability, which can cause biomolecules in the cell to exit or enter the cell. This technique has been used extensively as a pre-treatment to enhance the extraction of cellular metabolites from plant tissues. This study aims to design a square-wave high-voltage pulse generator PEF specifically designed for laboratory use on non-liquid samples. Four main components were used in this study to produce high-voltage pulses: a high-voltage power supply, a capacitor bank, a high-voltage switch, and a microcontroller. The high-voltage generator method used in this tool is the flyback principle. The high voltage generated by the FBT is a maximum of 40 watts, which makes it insufficient for the PEF process. Therefore, a capacitor bank is needed. Seven capacitor units rated 330 uF 450 V were connected in series to produce 47,1 uF 3,1 kV. High-voltage pulses will be generated through a switching process using a high- voltage switch, MOSFET, with a maximum voltage of 3 kV. A microcontroller controls the signal, switching frequency, pulse width, and treatment time. After the three parameters are determined, the process begins, and the microcontroller will create a control signal to produce high-voltage pulses. The PEF system can produce a square monopolar pulse with a high voltage of 3 kV and a pulse width of 400-600 ns.

Keywords : Pulsed Electric Field, high-voltage generator, non-thermal technology

ISAFE-16

The Study Assessed The Chronic Toxicity Effects Of Sappan Wood (*Caesalpinia Sappan L.*) Extract On Cardiac Structure And Lipid Profiles In Both Male And Female Rats (*Rattus Norvegicus*).

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Abstract: Chronic toxicity testing is a method used to detect toxic effects that arise after repeated administration of a test substance over the entire lifespan of the test animals. Sappan wood extract (*Caesalpinia sappan L.*) is believed to possess various health benefits, including its role as an antioxidant. This study aims to evaluate the safety of sappan wood extract as a herbal medicine through chronic toxicity testing, particularly focusing on cardiac structure and lipid profiles. The research was conducted as a laboratory experiment using rats (Rattus norvegicus) with a Completely Randomized Design (CRD) in a 6x2 factorial pattern. The first factor was the dose treatment, consisting of a negative control (administration of distilled water) and varying doses of sappan wood extract (100 mg/kg BW, 200 mg/kg BW, 300 mg/kg BW, 400 mg/kg BW, and 600 mg/kg BW). The second factor was the sex of the rats (male and female). Research parameters included the calculation of myocardial cell necrosis and apoptosis, measurement of fibrosis area in tissue, and analysis of lipid profile levels, including total cholesterol, LDL cholesterol, and triglycerides. Data that were normally distributed were analyzed using Two-Way ANOVA at a 95% confidence level, and if differences were found, Duncan's test was performed. The results showed that the administration of sappan wood extract at doses ranging from 100 to 600 mg/kg BW was safe for the cardiac structure and lipid profiles of both male and female rats.

Keywords *: Histopatology, cardiac, Sappan Wood (Caesalpinia sappan* L.), *Lipid Profile, Chronic*

ISAFE-17

Unveiling the Bioalcohol-Producing Potential of *Bacillus paramycoides* SB3 Using Genomic and Fermentation Approaches

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Abstract: Functional analysis based on whole-genome sequencing (WGS) of *Bacillus paramycoides* SB3 revealed key genes associated with alcohol production. Genomic analysis reveals that this strain possesses metabolic pathways capable of converting carbon sources into bioalcohols, highlighting its potential for bioenergy applications. To validate this, *B. paramycoides* SB3 was cultivated in reinforced clostridial medium (RCM) supplemented with butyric acid under varying fermentation conditions, including initial glucose concentration, pH, temperature, inoculum size, and fermentation time. The bacterium demonstrated the ability to produce ethanol and propanol derivatives, along with acetoin and formic acid, which are relevant to biofuel production. Experimental data confirmed glucose consumption during fermentation, leading to a decrease in pH, which may indicate metabolic shifts influencing product formation. Additionally, *B. paramycoides* SB3 consistently produced acetic acid under all tested conditions, suggesting a strong acidogenic phase that could impact bioalcohol synthesis. These findings underscore the potential of *B. paramycoides* SB3 for biofuel production and the value of integrating genomic and experimental approaches for elucidating microbial potential in bioenergy research.

Keywords: *Bacillus paramycoides*, Bioalcohol, Bioenergy, Fermentation, Genomic Analysis

ISAFE-18

Optimization Efficiency of Calcium Based Catalyst in Coconut Oil Transesterification via Box-Behnken Design

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Abstract: The utilization of renewable biomass resources for biofuel production has gained significant attention as an effective strategy for converting waste into valuable energy sources. Biodiesel, a promising form of biofuel, is derived from vegetable oils or animal fats through transesterification with methanol. Among the various methods employed for biodiesel production, base-catalyzed transesterification is widely recognized as the most efficient and cost-effective process. This study focuses on optimizing biodiesel production from coconut oil (CO) using a CaO/Al_2O_3 catalyst synthesized via the incipient wetness impregnation method. The optimization process was conducted using the Box-Behnken response surface methodology (RSM) in Design Expert statistical software. The optimal conditions identified for biodiesel production included a calcination temperature of 1000°C, a reaction time of 1 hour, and a catalyst

loading of 7%. Under these optimized conditions, an experimental fatty acid methyl ester (FAME) yield of 75.63% was achieved. The statistical models used to predict biodiesel yield demonstrated a high degree of correlation with experimental results, yielding an R-value of 0.9756. Furthermore, analysis of variance (ANOVA) confirmed the statistical significance of the model, with reaction time and catalyst loading identified as the most influential factors based on F- and P-values. The physicochemical properties of the produced biodiesel were found to be within the specifications recommended by ASTM standards, further validating the suitability of the synthesized catalyst and optimized reaction conditions for efficient biodiesel production.

Keywords: biodiesel; base catalyst; calcium oxide; coconut oil; Box-Behnken

ISAFE-19

Optimization of Bioethanol Yield from Liquid Pineapple Waste using Immobilized *Saccharomyces cerevisiae var. ellipsoideus* in PVA-Alginate-Sulfate Matrix

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Abstract: The increasing significance of bioethanol as a viable alternative to fossil fuels is driven by the depletion of conventional energy sources and the urgent need to reduce greenhouse gas emissions. Utilizing industrial or food wastes for bioethanol production is highly promising due to their rich sugar content. This study explores the feasibility of producing bioethanol from liquid pineapple waste using immobilized *Saccharomyces cerevisiae* var. *ellipsoideus* ATCC560 within PVA-alginate-sulfate beads. A statistical approach with a 2-level, 3-factorial design was employed, considering four variables: initial inoculum (3-6 g), temperature (30- 50°C), pH (4.5-5.5), and agitation speed (100-200 rpm). Additionally, Field Emission Scanning Electron Microscope (FESEM) analysis was performed to examine bead morphology. The optimal conditions for bioethanol production were identified, yielding a maximum concentration of 10.0438 g/L at pH 5.5, 30 °C, and 200 rpm using 3 g of beads. FESEM analysis verified the efficiency of this technique by confirming the successful immobilization of *S. cerevisiae var. ellipsoideus* within the matrix. This study highlights the potential of immobilized *S. cerevisiae var. ellipsoideus* to produce bioethanol from liquid pineapple waste, providing an environmentally friendly and sustainable approach to renewable energy production.

Keywords : Bioethanol, Immobilization, *Saccharomyces cerevisiae,* Optimization

ISAFE-20

Utilization of Banana Peel Extract Rich in Bioactive and Mineral Compounds for Sustainable Management of Fusarium and Growth Promotion in Green Mustard (*Brassica juncea*)

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Abstract: Banana production generates significant annual waste, with banana peel accounting for nearly half of it. Banana peel is rich in secondary metabolites, including phenolic compounds, known for their antifungal properties and role as physiological regulators in plant growth. This study evaluated the effectiveness of aqueous banana peel extract as an antifungal agent and its impact on the growth and disease control of Green mustard (*Brassica juncea*). Aqueous extracts were prepared from fresh and dried banana peels at 25% and 50% concentrations. The antifungal activity against *Fusarium* species was assessed using the agar well diffusion method, with the 50% dried banana peel extract showing the highest inhibition zone. This extract also exhibited the highest values in total phenolic content (TPC), total tannin content (TTC), total flavonoid content (TFC), and antioxidant activity assays, confirming its bioactive potential. A greenhouse experiment using a Randomized Complete Block Design (RCBD) with ten replications was conducted to test the efficacy of the 50% aqueous dried banana peel extract. Treatments were applied weekly as soil drenching and foliar spraying, with 40 ml per application to plants inoculated with *Fusarium* mycelial plugs. The untreated control plants were also inoculated but received no treatments. Results demonstrated that foliar spray application significantly improved plant growth parameters, including plant height, number of leaves, and yield, while effectively reducing disease severity compared to soil drenching. Lower concentrations provided moderate fungal control without adverse effects, whereas higher concentrations enhanced antifungal efficacy but posed risks of phytotoxicity. Additionally, mineral analysis using ICP- OES revealed that the banana peel extract is rich in essential nutrients such as potassium, calcium, magnesium, phosphorus, and micronutrients like iron, manganese, and zinc. These elements play key roles in plant metabolism, stress tolerance, and overall physiological function. The presence of both bioactive compounds and beneficial minerals underscores the dual function of banana peel extract as a natural antifungal agent and plant biostimulant. Its use contributes to waste valorisation and supports environmentally sustainable agricultural practices.

Keywords : Antifungal Activity, Soil drenching, Foliar spray, Plant Growth Enhancement, Sustainable Agriculture

ISAFE-21

Mesoporous Bifunctional K_2O Catalyst Using Chitosan Template for Biodiesel Production

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Abstract: Mesoporous metal oxides are highly effective catalysts for biodiesel production due to their large surface area and adjustable pore structures, which enhance mass transfer and catalytic activity. In this study, a K_2O mesoporous catalyst was synthesized using chitosan as a template via ionic gelation and templating method. Chitosan was dissolved in acetic acid to form a slurry, which was mixed with potassium ions. The amine and hydroxyl groups in chitosan formed complexes with potassium ions, stabilizing them for gelation. The beads were then calcined at 700 °C for 2 hours, decomposing the polymer and creating a porous structure. During calcination, potassium was transformed into K_2O, K_2O_2, and $K_2CO_3 \cdot 1.5H_2O$, which acted as active centers and preserved the bead structure. SEM analysis revealed a dense, porous structure, while the catalyst's bifunctional nature was confirmed by a total basicity of 1.346 mmol/g and total acidity of 1.515 mmol/g. The optimized synthesis conditions led to a maximum biodiesel yield of 95.26%, demonstrating the catalyst's potential for efficient biodiesel production.

Keywords : mesoporous beads, catalyst, chitosan, potassium, biodiesel.

ISAFE-22

Effect Pulsed Electric Field-Assisted Germination of Oat to Enhance Germination and Functional Properties of Oat: Antioxidant Capacity, β-Glucan, and GABA Content.

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Abstract: This study aimed to evaluate the effect of Pulsed Electric Field (PEF) treatment on oat (Avena sativa) germination and its influence on antioxidant activity and gamma-aminobutyric acid (GABA) content in the resulting germinated oat flour. Oat grains were soaked and subjected to PEF treatment at varying intensities and pulse numbers, followed by germination for 3–5 days under controlled conditions. After germination, the oats were dried and milled into flour. Total phenolic content was analyzed using the Folin–Ciocalteu method, antioxidant activity was assessed by the DPPH assay, and GABA content was determined via spectrophotometry. The results showed that PEF treatment significantly enhanced the germination rate and increased the levels of bioactive compounds such as GABA in the germinated oat flour compared to the untreated control. These findings indicate that PEF is a promising pre-processing technique to enhance the functional value of oat-based ingredients.

ISAFE-23

Neem Leaf (*Azadirachta indica* A. Juss) Water Extract on the Function and Kidney Histology of Chicken

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Abstract: Neem plant (*Azadirachta indica* A Juss) or *intaran* (Balinese) has been proven to be effective as an antibacterial because it contains phytochemical compounds that are able to inhibit the growth of bacteria so that it is expected to improve or maintain the health performance and production of chickens. This study aims to determine the effect of neem leaf water extract on urea, creatinine concentrations and histological picture of chicken kidneys. This study used 200 DOC with an initial body weight of 53±2 g which were then divided into four treatments with five replicates and 10 chickens per replicate unit. Neem leaf water extract was given to chickens by mixing into drinking water with several concentrations, namely 0% (control), 1%, 3% and 5% concentrations from the age of two weeks until the age of the chicken is six weeks. Checking blood urea and creatinine levels is one of the indications of healthy kidney function. If there is an increase in urea and creatinine levels, it indicates a decrease in kidney function. Urea levels of P1 (1%) had the highest values of any other group, while creatinine was most abundant in P2 (3%). Urea and creatinine levels did not differ significantly in all treatment groups. In chicken kidney organs that were given neem leaf water extract, it showed a varied and different effect on each treatment. Inflammatory cell infiltration is most prevalent in P3 treatment (5%), This can be affected because the high concentration of neem leaf water extracts so that it will cause inflammation in the kidneys.

Keywords: *creatinine, imflammation, kidney, neem, urea*

SFST-01

Exploring Microencapsulation of Postbiotic Using Different Types of Wall materials

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Abstract: Postbiotics, defined as inactive microbial cells, their structural components, or metabolites, are gaining increasing recognition for their health-promoting effects and stability advantages over live probiotics. Postbiotics has been utilized in the food industries for centuries to produce fermented milk products such as yogurt and kefir. However, maintaining their bioactivity during processing and targeted delivery is still a significant challenge. Microencapsulation presents an innovative solution to this issue by enclosing postbiotics within protective materials that enhance their stability, control their release, and improve their functionality in various food and pharmaceutical applications. Various techniques are employed for microencapsulation, including spray chilling, spray cooling, spray drying, fluidized bed coating, liposome entrapment, extrusion, freeze drying, and coacervation with a number of natural biopolymers as encapsulation materials, each offering diverse physicochemical properties and functional advantages. This review highlights key biopolymers: sodium alginate, valued for its gel- forming ability and compatibility; whey protein, another promising wall material which provides acid resistance and effective protection in gastrointestinal environments; pectin, a plant-derived polysaccharide noted for its biodegradability, gelling properties, and prebiotic potential; chitosan, natural polysaccharide derived from chitin, known for its antimicrobial and film-forming capabilities which can be used alone or often combined with alginate to form robust multilayer systems through electrostatic interactions; and gum arabic, another plant-based polymer, which enhances encapsulation efficiency, stability, and bioavailability, and is suitable for a variety of delivery systems including hydrogels and spray- dried powders. These biopolymers not only ensure the viability and functionality of encapsulated postbiotics but also support clean-label and sustainable formulation goals in the food industry. This review emphasizes the critical role of these encapsulation materials in optimizing the delivery, protection, and efficacy of postbiotic compounds in functional food systems and nutraceuticals.

Keywords: Biocompatibility, Encapsulation, Gum Arabic, Inulin, Prebiotics

SFST-02

Determination of the Isoelectric Point of Protein Isolate Derived from Snakehead Fish (Channa striata) Using the pH Shift Method

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Abstract: This study aims to determine the isoelectric point of protein isolate derived from snakehead fish (Channa striata) using the pH shift method. The isolation process was conducted under a completely randomized design, involving treatments with various extraction and isolation pH levels. In the initial stage, protein extraction was carried out at 40°C using extraction pH values of 10.00, 10.5, and 11, followed by isolation at pH levels of 4.2, 4.4, 4.6, 4.8, 5.0, and 5.2. The preliminary results indicated that the combination of extraction pH 11 and isolation pH 4.8 produced the best quality fish protein isolate (FPI). Based on these findings, the subsequent experiment was focused on extraction pH 11 and isolation pH ranging from 4.0 to 5.8 to determine the precise isoelectric point. The results confirmed that isolation at pH 4.8 yielded the highest protein content, reaching 95.11%. Further analysis of the amino acid composition from the FPI obtained at extraction pH 11 and isolation pH 4.8 showed that glutamate (16.02%), aspartic acid (10.08%), lysine (9.62%), leucine (8.2%), and alanine (5.19%) were the predominant amino acids. These findings indicate that the isoelectric point of the snakehead fish protein isolate is achieved at extraction pH 11 and isolation pH 4.8, which also produces high- purity protein with a favorable amino acid profile. This research is expected to contribute valuable insights for the development of high-nutrient food products and support the broader application of snakehead fish protein isolates in the food industry.

Keywords: Amino acid profile, fish protein isolate, isoelectric point, pH shift method, protein extraction, snakehead fish (Channa striata).

SFST-03

Utilization of Novel Food Technologies on Plant-Based Beverages Production to Improve Its Quality and Sustainability

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Abstract: Plant-based beverages refer to alternative dairy milk made from various plant material such as cereals, legumes, nuts, seeds, and pseudocereals. The demand of plant-based beverage increases over the years due to health concern, lactose intolerant, animal welfare, dietary choices, and sustainability option. However, there are some challenging problems regarding the production of plant-based beverage such as low stability, antinutrients, allergens, and off- flavours. In addition, plant-based beverage production also generates waste during the filtration process. This step is aimed to improve product texture and stability, results in high amount of waste rich in protein and dietary fibres. This is considered as food waste, and improper management may

contribute to environmental issue. Novel technologies are emerging and innovative methods with the potential to enhance the efficiency, quality, and safety of food production. In the context of plant-based beverage production, the application of novel technologies is increasingly explored to address production-related challenges. Commonly used technologies include ultrasound, high-pressure homogenization (HPH), pulsed electric fields (PEF), and high- pressure processing (HPP). These methods can improve extraction efficiency, enhance texture and stability, extend the shelf life, and potentially contribute to a more sustainable production of plant-based beverages. Therefore, this review discusses the utilization of novel food technologies in plant-based beverage production to avoid food waste and create more sustainable process as well as improve its quality.

Keywords: plant-based beverage, sustainable production, non-thermal technology, zero waste production

SFST-04

Bioactive Compounds of Peanut Tempeh

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Abstract: Tempeh has been known as a superfood originating from Indonesia. Typically, soybeans are used to make tempeh, however in Malang, a special product known as tempeh kacang is manufactured from bungkil, or peanut cake, which is the solid waste left over after extracting peanut oil. The open cells of the bungkil may be vulnerable for mycotoxin-produced fungi growth and lipid oxidation. Thus, the tempeh raw material for this study was whole peanuts. The purpose of the study is to assess the bioactive substances in peanut tempeh (using LC- HRMS) and their respective roles (based on literature reviews) in order to determine their potential uses beyond simple traditional foods. Tempeh was prepared in accordance with traditional tempeh making procedures, peanuts were washed and boiled 1 hour, drained and cooled at room temperature, reduced in size with a chopper, and inoculated with tempeh starter 0.1% w/w, packaged with perforated plastic, and incubated at 28oC for 48 hours. The findings indicated that the following suspected bioactive compounds were present in peanut tempeh: choline, essential amino acids (valine, arginine, isoleucine, lysine, histidine), amino acids (proline, serine, alanine, ornitine), dipeptide, phenolic acid (cinnamic and coumaric acid), alkaloid, mono-, di-, tri-acyl glycerol. Additionally, it is believed that peanut tempeh contains compounds that are used as flavouring (N-Lactoylethanolamine and L-γ-Glutamyl-L-leucine), have an impact on brain function (gamma-aminobutyric acid), improve intestinal epithelial barrier function and reduce inflammatory responses (trans-3-Indoleacrylic acid), and promote sleep (hypaphorine). These findings suggest that tempeh made from whole peanuts may be used as an ingredient in functional food.

Keywords : tempeh, peanuts, bioactive compounds, potential, functional

SFST-05

ANTIMICROBIAL ACTIVITIES OF ESSENTIAL OIL EXTRACTED WITH WATER STEAM DISTILATION FROM LEAVES, PEEL, AND TWIGS' KAFFIR LIME

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Abstract: Kaffir lime (Citrus hystrix DC.) essential oil (peel, leaves, twigs) contains several secondary metabolic compounds, namely phenol. The content of phenol compounds in kaffir lime essential oil (peel, leaves, and twigs) is one of the compounds that has antimicrobial activity. The purpose of this study was to determine characteristic and the antimicrobial activity of kaffir lime essential oil (peel, leaves, and twigs) with water steam distillation, against pathogenic bacteria Escherichia coli, Staphylococcus aureus, and Salmonella sp. The result (sequentially of peel, twigs dan leaves) showed moisture content raw material (64.31, 50.035 and 64.94) %; total fenolic (10.71, 9.42 and 9.72) %; refractive index (1.541, 1,451 and 1,467) nD25°. Colour of essensial oil was yellow. The results of the antimicrobial test of kaffir lime essential oil (peel, leaves, and twigs) showed an effect on pathogenic bacteria for Escherichia coli bacteria, the highest inhibition zone in leaf essential oil was 27 mm. Staphylococcus aureus bacteria, the highest inhibition zone in leaf essential oil was 20 mm. Salmonella sp bacteria, the highest inhibition zone in peel essential oil was 13.5 mm. This study concluded that the most effective samples of kaffir lime essential oil (peel, leaves, and twigs) inhibited Escherichia coli bacteria with the highest inhibition zone of 27 mm.

Keyword : kaffir lime, essential oil, antimicrobial

SFST-06

Rapid Detection of Organophosphate Pesticides in Vegetables Using Dispersive Liquid- Liquid Microextraction and pH-Dynamic Junction Capillary Electrophoresis-Diode Array Detection

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Abstract: Organophosphate pesticides (OPPs) pose significant health risks due to their extensive use in agriculture. This study presents a fast and efficient method for quantitation of OPP residues in vegetables using Dispersive Liquid-Liquid Microextraction (DLLME) coupled with pH- Dynamic Junction Capillary Electrophoresis-Diode Array Detection (CE-DAD). Several parameters affecting extraction capacity and efficiency were optimized: pH, salt type and amount, and extraction solvent type and volume. pH significantly influenced the ionization and migration behaviour of OPPs, with the optimal pH enhancing separation efficiency. The type and concentration of salt induced the phase separation and analyte partitioning, improving extraction selectivity. Furthermore, preconcentration factor affected by the choice of extraction solvent and its volume directly maximizing extraction proficiency and reduced matrix interference. Under optimal conditions, the developed method demonstrated high sensitivity, excellent reproducibility, and a low detection limit, making it a reliable approach for OPP residue analysis in vegetables. Online stacking is one of the alternative online preconcentration techniques to overcome sensitivity issue in

capillary electrophoresis with UV detection. pH dynamic junction with acetic acid ad leading electrolyte (LE) and trizma base as terminating electrolyte (TE) with different pH range will help to enhance stacking and improve sensitivity of tolclofos methyl and chlorpyrifos in vegetable samples. The separation condition for CE includes separation voltage at 20 kV, background electrolyte (20 mM sodium dihydrogen phosphate, pH 5) and temperature controlled at 20 ºC. The combination of DLLME and pH dynamic junction CE-DAD provides a fast, cost-effective, and environmentally friendly alternative for pesticide monitoring in food safety applications.

Keywords: Organophosphate Pesticides, Dispersive Liquid-Liquid Microextraction, Capillary Electrophoresis-Diode Array Detection, Food Safety.

SFST-07

The Effect of Drying Temperature on The Characteristics of Instant Red Bean Powder Drink (Phaseolus vulgaris L.)

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Abstract: In order to diversify food, red beans can be processed into instant powdered drinks. The process of making instant powdered drinks goes through a drying process, but the drying process at an inappropriate temperature can damage the nutritional components of food ingredients. Therefore, this study was conducted to determine the effect of drying temperature on the characteristics of instant red bean powdered drinks and to obtain the right drying temperature to produce instant red bean powdered drinks with the best characteristics. This study used a Completely Randomized Design experimental design with drying temperature treatments consisting of 5 levels, namely 60 C, 65 C, 70 C, 75 C, and 80 C. Each level was repeated three times, so that 15 experimental units were obtained. The data obtained were analyzed by analysis of variance and if the treatment had a significant effect, it was continued with the Duncan Multiple Range Test (DMRT). The parameters observed included yield, solubility, dissolution time, water content, ash content, total sugar, protein content, and sensory acceptance. The results showed that drying temperature affected the yield, solubility, dissolution time, water content, protein content, aroma (scoring), and taste (scoring), but did not affect the ash content, total sugar, and sensory characteristics. The drying temperature of 60°C produced the best characteristics of instant red bean powder drink with a yield of 12.39%, solubility of 50.81%, dissolution time of 15.90 s, water content of 4.35%, ash content of 1.65%, total sugar of 44.95%, protein content of 15.86%, normal color, slightly like and slightly like red bean aroma, normal and not like red bean flavor, and normal overall acceptance.

Keywords: red bean, instant powder drink, drying temperature

SFST-08

Screening Safer Alternative Surface Sterilization Methods for In Vitro Propagation of Gac (Momordica cochinchinensis)

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Abstract: Effective explant sterilization is essential for successful in vitro propagation. Common sterilization agents include mercuric chloride ($HgCl_2$), sodium hypochlorite (NaOCl), and hydrogen peroxide. While $HgCl_2$ is widely used, its high toxicity raises concerns. Despite extensive research on other crops, studies on gac explant sterilization remain limited. This study aims to identify safer alternatives to $HgCl_2$ and evaluate their effects on the growth and longevity of nodal and shoot explants. Gac explants were collected from the UMT Bukit Kor campus and treated with five concentrations of locally produced NaOCl (10%, 30%, 50%, 70%, 90%) for 30 minutes, with 0.1% $HgCl_2$ for 5 minutes as the control. Treatments were applied using a completely randomized design with five replicates per explant type. Data on explant durability, browning, contamination, aseptic conditions, and survival percentage were recorded over 10 weeks on Murashige and Skoog (MS) medium. The Kruskal-Wallis test and Tukey's post hoc test were used for statistical analysis. Results showed that 10% NaOCl achieved the highest explant survival (40%), whereas 0.1% $HgCl_2$ caused 100% browning and high contamination (60% nodal, 40% shoot), leading to 0% survival. These findings suggest that 10% NaOCl can replace $HgCl_2$ for explant sterilization. Additionally, nodal explants exhibited superior growth and longevity, forming shoots and roots faster than shoot explants. This study offers a safer, more effective approach for the in vitro propagation of gac.

SFST-09

Sensory, Nutrient, and Shelf Life of Moringa Yogurt

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Abstract: Moringa yogurt was a type of yogurt produced with cow's milk and Moringa leaves (Moringa oliefera leaf). The goal of this study was to determine the level of preference for moringa yogurt, as well as its nutritional composition and shelf life. Sensory test results showed that 90% of people loved the color, 86% liked the aroma, 94% liked the texture, 84 % liked the consistency, and 84 % liked the yogurt flavor. Nutritional value of moringa yogurt: carbohydrates: 69.57 g; protein: 4.75 g; fat: 2.84 g; iron: 6.277 mg; calcium: 3.087 mg; vitamin A: 2.885 mg; vitamin C : 14,652 mg. Moringa yogurt shelf life was calculated using water content, lactic acid bacteria (LAB), and lactic acid quantity with storage times of 0 weeks, 1 week, 2 weeks, 3 weeks, and 4 weeks. Water content for control without storage 87.53%, week 1 = 86.74%, week 2 = 85.53%, week 3 = 85.41%, week 4 = 84.21%. Number of Lactic Acid Bacteria (LAB) for control 10.23 x

10^2 cfu/ml; week 1 = 10.18 x 10^2 cfu/ml; week 2 = 10.15x 10^2 cfu/ml; week 3 = 9.98 x 10^2 cfu/ml; week 4 = 9.9 1x 10^2 cfu/ml. The amount of Lactic Acid at week 0 = 0.34%, week 1 = 0.41%, week 2 = 0.46%, week 3 = 0.52%, week 4 = 0.56%. Until the 4th week of storage, the condition of moringa yogurt was still normal according to SNI 2981:2009, namely the appearance of a thick liquid-solid, the smell is normal/typical of yogurt, the taste is sour/typical of yogurt, and the consistency is homogeneous.

SFST-10

Evaluation of Homemade Bio-desinfectantSolution Based on Lactobacillus (Lactobacillus casei, Lactobacillus paracasei) and Baker's Yeast Applied to Broiler Litter

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Abstract: This study aimed to evaluate the efficacy of a farmer's homemade bio-disinfectant solution containing Lactobacillus casei, Lactobacillus paracasei, Saccharomyces cerevisiae, and Eco Enzyme applied to broiler farm litter for reducing Escherichia coli colonization and its subsequent effects on broiler production performance. Bio-desinfectant was applied to the litter in a commercial broiler farm over a 30-day period. One-day-old Ross broilers (3000) were fed starter, grower, and finisher diets as control. The farm consisted of 3 broiler grow-out pen which were used for 3 trials. As the maximum stocking density was restricted to 18 kg/m^2, house space is 600 m^2. The bio-desinfectant was applied at two treatment group with TA 1 ml/100 ml and TB 1 ml/250 ml) at 2-day interval across treatment groups. Performance metrics including feed conversion ratio (FCR), slaughter body weight, mortality rate and overall health were monitored. CON had the lowest body weight ($p<0.05$) and highest mortality rate ($p<0.05$) compared to other treatment with. Results indicated significant E. coli reduction at both treatment ($p<0.05$) compared to control, with no significant adverse effects on broiler performance metrics at every treatment group These findings suggest potential benefits of bio-disinfectants offer a promising, eco-friendly alternative in enhancing both biosecurity and production performance efficiency in broiler poultry farms.

Keywords: Bio-desinfectant, Lactobacillus casei, Lactobacillus paracasei, Saccharomyces cerevisiae, broiler farm, E. coli

SFST-11

Sustainable Agricultural Practices: Enhancing Fruits and Vegetables Quality Based Natural Coatings

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Abstract: In the realm of advanced food technology, coatings play a pivotal role in enhancing the shelf life and quality of fresh produce. This study investigates the application of a D-Limonene and carrageenan-based coating on tomatoes, focusing on its effects on moisture retention, pH stability, and antioxidant activity. The coating, derived from natural polymer and essential oil, is evaluated for its potential to reduce water loss, extend shelf life, and preserve the quality of tomatoes under various storage conditions. Experimental results reveal that the D-Limonene coating enhances moisture content, especially under room temperature conditions, with a notable increase in water retention compared to uncoated tomatoes. pH analysis further indicates that the coating helps maintain acidity, a critical factor in flavor preservation and microbial growth inhibition. Additionally, the coating demonstrates antioxidant potential, effectively scavenging DPPH radicals, particularly at lower concentrations. The findings underscore the importance of integrating polymer technology and food science to create sustainable post-harvest solutions. By combining natural materials like carrageenan and essential oils, this research contributes to eco- technology approaches for reducing food waste and improving agricultural sustainability.

Keywords: Coating, Polymer technology, Food preservation, Moisture retention, Antioxidant activity

SFST-12

Influence of Extraction Methods on Ulvan Water Holding Capacity and Rheological Properties: A Systematic Review

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Abstract: This study compares five common extraction methods for ulvan and evaluates their effects on the water-holding capacity (WHC) and rheological properties. Ulvan, a valuable food additive, benefits from various extraction techniques, but the optimal methods for obtaining the desired properties are not well-defined. Using a systematic literature review (SLR), this study found that Hot Water Extraction (HWE) yields a stable ulvan with high molecular weight, sulfate, and uronic acid content. Chemical Extraction (CE) may enhance ulvan selectivity but risks depolymerization, reducing the molecular weight and key

components. Enzyme-assisted Extraction (EAE) provides high-purity ulvan under mild conditions, whereas ultrasound- assisted extraction (UAE) and Microwave-assisted Extraction (MAE) are eco-friendly with minimal energy and solvent use. Key factors for effective ulvan production include the temperature and extraction duration.

Keywords: Chlorophyceae, extraction, ulvan, rheology, water holding capacity

SFST-13

Analysis of Trace Metal Elements in Indigenous Fruits and Vegetables in Borneo

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Abstract: The current study highlights the safety and nutritional importance of Borneo's indigenous products, which serves as a staple food source and carries significant cultural and economic value. The potential contamination from environmental and agricultural activities underscores the need for continuous monitoring and vigilance to maintain food safety standards. This study examines the concentration and impact of trace metal elements in four indigenous fruits and vegetables from Borneo: Bambangan (Mangifera pajang), Dabai (Canarium odontophyllum), Terung Asam (Solanum ferox L.), and Tuhau (Etlingera coccinea). Atomic Absorption Spectroscopy (AAS) was employed to analyze seven metals—calcium (Ca), cadmium (Cd), chromium (Cr), copper (Cu), nickel (Ni), lead (Pb), and zinc (Zn)—following meticulous acid digestion of samples collected from Beaufort, Sabah, and Bintulu, Sarawak. The findings revealed that calcium was the most abundant metal, with concentrations following the order: Ca > Zn > Cu. The average concentrations detected in the analyzed fruits and vegetables were as follows: Ca (25.85 mg/kg), Zn (0.25 mg/kg), and Cu (0.17 mg/kg). All detected metal concentrations were within the permissible limits set by the World Health Organization/Food and Agriculture Organization (WHO/FAO, 2011) and the Malaysian Food Act (1985). Health risk assessments, including Estimated Daily Intake (EDI), Estimated Weekly Intake (EWI), and Hazard Index (HI), confirmed that these fruits and vegetables are safe for consumption, with no significant health risks identified. This research contributes to public health awareness and supports the sustainable use of Borneo's unique agricultural resources.

Keywords: Indigenous Fruits, Vegetables, Borneo, trace metal

SFST-14

In Vitro Antagonistic Study of Symbiotic Fungal Isolates from Taiwan Against Rhizoctonia solani Kühn, the Causal Agent of Sheath Blight Disease in Rice (Oryza sativa L.)

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Abstract: Sheath blight, caused by the fungal phytopathogen Rhizoctonia solani Kühn, can significantly reduce rice productivity and lead to substantial crop losses. Biological control using beneficial microbes is considered an alternative strategy to limit the growth of this pathogen. The objective of this research is to assess the antagonistic potential of Trichoderma ghanense, Trichothecium ovalisporum, Byssochlamys laguncularіae, and Cunninghamella antarctica against R. solani. Experimental methods, including dual culture and filtrate culture assays, hydrolytic enzyme activity test, analysis of hydrogen cyanide (HCN) production, mycoparasitism activity assessment using slide culture technique and scanning electron microscopy (SEM) analysis, and the ability to produce secondary metabolites such as volatile organic compounds (VOCs) using the double compartment method, were employed. A completely randomized design (CRD) was utilized in this study, with observed parameters including inhibition percentage, hydrolytic enzyme production, HCN, volatile organic compound production, and mycoparasitism interaction. Qualitative data were analyzed descriptively, while quantitative data were subjected to ANOVA followed by the DMRT test at a significance level of 5%. The results showed that T. ghanense and C. antarctica promisingly inhibited R. solani by >80% using dual culture, filtrate culture, and double plate assays. Slide culture and SEM tests exhibited that T. ghanense and C. antarctica could mycoparasitisize R. solani through mechanisms such as coiling, penetration, lysis, and destruction of pathogen hyphae. Additionally biochemical test showed that T. ghanense and C. antarctica could produce cell wall-degrading enzymes (CWDEs) such as chitinase and cellulase, as well as VOCs such as HCN. The findings could contribute to the development of effective and sustainable disease management strategies for rice cultivation.

Keywords: Antagonist, biological control, Rhizoctonia solani, volatile compounds, benefitial fungi

SFST-15

Selecting Leaf Harvest Stage in Bitter Melon (Momordica charantia L.) for Minimal Impact on Fruit Yield and Maximum Bioactive Compound Retention

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Abstract: Bitter melon (Momordica charantia L.) is a valuable plant known for its rich composition of bioactive compounds and potent antioxidant properties. While the phytochemical profile of the fruit has been extensively studied, the optimal harvest time of its leaves - particularly to balance functional compound accumulation and minimize yield loss - remains poorly understood. This study aimed to determine the optimal leaf harvesting stage that maximizes total phenolic content (TPC), total flavonoid content (TFC), and antioxidant capacity (IC_{50}), while reducing the impact on fruit development. Leaf samples were collected from three cultivation regions (six plants per region) at three plant ages (60, 80, and 100 days after sowing) and analyzed via UV-Vis spectrophotometry. Results showed that TPC significantly increased with plant age, from 7.81 mg GAE/g dry matter at 60 days to 24.40 mg GAE/g dry matter at 100 days. TFC remained statistically unchanged across all sampling stages. However, antioxidant capacity decreased with plant maturity, as evidenced by increasing IC_{50} values (from 4.06 mg/mL at 60 days to 9.44 mg/mL at 100 days). Harvesting leaves at 80 days offered the best compromise - providing a high concentration of bioactive compounds and effective antioxidant capacity, while occurring late enough to mitigate adverse effects on fruit yield. These findings provide an evidence-based strategy for leaf harvest timing in bitter gourd cultivation, with practical implications for both agricultural productivity and the development of functional food products.

Keywords: Bitter melon, Total phenolic content, Total flavonoid content, Antioxidant activity, Plant age, Functional foods.

SFST-16

Effect of Different Preparations of Moringa Leaves in a Complete Ration Based on Fermented Lemongrass Waste on Nutrient Content

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Abstract: This study aimed to evaluate the effect of Moringa (Moringa oleifera) leaf supplementation with different preparation methods on the dry matter (DM), organic matter (OM), and crude protein (CP) content of complete rations based on fermented lemongrass (Cymbopogon nardus) waste. The lemongrass waste underwent fermentation to enhance its nutritional value. At the same time, Moringa leaves—known for their high antioxidant and protein content— were added in various forms to assess their impact on overall feed quality. A Completely Randomized Design (CRD) was employed with four treatments: T0 (control, no Moringa supplementation), T1 (supplementation with dried Moringa leaves), T2 (Moringa leaf extract), and T3 (Moringa leaf extract concentrated using a rotary evaporator). The results showed that Moringa supplementation had a highly significant effect ($P < 0.01$) on all evaluated parameters. Dry matter content decreased notably in treatments using Moringa in liquid form, especially in T2 and T3. In contrast, organic matter and crude protein content increased significantly with the application of Moringa leaf extract. Among all treatments, T2 (Moringa leaf extract) yielded the best results, with the highest crude protein content (15.02%) and organic matter content (90.97%), despite a lower dry matter content (47.24%). These findings suggest that Moringa leaf extract can enhance the nutritional quality of rations based on fermented lemongrass waste, particularly in terms of crude protein and organic matter, although attention must be given to the resulting moisture content

SFST-17

Utilization of Gambier (Uncaria gambir Roxb) Leaves Fermented in The Ration on The Performance , Blood Lipid Profile and Meat of Broiler Chicken

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Abstract: Increasing the productivity of broiler chickens must be supported by proper management during rearing. Efforts to maintain the efficiency of broiler chicken production with a potential alternative that can be used as a feed additive to replace AGP are Gambier leaves (Uncaria gambier Roxb.). The aim of fermented gambir leaves is to produce products from ASUH broiler chickens by improving performance and reducing blood lipid profile levels of broiler chickens as an alternative ingredient to replace antibiotic growth promoter (AGP). Fermentation of gambier leaves with L. plantarum 1.5% + R. Oligosporus 1% inoculum. The experimental method used a completely randomized design (RAK), 5 treatments and 4 repetitions. R0: 100% Basal ration; R1: 100% Basal ration + 0.5% Fermented gambier leaf product; R2: 100% Basal ration + 1% Gambir leaf fermentation product; R3: 100% Basal ration + 1.5% Fermented gambier leaf product; R4: 100% Basal ration + 2% Gambir leaf fermentation product. The parameters measured were performance, blood and meat lipid levels. The research results are significantly different at P (<0.05) between R1-R4 and R0 in performance, can increase body weight gain and can reduce cholesterol, trilyceride and fat levels in blood and meat. Use leaf gambier fermentation of 0.5% - 1% in feed was recommended use as the feed additive to replace AGP.

Keywords: Gambier leaves, fermentation , performance , blood lipids , meat lipids

SFST-18

Impact Of Drying on The Quality Of Japonica (DS1) and Dai Thom 8 (DT8) Rice Varieties

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Abstract: Rice drying is a critical post-harvest process significantly influencing final grain quality. This study investigated the effects of drying on key quality parameters of Japonica (DS1) and Dai Thom 8 (DT8) rice varieties. This study evaluates the impact of three distinct drying methods – Industrial drying (ID), heat pump drying (HPD), and convectional drying (CD) – on the quality attributes of Japonica (DS1) and Dai Thom 8 (DT8) rice varieties. Convectional drying (CD)

proved most effective in rapidly reducing aw (DS1: 0.706±0.033; DT8: 0.483±0.138) and microbial counts. However, CD significantly increased kernel cracking (DS1: 26.33%; DT8: 16%) and resulted in the lowest head rice yield for DS1 (48.11%) and DT8 (50.51%). Heat pump drying (HPD) demonstrated superior performance in preserving grain integrity, yielding the highest HRY for both DS1 (63.69%) and DT8 (59.47%), with significantly lower cracking. Industrial drying (ID), a common industrial practice, offered a balance but generally had longer drying times (DS1: 24h; DT8: 18h) and intermediate HRY values (DS1: 57.48%; DT8: 52.92%). The research also investigated the effects of three drying protocols on the quality of DS1 and DT8 rice varieties: protocol A (modified protocol), protocol B (industrial drying protocol), and protocol C (full drying).. Protocol C consistently resulted in the shortest drying times. However, it also led to the lowest HRY for DS1 (57.74%) and OM18 (45.57%), and the highest broken rice ratios and crackness. Protocol A significantly reduced total drying time compared to Protocol B and achieved HRY (DS1: 63.31%; OM18: 50.60%) and broken rice levels much better than Protocol C. The quality from Protocol A was comparable or even slightly better than Protocol B for HRY. These results indicate that Protocol A can optimize the drying time, potentially shortening it by 25-50% compared to existing commercial methods, while maintaining or even enhancing HRY and reducing kernel damage.

Keywords: DS1, DT8, post-harvest quality, transporting time, head rice yield, microbial load, grain discoloration, milling quality.

SFST-19

Identification of Chemical Components in Namo-Namo Fruit (Cynometra cauliflora L.) from Halmahera Island and its Potential as a Feed Additive for Broiler Chickens

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Abstract: This study aims to determine the chemical composition of the namo-namo fruit from Halmahera island and its effects on the performance and carcass characteristics of broiler chickens. The nutritional content, total phenol and flavonoid levels, and antioxidant activity of the Namo-namo fruit extract were analyzed. The in vivo experiment involved 250 broiler chicks divided into five treatments: control (without namo-namo fruit extract); 0.25 ml, 0.50 ml, 0.75 ml, and 1 ml/kg feed containing namo-namo fruit extract. Weekly measurements of body weight and feed consumption were conducted, and on day 35, internal organ and carcass evaluations were carried out. Body weight gain, feed consumption, and feed conversion were all significantly higher ($p<0.05$) in the groups receiving the namo-namo fruit extract compared to the control group. No significant differences ($p>0.05$) were found in the internal organ weights and carcass percentages of the broiler chickens. It can be concluded that the namo-namo fruit extract from Halmahera Island contains phenols and flavonoids at 1.98 g/100 g and 2.01 g/100 g, respectively, and can be used as a feed additive for broiler chickens, as it improves performance without negatively affecting broiler carcass characteristics.

SDM-01

Identification of Land Use Affected by Tidal Floods using Unmanned Aerial Vehicles in Coastal Medan City, North Sumatra, Indonesia

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Abstract: The utilization of Unmanned Aerial Vehicle (UAV) technology in disaster management has many advantages such as high flexibility and can map disaster-affected areas. The existence of UAV technology can facilitate the mapping of land use in areas affected by tidal floods in coastal areas, Medan City. This research aims to identify land use using UAVs and map areas affected by tidal floods in Coastal Medan City, North Sumatra. The research location is the coastal area in Medan Belawan Sub-district, Medan City. The method used for land use classification is Object Based Image Analysis (OBIA) from UAV images with a flying height of 120 m and 80% overlap. The number of field verification points (ground check) was 150 points for accuracy testing using confusion matrix. The results of the research on making aerial photo maps with a flying height of 120 meters produced a total of 1,304 photos and produced a Ground Sampling Distance (GSD) spatial resolution of 2.91 cm/pix with a rea area of 100.60 ha. The results of land use classification with OBIA resulted in seven land use classes of settlements, mangroves, open land, developed land, roads, industries, and water bodies. The largest land use area is in the mangrove land use class with an area of 38.41 ha and the smallest area is the industry of 3.76 ha. The results of mapping the potential for tidal flood inundation using OBIA resulted in a tidal flood inundation area of 11.43 ha or 11.36% of the total study area. From the results of the tidal flood simulation modeling, it is known that land uses that have a high potential to be affected by tidal floods are settlements, open land, developed land, industry, mangroves, and roads. These land uses are vulnerable to tidal flooding, especially those adjacent to coastlines or rivers. Various parties need to design programs to reduce the impact of tidal floods in the coastal areas of Medan City, which tend to increase with climate change.

Keywords: Medan City, mapping drone, Sustainable Development Goals, tidal flood, Unmanned Aerial Vehicle

SDM-02

Sustainable Land Use and Ecotourism Development Prospects: Agroforestry Approaches in The Laguna Ternate Volcanic Lake Area

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Abstract: The Ternate Laguna Volcanic Lake (TLVL) area is one of the natural destinations that has great potential for ecotourism development. Wise land use through an agroforestry approach is one of the solutions to maintain a balance between ecotourism development and nature conservation. The purpose of this study is to analyze the potential for ecotourism development and sustainable land use in the Ternate Laguna Volcanic Lake area with an agroforestry approach. The research method was carried out in all catchment areas which had an effect on the sustainability of the Ternate Laguna volcanic lake. Catchment areas are divided into land units based on consideration of land characteristics and their effect on the lake. Each unit was randomly sampled for biophysical observations of the lake. The results of the biophysical research showed that there were 6 land use units (LUU), namely LUU 1, LUU 2, LUU 3, LUU 4, LUU 5, and LUU 6. The evaluation of land capacity in the Volcanic Lake area of Laguna Ternate is divided into 4 groups. Meanwhile, the prediction of soil erosion at the location has 4 levels, namely very light (VL), light (L), medium (M) and heavy (H). The results of the measurement of the shallowest lake depth are 8 meters in the East and the deepest 36.3 meters in the North, with the water surface area of the lake is 20.5 ha. Land use in this area consists of lakes, mixed gardens, shrubs and secondary forests. In conclusion, the land use pattern around the of TLVL is more oriented towards a mixed plantation farming pattern, with regional characteristics such as topography and land cover type directing prospects for LUU 1, LUU 2, LUU 3, LUU 4, LUU 5 to become business land with an agrisilviculture type agroforestry system, while LUU 6 is not recommended for agroforestry development.

Keywords: Lake; Volcanic; Laguna Ternate; Agroforestry; Ecotourism

SDM-03

Integrated Farming System: Urgency, Role, and Practices in Agro- Edutourism Attaqie Farm

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Abstract: As public interest in agro-edutourism continues to grow, sustainable agro-edutourism is emerging as a leading trend in Indonesia's tourism sector. Expert surveys conducted in 2023 and 2024 indicate a consistent increase of 46.15% in environmentally friendly tourism, driven by rising awareness of environmental issues. This shift is encouraging travelers to seek out sustainable destinations and experiences. One promising response to this demand is the implementation of integrated farming systems within agro-edutourism management. Research suggests that agro- edutourism based on integrated farming not only promotes environmental sustainability and food security, but also generates employment for local communities, attracts out-of-region visitors, and enriches public knowledge—particularly among children, students, university communities, and the general public. A case study at Attaqie Farm Agro-Edutourism, which employs an integrated farming model, illustrates the effectiveness of educational tourism in fostering environmental awareness. Through direct participation in activities such as planting, crop maintenance, organic fertilizer production (in accordance with national standards/SNI), and harvesting, young participants gain hands-on understanding of plant life cycles, biodiversity, and the role of vegetation in improving air and soil quality. This management model delivers educational, functional, and aesthetic benefits through diverse farming activities, including horticultural crop cultivation (e.g., starfruit and vegetables), aquaculture using the biofloc system, and livestock rearing with an elevated (stage) system. Notably, the application of compost derived from starfruit waste has reduced the use of inorganic fertilizers by 50% for pakcoy grown in vertical systems, and by 25% for butternut squash. Furthermore, applying 9 ml/L of liquid organic fertilizer led to a 20% increase in mustard green shoot weight compared to untreated controls.

Keywords: Agroedutourism; Bioflok; Eco-tourism, Recycle; Sustailable Agriculture

SDM-04

Landslide Preparedness Among Residents in Highly Susceptible Barangays in Tangub Misamis Occidenal, Philippines

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Abstract: Landslides are catastrophic events that cause significant harm to human life worldwide. This study aims to identify the preparedness among residents in highly susceptible barangays in Tangub City, Misamis Occidental. The study utilized a descriptive-quantitative method. The respondents of the study are the 826 residents of three barangays in Tangub City, Philippines, identified as highly susceptible to landslides: Barangays Sicot, Paiton, and Simasay. The instrument used in the study is researcher-made. Slovin's Formula was used to calculate the sample size necessary to achieve confidence intervals in the population. Results show that the level of landslide preparedness of Barangays Sicot, Simasay, and Paiton is somewhat prepared, interpreted as high. Among the susceptible barangays, the residents in Barangays Sicot, Paiton, and Simasay revealed no significant correlation between educational attainment and the level of preparedness. In terms of educational attainment, respondents of Sicot are predominantly elementary level, Paiton mostly elementary graduates, and Simasay respondents are generally high school level. It is recommended that residents establish a refuge plan for their pets and livestock. The City Disaster Risk Reduction

Management should strengthen preventative measures by installing the barangay community's warning system, flexible water pipes, and electric lines to home infrastructure that can resist breakage.

Keywords: educational attainment, evacuation, landslide, preparedness, susceptible

SDM-05

Flood Vulnerability Assessment in Cirasea Sub-Watershed: Spatial Analysis for Agricultural Risk Management and Food Security Planning

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Abstract: The Cirasea Sub-watershed, located in the Upper Citarum Basin, West Java, represents a critical agricultural area supporting local food production through intensive rice farming and mixed agricultural systems. This sub-watershed experiences recurring flood events that threaten agricultural productivity and food security for local communities. This research aims to: (1) develop a spatial flood vulnerability map for the Cirasea Sub-watershed using GIS analysis, (2) identify agricultural areas most at risk of flooding, and (3) provide spatial information to support agricultural planning and food security strategies. The results show that moderate flood- vulerability zones is 15.349 hectares in middle stream areas and high flood-vulerability zones 9.581,67 hectares primarily in downstream floodplains. The total vulnerable agricultural land 2.600 hectares or 25% of watershed agricultural area. Villages of Rancaekek Wetan and Jelegong are the highest concentration of vulnerable rice paddies. This significant proportion highlights the critical need for flood risk management in maintaining local food security. The study recommends implementing zone-based agricultural management through flood-resistant rice varieties and improved drainage systems in high- risk zones, developing crop diversification strategies with flood-tolerant alternatives in moderate-risk zones, maintaining intensive production as food security buffer areas in low- risk zones.

Keywords: flood vulnerability, GIS analysis, flood vulnerability, Cirasea sub-watershed, GIS mapping, agricultural sustainability, watershed management,

SDM-06

Unlocking Lake Toba's Agricultural Potential: Navigating Regulatory Overlaps and Traditional Practices for Sustainable Food Security

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Abstract: Lake Toba, as the largest volcanic lake in Southeast Asia, has strategic potential in supporting the food sector through agricultural and plantation activities in its surrounding areas. This research aims to analyze the relationship between Lake Toba utilization and food processes, as well as identify factors that influence the optimization of its utilization. The research method employs a literature study by analyzing various secondary sources including scientific journals, government reports, and policy documents related to Lake Toba management and the food sector. The research results indicate three main problems in utilizing Lake Toba for food processes. First, overlapping regulations between central and regional policies that hinder the implementation of food sector development programs. Second, communities around the lake still manage agricultural activities and utilize water traditionally with suboptimal productivity. Third, low technological innovation in agricultural and plantation systems that impacts the efficiency and quality of food production. The research conclusion emphasizes the need for three strategic steps to optimize Lake Toba utilization in food processes. First, synchronization of regulations between central and regional governments to create a harmonious policy framework. Second, community capacity development through training programs and technical assistance. Third, empowerment of modern agricultural technological innovation to improve productivity and sustainability of the food system in the Lake Toba region.

Keywords: Lake Toba, food sector, regulatory overlap, community capacity, technological innovation

SDM-07

Dynamics of Changes in Land Conversion from Paddy Fields to Non-paddy Fields in South Minahasa Regency and Its Implications for Local Food Security

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Abstract: Food self-sufficiency is one of the flagship programs contained in the Prabowo-Gibran Government's Asta Cipta. Changes in land cover, especially from agricultural to non- agricultural land cover, are not only widespread in Indonesia but have become a global trend. The conversion of agricultural land including rice fields to other uses (non-rice fields) which is currently rampant is a threat to food security and local food self-sufficiency. Changes in the function of rice fields to non-rice fields occurred in South Minahasa Regency. Data from the BPS of South Minahasa Regency in 2018 showed that the area of rice fields in South Minahasa Regency was 5,491 ha compared to data from the BPS of North Sulawesi in 2024 showing a decrease in the area of rice fields in South Minahasa Regency to 3,078.63 ha. The area of rice fields in South Minahasa Regency has changed and decreased in the last 6 years. Spatial land mapping of rice fields in

Tumpaan District showed changes in rice field land cover in the last 5 years (2018-2023). The results of the spatial analysis showed changes in the use of rice fields into dry fields for secondary crops or horticulture. This study aims to identify factors that influence the conversion of rice fields to non-rice fields in South Minahasa Regency. In depth interview with local farmers was conducted to identify the driven factors. Initial findings show that the reasons for the change in land use from rice fields to secondary crops (corn) and horticulture (watermelon, melon, 'nilam') are due to several factors, including a shortage of labor, water availability due to inadequate irrigation systems, and the high cost of fertilizers. The government, both central and local, has an important role in controlling the conversion of agricultural land to maintain food security. This role includes regulation, licensing, socialization, sanctions, as well as the development of agricultural infrastructure and the provision of incentives.

SDM-08

Strengthening Customary-Based Nagari Forest Management and Sustainable NTFP Business in Nagari Salibutan, West Sumatra-Indonesia

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Abstract: This research explores how effective approaches based on indigenous participation are in reinforcing customary forest governance and fostering Non-Timber Forest Products (NTFPs) businesses in Salibut nagari, Padang Pariaman-West Sumatra. Participatory Rural Appraisal (PRA) and Focus Group Discussion (FGD) were employed to map community needs and aspirations; use of mobile GIS devices for participatory mapping to record customary boundaries and conservation zones; and value chain analysis to pinpoint value-added aspects of NTFP products. Capacity building is implemented through "learning by doing" training and study visits to pilot nagari, while the nagari Social Forestry Business Groups (KUPS) assistance centers on preparing production Standard Operating Procedures (SOP), management strategies, and halal-organic certification. SMART indicators are developed, and quarterly reports are created with the help of an Android app (ODK/Kobo Toolbox) through participatory monitoring & evaluation (PM&E), which engages the community. The Theory of Change (ToC) framework helps outline the process of program change, bolstered by best practice documentation such as video storytelling and case studies. It is anticipated that the research findings will contribute to the development of a model for customary forest conservation and local economic empowerment that is effective, transparent, and sustainable, and that aligns with SDG 15 (Life on Land) and social justice objectives.

Keywords: participation, nagari, KUPS, Theory of change, forest conservation, local economic.

AE-01

Enhanced Leaf Area and Pigment Accumulation in *Stevia rebaudiana* Under Elevated CO_2 Conditions

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Abstract: Stevia (*Stevia rebaudiana* Bertoni) is a member of the Asteraceae family known for its sweet-tasting leaves due to the presence of steviol glycosides, which are 300–400 times sweeter than sugar. As the leaf is the main economic organ, it plays a vital role in the plant's commercial value. With increasing atmospheric CO_2 levels due to industrialization, plant productivity and physiological responses, especially leaf development, are significantly influenced. Elevated CO_2 (eCO_2) generally enhances photosynthesis, leaf area, and biomass accumulation, but also alters leaf pigments which play important role in plant physiology. Despite stevia's growing importance, limited studies have explored how eCO_2 affects stevia leaf growth and pigments. This study investigates the impact of eCO_2 on leaf area and pigments of *Stevia rebaudiana*." Plants were grown under ambient (400 ppm) and elevated (up to 1200 ppm) CO_2 concentrations in a glasshouse, and assessed for various leaf growth parameters, including total leaf area (TLA), specific leaf area (SLA), leaf area ratio (LAR) and leaf pigments namely chlorophyll a, Chlorophyll b and Carotenoids. Results indicated that eCO_2 significantly enhanced shoot and leaf fresh and dry weights. TLA was seen to increase by 31% under elevated with 1637.3 cm^2 area in comparison with aCO_2 treated plants (1134.8 cm^2). SLA was slightly higher under eCO2 concentrations than aCO2. However, the results were non-significant according to independent T- test at probability level of 0.05 percent while LAR significantly higher for plants under exposure of eCO_2. Additionally, chlorophyll a content was significantly higher under eCO_2, while chlorophyll b remained unchanged. Car was seen with the highest value (28.57 µg/mg) eCO2 while the plants grown under aCO2 just produce (14.30 µg/mg) of Car respectively. These findings demonstrate that eCO_2 positively influences the leaf growth and pigments development of *Stevia rebaudiana*, with implications for cultivation under future climatic conditions.

Keywords: Chlorophyll a, Carotenoids, Climate change, Leaf area ratio, Specific leaf area.

AE-02

Ecological Management of Insect Pests in Rice (*Oryza sativa* L.) Using Refugia Plants and Biopesticides: A Case Study in Northern Sumatera, Indonesia

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Abstract: This study evaluated the ecological management of insect pests in rice (*Oryza sativa* L.) through the integrated use of refugia plants and biopesticides in Lubuk Bayas Village, Northern Sumatera, Indonesia. A total of 21 insect species from 13 families and 6 orders were recorded across both treatment and control plots. Rice fields incorporating refugia and biopesticides demonstrated significantly higher insect abundance (2,686 individuals) compared to control plots (1,678 individuals). Furthermore, these ecologically managed fields exhibited greater species richness (R′= 0.29 vs. 0.14 in controls), greater evenness (E= 0.85 vs. 0.56 in controls), and increased diversity (H′ = 2.86 vs. 2.27 in controls). These findings highlight the substantial potential of integrating refugia plants with biopesticides as a sustainable strategy to enhance insect biodiversity and foster ecological pest regulation within rice agroecosystems. Ultimately, this approach can contribute to improved rice productivity and strengthen national food security in Indonesia.

Keywords: Ecological pest management; *Oryza sativa*; Refugia plants; Biopesticides; Insect diversity; Rice agroecosystem; IPM, Species richness; Sustainable agriculture; Northern Sumatera; Indonesia.

AE-03

Growth, Production and Quality of Basil (*Ocimum basilicum* L.) Accession at Various Composition of Urea Fertilizers and Cattle Urine

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Abstract: This study aims to determine the effect of giving urea and cattle urine on the growth, production and quality of various basil (*Ocimum basilicum* L.) accession. This study uses a factorial complete randomized design consisting of two factors, namely basil accession (Gegerbitung, Kadudampit 1, Kadudampit 2, Kemang, Ciaruteun, Cijujung, and Gasol), and composition of N fertilizers (100% urea, 75% urea + 25% urine, 50% urea + 50% urine, 25% urea + 75% urine, 100% urine, and 0% urea + 0% urine). The results of research showed that crops of basil accession of Kadudampit 2 showed the best results at the height of plants, the number of leaves, number of buds, total buds, rod diameters, vitamin C content, wet weight and dry weight of total harvest compared to other accession. Ciaruteun and Gasol accesions are significantly have higher leaf area and the highest nitrate content compared to other accession. The treatment of N fertilizer compositions significantly affected the growth and yield variables of the plant except for the total length of shoots. Giving fertilizer 100% cow urine significantly increases the number of leaves, the number of shoots, diameter, wet weight and dry weight of the first harvest. The use of fertilizer composition 75% urea + 25% cow urine significantly increases the total length of shoots, wet weight and dry weight weight of total harvest, and nitrate content.

Keywords: *Ocimum basilicum*, cow urine, N-organic, accession

AE-04

Bioencapsulation Formulation of Phosphate-Solubilizing Bacteria to Improve soil P Availability, and Yield of Maize

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Abstract: Low phosphorus availability in the soil can inhibit the growth and production of maize plants. Effort to restore P availability in soil is using phosphate-solubilizing biofertilizers. However, the rapid population decline in biofertilizers is a problem to the effectiveness of biofertilizers when applied. The bioencapsulation technique is an option to produce biofertilizers with high viability and effectiveness. This research aimed to obtain a bioencapsulation formula for phosphate solubilizing bacteria (PSB) that could improve the viability and effectiveness of PSB biofertilizers for maize production. The PSB bioencapsulation formula produces fertilizer in microcapsules form with good characteristics after adding additives, including a mixture of starch and kaolin, characterized by a water content reaching 11,54%, a swelling ratio reaching 340, 40%, and a microbial release level reaching 5,70 x 10^9 CFU g^{-1} on day 7 after incubation. The bioencapsulation formula composition consisting of alginate + starch + kaolin increased the viability of PSB for 16 weeks of storage. The application of bioencapsulated PSB biofertilizers 50 Kg ha^{-1} + P fertilizer 50 Kg ha^{-1} effectively increased the maize grain weight per hectare by 134,99% with a Relative Agronomic Effectiveness (RAE) value of 162,57%.

Keywords: Alginate, Starch, Kaolin, Ionic gelation, Viability

AE-05

Caste Dimorphism and its influence on Nechrophoric Behavior in Minor and Major workers of Weaver Ants *(Oecophylla smaragdina)*

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Abstract: Necrophilic behavior plays a vital role ensure cleanliness and prevent the spread of disease within social insect colonies. This study investigates the necrophoric responses of major and minor workers of O. smaragdina to recently deceased conspecifics. The experiment was conducted in an insectary at Universiti Sains Malaysia, where plastic containers measuring 26.5 cm by 30 cm housed 100 major and 100 minor workers. For the experimental group, 50 freshly killed conspecifics were introduced, while the control group consisted solely of live ants. Ants were allowed to acclimate for one week before the experiment. Behavioral responses, including the time taken to locate, collect, and remove dead ants, were recorded using video analysis. This setup provided insights into how these ants manage corpses to maintain colony hygiene and reduce pathogen risks. Data were manually counted three times to ensure accuracy. The results revealed statistically significant differences ($P < 0.05$) in necrotic response efficiency between castes, with major workers demonstrating superior corpse removal rates, higher pick-up frequencies, and faster detection times compared to minor workers. Corpse detection began within the first hour of exposure and progressively intensified over a 72-hour observation period. Major workers consistently dominated necrophoric tasks, reinforcing their central role in maintaining colony hygiene. These findings enhance our understanding of task allocation patterns in O. smaragdina and emphasize the role of chemical signaling mechanisms in coordinating sanitation behaviors among ant castes.

Keywords: Oecophylla smaragdina, Necrophoric behavior, Social insects, Colony hygiene, Division of labor

AE-06

In Vitro Inhibitory Mechanisms of *Trichoderma yunnanense* TM10 Against *Pyricularia oryzae* and *Rhizoctonia solani*, the Causal Agents of Rice Blast and Sheath Blight

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Abstract: Blast and sheath blight diseases, caused by *Pyricularia oryzae* and *Rhizoctonia solani*, respectively, are major threats to rice production worldwide. Efforts should be made to limit the spread of these phytopathogens, preferably through sustainable methods. In this study, we investigated the antagonistic potential of the local isolate *Trichoderma yunnanense* TM10 against the pathogenic fungi *P. oryzae* and *R. solani*. The results demonstrated that *T. yunnanense* TM10 inhibited the growth of *P. oryzae* and *R. solani* through mechanisms such as competition, mycoparasitism, and antibiosis. Dual culture, filtrate culture, and double plate assays showed that *T. yunnanense* TM10 could inhibit the growth of both *P. oryzae* and *R. solani*. Slide culture and scanning electron microscope (SEM) tests confirmed that *T. yunnanense* TM10 exhibited mycoparasitic activity, including attachment, coiling, penetration, lysis, and destruction of pathogen hyphae. Additionally, T. *yunnanense* TM10 was capable of producing cell wall-degrading enzymes (CWDEs) such as chitinase and cellulase, as well as volatile organic compounds (VOCs) such as hydrogen cyanide (HCN). The multifaceted abilities of *T. yunnanense* TM10 for limiting the growth of *P. oryzae* and *R. solani* underscore its potential as an effective biocontrol agent for enhancing productivity and sustainability in rice cultivation.
Keywords: Biological control, *Pyricularia oryzae*, *Rhizoctonia solani*, rice diseases, symbiotic lifestyle, *Trichoderma*

AE-07

Laying Performance of Japanese Quail (*Coturnix coturnix japonica*) Supplemented with Different Levels of Squash Meals

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Abstract: The study aimed to evaluate the laying performance of Japanese quail *(Coturnix coturnix japonica*) when fed with varying levels of squash meal supplementation. A total of sixty quails, consisting of forty-eight ready-to-lay females and twelve males, were organized in a Complete Randomized Design (CRD) with four treatments, each replicated three times. Each replication included four female quails and one male quail. The experimental treatments were structured as follows: Treatment 1 (1000g of commercial ration), Treatment 2 (900g commercial ration + 100g squash meal), Treatment 3 (800g commercial ration + 200g squash meal), and Treatment 4 (700g commercial ration + 300g squash meal). The key parameters observed included hen-day/hen-house egg production, average daily feed intake, feed conversion efficiency, body weight gain, feed cost per dozen eggs, and return above feed cost per dozen eggs. The data were analyzed using one-way analysis of variance (ANOVA), revealing notable trends in laying performance. While average daily feed intake, feed conversion efficiency, and body weight gain showed no significant differences across the treatments, key laying performance indicators, namely hen-day egg production and hen-house egg production, exhibited highly significant differences. Additionally, feed cost per dozen eggs and return above feed cost per dozen eggs produced showed significant differences, favoring certain treatment groups. These findings suggest that Treatment 2, which incorporated 100g of squash

meal into the quail's diet, provides an effective supplement. This treatment emerged as optimal due to its balance of local availability, low production cost, and nutritional benefits that support enhanced egg production in quails. Thus, supplementing commercial rations with 100g of squash meal offers a practical and economical strategy for improving egg yield in quail farming.

Keywords: Japanese quail (Coturnix coturnix Japonica), Squash meal, Laying performance, Squash peel, Squash seed

AE-08

Potential of Local Resources Ameliorant Formulation from Nagari Banuhampu, Agam to Increase Paprika (*Capsicum annuum* L.) Production on Inceptisols

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Abstract: Excessive use of chemical fertilizers can degrade soil quality in the long run, so alternatives are needed through local resource-based amelioration technologies that are more environmentally friendly and sustainable. This study has examined the best type and formulation of ameliorants for the production of paprika (*Capsicum annuum* L.) on Inceptisols. This study has used a completely randomized design with three replications. Ameliorants that have been used are Titonia green fertilizer (TGF), chicken manure (CM), compost Agam (CA), and bamboo biochar (B-B) both single and formulation, where there are eight treatment levels (control; TGF; CM; CA; B-B; formulation of CA+B-B; CA+TGF+CM; CA+TGF+CM+B-B). The application of local resource ameliorant formulations at a dose of 10 t ha^{-1} has significantly improved the chemical properties of Inceptisol and increased the production of paprika. The application of CA+TGF+CM+B-B with each dose of 2.5 t ha^{-1} can increase the pH value by 0.30; organic C (1.01%); total N (0.16%); available P (10.46 ppm); CEC [6.16 cmol(+)kg^{-1}] and base cations [0.30 cmol(+)kg^{-1} K., 0.65 cmol(+)kg^{-1} Ca, and 1.22 cmol(+)kg^{-1} Mg-exchangeable) and fruit fresh weight of 56 g pot^{-1}, fruit flesh thickness of 1.30 mm and nutrient of N (5.03 g pot^{-1}), P (2.56 g pot^{-1}), and K (6.80 g pot^{-1}), compared to the control. The application of local resource-based ameliorant formulations can be an effective strategy in improving soil and crop productivity and reducing dependence on chemical fertilizers as well as increasing the efficiency of agricultural production in suboptimal lands such as Inceptisols.

Keywords: Amelioration, Biochar, Compost, Chicken manure, Titonia green fertilizer

AE-09

Evaluation of Mineral Composition, Physical Properties, and Nutritional Value of Local Rock Flours as Feed Supplements for Laying Quails

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Abstract: The province of West Sumatra is rich in natural rock deposits in the form of mountains and hills, which have the potential to be used in poultry feed. This study aimed to determine the mineral composition, physical properties, and nutritional values of rock flour obtained from four different areas: Padang Panjang (PP), Palupuh (PH), Halaban (HB), and Kamang (KG). The samples of rock flour were analyzed for essential minerals, particle size distribution, bulk density, and angle of repose. The nutritional values were assessed by mixing 2.5-9.0% of rock flour with a basal diet and feeding it to 200 laying quails. There were five dietary treatments: basal diet + 2.5% oyster shell (control) (P0), basal diet + 9% PP (P1), + 7% PH (P2), + 6% HB (P3), and + 2.5% KG (P4). All diets were formulated to be iso-nitrogenous, iso-caloric, and iso-calcium. The quails were divided into 20 experimental units (10 birds each), and each treatment consisted of 4 replications. Parameters measured included feed intake, egg production, feed conversion ratio (FCR), eggshell quality, and tibia bone weight. Data was subjected to one-way variance analysis in a completely randomized block design, 5x4. Mineral composition and physical properties varied across the sources of rock flour, with Ca content ranging from 5% to 40%. The rock flours were also rich in Fe, Mn, and Se, with a bulk density of 1.1–1.6 g/mL and predominantly fine particles (<500 μm). Incorporating rock flour into the diet improved egg production, feed efficiency, and eggshell quality. Among the sources tested Kamang rock flour yielded the most favorable outcomes in terms of egg production, eggshell quality, and feed utilization. In conclusion, locally sourced rock flour from Kamang represents a promising alternative mineral supplement for poultry feed, enhancing production performance and bone mineralization in laying quails

Keywords: eggshell quality, local mineral, physical property, rock flour, quail nutrition

AE-10

Effects of the Mount Marapi Eruption on Plant Diversity and Mineral Status of Soil and Forage in West Sumatra, Indonesia

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Abstract: The December 2023 eruption of Mount Marapi in the Agam and Tanah Datar regencies of West Sumatra deposited volcanic ash and gravel across surrounding landscapes, affecting crops, forage availability, and livestock health. This study evaluates the eruption's effects on forage diversity, biomass production, and the mineral status of soils and forages in the impacted areas. A field survey of 55 cattle farmers across five sub-districts (Ampek Angkek, Canduang, Sungai Pua, X Koto, and Batipuah) was conducted to assess the eruption's impact on livestock, forage resources, and farmers' livelihoods. Soil and forage samples were collected and analyzed for dry matter content and key minerals (P, Mg, K, S, Na, and Cu). The eruption's impact was categorized into three degrees: severe, moderate, and low. Severe: Livestock experienced health issues; forages were destroyed or heavily contaminated. Moderate: Cattle remained healthy, but forage scarcity was prevalent due to damage and contamination. Low: Livestock and forage supply were unaffected, but farmers faced economic losses due to reduced crop yields and declining market prices. A total of 70 forage plant species, including grasses, shrubs, and herbs, were consumed by cattle post- eruption. Dominant species included Pennisetum purpureum (19.2%), *Axonopus compressus* (14.6%), *Digitaria sanguinalis* (7.4%), and *Cynodon dactylon* (5.3%). The findings suggest volcanic eruptions enhance forage diversity without substantially altering biomass production, carrying capacity, and mineral concentration in soils and forages.

Keywords: forage diversity, grazing cattle, soil minerals, volcanic eruption, volcanic materials

AE-11

Impact of Shading and Cultivation Methods on Black Turmeric Growth and Yield

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Abstract: *Curcuma caesia* or commonly known as Black turmeric, is a perennial herb with significant commercial value due to its medicinal qualities. It also has high market demand in local and foreign countries. One of the potential approaches to upscale production was the method of cultivation. This research was set up to improve the yield and quality of *C. caesia* by identifying the most effective cultivation methods for sustainable production of *C. caesia*. The experiment included two main factors which are different shading levels (light intensity) and planting methods (polybags and ridge). Totally eight treatments involved in this study which are shading 0% in polybag (N1T1), shading 30% in polybag (N2T1), shading 50% in polybag (N3T1), shading 70% in polybag (N4T1), shading 0 % in ridge (N1T2), Shading 30% in ridge (N2T2), Shading 50% in ridge (N3T2) and Shading 70 %, in ridge (N4T2). Pre-harvest parameter encompassed plant height, number of leaves, leaf area, crown diameter and stem diameter, while post-harvest parameter involved the determination of fresh weight and dry weight of the rhizome. This study reveals that plants in polybag consistently indicate lower growth across all parameters and yield compared to the ridge system. Moderate shading (50%) benefits plant growth, especially in ridge planting, but in terms of wet weight and dry weight of rhizome, 30% shading planting in ridge indicated highest result. Based on this study, it can be concluded that shading (30%- 50%) in ridge planting system is a promising strategy to enhance *c. caesia* yield and growth.

Keyword: Black turmeric, planting, light intensity, growth, yield

AE-12

Impact of Different Compost Ratios on the Growth, Yield, and Post- Harvest Quality of Brinjal

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Abstract: Compost is an essential organic soil amendment that enhances soil fertility and crop productivity by improving physical, chemical, and biological properties. This study evaluates the impact of different compost formulations on the vegetative growth and post-harvest quality of brinjal (Solanum melongena L.). Five compost treatments with varying ratios of agricultural waste, sawdust, biochar, and chicken manure were applied in a completely randomized block design (CRBD) under greenhouse conditions. Plant growth parameters, including plant height, stem diameter, number of leaves, fruit yield, and root biomass, were assessed from early vegetative stages to post- harvest. Statistical analysis was conducted using Tukey's test ($p < 0.05$) to determine significant differences among treatments. The results showed that compost containing 20% agricultural waste (AW), 20% sawdust (SD), 30% biochar (BC) and 30% chicken manure (CM) (T1); and 40% AW, 20% SD, 20% BC, and 20% CM (T2) significantly enhanced plant height, stem diameter, root length, and root biomass, suggesting an optimal nutrient balance for early plant development. However, the highest fruit yield was observed in T3 (60% AW, 20% SD, 10% BC, and 10% CM), indicating superior reproductive performance. T4 containing only 80% AG and 20% SD only showed moderate results. In contrast, the commercial compost (T5) exhibited poor performance, with minimal vegetative growth and no fruiting, highlighting its inadequate nutrient composition. The control treatment (soil + sand) supported moderate growth but failed to produce fruits. These findings underscore the importance of nutrient-rich compost in enhancing brinjal productivity, particularly in sustainable farming systems. Future research should focus on optimizing compost formulations for improved crop performance while addressing environmental sustainability.

Keywords: Compost, Brinjal, Organic Amendment, Plant Growth, Fruit Yield, Sustainable Agriculture

AE-13

Sustainable Use of Gibberellic Acid and Proline To Improve Sweet Potato Growth

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Abstract: Sweet potato (*Ipomoea batatas* L.) is a nutritionally valuable and climate-resilient crop that plays a key role in sustainable agriculture and food security. Plant growth regulators such as gibberellic acid (GA) and amino acids like proline enhance plant development and stress tolerance, but their optimal use for maximizing crop productivity requires further exploration. This study investigated the effects of various concentrations of GA and proline on the growth of the VitAto variety

of sweet potato under controlled conditions. Results showed that a specific combination of GA and proline significantly improved several growth parameters, indicating their synergistic effect on plant performance. The findings highlight the potential to integrate growth-promoting substances into sustainable crop management practices, support efficient input use, and contribute to resilient food production systems.

AE-14

The Effect of The Use of Molasses In Ruminant Livestock Rations on The Digestion Of Dry Matter, Organic Matter and Crude Protein In Vitro

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Abstract: This study aims to determine the effect of molasses use in rations on the digestibility of Dry Matter, Organic Matter and Crude Protein, livestock feed using field grass, indigofera and tithonia diversifolia. This study was conducted using an in vitro experimental method with a Completely Randomized Design, with 3 treatments and 5 replications, for each treatment used was P0 = Ration formulation without the use of molasses, P1 = Ration formulation with the use of 3% molasses, P2 = Ration formulation with the use of 6% molasses. The variables measured were Dry Matter digestibility, Organic Matter digestibility and Crude Protein digestibility in vitro. The results showed that the average dry matter digestibility at P0 = 63.03%; P1 = 67.99%; P2 = 69.02%, the average organic matter digestibility at P0 = 57.63%; P1 = 63.07%; P2=64.62%, and the average digestibility of crude protein at P0=57.84%; P1=61.22%; P2=63.19%. Based on the results of the study, it can be concluded that the use of molasses in ruminant livestock rations has a significantly different effect ($P<0.05$) on the digestibility of Dry Matter, digestibility of Organic Matter and digestibility of Crude Protein in vitro. Where the use of molasses as a source of non-structural carbohydrates up to 6% can increase digestibility.

Keywords: molasses, in vitro, ration, dry matter digestibility, organic matter digestibility, and crude protein digestibility.

AE-15

Evaluation of Oil Palm Fronds As Small Ruminant Feed: A Meta-Analysis

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Abstract: Oil Palm fronds (OPF) as the main waste of oil palm plantations have considerable promise as a small ruminant feed. Unfortunately, due to the diversity of previous findings, a clear response pattern has still to be determined. For this reason, in the present study, meta- analysis was employed to synthesize existing findings regarding the effect of OPF as a small ruminant feed. The database was constructed using data from ten published articles that fit the inclusion criteria. The applied statistical model was a mixed model. Findings revealed no significant effect ($P>0.05$) of OPF inclusion on nutrient intake, nutrient digestibility, animal performance, and nitrogen utilization. Despite this, there was a tendency for dry matter intake (DMI) to increase and average daily gain (ADG) to decrease with the greater presence of OPF in the feed. The insignificance of the present findings suggests that OPF can be included in small ruminant feed without causing significant negative effects.

Keywords: meta-analysis, oil palm fronds, small ruminant, feed

AE-16

Potential of *Ficus septica* Leaf Extract as A Botanical Fungicide to Control of *Aspergillus flavus*

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Abstract: *Aspergillus flavus* is a multicellular fungus that is capable of producing mycotoxins in the form of aflatoxins which are dangerous to humans. This fungus is capable of contaminating food and crops such as fruit and grain. Synthetic fungicides are still often used by farmers to control fungi that cause contaminants in agricultural products. Continuous use of synthetic fungicides at inappropriate doses can cause negative impacts on farmers' health and the presence of dangerous chemical compound residues in agricultural products. Alternative control is needed to reduce the use of synthetic fungicides, namely by using botanical fungicides. One of the plants that can be used as an active ingredient in botanical fungicides is *awar-awar* (*Ficus septica* Burm f.). This research aims to determine the inhibitory ability of *Ficus septica* leaf extract in inhibiting the growth of the *Aspergillus flavus* fungus. The test results for crude extract of *Ficus septica* leaves showed strong category results with an inhibitory zone diameter of 20.25 mm. The Minimum Inhibitory Concentration (MIC) test showed that the crude extract concentration was 0.3% with an inhibitory zone of 9.5 mm. A crude extract concentration of 3% is the optimal concentration which is able to inhibit the growth of *Aspergillus flavus* fungus with an inhibition zone of 17.30 mm. Based on a phytochemical screening test, the crude extract of *Ficus septica* leaves contains flavonoids, phenols, alkaloids, tannins and steroids.

Keywords: *Ficus septica*, *Aspergillus flavus*, contaminants, phytochemical, fungicides

AE-17

Efficiency of Organic Fertilizer From Chicken Manure Compost Enhancing Nitrogen Uptake in Green Mustard (Brassicca juncea) Cultivation

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Abstract: This research evaluated the efficiency of organic fertilizer derived from chicken manure compost in enhancing nitrogen uptake in green mustard (Brassica juncea). The study demonstrated the effectiveness of chicken manure compost in promoting green mustard growth by comparing its nitrogen uptake efficiency with that of NPK fertilizer. The research aimed to address the challenges posed by excessive use of chemical fertilizers, which contribute to environmental pollution and increased production costs. Key factors such as temperature, pH, and electrical conductivity (EC) were monitored as the chicken manure compost matured over a period of 56 to 70 days. A Completely Randomized Design (CRD) with four treatments was used: Treatment 1 (100% NPK fertilizer), Treatment 2 (100% chicken manure compost), Treatment 3 (a 50% combination of chicken manure compost and 50% NPK fertilizer), and Treatment 4 (control, no fertilizer). The results indicated that the combination of chicken manure compost and NPK fertilizer (T3) produced the best outcomes in terms of plant height, chlorophyll content, and dry weight, highlighting the benefits of using both organic and inorganic fertilizers. Treatment 3 exhibited the most significant overall growth. The study also found a positive correlation between nitrogen uptake efficiency and plant growth metrics, suggesting that chicken manure compost could serve as an effective and sustainable alternative to chemical fertilizers, enhancing crop yields while addressing environmental concerns. A strong positive correlation was observed between nitrogen uptake efficiency and plant traits such as plant height, dry weight, and chlorophyll content. Among these traits, plant height showed the strongest correlation (R^2= 0.946), followed by dry weight (R^2 = 0.9829) and chlorophyll content (R^2 = 0.9808). Treatment 3, which included chicken manure, achieved the highest nitrogen uptake efficiency, demonstrating its effectiveness in improving plant growth and productivity.

AE-18

Enhancing Nitrogen Uptake and Rice Productivity in Inceptisols Through *Moringa oleifera* and Golden Snail-Based Liquid Organic Fertilizers

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Abstract: Nitrogen deficiency is a prevalent challenge in organic rice cultivation within Inceptisols. The application of liquid organic fertilizer (LOF) is a potential strategy to address this issue. This study evaluates the effects of LOF formulations and concentrations on nitrogen uptake and rice yield in Inceptisols. LOF was derived from fermented *Moringa oleifera* and golden snails (*Pomacea canaliculata*). A greenhouse experiment was conducted using a completely randomized design (CRD) with two factors: LOF formulation (100% moringa, 100% golden snails, and a 50% moringa + 50% golden snail combination) and LOF concentration (0, 20, 40, 60, and 80 mL/L), with three replications. LOF was applied weekly (100 mL/pot) for 16 weeks. Statistical analyses included two-way ANOVA, the Duncan Multiple Range Test (95% significance), Pearson correlation, and regression analysis. Results indicated a significant interaction between LOF formulation and concentration on nitrogen uptake, with the highest uptake observed in the 100% moringa LOF at 60 mL/L, exhibiting a 161.2% increase over the control. However, rice yield was significantly influenced only by LOF concentration, with the highest yield occurring at 60 mL/L, reflecting a 115% increase over the control. These findings highlight the potential of moringa and golden snail-based LOF for sustainable organic rice production.

AE-19

Utilization of Bacillus thuringiensis strain MRTLRZ2.1 Liquid Waste To Control Xanthomonas Axonopodis Pv. Allii and Improve Shallot Plant Production in Alahan Panjang

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Abstract: Bacterial leaf blight disease caused by Xanthomonas axonopodis pv. Allii is a major disease in shallot plants. An alternative control is to utilize the microorganism Bacillus thuringiensis strain MRTLRZ2.1 as a biofertilizer agent. The application of B. thuringiensis strain MRTLRZ2.1 in the field needs to be formulated so that it is easy to propagate and increase its viability. The purpose of this study was to obtain the best liquid formula of B. thuringiensis strain MRTLRZ2.1 in suppressing the development of bacterial leaf blight and increasing the production of shallot plants in the field. Planting of shallot plants in the field was carried out experimentally using a Randomized Block Design (RAK) consisting of 6 treatments (liquid coconut formulation (AK), liquid tofu formulation (AT), liquid rice formulation (AB), liquid coconut formulation + liquid tofu + liquid rice (AKTB), bactericide Streptomycin (B), and control (K)), 5 replications, and each replication consisted of 20 plant units. The observed variables were disease development, Area Under Disease Progress Curve (AUDPC), and plant growth. The results of the study showed that the formulation of liquid coconut + liquid tofu + liquid rice (AKTB) was the best formulation in suppressing the development of bacterial leaf blight caused by X. axonopodis pv. allii and increasing the production of shallots in the field with the lowest disease severity of 3.25%, AUDPC value of 65.63 with a disease suppression value of 98.93%, and a fresh weight value of 110.90 grams/planting hole.

Keywords: Biological agents, Biofertilizer agents, Leaf blight, Shallot growth, disease severity

AE-20

Growth and Physiological Responses of Oil Palm Seedlings (Elaeis guineensis Jacq.) to Trichoderma Asperellum SL2 Inoculation

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Abstract: Growth and Genotype of the 2th generation Mutant (M2) of Black Soybean Variety Detam-2 Glycine max. The generation of growth diversity and polyploidy is significant in agriculture resulting from soybean plant mutagenesis. This study analyzes the Analysis of Growth Diversity, Polyploidy, and Karyotype of the 2th Generation Mutant (M2) Black Soybean Variety Detam-2 Glycine max. The experiment was conducted from October 25, 2024, to February 22, 2025, at the experimental field of the Faculty of Agriculture, Universitas Islam Riau, Pekanbaru, Indonesia. A total of 192 results of colchicine mutations of 3,500 ppm. Growth parameters were analyzed using the DMRT statistical test at $p<0.05$; mutant-2 produced the highest yield, height of 62.20 cm, and number of pods per plant of 193.00, significantly different from the control. The leaf shape of the mutant-3 sample was curly, which differed from mutant-1 and Mutant-2. Polyploidy of control and mutant-3 samples were diploid (2n=40), and Mutant-1 and mutant-2 were Triploid (3n=60). The karyotype of mutant-3 had sub-metacentric at number one for other mutants, and controls were all metacentric types.

AE-21

Impact of soil tillage and organic amendment on some chemical and biological characteristics of Entisol and sweet potato production on Maitara Island of Indonesia

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Abstract: Local food crop development programs have become essential for Indonesia to address the challenges posed by climate change and mitigate food insecurity throughout the country. However, the drylands that are potentially suitable for agriculture are considered sub-optimal, which may hinder the success of the efforts. To improve the productivity of these suboptimal lands, this study assessed the impact of soil tillage and organic mulch on various soil chemical and biological characteristics, as well as food crop production. A field experiment was conducted in 2023 on Maitara Island using a randomized block design with a factorial arrangement. The experiment took place on an Entisol soil type, utilizing planting beds and incorporating two treatment levels. The first treatment involved tillage systems with tillage operations (T1) and no tillage (T0). The second treatment considered the use of organic mulch, with one group receiving mulch (M1) and the other not (M0). All planting beds were cultivated with sweet potatoes. The observed variables included various soil chemical and biological properties, along with crop production data. The results indicated that the application of mulch, regardless of whether tillage was used or not, enhanced the content of soil organic carbon (SOC), total nitrogen (N), and available phosphorus (P), as well as the abundance of P- solubilizing bacteria and mycorrhizal spores, and improved crop production. However, it was noted that the pH values tended to decrease in treatments that included mulch. This study suggests that minimal tillage practices, combined with the use of organic mulch, are effective strategies for enhancing soil productivity in suboptimal drylands.

Keywords: crop production, organic mulch, soil productivity, tillage systems

AE-22

Correlation Study of Rhizobium Bacteria and Legume Cover Crops (LCC) as Nutrient Providers and Bioremediators on Post-Mining Land At PT. Agincourt Resources

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Abstract: Gold mining activities have a significant impact on land degradation, particularly in terms of the physical, chemical, and biological aspects of soil. Post-mining land reclamation is an important effort to restore environmental conditions, one of which is through the use of Legume Cover Crops (LCC) that are symbiotic with Rhizobium bacteria. This study aims to analyze the correlation between Rhizobium bacteria and LCC in nutrient supply and their potential as bioremediation agents on post-mining land at PT. Agincourt Resources. The methods used include macroscopic and microscopic observations of root nodules on Vigna unguiculata plants, Desmodium gyrans plants, and Mucuna Bracteata plants grown in the Melisa Dump reclamation area. The results show that Mucuna Bracteata plants have the highest number of nodules with a dominant pink color, indicating high nitrogenase activity. Desmodium gyrans plants produced nodules with fairly good nitrogenase activity, while Vigna unguiculata plants produced nodules with low nitrogenase activity. These findings indicate that the combination of Rhizobium and Mucuna bracteata plants has great potential for improving soil fertility and soil quality in post- mining areas. This study recommends that PT. Agincourt Resources prioritize Mucuna bracteata as a cover crop in their reclamation program.

Keywords: Rhizobium, Legume Cover Crops, Root Nodules, Bioremediation, Mine Reclamation

AE-23

Earthworm Population and Diversity in Smallholder Oil Palm Plantations under Conventional and Semi-Organic Systems in Labuhan Batu Regency

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Abstract: Oil palm (Elaeis guineensis Jacq.) is a vital plantation commodity for the Indonesian economy. The system most commonly used by farmers is the conventional farming system. This system hurts both microfauna and macrofauna, particularly on earthworms. The study aimed to analyze the relationship between the population and diversity of earthworms in conventional and semi- organic farming systems in oil palm plantations. The research was conducted in 18 smallholder oil palm plantations aged more than 10 years in the North Sumatra region, specifically in Labuhan Batu Regency, from October 2023 to April 2024. The research was conducted in 18 locations of producing oil palm plantations. Each location was sampled as many as three times, resulting in 54 samples (n = 54). The research method was a survey method, and the samples were collected using purposive sampling. The study results showed that pH, sand content, and soil C-organic parameters positively correlated with the earthworm population. In contrast, the negatively correlated parameter was soil moisture content. Earthworm diversity is positively correlated with pH and soil sand content while negatively correlated with soil water and Organic Carbon.

Keywords: Earthworms, population, diversity, farming systems, oil palm

AE-24

Effectiveness of Cinnamon Leaf Extract (Cinnamomum Burmanni Blume) 'Pupuan' Bali in Controlling Blast Disease Attacking Rice Plants

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Abstract: Cinnamon plants as biofungicides can be used as biological control against plant diseases. Cinnamon leaf extract can control plant pathogenic fungi. Cinnamon plants that live in Pupuan Village, Pupuan District, Tabanan, Bali have never been studied for their inhibitory power against plant pathogens, especially against fungi that cause Blast disease that attacks rice plants, their phytochemical content and their species. Based on this, a series of experiments will be carried out, namely the effectiveness of cinnamon leaf inhibition against fungi that cause Blast disease that attacks rice plants, their phytochemical content, GC-MS analysis and analysis of cinnamon leaf diversity based on PCR analysis. Cinnamon leaf acetone extract from Batungsel Village, Pupuan District, Tabanan, Bali can inhibit the growth of fungi that cause Blast disease in rice plants with an inhibitory diameter of 36 mm. Minimum Inhibiting Concentration (MIC) value at a concentration of 0.5% with a diameter of 7 mm. This extract contains a group of phytochemical compounds, namely phenol, tannin, flavonoid, steroid/terpenoid and alkaloid. With more specific compounds consisting of 11 compounds with 4 dominant compounds, namely 2-Propenal, 3-phenyl-; 6-phenyl-3, 5-hexadien-2-one; Acetic acid, cynamyl ester; and 2-propen-1-ol, 3-phenyl-, (E) - each with a content of 25.58%, 11.77%, 10.44% and 10.14%. The identity of the cinnamon species has not yet been determined, but it has the same ancestor as C. tamala, C. daphnoides, C. osmophloeum, and C. burmanii, with the closest relative genetic distance to C. tamala, namely 94 mutations.

Keywords: biofungicide, GC-MS, inhibitory power, phytochemicals, PCR-DNA

SPD-01

Computer-Assisted Semen Analysis in Indonesian Buffalo: Correlations with Plasma Membrane Integrity, DNA Fragmentation, and Acrosome Integrity

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Abstract: This study evaluates sperm quality parameters and kinematic traits in frozen semen from Silangit and Toraya Buffaloes, highlighting significant breed-specific differences and correlations. Plasma membrane integrity was comparable between the two breeds, whereas DNA fragmentation was significantly higher in Silangit than Toraya Buffaloes ($p < 0.05$). Acrosome integrity was consistently high across both breeds without significant differences. Plasma membrane integrity was significantly positively correlated with straight-line velocity in Silangit Buffaloes ($p < 0.05$), while in Toraya Buffaloes, it exhibited a significant negative correlation with amplitude of lateral head displacement ($p< 0.05$). DNA fragmentation had weak correlations with kinematic parameters in Silangit Buffaloes but showed significant positive correlations with straightness and straight-line velocity in Toraya Buffaloes ($p < 0.01$). Acrosome integrity was significantly positively associated with curvilinear velocity in Silangit Buffaloes ($p < 0.05$) and negatively correlated with progressive motility in Toraya Buffaloes ($p < 0.05$). Kinematic analysis showed no significant breed differences in progressive motility, velocity curved line, or wobble. However, Toraya Buffaloes exhibited significantly higher velocity average path ($p < 0.01$) and amplitude of lateral head displacement ($p < 0.05$), whereas Silangit Buffaloes

displayed significantly greater straightness ($p < 0.01$), linearity ($p < 0.05$), and beat cross frequency ($p < 0.05$). These findings demonstrate the critical roles of plasma membrane integrity, DNA fragmentation, and acrosome status in influencing motility patterns, with breed-specific differences underscoring the importance of tailored cryopreservation protocols. This research provides valuable insights into improving artificial insemination practices and enhancing fertility outcomes in buffalo breeding programs.

Keywords: Buffalo reproduction, kinematics, Plasma Membrane Integrity, DNA fragmentation, Acrosome Integrity

SPD-02

Development of Institutional Batik Design Based on Water Spinach and Institutional Visual Elements: Sustainability and Visual Identity Representation

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Abstract: Batik as Indonesia's cultural heritage has great potential in supporting sustainable fashion, especially through the exploration of nature-based motifs and the use of environmentally friendly textile materials. However, the use of batik in the context of institutional identity is still limited, especially in integrating sustainability elements. This research develops an institutional batik design that adapts the motif of water spinach, which is an aquatic plant with high ecological value, as a symbol of growth and sustainability, combined with institutional visual elements. This research focuses on strengthening the visual identity of institutions through batik, with a case study in the Undergraduate Fashion Design Education Study Program Surabaya State University (UNESA). This study aims to: (1) develop institutional batik designs based on natural motifs and institutional visual elements as an implementation of environmentally friendly fashion; and (2) describe the role of batik design in representing the visual identity of the institution. This research uses the practice- led research method, which consists of four stages: (1) pre-design, in the form of literature exploration, visual study, and philosophical analysis of motifs; (2) design, including development of design concepts, motif sketches, and selection of batik techniques with appropriate textile materials; (3) embodiment, in the form of making written batik prototypes and evaluating batik designs; and (4) presentation, including scientific publications and product documentation in the form of an E-Catalog. The research results show that: (1) batik designs with water spinach motifs and elements of institutional identity produce a batik collection with the theme Batik Fashionesa, which is applied to wrapped cloth, sarongs and long cotton cloth; and (2) institutional batik plays a role in strengthening visual identity, increasing recognition of the institution both in the academic environment and the wider community and functions as a medium for differentiation of the institution's unique character.

Keywords: Institutional_batik, nature_inspired_motif, water_spinach, visual_identity, sustainable_fashion

SPD-03

Nature's pH Palette: Eco-Friendly Extraction and Spectroscopic Insights into Red Cabbage Anthocyanins as Freshness Sensors

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Abstract: This study explores the colorimetric response and spectroscopic properties of red cabbage (Brassica oleracea) anthocyanins across the full pH range (1–14) using buffer solutions adjusted with acetic acid, sodium thiosulfate, HCl, and NaOH. Anthocyanins were extracted and purified prior to experimentation, then introduced into each buffer, resulting in a vivid spectrum of color changes: red in acidic conditions, purple at neutral pH, and blue to yellow in alkaline environments, consistent with their known pH sensitivity. These transitions were visually observed and further characterized by UV-Vis spectroscopy, which revealed clear, pH- dependent shifts in absorption maxima corresponding to different anthocyanin structures. The study confirms that red cabbage anthocyanins are reliable, natural pH indicators, showing distinct and reversible color changes that can be easily detected by the naked eye. Their low cost, abundance, and strong halochromic capacity make them particularly suitable for use in freshness sensors for perishable foods and smart packaging applications. This work highlights the practical value of red cabbage anthocyanins as sustainable, biodegradable alternatives to synthetic indicators, supporting both food safety and environmental sustainability.

Keywords: red cabbage anthocyanins, natural pH indicator, colorimetric response, UV- Vis spectroscopy, freshness sensor

SPD-04

Development of Ethylene-Adsorbing Active Packaging to Extend the Shelf Life of Cavendish Bananas

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Abstract: Bananas are a widely cultivated agricultural product with significant potential for utilization. However, as climacteric fruits, they exhibit high respiration rates and ethylene production after harvest, leading to a short shelf life. To address this issue, active packaging technology can be implemented to preserve the freshness of horticultural products during storage and distribution. This research aims to develop ethylene-adsorbing active packaging to slow the ripening process of Cavendish bananas, thereby extending their shelf life in a cost-effective manner. The KMnO4-based adsorbent material, combined with activated charcoal, functions by capturing ethylene emitted during ripening and oxidizing it, thus delaying the ripening process. The study employed a randomized block design (RAK) with variations in potassium permanganate concentration and storage temperature. Fruit quality was assessed through color

analysis, shelf life evaluation, hardness measurement, total soluble solids (TSS), vitamin C content, and total titratable acidity. The results demonstrated that ethylene-adsorbing active packaging, utilizing a pouch model made from litho paper, effectively preserved fruit quality and extended the shelf life of Cavendish bananas compared to the control at an optimal storage temperature of 14– 16°C. The initial shelf life of three days was successfully extended to five to six days. Based on expert design optimization, the ideal active packaging formulation was achieved using a KMnO4 concentration of 0.7g per pouch.

SPD-05

Physicochemical Properties Evaluation of Mix Extracts Toothpaste for Dental Health

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Abstract: The increasing demand for herbal toothpaste arises from its natural antimicrobial and anti- inflammatory properties. Mix extracts toothpaste (red ginger, cumin, cinnamon, royal jelly) are innovative formulations; however, comprehensive evaluations of their physicochemical properties are limited. This study aims to assess the physicochemical quality of mix extracts toothpaste based on the Indonesian National Standard (SNI). Laboratory experiments were conducted to evaluate homogeneity, viscosity, pH, organoleptic properties, and foam formation over 21 days of storage (days 1, 7, 14, 21). Results showed that Mix extracts toothpaste exhibited good homogeneity, viscosity, and pH stability. Organoleptic tests revealed similar in color, taste, aroma, and texture. Mix extracts toothpaste met the SNI foam formation criteria. In conclusion, mix extracts toothpaste demonstrated superior physicochemical properties, supporting its potential in Dental health applications.

Keyword: cinnamon, cumin, dental health physicochemical,red ginger, royal jelly, toothpaste

SPD-06

Cavendish Banana Pseudostem and Blitar Honey Pineapple Leaves as Fiber Sources for Tapestry Weaving Featuring the Lung-Lungan Pattern."

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Abstract: This study examines the utilization of honey pineapple leaves and Cavendish banana sheaths, which grow abundantly on the slopes of Mount Kelud-Blitar, as natural fiber materials for tapestry weaving. By utilizing these agricultural wastes, the research aims to process fibers from both plants using the Practice-Led Research method, which consists of four stages: discover (identifying materials and potential), define (formulating problems and objectives), develop (developing processing and manufacturing techniques), and deliver (presenting the final results).The processing involves sorting the materials, fiber extraction, drying, combing, and fiber joining by twisting 3 to 15 strands into weft threads. These twisted threads are then woven together with warp threads to produce a weave featuring a geometric lung-lungan pattern.The study results show that the tapestry made from honey pineapple leaf fibers and banana sheaths has a unique and appealing rough texture, which is well accepted and liked by the community. This research also highlights the potential of environmentally friendly and sustainable local materials for developing traditional textile arts with an innovative touch.

SPD-07

The Effectiveness of Nanocoating-Porang as A Natural Preservative To Maintain The Quality of Kintamani Siam Oranges

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Abstract: Siam Kintamani orange (Citrus nobilis) is a superior Indonesian variety known for its sweet and fresh taste, but has a relatively short shelf life, especially in Kintamani, Bali. Damage caused by microorganisms such as fungi and bacteria, as well as environmental factors, threaten the quality and competitiveness of the product in the market. This study aims to explore porang-based nano- coating technology incorporated with natural antimicrobial materials to extend the shelf life of Siam Kintamani oranges. Nano-coating functions as a protector to reduce physical and biological damage to the fruit. The research method consists of five stages, starting with the characterization of oranges based on harvest age, preparation of nano-coating solutions, and testing of application methods (spraying, dipping, and controlled dripping). Furthermore, the nano-coating's structure and properties were analyzed using Scanning Electron Microscopy (SEM). The final stage includes testing the shelf life of oranges at various storage temperatures and types of packaging. The parameters observed include weight loss, color, number of damaged fruits, texture, water content, pH, vitamin C content, total soluble solids, total microbes, and shelf life. The results are expected to provide innovative solutions that support the sustainability of the agricultural industry, increase the added value of products, and ensure the adoption of technology among farmers and business actors in Indonesia.

Keywords: effectiveness, nanocoating-porang, natural preservative, fruit quality, siam oranges

SPD-08

Cellulose Obtained from Sea Grass (*Enhalus acoroides*) Leaf and Sago Pith Waste (*Metroxylon sagu Rottb.)* Through Hydrogen Peroxide Citric Acid Treatment

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Abstract: This study reported the cellulose characteristics obtained between sea grass (*Enhalus acoroides*) and sago pith waste (*Metroxylon sagu Rottb.)* through green technology treatment, hydrogen peroxide citric acid mixture, under autoclaving (AT) and water-bath hot plate (WBHP) condition. Prior to cellulose isolation both raw materials were delignified under alkaline hydrogen peroxide treatment. Cellulose was characterized for degree of polymerization, functional groups, crystallinities, thermal behavior, water holding capacity (WHC), and oil holding capacity (OHC). Results show that AT treatment produces yellowish color indicated the presence of lignin-oxidized exposed to the surface while WBHP treatment result in white color which also detected through infra-red spectra that purify cellulose was obtained from WBHP treatment. Degree of polymerization of cellulose significantly decrease below 400 indicating the harsh of biopolymer scission. Crystallinity and thermal behavior of both celluloses improved as cellulose purify was obtained. Although, the WHC and OHC are still undergoing investigation, it is expected that the presence of non-cellulosic component will influence such phenomena. Interestingly, cellulose between sea grass and sago pith waste has similar characteristic. This research provides information for adding value of unutilized cellulose source through green approach for sustainable advanced material and food field application.

SPD-09

Preparation and Characterization of Chitosan Nanoparticles of Sea Urchin (*Tripneustes Gratilla*) using Beads-Milling Method for Biodegradable Edible Film Fillers

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Abstract: The purpose of this study is to determine the mechanical properties and barrier properties of palm starch film (PS) which is substituted with kappa carrageenan (KCRG) with chitosan sea urchin nanoparticles (NPs CsSU) as fillers produced by *the beads-milling* method. The use of nano-sized chitosan polymers functions as biopolymers that contain antimicrobial substances that can be used as preservatives that extend the shelf life of food. The use of NPs CsSU is as a filler with a concentration (0, 1, 2, 3%) incorporated into 2 mg of palm starch and caragenan (2:1) with the addition of CMC and glycerol (2:1) as a plasterer former. The results showed that the brightness color change (L*) with the addition of 3% NPs CsSU was 61.13 compared to the 61.32 control. The process of stirring the solution using a 1500 rpm *magnetic stirrer* also affects the properties of the film thickness, occurring at the time of printing so that the thickness of the film varies in the range of 0.07–0.13 mm. The use of palm starch with a certain concentration affects tensile strength in the range of 3.09 – 12.79 MPa and elongation properties of 17.81 – 34.49%, water vapor permeability level (WVTR) of 3.91 – 14.24 g.mm/$m^{2h\text{-}1kPa\text{-}1}$. Nanocomposite films have great potential to be developed as active packaging.

Keywords: nanoparticles, chitosan sea urchin, palm starch, edible film

SPD-10

Effect of carrier combination on microencapsulation efficiency and physicochemical properties of *Citrus latifolia* peel essential oil by spray drying

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Abstract: Essential oils in general and lime essential oil (*Citrus.sp*) in particular tend to be susceptible to changes and quality deterioration during storage. This study was conducted to evaluate the impact of carriers in the microencapsulation process on the microencapsulation efficiency and physicochemical properties of *Citrus latifolia* peel essential oil by spray drying method. The results showed that the use of maltodextrin combined with whey protein or gum arabic (ratio 1:1) gave high encapsulation performance (57.04% - 61.14%), superior to the use of maltodextrin alone or combined with tween 80 (4.16% - 5.77%). However, these samples had low surface oil content and lower solubility. The sample using maltodextrin:tween 80 had different moisture content, aw index and L* brightness value compared to other carriers. Notably, the maltodextrin:whey mixture showed higher recovery efficiency and antioxidant capacity. However, the maltodextrin:gum arabic mixture had the highest content of microencapsulated essential oil and showed superior efficacy in inhibiting *Fusarium equiseti* and other contaminating microorganisms. These results indicate the potential application of microencapsulated lime essential oil in the field of postharvest preservation of agricultural products.

Keywords: Citrus latifolia, essential oil, microencapsulation, antioxidant, antifungal.

SPD-11

Smart Colorimetric Film For Monitoring Freshness of Chicken

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Abstract: Food spoilage is a critical issue affecting public health and food security, necessitating the development of intelligent packaging solutions for real-time freshness monitoring. In this study, a bio-composite film composed of polyvinyl alcohol (PVA), cellulose nanocrystals (CNC), and anthocyanin extracted from natural sources was developed as a pH-sensitive indicator to detect spoilage in chicken breast. The incorporation of anthocyanin, a natural pH- responsive dye, enables the film to exhibit visible color changes in response to the volatile nitrogenous compounds released during microbial decomposition. The physicochemical properties, mechanical strength, water resistance, and colorimetric response of the bio- composite film were systematically investigated. The results demonstrate that the PVA/CNC/anthocyanin film undergoes a distinct color transition from reddish-purple to greenish-blue, corresponding to pH changes associated with the freshness deterioration of chicken breast. This study highlights the potential application of sustainable, biodegradable, and intelligent packaging materials in the food industry, contributing to enhanced consumer safety and waste reduction.

Keywords: Polyvinyl alcohol, cellulose nanocrystals, anthocyanin, pH-sensitive film, intelligent packaging, food freshness monitoring.

SPD-12

Agricultural-based Biomass as an Efficient Absorbent for Chemical Spill

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Abstract: Hazardous chemical spills pose significant risks to human health, property, and the environment. Conventional spill kits require separate absorption and neutralization steps, prolonging spill cleanup. Agricultural biomass, such as rice husk (RH) and palm oil empty fruit bunches (EFB), has emerged as a potential sustainable alternative for bi-functional absorbents. This study investigates the modification of RH and EFB using sodium bicarbonate (SBRH) and oxidation methods to enhance their dual functionality. Characterization techniques including XRD, BET, SEM, FTIR, XRF, TGA, and carboxyl content analysis confirmed structural and chemical modifications. SBRH demonstrated increased surface area and mesoporous structure, while XRF showed the incorporation of sodium compounds. EFB modifications resulted in increased carboxyl functional groups, with oxidation reducing lignin content and enhancing acid neutralization capacity. XRD revealed reduced amorphous content in oxidized EFB, signifying the removal of non- cellulosic components. BET analysis indicated structural changes, with varying pore volumes and surface areas across different modifications. Performance tests demonstrated that SBRH effectively absorbed and neutralized acid spills, with an optimal absorbent-to- neutralizer ratio of 1:0.5. Oxidized EFB, particularly EFB/KMnO4, exhibited strong absorption and neutralization properties, with 0.6 g required to absorb 1 mL of base spill. However, EFB/9% H2O2 showed limitations in oil absorption and prolonged neutralization time for strong acids. Overall, modified RH and EFB serve as promising bi- functional absorbents for spill mitigation, offering cost-effective and environmentally friendly alternatives to synthetic spill kits.

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SDGs-01

A bibliometric study on the use of *Ganoderma* species in mycoremediation: A critical assessment

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Abstract: Mycoremediation has emerged as a promising strategy for addressing various environmental pollutants. Despite the considerable body of research on this topic, a comprehensive bibliometric analysis has been lacking to map the research landscape and identify key trends. This study analysed publications on the bioprospecting potential of *Ganoderma* species in mycoremediation, retrieved from the Web of Science. The findings reveal significant growth in publication output and citations over the past 25 years, reflecting heightened interest in this field. China led in publication output. Elsevier journals were identified as the most prolific and highly co-cited publishing platforms. According to the keyword, *Ganoderma lucidum* is extensively studied among Ganoderma species. In this respect, this research gives a comprehensive outline of the development of this area. It provides aspects that might be useful for subsequent studies, promoting further collaborative research worldwide on mycoremediation applications. In retrospect, mycoremediation is susceptible to SDG number six, which is Clean Water and Sanitation.

Keywords: *Ganoderma lucidum*, mycoremediation, pollutant, wastewater treatment, SDG6 Clean Water and Sanitation

SDGs-02

Practice-Based Ecofeminism: Women's Ecological Knowledge In Sustainable Food Systems

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Abstract: Sustainable food systems transformation requires understanding how women's ecological knowledge drives climate adaptation, yet current frameworks inadequately capture women's agency in creating resilient agricultural practices. This study examines women's adaptive strategies in two climate-vulnerable villages in Manggarai Barat, Eastern Indonesia. Using participatory feminist methodology, we conducted six-month ethnographic research with 15 women farmers in contrasting agroecological contexts: intensive monoculture versus diversified water-constrained agriculture. Women demonstrate sophisticated ecological knowledge through community seed banks maintaining 12+ local varieties, intensive polyculture home gardens, and water-efficient rotation systems. Rather than victims of climate change, women function as "informal agroecology laboratories," continuously innovating traditional practices for sustainability. They exhibit "dual agency"—transforming structural marginalization into alternative authority over food system resilience. We propose "Practice-Based Ecofeminism" theory, advancing beyond essentialist women-nature relationships to reveal women's technical, adaptive ecological knowledge. Our "Rooted Sustainability" framework integrates ecological, cultural, and autonomy dimensions of agricultural sustainability. Findings show sustainable food systems emerge from supporting existing women-led innovations rather than external technological interventions. This research provides evidence-based frameworks for gender-responsive sustainable food systems policy recognizing women as primary agents of agricultural transformation.

Keywords: sustainable agriculture, women's ecological knowledge, climate adaptation, food systems transformation, practice-based ecofeminism

SDGs-03

Analysis of Milk Consumption Habits and Nutritional Status Of Toddlers as A Basis For Preparing A Free Milk Program in The Namorambe Community Health Center Area, Deli Serdang Regency

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Abstract: Basic health research in Indonesia found that 27% of toddlers are malnourished and 8% are severely malnourished. Lack of food intake in toddlers and poor parenting are suspected to be the main causes of malnutrition in toddlers. Additional food programs such as milk provision are efforts to fulfill nutritional intake to improve malnutrition in toddlers. This can be known by analyzing how toddlers' milk consumption habits and nutritional status are so that the plan to provide free milk is right on target. The results of the study showed that toddlers with good nutritional status were 78% based on BB/A and based on TB/A, only 22% of toddlers had normal height. Milk consumption habits are known that 76% of toddlers receive colostrum and 78% of toddlers have received exclusive breastfeeding. However, 24% of toddlers do not receive breast milk and only 20% of toddlers receive breast milk according to the provisions, namely for 2 years. Consumption of formula milk at least 3 times a day is found in 44% of toddlers with various types of formula milk, but there is still a consumption of sweetened condensed milk as much as 4%. For toddlers over 6 months - 2 years, free milk should be in the form of powdered formula milk served by the toddler's mother. Meanwhile, for toddlers aged 2 to 5 years, it can be given in the form of powdered formula milk which is prepared by the toddler's mother or in the form of ready-to-drink milk in boxes or bottles

Keywords: milk consumption habits, nutritional status, toddlers, free milk program

SDGs-04

Traditional Indian knowledge system - A Significance Way to Maintain Sustainability

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Abstract: Traditional Indian knowledge can be defined as 'the knowledge developed by the local people of a given environment that is transmitted from generation to generation through oral tradition, kinship networks, communal connections, social groups, etc. for the wise management of those resources' On which their daily sustenance depends. Although there is no concrete definition of traditional Indian knowledge, it has been defined and redefined by many scholars, platforms, organizations, etc. The World Bank (2003) defines indigenous knowledge as 'a large set of knowledge, skills and experiences developed outside the formal educational system' that people apply to develop, improve and sustain their livelihoods. Indian Knowledge System (IKS) is the transmission of knowledge from one generation to the next. This is a well-structured system and process of knowledge transfer, not just a tradition. Vedic literature is it is considered the source of Indian knowledge tradition. Upanishads, Vedas and Upvedas are all parts of Indian knowledge system. The Indian education system believes in the existence of life in all things in the universe. Our Vedas treated Nature is like God where plants like Neem, Tulsi, Peepal etc. are also worshiped and propagated. To plant trees. India has always been a cente of knowledge with world's top universities like Nalanda Takshashila and Magadha universities were established and education in all subjects was give here. the Indian Knowledge systems consisting of knowledge, science and philosophy of life have developed from experience, Observation experimentation and rigorous analysis. indigenous knowledge and natural resources and their utilization among the local population with focus of relationship between human beings and natural biodiversity. Natural Resource Management (NRM) refers to the management of natural resources such as land, water, soil, plants and animals, with a specific focus on how management affects the overall quality of life. Indigenous people happen to be the carriers of ancestral knowledge and wisdom regarding biodiversity. Their active participation in biodiversity conservation programs is essential for resource management to be more effective and cost-efficient. The traditional Indian knowledge system is rich and diverse such as food and seed storage, environmental sustainability, crop management or agriculture productivity, water management. Existing research inthis area has confirmed the importance of indigenous knowledge in environmental sustainability, while adopting, redefining and integrating these knowledge systems into mainstream policy and programming to enhance overall sustainable development of the world at large.

SDGs-05

Traditional knowledge system and Environmental Sustainability

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Abstract: Traditional Indian knowledge can be defined as 'the knowledge developed by the local people of a given environment that is transmitted from generation to generation through oral tradition, kinship networks, communal connections, social groups, etc. for the wise management of those resources' On which their daily sustenance depends. Although there is no concrete definition of traditional Indian knowledge, it has been defined and redefined by many scholars, platforms, organizations, etc. The World Bank (2003) defines indigenous knowledge as 'a large set of knowledge, skills and experiences developed outside the formal educational system' that people apply to develop, improve and sustain their livelihoods. Indian Knowledge System (IKS) is the transmission of knowledge from one generation to the next. This is a well-structured system and process of knowledge transfer, not just a tradition. Vedic literature is it is considered the source of Indian knowledge tradition. Upanishads, Vedas and Upvedas are all parts of Indian knowledge system. The Indian education system believes in the existence of life in all things in the universe. Our Vedas treated Nature is like God where plants like Neem, Tulsi, Peepal etc. are also worshiped and propagated. To plant trees. India has always been a cente of knowledge with world's top universities like Nalanda Takshashila and Magadha universities were established and education in all subjects was give here. the Indian Knowledge systems consisting of knowledge, science and philosophy of life have developed from experience, Observation experimentation and rigorous analysis.

SDGs-06

The Environmental Crisis or Relevance of Indian way for sustainable development and management

Lakshki Choudhary
Mahila Samnavya Jaipur> Indie

Abstract: The environmental deterioration that is happening, thanks to our life styles and worship of development and progress, is worsening day by day. Gandhiji has not said anything specific on it as environmental degradation had not become a problem then. But we have it in his writings. Once, when asked for a message to humanity, Gandhiji said, **"my life is my message"**. We can find everything we want, provided we go through his writings, his speeches and his life. Man's progress and the road to development has led to the deterioration of nature. In his quest for fulfilling his needs, he has exploited nature to its maximum. This is development that is ecologically not sustainable. In the words of James Mc hall, the human being has become the most dangerous organism that the planet has ever hosted.awareness about the degradation of environment has been growing since the fifties. Steps were being taken to increase this awareness through books, conferences, etc. The irony is that though every responsible person seems to be worried and anxious about environmental degradation, a meaningful solution is nowhere in sight. It is here that the Mahatma's teachings give us some hope.in the western tradition man was an entity apart from the earth which he was encouraged to conquer, whereas in Indian tradition earth was his mother which he should hold in veneration. Gandhiji was very much influenced by our tradition and stressed on Truth and non-violence. In the words of Gandhiji "man has no power to create life, therefore, he has no right to destroy life." Man has been endowed with higher faculties so that he can be compassionate to lower beings. If environment is to be saved from degradation we have to avoid or limit the use of machinery. That is where Gandhiji's promotion of Khadi and Village Industries have become more relevant today than during the freedom struggle. We should read Gandhiji's Constructive Programme. Harijans and women are not yet treated as equal members of our society. Health and hygiene are wanting in Rural India. Many other aspects of life are discussed in the constructive programme. Adopting some of his ideas will be the first step in

saving the environment.even more important are the eleven Vows or Vratas of Gandhiji which are non- violence, Truth, Non-stealing, Brahmacharya, Non-avarice, Physical labour, Control of Palette, Religious harmony, Fearlessness, Swadeshi and Abolition of untouchability. In fact, the significance of each of the vratas could be elaborated in the context of preserving the environment. Through the cardinal point Gandhiji has been expounded in this essay, I cannot help repeating Gandhiji's famous quotation. "The earth has enough resources for our need, but not for our greed." What greater message is there to save this earth from the environmental disaster

SDGs-07

Decoding India's SDG Implementation: Stakeholder Insights on Barriers, Priorities, and Regional Disparities

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Abstract: The Sustainable Development Goals (SDGs) offer a global framework for inclusive development, yet their implementation in developing countries remains complex and context- dependent. This study explores stakeholder perceptions of SDG implementation in India through an online survey of professionals from academia, civil society, and industry. Findings reveal that while a significant share of respondents view SDGs as relevant to India's development needs, concerns persist around data gaps, weak intergovernmental coordination, and inadequate financing. Priority SDGs identified include Zero Hunger, Good Health, Gender Equality, Clean Water, and Reduced Inequality, whereas SDGs such as No Poverty and Climate Action received lower urgency ratings. Regional disparities and institutional weaknesses were seen as major barriers, particularly in low-income states. The study highlights the need for localized strategies and improved stakeholder engagement to enhance implementation effectiveness and equity. It offers evidence-based insights to support national planning and policy alignment with the SDG framework.

Keywords*:* Sustainable Development Goals, India, Stakeholder Perception, Policy Implementation, Regional Disparities

SDGs-08

Willingness of Public Duty Bearers to Pay and Adopt Ecosystem-based Disaster Risk Reduction: A Policy Implication for Climate Resilience in Victoria, Oriental Mindoro, Philippines

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Abstract: The successful implementation of Ecosystem-Disaster Risk Reduction and Climate Change Adaptation (Eco-DRR/CCAM) initiatives significantly hinges on the willingness of public duty bearers, such as policymakers and implementers, to support and adopt these programs. A critical method for assessing this willingness is through testing their financial contributions to the initiative, known as willingness to pay (WTP). The survey results reveal a strong community commitment to ecosystem-based strategies for disaster risk reduction and climate change adaptation, with all 147 respondents (100%) expressing readiness to engage in these initiatives. Notably, 95.9% of individuals indicated a willingness to participate in forest reforestation efforts, highlighting the vital role of forests in mitigating climate change and enhancing biodiversity. Although a small percentage (4.1%) expressed reluctance to contribute, the majority demonstrated significant financial commitment, pledging a cumulative total of 73,000 pesos for reforestation. However, concerns regarding accountability and transparency in funding emerged, as some respondents believed the government should lead these efforts. Despite these hesitations, substantial contributions were made, particularly from individuals willing to donate higher amounts, reflecting a robust base of support for reforestation initiatives. The findings underscore the potential for community-driven action to enhance environmental sustainability and manage flood risks, advocating for educational outreach to further engage individuals in these essential efforts.

Keyword: WTP, Adopt Eco-DRR, Policy, Climate Resilience

SDGs-09

Do University Students Recognize and Understand the SDGs?

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Abstract: As the world moves closer to the 2030 deadline for achieving the United Nations Sustainable Development Goals (SDGs), university students play a key role as future leaders and change makers. This study explores how well students in India know and understand the SDGs, and how relevant they find them in their personal and professional lives. A survey was carried out with both undergraduate and postgraduate students from different academic backgrounds using a structured questionnaire. The results show that awareness of the SDGs is increasing, but not evenly. Undergraduate commerce students were generally more familiar with the goals than their postgraduate or humanities/science peers. Interestingly, students who understood the SDGs better—especially undergraduates—also felt a stronger sense of responsibility as citizens. However, many still lack a clear understanding of the SDGs' core concepts. These findings suggest a need to include SDG-related content in higher education to build awareness, responsible citizenship, and sustainable thinking among youth.

Keywords*:* Sustainable Development Goals (SDGs), India, University Students, Higher Education, Awareness and Perception

SDGs-10

The Influence of Fast Fashion Awareness on Clothing Disposal and Management Habits

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Abstract: The advancement of the times has made clothing trends develop faster, until the fast fashion trend emerged. The rise of fast fashion can cause overproduction and excessive consumption, thus creating piles of textile waste and hazardous emissions into the air, water, and soil. Real action is needed to reduce the amount of clothing waste caused by fast fashion. This study aims to analyze the habits of people in 4 major cities in Indonesia in managing clothes. The type of research used is quantitative and qualitative descriptive research. The subjects of this study were residents of Cianjur Regency, Medan City, Bandung City, and Jakarta City, aged 18-50 years, and had bought clothes for their own needs. The data collection technique used was by distributing questionnaires. The data analysis techniques used were descriptive statistical analysis techniques, correlation analysis, and thematic analysis. The results of the study showed that there was a relationship between fast fashion awareness and the habit of throwing away clothes (p-value = 0.000). The conclusion obtained is that there is a positive and significant relationship between knowledge and awareness of fast fashion and people's habits in managing clothes, where the higher a person's level of understanding, the better their behavior in storing, donating, or managing old clothes responsibly.

Keywords: awareness, clothing, fast fashion, textile waste

SEAFE-01

Development Potential of Bali Cattle in South Sulawesi: A Study on Population Structure and Management System

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Abstract: Bali cattle (Bos sondaicus) is one of Indonesia's indigenous livestock commodities that plays an important role in supporting food security, especially in the livestock sector. South Sulawesi, as one of the centres of beef cattle development, has excellent potential in developing Bali cattle, although smallholder farms still dominate beef cattle farming in this region. This study aims to examine the relationship between population structure, management system and reproductive success. A field survey involving 166 farmers with a total sample size of 826 Bali cattle spread across several districts was conducted. Data collection was conducted using questionnaires, and descriptive analysis was used to assess population characteristics and management practices. The results showed that female cattle dominate the Balinese cattle population, thus providing opportunities for cattle development through appropriate breeding strategies to increase the population. Extensive and semi-intensive management systems generally use natural mating (NM), while intensive systems prefer artificial insemination (AI). Calving rates across all methods were consistent, ranging from 58.33% to 59.09%, indicating reproductive success. However, AI proved to be more effective in improving genetic quality. Despite these promising results, challenges such as limited access to superior males and numerous shortages through NM hinder productivity. In conclusion, Bali cattle development in South Sulawesi requires integrating AI technology and other reproductive technologies into farming practices. Policy support is essential to facilitate the adoption of these technologies and improve genetic quality and overall productivity, thus ensuring the sustainable growth of Bali cattle farming in the region.

Keywords: Bali Cattle, Farming System, Mating Method, Population Structure, South Sulawesi

SEAFE-02

Diamond Porter Analysis to Measure the Competitiveness of Coffee Agribusiness in the Karo Regency Highlands, North Sumatra Province

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Abstract: The research aim is to identify the competitiveness analysis of Arabica coffee commodities in the Karo Regency highlands using Porter's Diamond theory analysis to determine Arabica coffee export policies to the international market. The results of the analysis show that comparative RCA (Revealed Comparative Advantage) shows that the competitiveness of Arabica coffee in Karo Regency has strong competitiveness. While the results of Porter's Diamond competitiveness show that each main component has a mutually supportive relationship. The supporting component, namely the role of the government, also has a mutually supportive relationship with all main components.

Keywords: Competitiveness; Arabica Coffee; Porter's Diamond

SEAFE-03

Rooted Resilience: Women's Dual Agency and Epistemic Empowerment in Food Diversification Strategies in Manggarai Barat, Indonesia

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Abstract: This paper examines women's roles in maintaining food security amidst climate change in West Manggarai Regency, Indonesia, through an ecofeminist lens. Drawing on qualitative research in two villages, we identify "dual agency" in women's food system engagement— experiencing formal marginalization while developing alternative domains of influence. The study introduces "epistemic empowerment" as a framework for recognizing women's ecological knowledge systems as legitimate forms of power enhancing resilience. While women face structural exclusion from land ownership and formal decision-making, they maintain control over seed selection, local variety conservation, and food management. Women have developed sophisticated food diversification practices that integrate technical knowledge with cultural identity, revealing "practice-based ecofeminism" that challenges conventional theory. Our research contributes to gender and rural development discourse by proposing a more contextual approach to empowerment, recognizing how women transform ecological constraints into innovation sources rather than merely overcoming them.

Keywords: Ecofeminism, food security, gender, dual agency, epistemic empowerment, Indonesia

SEAFE-04

Analysis of the Impact of Flash Floods on Socio-Economic, Food Security, and Farmer Adaptation in Tanah Datar District-West Sumatra Province

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Abstract: Flash floods and the eruption of Mount Marapi significantly impact the socio-economic sustainability of agricultural communities, especially farmers in disaster-prone areas in Nagari Limo Kaum, Tanah Datar District, West Sumatra Province. This disaster caused damage to 67.92 hectares of agricultural land, all of which were active rice fields, thus disrupting food production and the main livelihood of farmers. This study aims to analyze the impact of disasters on socio-economic conditions, food security, and farmers' adaptation strategies. The method used was the explanatory sequential mixed method, in which the quantitative approach was carried out by surveying 65 food crop farmer houses through the Livelihood Vulnerability Index - IPCC (LVI-IPCC) to measure the level of socio-economic vulnerability and adaptation, and the Food Insecurity Experience Scale (FIES) to assess the level of food security. A qualitative approach was used to support the interpretation of quantitative data, particularly in describing farmers' responses to changes in livelihoods, food access, and post-disaster coping strategies. Given the complexity of occupational shifts and post-disaster land loss, data were collected from the affected population using a combination of government beneficiary data and snowball sampling techniques. Preliminary results show a consistent relationship pattern: the higher the sensitivity value and the lower the adaptive capacity, the higher the level of food vulnerability. The results of this study are expected to be the basis for data-based disaster interventions and contribute to adaptive policy making in the agricultural sector in disaster- prone areas.

Keywords: Flash flood, agriculture, vulnerability, food security, farmer adaptation

SEAFE-05

Analysis of Indonesian Sustainable Palm Oil (ISPO) Perception for Palm Oil Farmers in Ensuring Sustainability Of Palm Oil Supply in West Sumatera

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Abstract: In order to increase the competitiveness of national palm oil through sustainable development, the government has issued a sustainable agricultural approach called ISPO (Indonesian Sustainable Palm Oil) certification, which aims to guarantee the legality of Indonesian palm oil and at the same time promote sustainable palm oil plantations so that Indonesia is expected to be able to respond to global market pressures while ensuring that palm oil products are produced in a way that does not damage the environment and society. The government has ratified it through Presidential Regulation No. 44/2020 concerning the obligation to implement ISPO for all plantation business actors, including smallholders. However, the implementation of its achievements to date is still very low. Until 2025, the achievement was only 5.68 million ha out of 16.38 million ha (37%). So this study aims to determine the level of perception of oil palm farmers in West Sumatra regarding the current ISPO certification and analyze the implementation of ISPO certification for oil palm farmers in West Sumatra. This study covers the level of perception of oil palm farmers in West Sumatra regarding the current ISPO certification. To determine the level of perception of ISPO certification, it is measured using a Likert scale with a scale score of 3: agree = 3, neutral = 2, and disagree = 1. The calculation results show the percentage of the level of perception of oil palm farmers with scores in 3 levels, namely: High (score> 77%), Medium (score 59% -77%) and Low (score <59%). It is hoped that the results of this study can provide policy recommendations on the importance of ISPO certification for the community, especially oil palm farmers in West Sumatra.

Keywords: Perception, recommendations, ISPO

SEAFE-06

Bridging Islands: A Supply Chain Study of Agricultural and Plantation Commodities in North Maluku

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Abstract: North Maluku is an archipelago province with air, land and sea transportation routes. This diversity results in a long distribution of agricultural products. The agricultural sector has an important role in the food security of a region. Food availability in North Maluku is related to the supply chain of agricultural and plantation commodities at the location. The aim of this research is to map and describe the supply chain for agricultural and plantation commodities in the North Maluku Islands. Data collection was carried out on several islands, namely Hiri, Halmahera, Bacan, Obi, Morotai, Sula, and Taliabu. Data were obtained based on interviews and observations that were analyzed descriptively. The supply chain of agricultural products in the North Maluku region involves several parties, namely farmers, collectors, retailers, and consumers. Various types of agricultural and plantation commodities are cultivated by farmers in North Maluku. In general, there are five types of supply chains in North Maluku. The types of supply chains for vegetables are generally type 1, type 2, and type 3; local fruits use type 4; and plantation products (nutmeg, cloves, copra, cocoa) use type 5. Other commodities that cannot be cultivated in North Maluku are supplied from outside.

Keywords: food security, North Maluku, supply chain

SEAFE-07

Determinants of Hybrid Rice Technology Adoption in Camarines Sur, Bicol Region, Philippines

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Abstract: Rice is a staple food for the majority of Filipinos, with hybrid rice boosting productivity in recent years. In Camarines Sur, the rice granary of the Bicol Region, rice farming plays a critical role in the local economy. This study examines the adoption of Hybrid Rice Technologies (HRT), analyzing the socio-economic and farm characteristics of rice farmers, and the determinants of adoption. Conducted in Camarines Sur's 5th district, specifically in the municipalities of Bula, Nabua, and Buhi, the study provides localized insights into agricultural practices and their implications for sustainable productivity and profitability. A random sample of 323 rice farmers was selected and surveyed using a pre-tested questionnaire. Data analysis included descriptive statistics and a Probit regression model to assess the likelihood of farmers' adoption of HRT.
Results indicate that adoption is significantly influenced by socio-economic and farming characteristics such as the farmer's occupation, credit access, tenurial status, planting method, distance from the road, and distance from the Municipal Agriculturist Office (MAO). Efforts should focus on enhancing land tenure security, access to credit, and providing targeted support to smallholder farmers, as these measures can increase adoption rates and improve productivity.

Keywords: Hybrid Rice, Technology Adoption, Probit Regression, Sustainable Farming Practices

SEAFE-08

A Comparative Profitability Analysis of Hybrid and Inbred Rice Farming in Bicol Region, Philippines

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Abstract: Several studies conducted on rice has focused on its productivity advantages between hybrid and non-hybrid varieties, consistently demonstrating the superior yield performance of hybrid rice. However, while productivity is crucial, profitability remains a more critical factor in economic analysis. This study extends beyond productivity evaluation by conducting a comparative economic analysis between the two production systems, emphasizing cost structures and profitability. Utilizing data from 323 rice farmers (143 hybrid and 180 inbred), a multiple linear regression analysis was performed to identify key cost components and farm attributes influencing profitability. Results indicate that hybrid rice exhibits higher productivity but incurs substantially greater production costs compared to inbred rice. Seed expenses emerged as the most significant determinant negatively affecting the profit-cost ratio in hybrid rice farming, followed by fertilizer, fuel, and machinery rental costs. While hybrid rice generates higher absolute net returns due to increased yield, its profit-cost ratio is lower than that of inbred rice. Notably, factors such as training attendance, credit access, and farming experience had negligible effects on profitability, whereas seed type was the only statistically significant determinant of net returns. To enhance hybrid rice profitability, policymakers and stakeholders should consider cooperative-based bulk seed purchasing, development of cost-effective hybrid varieties through localized hybrid seed production, and implementation of machinery- sharing programs. Accessible community-based credit schemes and targeted training on precision input use can help mitigate high input costs, ensuring both economic sustainability and enhanced profitability for rice farmers.

Keywords: Cost structure, Hybrid rice, Inbred rice, Profitability, Profit-cost ratio, Philippines

SEAFE-09

Financial Literacy Mediation: Digital Payment Systems and Financial Satisfaction

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Abstract: The results of the current research show that financial literacy as a mediating relationship between digital payment systems and financial satisfaction is still very limited. The same is true of the relationship between digital payment systems and financial literacy. The purpose of this study is to examine the financial literacy variable as a mediating variable in the relationship between digital payment systems and financial satisfaction. The sample in this study was determined using the purposive sampling method with the consideration that the sample had shopped the least using the digital payment system at least twice in Ternate City. A total of 118 respondents were involved in this research. The research in the hypothesis testing process uses simple and hierarchical regression analysis with the help of statistical product and service solutions (SPSS) version 24. The results of the research reveal all the hypotheses supported in this study, both partial and mediation.

Keywords: Digital Payment Systems, Financial Literacy, Financial Satisfaction, Hierarchical Regression, Ternate City

SEAFE-10

Work-family conflict and turnover intention of SME employees: The role of psychological well-being and burnout

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Abstract: This study aims to examine the effect of work-family conflict on turnover intention with psychological well-being and burnout as mediating variables in employees of Small and Medium Enterprises (SMEs) in Indonesia. The study used a quantitative approach with a survey method of 356 respondents selected through purposive sampling techniques. Data were collected through online and offline questionnaires, then analyzed using the PLS-SEM method. The results of the analysis showed that work-family conflict had a negative effect on psychological well-being, and a positive effect on burnout and turnover intention. In addition, psychological well-being was proven to have a negative effect on turnover intention, while burnout had a positive effect on turnover intention. Other findings showed that psychological well-being and burnout significantly mediated the relationship between work-family conflict and turnover intention. This study provides implications for SME management to pay attention to work-family balance and support employee mental health in order to reduce turnover rates.

Keywords: Work-family conflict, Psychological well-being, Burnout, Turnover intention

SEAFE-11

Economics of Production And Marketing of Small-Scale Sakurab (*Allium chinense* G. Don) Farms in Bangsamoro Re- Gion in Muslim Mindanao (Barmm), Philippines

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Doctor of Philosophy (Agricultural Economics), Central Mindanao University, University Town, Musuan, Bukidnon, December 2024.
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Abstract: Sakurab plays a vital role in the cultural identity and economy of Lanao del Sur, Bangsamoro Region in Muslim Mindanao (BARMM). Despite its economic benefits and alignment with organic farming, research remains limited, focusing mainly on growth performance. This highlights the need for studies assessing its production, marketing potential, and contributions to local economies and food security in the region. The study aimed to assess the economic aspects of small-scale sakurab farming. It also investigated marketing preferences and identified strengths, weaknesses, opportunities, and threats (SWOT) in sakurab production and marketing. The study employed various statistical formulas and SWOT analysis to evaluate sakurab production and marketing. Data were collected through personal interviews with 169 small-scale sakurab farmers randomly selected from the five municipalities in Lanao del Sur, BARMM and thirty (30) sakurab traders. The study found that factors such as area planted, education, household size, and market distance were significant variables affecting the productivity of sakurab. The study also confirmed sakurab farming to be a viable and profitable venture in the region, with a net return of 4,764.76 and an ROI of 28.55% and vital to the Maranao culture cuisine particularly in the processing of palapa. The study also highlights on marketing practices which revealed strong trader preferences for the Urder variety over the Rikit variety due to better returns and higher demand. The study also reveals different marketing preferences between the buyer and seller. Situating these findings within a broader context, it is clear that sakurab farming is closely tied to both the local economy and the maranaos. It is recommended that government through Ministry of Agriculture, Fisheries, and Agrarian Reform (MAFAR) and Provincial Agriculture Office (PAO) enhance their support to sakurab farmers and traders in Bangasamoro Region in Muslim Mindanao (BARMM) by providing education, trainings and seminars as well as financial assistance and access to machineries and equipment. These initiatives aim to improve best oractices in sakurab production and processing of palapa, ultimately boosting productivity and profitability in the region.

Keywords: Production Economics, Sakurab farming, SWOT Analysis, Marketing strategies

SEAFE-12

Farm machinery breakdowns: Causal Factors and Preventive Measures (Case study of using small farm machines in Riau Province, Indonesia)

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Abstract: Farm machinery breakdowns can be a crucial problem for farm business: causing costly operations, leading to downtime, and reducing productivity. Understanding the root couses of farm machinery breakdowns can help farmers to implement effective preventive measures. The puspose of this study is to investigate farm machinery breakdowns, causal factors and preventive measures. The survey was carried out in three regencies of the Riau Province namely Kampar, Siak, and Indragiri Hulu from June to July 2023. The data were collected from personally interviewing 30 machine operators and 10 mechanics. Five types of farm machinery were selected for study, including mouldboard plows, rotary tillers, four-wheel tractors, rice transplanters, and combine harvesters. Farm machinery breakdowns were found to increase every year with different rates for different machines. The main causes of farm machinery breakdowns were found to include poor/harsh field conditions, ignoring maintenance, unskilled operators, improper storage practices, and overload/intensive use of machines. To prevent the farm machinery breakdowns, the result recomments that machine operators must keep the work area clean before beginning operation, conduct regular maintenance, store farm machines inside and keep them clean conditions, and do necessary training and experience for operators.

Keywords: Farm machinery breakdown, Causal factor, Preventive measure.

SEAFE-13

Legal and Agricultural Perspective on the Importance of Farm Roads in Ternate City

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Abstract: Background: The development of farm roads in Ternate holds significant urgency from both legal and regional development perspectives. From a normative standpoint, farm road construction is regulated under Indonesian Ministry of Agriculture Regulation No. 4 of 2022, which establishes that farm business roads (Jalan Usaha Tani/JUT) constitute vital infrastructure for facilitating equipment mobility, production input distribution, and transportation of agricultural products from fields to markets or processing facilities. At the local level, the need for farm roads in Ternate has become increasingly pressing, as expressed by communities and supported by regional government and legislative bodies, since adequate access can enhance farmer welfare and reduce logistical costs and Given Ternate's geographical constraints as an island city with limited agricultural land, efficient transportation infrastructure becomes essential for maximizing the productivity of available agricultural areas and ensuring reliable food distribution to urban centers.
Objective: This study aims to analyze the urgency of farm roads in Ternate City, focusing on National Legislative Foundation, Technical Specifications, Regulatory Standards, Productivity Enhancement and Market AccessMethods: This research was classic doctrinal research which employed a statute approach and a library approach. To collect data in this study, the researchers employed literature and legislation studies (Wardiono, 2019). There were two types of data collected, namely primary data and secondary data. The primary data were obtained through statute studies, while the secondary data originated from literature studies (Subroto, Sari, Anggraini, & Muhammadi, 2024). The results of the data inventory were analyzed to obtain conclusions. Then, they were analyzed using the integrative and conceptual analysis methods that were directed at finding, identifying, processing, and analyzing legal materials to understand their meaning, significance, and relevance (Sonata, 2014). The data obtained were systematically arranged after being selected based on the problems. It was carried out after seeing their suitability with applicable provisions and then discussed theoretically. These results were combined to produce conclusions.
Results: The development of farm roads in Ternate City has influenced land use patterns in agricultural areas . GIS analysis of land cover changes between 2020 and 2025 shows that areas with improved farm road access have experienced a 15% increase in cultivated land area, as previously underutilized land became more accessible and economically viable for farming . However, the research also identified cases where farm road development has inadvertently facilitated land conversion from agricultural to non-agricultural uses, particularly in areas close to urban centers. Survey results show that farmers with access to improved farm roads report an average increase in crop yields of approximately 18% compared to pre-road conditions or areas without adequate farm road access . This productivity improvement is attributed to several factors, including better access to agricultural inputs, improved ability to use machinery, and reduced post-harvest losses due to more timely transportation. Conclusion: The legal and agricultural perspectives on farm roads in Ternate City converge on their fundamental importance as enablers of sustainable rural development and agricultural modernization. From a legal standpoint, the comprehensive regulatory framework established through national legislation and ministerial regulations provides clear mandates and technical standards for farm road development, ensuring alignment with national agricultural development objectives. The agricultural significance of these roads extends beyond transportation to encompass economic empowerment, productivity enhancement, and food security contributions essential for Ternate's sustainable development.

Keywords: Farm Roads, Infrastructure, Legal, Agricultural Land

Evaluating Knowledge Creation in Smart Container-Based Monitoring and Prediction of Fresh Fruit Quality: A Systematic Literature Review

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Abstract: Postharvest losses of fresh fruit remain a critical challenge in global horticultural supply chains. In the era of digital transformation and Industry 4.0, the evolution of fruit quality monitoring systems increasingly relies on the integration of Internet of Things (IoT), non-destructive sensors, and machine learning—advancing the emergence of smart container-based solutions. However, the existing scientific literature still shows limited evaluation of how *knowledge creation* is implemented and measured within these digital monitoring systems. Therefore, this study aims to conduct a Systematic Literature Review (SLR) to identify trends, indicators, and conceptual gaps in the implementation of knowledge creation within smart container systems for predicting fresh fruit quality. The analysis draws on 232 publications, utilizing bibliometric visualization through VOSviewer and Bibliometrix. Thematic mapping reveals that *machine learning*, *fruit quality*, *cold chain*, and *shelf life* represent foundational (basic) themes, while *hyperspectral imaging* and *support vector machine* dominate as motor themes driving AI-based quality prediction innovation. Meanwhile, concepts such as *knowledge creation*, *knowledge sharing*, and *knowledge management* remain clustered in the emerging or declining quadrants, indicating that knowledge-based approaches have not yet become central to smart monitoring system design. Overlay visualizations and temporal trends further show that the term "smart container" has not emerged as a dominant keyword, reinforcing the presence of systemic and terminological gaps in current scholarly discourse. This study concludes that the development of smart container systems for fresh fruit should shift from a tool-centric paradigm to a knowledge-centric approach that is both adaptive and systemic. By integrating the SECI model (Socialization–Externalization– Combination–Internalization) into digital monitoring architectures, future research can enhance the knowledge management infrastructure within precision agriculture logistics. These findings offer strategic contributions for academic and practitioners in developing indicators and evaluation systems for knowledge creation that support sustainable efficiency, quality, and resilience of fresh fruit distribution chains.

Keywords: Machine learning, Supply chain, Shelf life estimation, Food freshness detection

Utilization of Spatial Technology in Provision for Land of Food Crop (Corn) in the Kora Kora Watershed, Minahasa Regency

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Abstract: The provision of suitable land is an important factor in supporting the productivity of food crops, including corn, which is a national commodity. This study aims to provide potential land for corn cultivation in the Kora Kora Watershed (DAS), Minahasa Regency by utilizing spatial technology. The methods used include collecting and analyzing spatial data such as satellite imagery, topographic maps, land cover, and climate and soil type data, which are then processed using a Geographic Information System (GIS). Land suitability analysis is carried out based on several physical parameters, including slope, soil type, and rainfall. The results of the study indicate that spatial technology is effective in mapping land zones suitable for corn crops and supporting more appropriate and sustainable land use planning. 53.42 Ha of land was obtained with potential for corn development in the Kora Kora Watershed, which is expected to increase the efficiency of land use and support local food security in the Minahasa region.

Keywords: spatial technology, corn, GIS, land balance, Kora Kora Watershed, Minahasa

Environmental management adaptation in palm oil mills across biophysical land types: A systematic review and bibliometric analysis

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Abstract: Operations of Palm Oil mills are complex, among others, due to variations in land conditions from peatlands to dry soils and even flood-prone zones. Tailoring management approaches based on these varied landscapes is essential for sustainability, as well as in compliance with regulations. While most challenges arise within the processing stage, upstream plantation conditions also influence how mills manage inputs, waste, and environmental performance. To our surprise, there are just a few systematic reviews that summarize these adaptive strategies. It directly responds to this gap in knowledge by examining how Palm Oil mills are adapting their environmental policies according to land types, while also considering plantation-level factors that impact mill operations. A Systematic review, combined with bibliometric analysis, was performed considering articles published from 2015 to 2025 and indexed in Scopus. The Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) 2020 guidelines were followed, and the review was facilitated by Rayyan software. From an initial pool of 255 articles, 47 met the inclusion criteria—articles were selected using the PICOC framework and excluded if they did not focus on mill-level practices or failed to reference biophysical land characteristics. The results reveal that environmental management in Palm Oil mills is very particular to the site. Anaerobic wastewater treatment and biogas recovery systems are commonly used in the mills located in peatlands. Those sited in sloping

or erodible lands would focus on soil and water conservation, and those erected in flat mineral soils are likely to focus on energy technology. Institutional dimensions, such as certification through the ISPO and RSPO, national regulatory policies, are influential in determining these adaptation patterns. This review suggests a need to better develop and refine site-specific environmental management policies and highlights the need for new and improved performance metrics and integration of spatial analysis.

Keywords: palm oil mills, environmental management, peatland, dryland, biophysical adaptation, sustainability, systematic review.

CAFÉ-02

Green Synthesis: Harnessing Eco-Friendly Processes To Drive The Nanocircular Economy

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Abstract: Sustainable synthesis in the field of nanotechnology involves fabricating nanomaterials by using natural synthesis techniques and principles to limit the use of harmful substances and decrease waste production. This approach aims to reduce the environmental effects linked to conventional synthesis techniques that use toxic and environmentally harmful substances, releasing harmful byproducts and gases during production. Consequently, the toxicity of the chemically synthesized nanomaterials poses a significant challenge for biological applications. Therefore, eco-friendly methods are required to create nanomaterials that are less toxic or non- toxic for biological use. A fundamental change is needed in how nanoparticles are synthesized and functionalized, with a focus on biogenic resources to provide more environmentally friendly and biocompatible solutions. The green synthesis method effectively produces environmentally friendly nanosized materials by utilizing green substances like plant extracts, herbal infusions, leaf extracts, fruit juices, and enzymes, rather than chemical reducing agents. Among these, fruit juices and plant extracts are particularly advantageous due to their safety, eco-friendliness, accessibility, low cost, and ease of handling. Use of green synthesis process like sol-gel synthesis, biomineralization and self-assembly provides valuable insights into the nanocircular economy (NE) and offer numerous advantages. Firstly, it lowers the environmental impact of nanotechnology by cutting down on energy use and reducing waste production. Secondly, it enhances resource efficiency by integrating recycling and reusability principles. By emulating natural processes, a range of nanomaterials can be developed that are biocompatible, biodegradable, and have a reduced environmental impact.

CAFÉ-03

Combination of Inorganic Fertilizer and Starfruit Waste Compost on Butter Nut (Cucurbita Moschata) To Support Sustainable Agriculture

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Abstract: Butternut pumpkin (Cucurbita moschata) is a fruit that has commercial potential. In butternut cultivation, using chemical fertilizers for a long time can reduce plant productivity and land quality. Compost is needed to improve soil quality, increase fertility, and increase crop yields in sustainable agriculture. This study aimed to determine the effect of starfruit waste compost fertilizer on reducing the dose of NPK fertilizer on the growth and yield of Butternut pumpkin. The research was conducted from February to August 2023, in a smallholder plantation, Payuran Village, Tuban Regency, East Java. The design used was Randomized Group Design (RAK) with four levels of fertilization in combination with inorganic fertilizers, which include 100% NPK, 100% NPK + star fruit compost 20 tons/ha, 75% NPK, 75% NPK + star fruit compost 20 tons/ha. The results showed that treating starfruit waste compost and NPK fertilizer had no significant effect. Giving a combination of 17% NPK fertilization and star fruit compost offers results that are not different from 100% NPK fertilizer. The results show that with the use of NPK fertilizer. Fertilization efficiency can be achieved by using a 75% NPK fertilizer dose and star fruit waste compost.

Keywords: Efficiency of Fertilizer, Recycle; Sustailable Agriculture

CAFÉ-04

Greening the Growing Medium: Sustainable Alternatives to Peat Moss Using Mushroom Waste, Biochar, and Coffee Grounds

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Abstract: Peat moss has traditionally been a preferred growing medium in horticulture due to its excellent water retention and nutrient-holding capacity. However, environmental concerns linked to peat extraction, such as habitat destruction and carbon emissions, necessitate the development of sustainable alternatives. This study investigates the potential of using a blend of raw mushroom spent (RMS), composted mushroom spent (CMS), biochar, and coffee grounds as a substitute for peat moss for the seed germination and propagation of spearmint (Mentha spicata L.). These organic materials were selected for their availability, nutrient content, and ability to enhance substrate structure and microbial activity. A greenhouse experiment using a Randomized Complete Block Design (RCBD) with six treatments and six replications was conducted over eight weeks. Growth performance indicators—such as percentage of germination rate, the number of new nodes, branches, leaves and plant height- were assessed. Physicochemical properties of the growing media, including pH, electrical conductivity, and nutrient composition, were also analysed. Among the treatments, a formulation comprising 15% RMS, 15% biochar, and 15% coffee grounds (T3) yielded the best overall growth performance while formulation of 40% CMS, 10% biochar and 10% coffee and 100% CMS indicate the best growth outperforming even the conventional 100% peat moss and soil mixture controls. This blend significantly improved plant growth due to its synergistic effects on water retention, nutrient availability, and soil aeration. The results affirm that this alternative mix is a sustainable, eco-friendly growing medium, effectively

repurposing agricultural and urban waste. The findings support circular economy principles and offer practical implications for reducing peat dependency in commercial horticulture. Further research is recommended to optimize nutrient balance and validate efficacy across diverse crops and climates.

CAFÉ-05

Sustainable Biomass Energy Supply Chain in Indonesia: A Circular Economy Approach For Resource Optimization

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Abstract: The shift toward renewable energy is crucial for Indonesia's sustainable development, with biomass playing a significant role as an alternative to fossil fuels. However, inefficiencies within biomass energy supply chains limit its effectiveness. This study examines how circular economy (CE) principles can be integrated to optimize resource utilization in Indonesia's biomass energy sector. By adopting a supply chain management perspective, this research identifies critical challenges, including resource inefficiencies, excessive waste, and logistical bottlenecks. A framework incorporating CE strategies— such as waste valorization, closed- loop supply chains, and industrial symbiosis—is proposed to enhance sustainability and operational efficiency. To assess potential improvements, this study applies the Supply Chain Operations Reference (SCOR) model and Multi-Criteria Decision Making (MCDM)**.** The findings demonstrate that applying CE principles to biomass supply chains can minimize waste, reduce costs, and enhance energy output, supporting Indonesia's transition to a low-carbon economy. This research offers valuable insights for policymakers, industry practitioners, and stakeholders seeking to develop sustainable biomass energy systems.

Keywords: Biomass Energy, Circular Economy, Sustainable Supply Chain, SCOR Model, Indonesia.

CAFÉ-06

Financial Risk Management Strategy to Encourage Growth and Sustainability of *Rumah Dangke* Business in Local Industry

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Abstract: The study aims to identify internal and external factors, formulate financial risk management strategies, and determine financial risk management strategies to encourage the growth and sustainability of dangke house businesses in the local industry. This type of research uses a qualitative approach with a choice of case study strategies. The research analysis methods used in this study are the SWOT analysis method and the QSPM analysis method. The results of this study are the identified internal factors, namely the strengths and weaknesses of the financial risk management of the sustainability of dangke house businesses consisting of: an organized financial system, business capital from various sources, stable market demand, production efficiency. while some weaknesses consist of: lack of financial literacy, inconsistent financial records, dependence on local raw materials, and limited access to external financing. The identified external factors are the opportunities and threats of the financial risk management of the sustainability of dangke house businesses, consisting of: increasing market demand, government and financial institution support, export potential and digital markets, collaboration with MSMEs and the culinary industry and product innovation and diversification. while some threats consist of: fluctuations in raw material prices and production costs, competition with alternative products, limited access to financing, changes in regulations and product standardization and changes in consumer trends. The SO strategy that utilizes strengths for existing opportunities, namely the application of the circular economy concept in *Rumah Dangke's* financial risk management, can be an innovative solution to increase production cost efficiency and reduce dependence on new raw materials. By reusing production waste as additional raw materials, optimizing the use of renewable energy, and implementing recycling strategies in the supply chain, Rumah Dangke's business can increase financial sustainability and reduce the risk of raw material price fluctuations. In addition, this approach supports long- term business resilience, while contributing to reducing industrial waste and preserving the environment. The implementation of a circular economy not only increases the competitiveness of local industries but also strengthens the commitment to more environmentally friendly and sustainable economic development.

Prospects and Challenges of The Space-Based Energy

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Abstract: This study examines the potential of space-based energy technologies, focusing on solar panel satellites and solar wind energy harvesting as sustainable alternatives to ground- based energy production. By conducting a comprehensive literature review, we assess the current technological state, economic viability, environmental impact, and regulatory needs of these systems. Our analysis reveals that solar panel satellites can provide continuous power independent of weather conditions, with decreasing launch costs and lighter technology. Solar wind satellites, while less developed, show promise for high energy output using abundant materials. However, both technologies face challenges, including energy transmission efficiency and environmental costs of launch. Addressing these obstacles through policy, technological innovation, and international cooperation could position space-based energy as a viable solution for clean, scalable energy in the future.

Keywords: Renewable resources; Solar energy; Space-based energy; Sustainable energy solutions; Wind energy

ISAFE-02

Application of Magnetized Water For Cotton Irrigation in The Conditions of The Republic of Karakalpakstan

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Abstract: The study focuses on the reclamation of highly saline barren soils in the Republic of Karakalpakstan, particularly in the ancient Amu Darya delta, where over half of the irrigated lands are highly saline, and 33% of the area is occupied by moderately to highly saline barren soils. These soils, characterized by poor water-physical properties, heavy mechanical composition, and low salt-releasing capacity, require extensive reclamation measures. Traditional leaching methods are constrained by low filtration rates and high water demands. The study aims to reduce water consumption, shorten leaching time, increase salt yield, and evaluate the effectiveness of magnetized water for leaching saline barren soils. Experiments were conducted on old irrigated soils in the lower reaches of the Amu Darya River. Two leaching methods were compared: the first used magnetized water, prepared with an MPD (Magnetic Processing Device), while the second used ordinary water. Field studies were performed before and after leaching to analyze soil hydro-physical properties, residual salt density, and ion composition (anions and cations). Salt transfer parameters were calculated using analytical formulas. The findings reveal that leaching with magnetized water is significantly more efficient than conventional methods. Magnetized water intensifies the leaching process, increases salt yield, reduces the washing rate by 1.5 times, and shortens the leaching period. The study highlights the potential of magnetized water as an innovative and sustainable approach to reclaim highly saline soils, which is crucial for improving agricultural productivity and environmental sustainability in water-scarce regions.

Keywords: Barren soils, leaching rate, salt yield, magnetic water, toxic salts, dense residue, efficiency coefficient.

ISAFE-03

Biodiesel Production Using CaO Catalyst Modified with Oxalic Acid Activated Palm Oil Mill Fly Ash

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Abstract: This study aims to develop and evaluate heterogeneous catalyst of calcium oxide (CaO) with fly ash (FA) as support for biodiesel production from refined, bleached, deodorized palm oil (RBDPO). The CaO catalyst was obtained from calcination of limestone from Agam Regency, West Sumatra and FA came from boiler waste of palm oil mills with palm shell as solid fuel. The first step was the raw materials preparation of limestone by calcination process and FA was activated with 1.5 M oxalic acid solution. Furthermore, the synthesis of CaO with FA as support catalyst was carried out by wet impregnation method with variations of CaO to FA ratios 1:1, 2:1, and 3:1 (wt/wt) and thermally activated at 600 ^{o}C. The transesterification process of RBDPO into biodiesel was carried out with variations in the molar ratio of methanol to RBDPO 8:1 at temperature of 60 ^{o}C for 3 hours with a catalyst concentration of 3 % (wt/wt oil). The results showed that the CaO-FA catalyst with ratio of 1:1 produced the highest biodiesel yield of 80.72 %. The composition analysis of biodiesel showed that the main components were methyl palmitate (87.16 %), methyl laurate (2.66 %), and methylmyristate (7.56 %). The FA activation with oxalic acid as catalyst support was able to significantly increase the biodiesel yield compared to the CaO catalyst itself. The CaO-FA heterogeneous catalyst shows potential as an alternative catalyst that is economical and environmentally friendly for industrial-scale biodiesel production using local raw materials.

Keywords: biodiesel, CaO, catalyst, fly ash, RBDPO

ISAFE-04

The Identification Biomass and Calorific Value Bamboo (*Bambusoideae*) and Its Use as Briquettes

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Abstract: Biomass is material obtained from plants directly or indirectly and can be used as an energy source. Bamboo is one of the biomass that has the potential as an alternative energy source. This study aims to determine the type and place of growing bamboo that has potential biomass and calorific value which is then used as briquettes. This research method used a randomized block design with 3 treatments betung bamboo (*Dendrocalamus asper)*, Peting bamboo *(Gigantochloa levis)* and yellow Bamboo *(Bambusa vulgaris Schard*) and 2 groups (growing in dry land and around wetlands). The bamboo sample used was a bamboo stem at the base of 1,5 m. The result showed that the biomass of 3 types of bamboo ranged from 0.002 ton/ha to 1.157 ton/ha. The highest biomass was found in betung bamboo, either growing on dry land or around wetlands. The calorific value of 3 types of bamboo ranged from 15.529,4 J/g to 16.736,87 J/g. Based on the caloric value, the three types of bamboo are potential as biomass energy materials. However, based on the amount of biomass, bamboo betung is very potential compared to other bamboos. The tree types of bamboo are then processed into briqquettes with a value af caloric value ranged from 5,703.14 cal/g to 6,348.06 cal/g. The calorific value of the resulting briquettes is in accordance with Indonesian National Standard, which is a minimum of 5000 cal/g.

Keywords : biomass, energy, calorific value, bamboo, briquettes

SFST-01

Effect of Pressing Temperature on The Shelf Life and Quality of Linoleic and Oleic Compounds in Sesame Oil

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Abstract: Oil quality is greatly influenced by the processing process, especially the temperature factor. Linoleic and oleic content play a major role in determining the quality of sesame oil. The purpose of the study was to determine the effect of pressing temperature on the storage life and quality of sesame oil (linoleic and oleic compounds). The study was conducted in the laboratory of the Faculty of Agriculture with a pressing method using a completely randomized design. Observation parameters include oil content, oil color, oil aroma and linoleic content, and Olet after storage. The results of the study showed that the increase in the temperature of the processing process would increase the stability of the quality of oleic and linoleic compounds. Where the optimum processing temperature is 225^{o}C, but the longer the storage will decrease the quality and the optimum storage is 12 months.

Keyword : Temperature, extraksi, Quality , sesame oil

SFST-02

Development of Cricket Flour-Fortified Crackers as a Novel Protein-Enriched Snack

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Abstract: Cricket flour (CF), derived from domestic cricket (Gryllus sp.), is a high-protein, mineral-rich alternative food ingredient with significant potential to support sustainable food systems. This study aimed to formulate and evaluate crackers fortified with cricket flour at concentrations of 0% (control), 5%, and 10%, alongside a commercial cracker sample as a benchmark. The developed formulations were assessed for their chemical composition and sensory characteristics, including color, tactile texture, crispiness, hardness, and overall acceptability. Organoleptic properties were evaluated using a 9-point hedonic scale with untrained panelists. Among the experimental samples, the 5% cricket flour (CF-5) cracker exhibited the most favorable volume expansion and received the highest scores for color and overall sensory acceptance, suggesting its suitability for further nutritional analysis. Proximate analysis of the CF-5 sample revealed an increase in protein content (2.87%) and ash content (5.10%), indicating enhanced mineral contribution compared to the control and commercial samples. The increased protein and mineral contents were accompanied by a reduction in carbohydrate content, measured at 88.81% in the control sample. These results demonstrate that cricket flour fortification can improve the nutritional quality of snack products without compromising sensory appeal at moderate inclusion levels. Overall, the incorporation of cricket flour in cracker formulations presents a promising strategy for developing value-added, nutrient- dense, and environmentally sustainable food products. This study supports the integration of edible insects into mainstream food applications to address global challenges in food security and environmental sustainability.

SFST-03

Physicochemical and Sensory Characteristics of Globe Amaranth (Gomphrena globosa L) Gummy Candy with Addition of Betel Leaf Extract (Piper betle L)

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Abstract: Gummy candy is a popular confectionery product among the public. However, gummy candy generally has low nutritional value. The addition of functional components to gummy candy can serve as a solution to enhance its nutritional value. Betel leaves have the potential as a source of antioxidants that can improve the nutritional content of gummy candy. Additionally, globe amaranth flowers can be utilized as natural colorants to enhance the visual appeal of gummy candy. This study aims to examine the effect of adding betel leaf extract on the physicochemical and sensory characteristics of globe amaranth gummy candy. The research was conducted using a completely randomized design (CRD) with one factor, namely the concentration of betel leaf extract: 0% (control), 5% (F1), 7.5% (F2), and 10% (F3). In this study, commercial product was used as a comparison to the gummy candy produced. The results showed that the betel leaf extract addition to gummy candy increased antioxidant activity, total phenolic compounds, and flavonoids, with inhibition percentages ranging from 68.32% to 93.30%. The addition of betel leaf extract also influenced the color and texture of the product. Sensory analysis indicated that incorporating betel leaf extract into gummy candy led to a decrease in overall acceptability compared to the control and commercial samples, with overall liking of 5.70 to 5.86 (neutral). The best formulation was F2, where the addition of 7.5% betel leaf extract produced gummy candy with relatively high antioxidant activity (86.05%) while maintaining good sensory acceptability.

SFST-04

The Level of Utilization of Larvae (Bsf) as A Substitution in Feed on Live and Carcass Weight, Carcass Percentage and Commercial Cut in Kub Chicken

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Abstract: This study aims to determine the optimum limit of maggot larvae use on live weight, carcass weight, and commercial cuts in KUB chickens (Kampung Unggul Balitnak). This study used 60 DOC KUB chickens. The method used was an experiment with a Randomized Block Design (RBD) with 5 treatments and 4 groups based on initial body weight. The treatments used in this study were RA treatment (0% larvae BSF), RB treatment (3.75% larvae BSF), RC treatment (7.50% larvae BSF), RD treatment (11.25% larvae BSF), RE treatment (15% larvae BSF). The treatment ration was formulated with 17.5% protein and 2800 kcal/kg energy. The variables observed were live weight, carcass weight, carcass percentage and commercial cuts in KUB chickens. The results showed that the provision of BSF maggot flour in KUB chicken feed had no significant effect (P>0.05) on the percentage of carcasses and commercial cuts while having a significant effect (P<0.05) on live weight and carcass weight. The best conclusion is that the level of BSF maggot flour as a substitute in KUB chicken feed with a provision level of 3.75% can increase the live weight and carcass weight of KUB chickens.

Keyword: KUB chicken, live, carcass weight, carcass percentage, commercial cuts, BSF maggot meal

SFST-05

The Development of Functional Jelly Drinks Incorporating Red Yeast Rice (Angkak) Extract: An Evaluation of Physicochemical and organoleptic characteristics

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Abstract: Red Yeast Rice (angkak), a product derived from the fermentation of rice by the Monascus purpureus fungus, was notably rich in bioactive compounds, especially monacolin K, known for its potential cholesterol-lowering properties. However, angkak's application was somewhat constrained due to its inherent bitter taste and vibrant red color. In contrast, jelly drinks had gained significant popularity among consumers, appreciated for their soft texture and refreshing qualities. This study aimed to evaluate the physicochemical, antioxidant and sensory characteristics of functional angkak jelly drinks. A quantitative research approach was employed, utilizing a completely randomized design. The angkak extract was introduced in four treatment concentrations: P1 (0.25%), P2 (0.5%), P3 (0.75%), and P4 (1%). Comprehensive assessments were conducted to evaluate color, viscosity, pH, total dissolved solids, sensory attributes, and antioxidant activity. The findings indicated that the optimal concentration was P2, exhibiting the following results: an L* value of 25.26, an a* value of 7.8, a b* value of 5.03, a viscosity of 1115 cP, a pH of 4.39, total dissolved solids of 11.3 obrix, and an organoleptic score ranging from 6.59 to 7.28. Additionally, the antioxidant inhibition percentage was recorded at 80%. These results suggest that the incorporation of angkak extract significantly enhances the physicochemical properties, sensory attributes, and antioxidant content of jelly drinks.

Keywords: Angkak, Red yeast rice extract, functional jelly drink, jelly drink, antioxidant.

SFST-06

Physical and sensory characteristics of cascara water kefir with the addition of butterfly pea (Clitoria ternatea) flowers

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Abstract: One of the by-products of coffee processing is the fruit skin, which after drying is called cascara. This study aims to study the production of water kefir from cascara with addition of butterfly pea flower extract. The factors studied were the type of cascara (pulp and husk) and the concentration of butterfly pea flower extract added (0; 2 and 4%). The parameters analyzed included physical (color L*, a*, b*) and sensory (hedonic and descriptive) characteristics. The results showed that the type of cascara and concentration of butterfly pea flowers affect all physical parameters. Increasing the concentration of butterfly pea flowers causes a decrease in the L*, a*, and b* color values. The panelists' level of preference for the color and taste of the product also decreased with i ncreasing concentration of butterfly pea flowers. The best formulation was obtained from the combination of cascara husk with the addition of 2% butterfly pea flower.

SFST-07

Quality Characterization of Arabica Coffee Soaked at Different Fruit Maturity Levels

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Abstract: Coffee is one of the world's primary agricultural commodities, with its economic value depending on agronomic and post-harvest quality. In racutan/lelesan harvesting, green cherries are still collected if less than 10% of the fruit remains on the tree. However, data on optimal fruit selection for producing high- quality coffee remains limited. This study aims to determine the quality and flavor of Arabica coffee after soaking at various fruit maturity levels. The research method used was a Two-Way ANOVA 2 x 3 design, with two factors: two types of soaking containers (A1 = plastic basin, A2 = stainless steel container) and three fruit maturity levels (B1 = Red, B2 = Half-ripe, B3 = Green), with a control treatment using hot water. The observed parameters included physical tests, acidity tests, and cup tests. The results showed that soaked coffee had good physical quality, with normal color and aroma, free of foreign objects and insects. Most beans passed through a <7 mm sieve, with the highest quality found in sample A1B3 (defect number 9.6, grade 1) at the green maturity level. Acidity tests showed no significant effect based on the container or fruit maturity level. Organoleptically, the fragrance was dominated by caramel and sugarcone aromas. The selection of green coffee cherries can produce the best physical quality with the appropriate soaking method. Further studies are needed on other coffee varieties and additional quality parameters.

AE-01

The Invitro Digestibility and Rumen Fermentation Characteristics of Cattle Diet made from Ammoniated Palm Fronds and Fermented Solid

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Abstract: This study aims to evaluate the characteristics of rumen fermentation and in vitro digestibility of cattle rations fed with ammoniated palm fronds, palm kernel meal and fermented solids. Palm fronds were ammoniated with 6% urea for 21 days. The concentrate formula was solid (72%), rice bran (25%) and added liquid ingredients (3%). The liquid ingredients consisted of water (1.8%) 40ml, urea (0.2%) 4 grams, salt (0.1%) 2 grams, dolomite (0.4%) 8 grams, molasses/molasses (0.4%) 8 grams and bionak fermentor (0.1%) 2 grams. Solid fermentation was carried out for 2 weeks. The research design was a completely randomized design with four treatments and six replications. Treatment consisted of T1 = T1 (40% fresh fronds + 60%Palm kernel meal), T2 (40% ammoniated fronds + 60% palm kernel meal), T3 (40% fresh fronds + 60% fermented solids), and T4 (40% ammoniated fronds + 60% fermented solids). The results showed that the treatment had a significant effect on the VFA, NH_3 values and had no significant effect on the pH and digestibility of the feed. VFA, NH_3 and rumen pH values are within the normal range. The digestibility of dry matter and organic matter of the ration ranged from 52.66% - 66.62%, indicating good digestibility values.

Keywords: ammoniated_palm fronds, fermented_solids, rumen_fermentation, digestibility

AE-02

The Effect of Climate Anomalies on Oil Palm Productivity: A Quantitative Analysis

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Abstract: Oil palm productivity is highly sensitive to climatic anomalies, especially fluctuations in rainfall and temperature. Significant variability in recent years, influenced by climate anomalies caused by El Niño. This study aims to investigate the influence of climate anomalies, particularly changes in rainfall and temperature, on oil palm productivity. This study uses a quantitative descriptive method. The research was conducted at the PT. Citra Putra Kebun Asri, Jorong District, Tanah Laut Regency, South Kalimantan, Indonesia. Climate data was obtained from monthly records during 2014–2023. Productivity data (tonnes per ha, average bunch weight, number of bunches per tree) were collected from 2016–2023 on 124.49 ha of oil palm land with a planting age of 10–17 years. Data were analyzed using multiple correlation and regression models using a time lag model of 0, 1, and 2 years to see the influence of climate anomalies on palm oil productivity. The results showed that the 1°C increase in temperature from the previous year reduced the number of bunches per tree by 3.741 and tons per Ha by 7.08. Rainfall from the previous year had a significant positive effect on the BJR, but not on the number of bunches per tree or tons per ha. Increased rainfall two years before harvest had a positive impact on all productivity measures, while higher temperatures two years earlier had adverse effects. The study emphasizes the importance of dealing with unstable climatic conditions, especially two years before harvest, to ensure sustainable palm oil production.

Keywords: Palm oil productivity, climate anomalies, El Niño, temperature, and rainfall

AE-03

Scientifically Substantiated Irrigation Regimes For Cotton and Winter Wheat in The Tashkent Region of The Republic Of Uzbekistan

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Abstract: This article presents a study on the monitoring and control of irrigated land in the Tashkent region of Uzbekistan, focusing on the determination of daily actual evaporation (ET_0) and seasonal irrigation norms for cotton and winter wheat using the "CropWat 8.0" program. Based on the agro-meteorological conditions of the region, field experiments were conducted on typical gray soils in 2022 to compare the calculated data with actual field results. The study employed the FAO methodology for evapotranspiration calculation, and the irrigation procedure for cotton and winter wheat was developed considering the region's natural and climatic conditions. The seasonal irrigation norms for cotton and winter wheat were calculated using weather station data in the "CropWat 8.0" program, taking into account soil mechanical properties, seepage water depth, and mineralization. The results indicated that the seasonal irrigation standards for cotton in the ninth hydro module region were 2,800 m^3 per hectare, while for winter wheat, it was 2,000 m^3. In the first hydro module region, the seasonal norms were 6,200 m^3 for cotton and 3,600 m^3 for winter wheat. The calculated ETo values were in close agreement with field experiment results, with errors of ± 8-10%. The findings highlight the importance of using water-saving irrigation technologies and the "CropWat 8.0" program for optimizing irrigation practices in the Tashkent region under changing climate conditions.

Keywords: "CropWat 8.0" program, hydromodule, cotton, wheat, evaporation

AE-04

Pedogeochemical Barriers in Hydromorphic Soils and Their Influence on Cotton

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Abstract: This study examines geochemical barriers in soils, focusing on the radial double- sided geochemical barriers formed in the irrigated meadow soils of Central Fergana in Uzbekistan. The migration and accumulation of chemical elements within these barriers are analyzed using geochemical spectral formulas. Additionally, the influence of these barriers on cotton yield is assessed. Certain unexplored elements generate only scattering fluxes, while consideration of pedolithic horizon characteristics during the vegetation season and leaching periods contributes to optimizing irrigation water use. As a vital region for food security in Central Asia, the Fergana Valley contains human- altered soils that play a key role in this transboundary area. Investigations of irrigated chloride-sulfate saline soils with surface and deep pedolithic horizons—characterized by extremely low water and air permeability—have revealed their chemical, pedogeochemical, and biogeochemical properties. The study establishes the background concentrations of elements in these soils and identifies pedolithic horizons that may serve as model layers for biogeochemical research and soil amelioration strategies. The findings enhance the understanding of desert-zone soil geochemistry, offering insights for sustainable agricultural practices and improved land management.

Keywords: pedolite, geochemical barriers, meadow saz, arzyk-shokh, cotton.

AE-05

Evaluation of Nutritional Regime in Sandy Soils Based on Fertilizer Application Rates

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Abstract: The assessment of soil fertility and its ability to support high agricultural yields is primarily determined by the availability of essential nutrients in forms accessible to plants. Therefore, agrochemical analysis of sandy soils, which provides insights into the dynamics of mobile nutrient forms such as nitrogen, phosphorus, potassium, and organic matter, is crucial for informed fertilizer management. In this context, a systematic approach to determine the optimal fertilizer rates and their application methods is fundamental to achieving sustainable crop production. The enrichment of sandy and sandy-loamy soils through targeted agrotechnological practices and innovative technologies plays a pivotal role in restoring and enhancing soil fertility. Additionally, effective strategies to protect against sand erosion, optimize irrigation practices, and employ fertilizers in appropriate quantities and proportions are critical to increasing yields, particularly in cotton cultivation. This research addresses these challenges, emphasizing the importance of a balanced approach to fertilizer use and the development of sustainable agricultural practices for cotton production under irrigated conditions.

Keywords: plants, sands, fertilizers, manure, nutrient regime, nitrogen, phosphorus, potassium, dynamics, horizon.

AE-06

Factors of Soil Protection, Abundant And Quality Harvesting of Crops

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Abstract: This study investigates the classification and mapping of erosion, methods for the efficient use of irrigation water, and strategies for reducing soil leaching while maintaining and enhancing soil fertility. Despite extensive research in these areas, the effective utilization of land, water, fertilizers, and other resources remains an urgent challenge. In Uzbekistan, approximately 722,000 hectares of land are affected by irrigation erosion, 1,812,000 hectares by wind erosion, and 1,929,000 hectares by sudden water and wind erosion. Consequently, the prevention of erosion processes, the maintenance and enhancement of soil fertility, and the production of high- quality crops are critical issues. The aims of this study were to ensure the efficient use of land resources, irrigation water, and mineral fertilizers in irrigated eroded areas and to reduce soil particle leaching. The results indicate that the amount of soil particles washed away by conventional irrigation methods was 8.3 tons per hectare per season, while the zig-zag irrigation method resulted in a lower loss of 4.9 tons per hectare in the typical gray soils of Tashkent province. Furthermore, in the Andijan, Samarkand, and Kashkadarya provinces, soil particle leaching from zig-zag irrigation was reduced by 2.5 to 3.8 tons per hectare compared to conventional irrigation methods for secondary crops.

Keywords: irrigation, erosion, mineral fertilizers, zig-zag irrigation, soil fertility.

AE-07

Leveraging Nickel Micro-Nutrient to Improve Root Development of Sugarcane Single Bud Chips in the Face of Climate Change Challenges

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Abstract: Sugarcane is a vital crop for sugar and bioenergy production, with its growth significantly influenced by climate factors. As climate change intensifies, adaptive farming practices are critical for ensuring the sustainability of sugarcane production. This study investigates the role of nickel (Ni), an essential micronutrient, in improving root development of sugarcane seedlings. Four single bud chip clones, including three mutant varieties (M2.2, M3.2, and M3.4) and one standard variety (Bululawang), were treated with Ni concentrations of 0, 0.25, 0.5, and 1 ppm. The results revealed that a 0.5 ppm Ni concentration significantly enhanced root growth, as evidenced by improved root length, volume, and surface area. These findings suggest that optimal Ni fertilization can promote better root development in sugarcane seedlings, potentially improving water and nutrient uptake, and increasing resilience to climate stressors such as drought and extreme temperatures. This research highlights the importance of Ni in enhancing sugarcane root systems for improved productivity and climate adaptability.

Keywords: climate change resilience, micronutrient, nickel (Ni), root development, sugarcane

AE-08

Translocation of N, P, and K in Mentik Wangi Rice (Oryza sativa L.) with the Application of Liquid Organic Fertilizer from Moringa Leaves (Moringa oleifera)

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Abstract: Rice (Oryza sativa L.) is a major food crop that is important for global food security, especially in Indonesia. Its productivity is highly dependent on the availability and absorption of essential nutrients such as nitrogen (N), phosphorus (P), and potassium (K). Excessive dependence on synthetic fertilizers causes soil degradation, environmental impacts, and increased production costs. Therefore, liquid organic fertilizer (LOF) is a sustainable alternative to improve nutrient absorption efficiency. Mentik Wangi, a premium aromatic rice variety in Indonesia, has a high response to fertilization so that it requires proper nutrient management. Moringa oleifera (moringa) has the potential as a source of organic fertilizer because of its N, P, K content, and bioactive compounds that support plant growth. This study aims to evaluate the effect of moringa- based LOF on nutrient translocation efficiency in Mentik Wangi rice. The experiment was conducted in a greenhouse with a Completely Randomized Block Design (CRBD) using three treatments: T0 (control, without LOF), T1 (6% moringa LOF), and T2 (8% moringa LOF), each with three replications. LOF was applied every seven days for 14 times, and harvested at 120 days after planting. The concentrations of N, P, and K in leaves, stems, roots, and grains were analyzed to assess the efficiency of nutrient translocation. The results showed that moringa- based LOF significantly increased nutrient uptake and translocation. N accumulated mainly in leaves and panicles, increasing chlorophyll synthesis and photosynthesis. P was more translocated to panicles for seed formation, while K was evenly distributed, supporting water balance and stress resistance. Application of 8% moringa LOF (T2) resulted in the highest nutrient translocation efficiency, increasing the number of productive tillers, grain yield per panicle, and grain weight compared to the control. In conclusion, moringa-based LOF is an alternative sustainable fertilizer that increases the efficiency of nutrient uptake and translocation in Mentik Wangi rice. Further research is needed to optimize the application dose and assess its long-term impact on soil health and plant productivity. The application of organic fertilization can support sustainable rice production and reduce environmental impacts.

Keywords: Translocation, Macronutrients, Liquid Organic Fertilizer, Moringa Leaves, Mentik Wangi Rice

AE-09

The Effect of Vermicompost on the Growth, Yield, and Anthoacyanin Content of Local Black Rice

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Abstract: Black rice (Oryza sativa) is one type of rice that contains anthocyanin pigments. However, its production remains relatively low and poses a major challenge, influenced by various agronomic and environmental factors. One effort to increase black rice production is through the use of vermicompost organic fertilizer. This study aims to evaluate the effects of different doses of vermicompost on the growth and yield of three local black rice varieties. The research was conducted using a factorial Completely Randomized Design (CRD) with two factors: local black rice varieties (Purwokerto, Purbalingga, and Kupang) and vermicompost doses (0 grams, 45 grams, 90 grams, and 135 grams). The results showed that the interaction between black rice varieties and vermicompost doses significantly influenced several growth and yield variables, such as plant height, panicle length, total tillers, productive tillers, 100- grain weight, grain weight per clump, and chlorophyll content. However, anthocyanin content was not significantly affected by different vermicompost doses. A vermicompost dose of 90 grams per plant is recommended as the optimal dose for enhancing the growth and yield of black rice. Among the three black rice varieties tested, the Kupang variety exhibited higher production compared to the others. Therefore, the Kupang black rice variety is recommended as the primary choice for cultivating local black rice with vermicompost application.

Keywords: black rice, vermicompost, growth and yield, chlorophyll, anthocyanin

AE-10

Application of PGPR (Plant Growth Promoting Rhizobacteria) to Two Potato Varieties

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Abstract: Potatoes are a priority horticultural crop to be developed because of their high economic value, balanced nutritional content, rich in vitamins and minerals. The demand for potatoes continues to increase in line with population growth and the proliferation of fast food made from potatoes. Efforts made include increasing potato productivity by using superior varieties and applying Plant Growth Promoting Rhizobacteria (PGPR). It is necessary to increase yields by providing PGPR which can grow and yield potato plants. This research was conducted in December 2023-April 2024 at at the West Sumatra Agricultural Instrument Standard Application Center (AISAC) Experimental Garden. This research aims to obtain interactions between potato varieties and PGPR that can increase the growth and yield of potato plants. This experiment was a 2-factor factorial with 4 groups arranged in a randomized block design (RBD). The first factor is the potato variety, namely granola and Red Potatoes. The second factor is the concentration of PGPR with 4 levels, namely, 0, 6, 12 and 18 ml/l. Data were analyzed by analysis of variance with the STAR program. The results showed that there was no interaction between potato varieties and PGPR concentrations. There were differences between varieties and PGPR concentrations in the number of tubers.

Keywords: Potatoes, PGPR, Variety, vitamins, increased

Exploring phosphate-solubilizing bacteria in paddy rhizospheres across varied management systems

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Abstract: Exploration of phosphate-solubilizing bacteria from various paddy rice management systems has the potential to identify superior bacterial strains for dissolving phosphorus as biofilm biofertilizer inoculants. This study aims to identify bacteria with superior phosphate- solubilizing abilities from different rice rhizospheres managed under varying conditions and the factors influencing these abilities. The inoculants were sourced from rice rhizospheres managed conventionally, semi- organically, and organically for 15 years, 10 years, and 7 years. Samples were collected from paddy fields with Inceptisol soil in Mojogedang, Karanganyar, Indonesia. The research findings indicate that different rice field management systems had no significant effect on the total bacterial population density, which averaged 6.68×10^{18}. From the total bacterial colonies, 15 isolates (R1, R2, R3, R5, R6, R7, R8, R9, R10, R11, R12, R13, R16, R18, R20) were identified as capable of solubilizing phosphate. The highest phosphate solubilization index was observed in R5 (5.10), while the lowest was in R8 (2.12). The soil properties most strongly correlated with the phosphate solubilization index were organic carbon (r = 0.56*) and available soil phosphorus (r = 0.83*). These inoculants potential for developing innovative biofilm biofertilizer formulations.

Application of FTIR-ATR Spectroscopy for Quality Mapping and Authenticity Verification of Coffee from Traditional Markets in Padang City Indonesia

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Abstract: Ensuring the authenticity and quality of coffee is essential, particularly in regions where traditional markets play a significant role in daily trade and consumption. This study explores the application of Fourier Transform Infrared-Attenuated Total Reflectance (FTIR-ATR) spectroscopy as a rapid, non-destructive analytical technique to assess the quality and verify the authenticity of coffee samples from traditional markets in Padang City, Indonesia. A set of reference spectra was first established using traceable, original coffee beans. These spectra were then compared to those obtained from market samples using multivariate statistical methods. The analysis revealed notable differences in spectral patterns between the original and market-sourced coffee, indicating potential adulteration or blending practices. These discrepancies suggest that some commercially sold coffee may have undergone mixing with inferior or foreign substances, compromising its quality and authenticity. While FTIR-ATR has proven to be an effective preliminary screening tool, further confirmatory analyses such as chromatographic or metabolomics based approaches are recommended to validate the findings. This study emphasizes the importance of quality assurance in traditional markets and supports the use of spectroscopic methods as part of routine monitoring systems in the coffee supply chain.

Keywords: Coffee authenticity, FTIR-ATR spectroscopy, quality mapping, traditional markets, Padang, multivariate analysis, adulteration detection, coffee traceability.

Formulation and Evaluation of Corn Silk Extract Lozenges as a Source of Bioactive Compounds

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Abstract: Corn silk a traditionally underutilized byproduct of corn cultivation is rich in various phytochemicals including flavonoids and phenolic acids, known for their antioxidant and anti- inflammatory, antibacterial**,** and antihypercholesterolemic properties. Current methods of consuming such beneficial compounds can be inconvenient or suffer from low bioavailability. Developing a palatable and convenient delivery system, such as lozenges, offers a promising avenue to enhance the accessibility and efficacy of these compounds from corn silk, thereby transforming an agricultural waste product into a valuable health supplement. This study aimed to determine the formulation and to evaluate corn silk extract lozenges as a source of bioactive compounds. This research employed a completely randomized design (CRD) with six factors and three replications. The lozenges were prepared using the wet granulation method, applying varying mannitol-sucrose ratios: Formula 1 (3:1), Formula 2 (2:2), and Formula 3 (1:3). The results showed that the mannitol-sucrose ratio significantly affected ($p<0.05$) the characteristics of the corn silk lozenges. Formula 1 (3:1) was selected as the best formulation, exhibiting mean values for: dissolution time at 6.37 minutes, pH at 6.0, moisture at 3.09%, ash at 1.04%, fat at 0.20%, protein at 1.03%, antioxidant activity at 18.20%, vitamin C at 212.80 mg, and tannin at 1.04%. This research indicates that corn silk lozenges have significant potential for development as a readily accessible source of bioactive compounds.

Keywords: corn silk; lozenges; mannitol; sucrose; ratio

SPD-03

Spoilage Slayers: Harnessing Green-Extracted Moringa oleifera to Boost Fruit Longevity

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Abstract: Moringa oleifera is esteemed for its abundant bioactive components that possess antioxidant and antibacterial capabilities, positioning it as a viable option for sustainable food packaging applications. This research examines the eco-friendly extraction of bioactive compounds from Moringa oleifera leaves via a hot water extraction method. Hot water extraction, as an eco-friendly and non-toxic technique, adheres to green chemistry principles and provides a safer alternative to traditional solvent-based methods. The main goal is to assess the viability of the recovered chemicals for use in biodegradable coatings. Characterisation investigations were performed to ascertain the physicochemical and functional properties of the extract. This encompasses assessments of moisture content, carotenoid concentrations, total flavonoid content (TFC), DPPH radical scavenging activity, pH, colour (Lab* values), and antimicrobial efficacy. These criteria are crucial for evaluating the stability, functionality, and compatibility of the extract inside coating systems. This study advocates for the creation of environmentally sustainable coating formulations that incorporate plant-derived bioactives to enhance food preservation. The project advances green packaging technology and environmental sustainability by blending sustainable extraction processes with practical applications.

Keywords: Moringa oleifera, Green extraction, Hot water extraction, Bioactive compounds.

SPD-04

Preliminary Study on the Effectiveness of Sun Protection Factor capacity in Lotion Formulated with Secang, Stevia, and Breadfruit Extracts on Wistar Rats: A Comparative Dermal Evaluation

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Abstract: The development of plant-based topical agents with anti-inflammatory properties has gained increasing attention. This study investigates the effects of *Caesalpinia sappan* (secang), *Stevia rebaudiana* (stevia), and *Artocarpus altilis* (breadfruit) leaf extracts on the skin of Wistar rats, focusing on dermal inflammation and irritation. Thirty Wistar rats were divided into five groups: negative control (no treatment), positive control (commercial product), and three treatment groups receiving topical applications of secang, stevia, or breadfruit leaf extracts. A defined area of dorsal skin was shaved and treated with UV lamp daily. Skin responses were observed macroscopically for signs of erythema, irritation, and lesion development. Body weights were also monitored to assess systemic effects. The negative control group exhibited normal skin appearance with no irritation. The positive control group showed clear signs of erythema and mild lesion formation. The secang- treated group showed the most favorable outcome, with minimal erythema and rapid recovery. The stevia and breadfruit extract groups showed moderate inflammatory responses, though milder than the positive control. No significant changes in body weight were observed in any group, suggesting no systemic toxicity. Topical application of *Caesalpinia sappan* extract demonstrated a superior anti-inflammatory effect compared to *Stevia rebaudiana* and *Artocarpus altilis* extracts. These findings support the potential of secang as a natural ingredient in topical anti-inflammatory formulations. Further studies, including histological and molecular analysis, are recommended to validate these effects.

Keywords: Topical inflammation, plant extract, secang, stevia, breadfruit, Wistar rat, dermal irritation.

SDGs-01

The Impact of Sustainable Development on An Inclusive Labor Market in The Context of Digitalization and Its Management in Kazakhstan.

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Abstract: The article examines the impact of sustainable development principles on the formation of an inclusive labor market in Kazakhstan in the context of active digitalization of the economy. Particular attention is paid to the analysis of modern challenges associated with digital inequality, changes in the employment structure and the need to adapt labor resources to new technological realities. The author examines the specific features of the Kazakhstani labor market, including regional disparities, gender aspects of employment and problems of employment of vulnerable groups of the population. Based on the analysis of statistical data and state development programs, the effectiveness of measures for the digital transformation of the labor sphere in the context of sustainable development goals is examined. The work highlights such key aspects as the development of digital skills of the population, support for entrepreneurship in the digital economy and the creation of inclusive jobs. The author proposes an integrated approach to managing the processes of

digitalization of the labor market, combining government regulation, corporate initiatives and international experience. The results of the study contain practical recommendations for improving employment policies, educational programs and social protection in the context of digital transformation. The article is of interest to specialists in the field of labor relations, digital economy and social development, as well as to developers of state programs for sustainable development of Kazakhstan.

Keywords: sustainable development, inclusive labor market, digitalization, Kazakhstan, employment management, digital skills.

SDGs-02

Increasing the Ecological Efficiency of Training in Higher Education

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Abstract: This article covers the reforms being implemented in the higher education system, the conditions of training in them, existing factors, advantages, process, status and directions for increasing the ecological efficiency of training in them. Also, scientific proposals and practical recommendations are offered on further increasing the ecological efficiency of training in the field of higher education, effective teaching methods, advanced techniques, principles, existing conditions and opportunities, the most important areas of attention aimed at increasing the ecological knowledge of students based on the results of teaching efficiency. In addition, consistent measures are presented to deeply reform the higher education sector of our country in various forms, deepen and further deepen socio-economic relations. The results obtained and their foundations are analyzed theoretically, methodologically and economically.

Keywords: education, higher education, teaching, efficiency, environmental efficiency.

SDGs-03

The Implementation of Climate Village (Program Kampung Iklim: PROKLIM) in Karanganyar Regency, Central Java, Indonesia

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Abstract: The attempt of adapting to and mitigating climate change needs to be taken by all communities. Climate Village Program (Indonesian: Program Kampung Iklim or Proklim) is a program initiated by Indonesia's Ministry of Living Environment and Forestry with the target of 200,000 climate villages in 2024. This research aims to describe the implementation of proklim in Karanganyar Regency, Central Java Province. This research employed a descriptive qualitative approach. Data were collected through interview, field observation, documentation and Focus Group Discussion (FGD). Informant consisted of local activists, forestry extensionist, agricultural extensionist, health cadre, service office, village government, farmer group, female farmer group, Family Welfare Program (FWP) and youth organization (Karang Taruna). Data validity was tested using source and method triangulations. The result of research shows that the implementation of proklim in Karanganyar Regency has reached 40 villages (16 sub districts), 5 of which belong to pratama grade, 16 to madya grade, and 19 to utama grade. Proklim initiative has been implemented in 2 models:

1. intervention and support from Living Environment Service Office, and
2. local initiative of local community with facilitation from forestry extensionist. The growth of proklim in Karanganyar keeps developing despite reinforcement and facilitation needed toward sustainability.

SDGs-04

The Influence of Motivation on the Impact of the Climate Village Program Implementation (Study Case of Thematic Community Service Program in Climate Villages)

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Abstract: Motivation serves as a driving force for people to participate in the implementation of every program. This research aims to analyze the influence of motivation on the impact of the Community Service Program (KKN) themed on climate village development. The data analysis method used in this research is a quantitative method with survey techniques. The research respondents consisted of 92 students who were selected through a census. The selection of the location was done intentionally, namely Gondangrejo District, Karanganyar Regency, Central Java, which became the site for the Community Service Program (KKN) with the theme of Climate Village Development. Motivation is examined through three main dimensions, namely existence motivation, relationship motivation, and self- development motivation. Meanwhile, the impact of the program on students is examined based on indicators of knowledge, understanding, application, analysis, synthesis, and evaluation. Next, the data were analyzed using multiple linear regression analysis. The research results show that the levels of existence and development motivation are classified as very high, while relational motivation falls into the high category. The impact

of the community service program provides an increase in knowledge, understanding, and synthesis (very high), as well as application, analysis, and evaluation in the high category. Existential motivation (X1) and social interaction (X2) significantly influence the impact of the climate village program, while motivation for development (X3) is not significant.

Keywords: motivation, program impact, climate village

SEAFE-01

Analysis of the Work Posture of the Malay Songket Weaving Craftsman Wan Syamsinar Dumai

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Abstract: Songket is a type of traditional Malay woven fabric that was inherited from time to time. The Malay Songket Weaving Wan Syamsinar is one of the songket woven cloth craftsmen in the city of Dumai. The workers at the place use manual methods. Therefore, manual work is at risk for musculoskeletal disorders. Knowing the level of work posture risk experienced by weavers while working is the purpose of this study. In data processing, the authors used the Rapid Upper Lamb Assessment method, to find out the musculoskeletal disorders experienced by workers using the nordic body map questionnaire. Results of discussion and data analysis of the 3 work postures carried out showed that the posture of arranging the threads of the six workers was at a low risk with a range of 3-4 levels, in the posture of pulling the loom handle of the six workers at a low risk with a range of 3 – 4 risk levels, for the posture of pushing the loom handle 3 workers are at low risk ranging from risk level 3-4 required some action in the future while 3 more workers are at moderate risk with risk level range 5-6 actions in the near future.

Keywords: Musculoskeletal disorders, Nordic Body Map, Rapid Upper Limb Assessment, Weaving

SEAFE-02

Techno-economics of Coconut Oil Extraction Using Wet, Dry and Fermentation Methods

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Abstract: Coconut oil production is carried out by extracting oil from old coconuts. High yield and quality are the desired target in coconut oil production efforts. The quality parameter of coconut oil was the content of free fatty acids (FFA). This study determined the technoeconomics of coconut oil production by wet, dry and fermentation methods. The yield produced is the main parameter for consideration in choosing an extraction method. Economic calculations was carried out to calculate the IRR, net B/C, BEP (break event point) and payback period (PP) values. The results of the study indicated that technologically, the need for simple/cheap and relatively easy-to-operate equipment/machines is the choice of micro and small business actors. The results of the study indicated that high coconut oil yields were obtained from the dry extraction method with an FFA content of 0.08% meeting the quality requirements of Indonesia SNI 3741:2013, namely <0.60%. Based on detailed estimates, the cost of producing coconut oil using the wet method was 15.77 ± 0.59 w/w%. The dry method was 21.56 ± 0.41 w/w%, and the fermentation method was an average yield of 21, 56% for 24 hours fermentation and 24.29% for 48 hours fermentation time. The coconut oil extraction method with the highest profit was the dry extraction method with an total production per year and oil selling price of Rp. 70,000.00 and 9545.69 liters/year with annual sales and net profit of 23.75%, with Gross B/C; Net B/C ratio; IRR; BEP and PP of 1.36%, 1.19%, 3261 liters, and 2.29 years respectively as a condition of neither profit nor loss (breakeven).

Keywords: B/C ratio; BEP; coconut oil; extraction; FFA

SEAFE-03

An Analysis of Household Food Consumption and Desirable Dietary Pattern (DDP) Score Among Extremely Poor Households (Decile 1) in the Coastal Area of Demak Regency

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Abstract: Food security is a critical issue in both national and global development, as it concerns the fundamental aspects of human life. Diversification of food consumption is one of the strategies to achieve food security. The level of achievement in food consumption diversification can be measured through the Desirable Dietary Pattern (DDP) score. This study aimed to analyze household food consumption patterns and the DDP score among poor households in the coastal areas of Demak Regency. The research employed a survey method and was conducted purposively in Sayung District (Tugu and Banjarsari Villages) and Bonang District (Morodemak and Purworejo Villages). A total of 104 households were selected as research samples through multistage random sampling. Data collection was carried out between October 2024 and March 2025. Data were gathered through interviews using a 2x24-hour food recall method. The analysis was performed using descriptive statistics with SPSS 25. The findings revealed that the average household energy consumption in the coastal area of

Demak Regency was 1,585.28 kcal/person/day or 75.49% from Recommended Dietary Allowances (RDA). The average household protein consumption was 51.09 gram/capita/day or 89.63% from RDA. Meanwhile, the Desirable Dietary Pattern (DDP) score was 85.63.

Keywords: Food Security, Desirable Dietary Pattern (DDP) Score, Household Food Consumption

SEAFE-04

Communicative Experiences and Business Sustainability: How Interpersonal Strategies Influence Customer Retention in Bandung's Coffee and Art Spaces

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Abstract: Customer retention plays a critical role in business sustainability, particularly within service-oriented sectors such as coffee shops and art spaces. This study examines how interpersonal communication strategies influence customer retention and long-term business success in Bandung's Ethnic Vintage Art Space (Studio Rosid) and Countou Coffee Bandung. Using relationship marketing theory, experiential marketing, and social exchange theory as analytical frameworks, this research explores how these businesses create distinct communicative experiences to foster brand loyalty. Employing a qualitative case study approach, this study incorporates non-participant observational analysis, semi-structured interviews, and textual-social media analysis to examine customer interactions in both establishments. The findings reveal that Studio Rosid's personalized, culturally immersive communication generates deeper emotional connections, leading to stronger customer loyalty and advocacy. Meanwhile, Countou Coffee Bandung's efficient and digital-driven interactions enhance accessibility and brand relevance but result in less personal attachment. These insights highlight the dual paths to business sustainability through either interpersonal engagement or digital communication strategies. The study concludes that balancing immersive communication with technological efficiency is essential for optimizing customer retention. Additionally, integrating moral storytelling elements into business models can strengthen customer relationships beyond transactional exchanges. Future research could explore the intersection of digital and interpersonal engagement in broader creative industry contexts.

Keywords: Interpersonal communication, Customer retention, Experiential marketing, Business sustainability.

IT-01

Profiling Condition of MSME As An Initial Step In Improving Business Processes To Increase Competitiveness Agricultural MSMEs

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Abstract: Company profile is important for understanding a company's condition as an initial step for improvement activities to increase competitiveness. Micro, Small, and Medium Enterprises (MSMEs) require competitiveness for preparation of the ASEAN Economic Community. Competitiveness can be improved by applying technology. The failure in applying technology often occurs due to a lack of understanding of technology requirements. These requirements can be identified through profiling the condition of MSMEs, which maps both external and internal conditions. Understanding business processes aims to determine the internal condition of MSMEs by analyzing the maturity level of business processes to adapt to technology requirements. External conditions are assessed using Porter's five forces to determine the level of competitiveness. This paper uses a livestock MSME in Lumajang, Indonesia as its object. The results found that this MSME scored 5.17 in competitiveness on a Likert scale of 1-7 and demonstrated an ad- hoc level of business process maturity. These results serve as a first step in analyzing processes for business process improvement.

Keywords: MSME, process business, maturity level, Ad-hoc, poter 5 forces, external factor

IT-02

Literature Review: Sustainable Balanced Scorecard in the Organic Fertilizer Industry Based on Palm Oil Biomass

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Abstract: The Sustainable Balanced Scorecard (SBSC) is an advancement of the Balanced Scorecard (BSC) that incorporates environmental and social dimensions into the strategic performance measurement system. The organic fertilizer industry, particularly that based on palm oil biomass, is developing alongside the push to create a circular economy and sustainable agricultural practices. However, research on the application of SBSC in this industry remains very limited. This study aims to review the literature related to SBSC and identify theoretical, methodological, empirical, and practical gaps in its application within the organic fertilizer industry based on palm oil waste. This research employs a systematic literature review method on 30 recent national and international journals. The findings indicate that although SBSC has been widely applied in the energy and manufacturing sectors, no comprehensive model or study has been specifically developed for the organic fertilizer sector derived from palm oil waste. Therefore, this study recommends the development of an SBSC framework that is relevant to the characteristics of this industry as a contribution to sustainability practices and strategic agribusiness management.

Keywords: Sustainable Balanced Scorecard, organic fertilizer, palm oil biomass, performance measurement, literature review.