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# PROGRAM BOOK

## The **2<sup>nd</sup>** ICESAS 2026

International Conference on Environmental Sciences,  
Agriculture, and Sustainability



### Theme:

*Innovative and Collaborative Approaches to Optimizing  
Marine, Agricultural, and Archipelagic Resources  
for Sustainable National Development*



28 October 2026



Universitas Pattimura,  
Ambon, Indonesia



Hybrid Conference



Website:  
[icesas.pasca.unpatti.ac.id](https://icesas.pasca.unpatti.ac.id)



E-mail:  
[icesas@mail.unpatti.ac.id](mailto:icesas@mail.unpatti.ac.id)



## 2<sup>nd</sup> ICESAS 2026

# THE 2<sup>ND</sup> INTERNATIONAL CONFERENCE ON ENVIRONMENTAL SCIENCES, AGRICULTURE, AND SUSTAINABILITY

## OFFICIAL PROGRAM BOOK

|                  |                                                                                                                                             |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Theme</b>     | Innovative and Collaborative Approaches to Optimizing Marine, Agricultural, and Archipelagic Resources for Sustainable National Development |
| <b>Date</b>      | Wednesday, 28 October 2026                                                                                                                  |
| <b>Venue</b>     | The Natsepa Hotel & Resort, Ambon, Maluku, Indonesia                                                                                        |
| <b>Format</b>    | Hybrid Conference: On-site and Online Presentations                                                                                         |
| <b>Time Zone</b> | Eastern Indonesia Time / WIT (UTC+09:00)                                                                                                    |
| <b>Organizer</b> | Postgraduate Program, Universitas Pattimura                                                                                                 |

### Edition and update status

Pre-conference edition prepared on 2 August 2026. The detailed paper-by-paper parallel-session schedule, final keynote titles, moderators, room chairs, and access credentials will be inserted after the final acceptance and confirmation process. Welcome messages are editorial drafts for institutional approval before public release.

**Official conference website:** <https://icesas.pasca.unpatti.ac.id/>

# CONTENTS

*Guide to the program book*

|           |                                                     |
|-----------|-----------------------------------------------------|
| <b>01</b> | <b>Welcome Messages</b>                             |
| <b>02</b> | <b>Conference Profile</b>                           |
| <b>03</b> | <b>Conference at a Glance</b>                       |
| <b>04</b> | <b>Scientific Chambers</b>                          |
| <b>05</b> | <b>Keynote Speakers</b>                             |
| <b>06</b> | <b>Conference Leadership and Committees</b>         |
| <b>07</b> | <b>Day Program / Rundown</b>                        |
| <b>08</b> | <b>Parallel Scientific Sessions</b>                 |
| <b>09</b> | <b>Presenter Guidelines</b>                         |
| <b>10</b> | <b>Publication and Editorial Policy</b>             |
| <b>11</b> | <b>Important Dates and Fees</b>                     |
| <b>12</b> | <b>Venue, Contacts, and Participant Information</b> |

## Program note

All times in this book use Eastern Indonesia Time (WIT), equivalent to UTC+09:00. International participants should convert the schedule to their local time zone.

## 01

## WELCOME MESSAGES

*Institutional and conference leadership***MESSAGE FROM THE RECTOR OF  
UNIVERSITAS PATTIMURA**

On behalf of Universitas Pattimura, I warmly welcome keynote speakers, presenters, participants, partners, and guests to the 2nd International Conference on Environmental Sciences, Agriculture, and Sustainability (ICESAS 2026). This international forum reflects our shared conviction that science, innovation, and collaboration are indispensable for addressing environmental challenges and strengthening sustainable development in archipelagic regions.

The conference theme places marine, agricultural, coastal, and island resources at the center of national development. These resources must be governed responsibly, supported by rigorous research, and transformed through technology and inclusive policy. ICESAS 2026 provides an important space for researchers, practitioners, government representatives, industry, civil society, and postgraduate students to exchange evidence, test ideas, and build partnerships that can generate measurable impact.

I hope the discussions held in Ambon will lead to durable networks, high-quality publications, and practical initiatives that contribute to resilient communities, a sustainable blue and green economy, and Indonesia Emas 2045. May the conference be intellectually rewarding and strengthen international friendship and academic cooperation.

**Prof. Dr. Fredy Leiwakabessy, M.Pd.***Rector, Universitas Pattimura*

## MESSAGE FROM THE DIRECTOR OF THE POSTGRADUATE PROGRAM



It is a privilege to welcome the international academic community to ICESAS 2026, organized by the Postgraduate Program of Universitas Pattimura. As a postgraduate institution located in one of Indonesia's most important archipelagic regions, we recognize both the opportunities and responsibilities associated with environmental stewardship, food security, marine resource governance, renewable energy, and sustainable livelihoods.

This conference is designed not only as a venue for presenting research, but also as a platform for interdisciplinary dialogue and collaboration. The five scientific chambers connect environmental quality, marine and coastal sustainability, climate-smart agriculture, green technology, and sustainable governance. Together, they represent a comprehensive response to the interconnected challenges facing island, coastal, rural, and urban communities.

The conference also forms part of the 22nd Anniversary of the Postgraduate Program of Universitas Pattimura. We are grateful to all speakers, reviewers, committee members, partners, and participants whose contributions make this international forum possible. I invite everyone to participate actively, exchange perspectives respectfully, and develop collaborations that continue well beyond the conference day.

**Prof. Dr. Richard Benny Luhulima, S.T., M.T.**  
*Director, Postgraduate Program, Universitas Pattimura*

## MESSAGE FROM CHAIRPERSON OF THE 22ND ANNIVERSARY COMMITTEE POSTGRADUATE PROGRAM, UNIVERSITAS PATTIMURA



On behalf of the Organizing Committee of the 22nd Anniversary of the Postgraduate Program, Universitas Pattimura, I am delighted to welcome all keynote speakers, presenters, participants, and distinguished guests to The 2nd International Conference on Environmental Sciences, Agriculture, and Sustainability (ICESAS 2026).

Under the theme “Innovative and Collaborative Approaches to Optimizing Marine, Agricultural, and Archipelagic Resources for Sustainable National Development,” this conference provides an important platform for sharing research, exchanging ideas, and strengthening collaboration in addressing environmental, agricultural, marine, and sustainability challenges.

We sincerely appreciate the contributions of all speakers, reviewers, committee members, partners, and participants. May ICESAS 2026 inspire meaningful discussions, productive partnerships, and innovative solutions for sustainable development. Welcome to ICESAS 2026 and the 22nd Anniversary of the Postgraduate Program, Universitas Pattimura..

**Prof. Dr. Christina Sososutiksno, M.Si, Ak, CA.**

*Chairperson of the 22nd Anniversary Committee*

*Postgraduate Program, Universitas Pattimura*

## MESSAGE FROM THE CONFERENCE CHAIR



Welcome to ICESAS 2026. The organizing committee is honored to bring together scholars and stakeholders from Indonesia and abroad for a focused exchange on environmental sciences, agriculture, and sustainability. We have prepared a hybrid program that combines institutional remarks, keynote sessions, parallel scientific presentations, networking, cultural engagement, and a closing celebration.

The scientific program is organized into five chambers to ensure that presentations are discussed by participants with related interests and expertise. Presenters are requested to observe the allocated time, use clear academic English, follow the instructions of session chairs and technical teams, and remain available for questions and scholarly discussion. Authors whose papers are considered for proceedings publication must also complete all review, revision, ethical, formatting, and editorial requirements.

I express sincere appreciation to Universitas Pattimura leadership, the Scientific Committee, reviewers, keynote speakers, organizing teams, partners, and every participant. Your contribution is central to the quality and impact of the conference. I wish everyone a productive program, meaningful connections, and an enjoyable experience in Ambon.

**Assoc. Prof. Dr. Paul Arjanto, M.Pd.**  
*Conference Chair, ICESAS 2026*

## 02

## CONFERENCE PROFILE

*Purpose, context, and expected contribution*

## ABOUT ICESAS 2026

The 2nd International Conference on Environmental Sciences, Agriculture, and Sustainability (ICESAS 2026) is an international academic forum organized by the Postgraduate Program of Universitas Pattimura, Ambon, Indonesia. It facilitates the exchange of scientific ideas, interdisciplinary research findings, technological innovations, and policy-oriented solutions related to environmental sustainability, marine and coastal resource management, sustainable agriculture, renewable energy, green technology, blue economy development, and sustainability transformation.

Carrying the theme “Innovative and Collaborative Approaches to Optimizing Marine, Agricultural, and Archipelagic Resources for Sustainable National Development,” the conference emphasizes the strategic importance of marine, agricultural, coastal, and archipelagic resources. It provides a platform for researchers, academics, practitioners, policymakers, postgraduate students, government agencies, non-governmental organizations, industry partners, and development stakeholders to present research and build collaborations that contribute to sustainability, resilience, and impactful development, particularly in island and coastal regions.

ICESAS 2026 aligns with the institutional commitment of Universitas Pattimura and its Postgraduate Program to promote innovation, collaboration, sustainability, and impactful contributions toward Indonesia Emas 2045.

### Conference Objectives

- Provide an international platform for the dissemination of high-quality research and innovation in environmental sciences, agriculture, and sustainability.
- Promote interdisciplinary and cross-sector collaboration among universities, government, industry, communities, and development organizations.
- Strengthen evidence-based approaches to marine, coastal, agricultural, energy, environmental, and natural-resource challenges in archipelagic regions.
- Facilitate scholarly networking, research partnerships, and prospective joint publications or projects.
- Contribute scientific and policy perspectives that support sustainable national development and resilient island communities.

### Expected Outcomes

- Peer-reviewed scientific exchange and constructive feedback for authors.
- New national and international research networks.
- Policy and practice recommendations relevant to sustainability and resource governance.
- Selected proceedings papers that satisfy conference and publisher requirements.
- Greater visibility for sustainability research originating from island and coastal contexts.

## 03

# CONFERENCE AT A GLANCE

*Core information for delegates*

|                                |                                                                                                                                                                                 |
|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Official Name</b>           | The 2nd International Conference on Environmental Sciences, Agriculture, and Sustainability                                                                                     |
| <b>Acronym</b>                 | ICESAS 2026                                                                                                                                                                     |
| <b>Theme</b>                   | Innovative and Collaborative Approaches to Optimizing Marine, Agricultural, and Archipelagic Resources for Sustainable National Development                                     |
| <b>Date</b>                    | Wednesday, 28 October 2026                                                                                                                                                      |
| <b>Venue</b>                   | The Natsepa Hotel & Resort, Ambon, Maluku, Indonesia                                                                                                                            |
| <b>Format</b>                  | Hybrid: on-site and online                                                                                                                                                      |
| <b>Time Zone</b>               | WIT / UTC+09:00                                                                                                                                                                 |
| <b>Organizer</b>               | Postgraduate Program, Universitas Pattimura                                                                                                                                     |
| <b>Official Language</b>       | English                                                                                                                                                                         |
| <b>Parallel Sessions</b>       | 14:00–17:00 WIT; five on-site rooms and five Zoom rooms                                                                                                                         |
| <b>Standard Oral Slot</b>      | 15 minutes: 10 minutes presentation + 5 minutes discussion                                                                                                                      |
| <b>Proceedings Opportunity</b> | Selected papers considered for IOP Conference Series: Earth and Environmental Science, subject to peer review, editorial evaluation, scope compliance, and publisher acceptance |

## Sustainability focus

ICESAS 2026 connects environmental quality, marine and coastal systems, food and agriculture, clean energy and advanced materials, and sustainable governance. The conference places particular emphasis on island and archipelagic contexts.

# 04

## SCIENTIFIC CHAMBERS

*Five interdisciplinary tracks*

### CHAMBER 1

#### **Environmental Quality, Ecotoxicology, Pollution Control, and Ecosystem Restoration**

Environmental quality; pollution assessment and monitoring; ecotoxicology; sediment, water, soil, and air quality; catchment and watershed management; environmental risk assessment; remediation; ecological rehabilitation; and restoration of degraded ecosystems.

### CHAMBER 2

#### **Marine, Coastal, and Archipelagic Resource Sustainability**

Sustainable marine and coastal management; fisheries; biodiversity conservation; blue economy development; coastal resilience; island development; marine innovation; and community-based stewardship of archipelagic resources.

### CHAMBER 3

#### **Climate-Smart Agriculture, Agrometeorology, Food Security, and Sustainable Livestock Systems**

Climate-smart farming; agrometeorology; crop-weather relationships; food security; agroecology; rural resilience; sustainable livestock systems; alternative feed and protein; and local-resource-based agricultural innovation.

### CHAMBER 4

#### **Renewable Energy, Advanced Materials, Carbon Capture, and Green Technology**

Renewable energy; energy storage; advanced materials; lithium-ion and sodium-ion batteries; carbon capture; environmental engineering; low-carbon innovation; green technology; and sustainable infrastructure.

### CHAMBER 5

#### **Sustainable Supply Chains, Circular Economy, Blue Economy Policy, and Natural Resource Governance**

Sustainable supply chains and operations; circular economy; blue economy policy; community empowerment; natural-resource governance; institutional collaboration; environmental policy; and sustainability-oriented socioeconomic development.

05

## KEYNOTE SPEAKERS

*International expertise across the five scientific chambers*



**Prof. Amanda Reichelt-Brushett, Ph.D.**

**Southern Cross University, Australia**

**Expertise:** Ecotoxicology; environmental science; rehabilitation and restoration; catchment management; sediment and water quality; pollution control.

**ON-SITE**



**Prof. Dr. Eng. Koichi Murata**

**Nihon University, Japan**

**Expertise:** Sustainable supply chain management; operations management; production management.

**ON-SITE**



**Prof. Peter Strausz, Ph.D.**

**Corvinus University of Budapest, Hungary**

**Expertise:** Sustainable livestock systems and agricultural management.

**ONLINE**



**Prof. Dr. Saon Banerjee**

**Bidhan Chandra Krishi Viswavidyalaya, India**

**Expertise:** Agricultural meteorology; climate-change impacts on agriculture; climate-smart agriculture and food security.

**ONLINE**

05

## KEYNOTE SPEAKERS

*Continued*



**Prof. Aditya Wibawa Sakti, Ph.D.**

**Waseda University, Japan**

**Expertise:** Advanced materials; lithium-ion and sodium-ion batteries; carbon capture; computational chemistry; molecular simulation; green technology.

**ONLINE**



**Prof. Wilma Latuny, Ph.D.**

**Universitas Pattimura, Indonesia**

**Expertise:** Artificial intelligence; artificial neural networks; computing in mathematics and natural science; industrial engineering; petroleum engineering.

**ON-SITE**

## 06

# CONFERENCE LEADERSHIP AND COMMITTEES

*Institutional leadership, conference management, and scholarly review*

## Institutional and Conference Leadership

|                              |                                                                                                                                              |
|------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Official Opening</b>      | Hendrik Izaac Lewerissa, S.H., LL.M. — Governor of Maluku                                                                                    |
| <b>Institutional Remarks</b> | Prof. Dr. Fredy Leiwakabessy, M.Pd. — Rector, Universitas Pattimura                                                                          |
| <b>Welcome Remarks</b>       | Prof. Dr. Richard Benny Luhulima, S.T., M.T. — Director, Postgraduate Program, Universitas Pattimura                                         |
| <b>Welcome Remarks</b>       | Prof. Dr. Christina Sososutiksno, M.Si, Ak, CA. — Chairperson of the 22nd Anniversary Committee, Postgraduate Program, Universitas Pattimura |
| <b>Conference Chair</b>      | Assoc. Prof. Dr. Paul Arjanto — ICESAS 2026                                                                                                  |

## Operational Units

| Unit                                              | Primary Responsibility                                                                                                |
|---------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| <b>Program and Scientific Sessions</b>            | Program design, keynote coordination, chamber allocation, moderators, room chairs, and time management.               |
| <b>Scientific Review and Editorial</b>            | Reviewer assignment, scientific quality, ethical screening, similarity checks, revisions, and publication compliance. |
| <b>Secretariat and Registration</b>               | Correspondence, registrations, payments, certificates, delegate information, and administrative records.              |
| <b>IT and Hybrid Conference</b>                   | Zoom rooms, audio-visual systems, screen sharing, recordings, online attendance, and technical support.               |
| <b>Protocol, Event, and Cultural Program</b>      | Opening protocol, master of ceremony, cultural performance, group photo, closing ceremony, and gala dinner.           |
| <b>Venue, Logistics, Liaison, and Hospitality</b> | Room setup, equipment, speaker liaison, transportation coordination, meals, delegate kits, and guest support.         |
| <b>Documentation and Communications</b>           | Photography, video, website, social media, program materials, and institutional reporting.                            |

## 06

## SCIENTIFIC COMMITTEE

*International and national scholarly oversight*

| No. | Name                                                          | Affiliation                                             |
|-----|---------------------------------------------------------------|---------------------------------------------------------|
| 1   | <b>Prof. Dr. Richard B. Luhulima, S.T., M.T.</b>              | Universitas Pattimura, Indonesia                        |
| 2   | <b>Prof. Dr. Dominggus Rumahlatuh, S.Pd., M.Pd.</b>           | Universitas Pattimura, Indonesia                        |
| 3   | <b>Prof. Dr. Dra. Maria Nindatu, M.Kes.</b>                   | Universitas Pattimura, Indonesia                        |
| 4   | <b>Prof. Dr. Ch. I. Tupan, S.Pi., M.Si.</b>                   | Universitas Pattimura, Indonesia                        |
| 5   | <b>Prof. Dr. H. Sinay, M.Si.</b>                              | Universitas Pattimura, Indonesia                        |
| 6   | <b>Prof. Ir. Irma Kesaulya, M.Sc., Ph.D.</b>                  | Universitas Pattimura, Indonesia                        |
| 7   | <b>Prof. Dr. Christina Sososutikno, S.E., M.Si., Ak., CA.</b> | Universitas Pattimura, Indonesia                        |
| 8   | <b>Prof. Dr. Tanwey G. Ratumanan, M.Pd.</b>                   | Universitas Pattimura, Indonesia                        |
| 9   | <b>Prof. Dr. Ir. Johan Riry, M.P.</b>                         | Universitas Pattimura, Indonesia                        |
| 10  | <b>Dr. Jeffry E. M. Leywakabessy, S.Pi., M.Si.</b>            | Universitas Pattimura, Indonesia                        |
| 11  | <b>Prof. Omar M. K. Mahasneh, Ph.D.</b>                       | Al-Balqa Applied University,<br>Jordan                  |
| 12  | <b>Dr. Seng Tong Chong</b>                                    | University Tenaga Nasional,<br>Malaysia                 |
| 13  | <b>Prof. Dr. Inero Valbuena Ancho</b>                         | University of the Philippines Los<br>Baños, Philippines |
| 14  | <b>Ahmad Zufrie Abd Rahman, Ph.D.</b>                         | University Tenaga Nasional,<br>Malaysia                 |

## 06

## SCIENTIFIC COMMITTEE

*Continued*

| No. | Name                                | Affiliation                                                  |
|-----|-------------------------------------|--------------------------------------------------------------|
| 15  | <b>Prof. Dr. W. Mataheru, M.Pd.</b> | Universitas Pattimura, Indonesia                             |
| 16  | <b>Vasanthan, Ph.D</b>              | Nagaland University, India                                   |
| 17  | <b>Arko Barman, Ph.D.</b>           | Rice University, United States                               |
| 18  | <b>Habil Peter Strausz, Ph.D.</b>   | Corvinus University of Budapest, Hungary                     |
| 19  | <b>Prof. Dr. Gábor Biczó</b>        | University of Debrecen, Hungary                              |
| 20  | <b>Dr. Bagi Zoltán</b>              | University of Debrecen, Hungary                              |
| 21  | <b>Vahid Nimehchisalem, Ph.D</b>    | University of Economics and Human Sciences in Warsaw, Poland |
| 22  | <b>Walton Wider, Ph.D</b>           | INTI International University, Malaysia                      |
| 23  | <b>Loh Kee Shyuan, Ph.D</b>         | University Kebangsaan Malaysia, Malaysia                     |
| 24  | <b>Karthikeyan, Ph.D</b>            | National College, India                                      |
| 25  | <b>Dr. Endurance Edigue Ewere</b>   | Southern Cross University, Australia                         |

**Scientific Committee responsibilities**

The Scientific Committee supports reviewer selection, scholarly quality assurance, ethical and similarity screening, session organization, and recommendations on acceptance, revision, or rejection. Final publication decisions remain subject to editorial and publisher requirements.

## 07

# DAY PROGRAM / RUNDOWN ACARA

Wednesday, 28 October 2026 | WIT (UTC+09:00)

| Time        | Agenda / Activity                                      | Description / Flow                                                                                                        | PIC / Notes                                              |
|-------------|--------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|
| 08:00–09:00 | <b>Participant Registration &amp; Welcoming Coffee</b> | Registration, delegate kit distribution, attendance confirmation, presenter verification, and online technical support.   | Registration Committee; Secretariat; IT Team             |
| 09:00–09:05 | <b>Opening by Master of Ceremony</b>                   | Welcome to distinguished guests, keynote speakers, presenters, participants, partners, and stakeholders.                  | MC                                                       |
| 09:05–09:10 | <b>National Anthem</b>                                 | Singing of “Indonesia Raya”.                                                                                              | Protocol Team                                            |
| 09:10–09:15 | <b>Prayer</b>                                          | Opening prayer according to the official protocol arrangement.                                                            | Protocol Team                                            |
| 09:15–09:35 | <b>Opening Cultural Performance</b>                    | Maluku cultural performance representing archipelagic identity.                                                           | Event & Cultural Team                                    |
| 09:35–09:45 | <b>Welcome Remarks</b>                                 | Welcome remarks by the Director of the Postgraduate Program, Universitas Pattimura.                                       | Prof. Dr. Richard Benny Luhulima, S.T., M.T.             |
| 09:45–09:55 | <b>Institutional Remarks</b>                           | Remarks by the Rector of Universitas Pattimura.                                                                           | Prof. Dr. Fredy Leiwakabessy, M.Pd.                      |
| 09:55–10:10 | <b>Official Opening</b>                                | Remarks and official opening of ICESAS 2026, symbolically marked by the Pemukulan Tifa.                                   | Governor of Maluku: Hendrik Izaac Lewerissa, S.H., LL.M. |
| 10:10–10:20 | <b>Group Photo</b>                                     | University leaders, keynote speakers, committee, invited guests, and participants.                                        | Documentation Team                                       |
| 10:20–11:50 | <b>Keynote Session 1 — On-site</b>                     | Prof. Amanda Reichelt-Brushett; Prof. Dr. Eng. Koichi Murata; Prof. Wilma Latuny. Moderated presentations and discussion. | Moderators; IT Team                                      |
| 11:50–13:00 | <b>Keynote Session 2 — Online</b>                      | Prof. Peter Strausz; Prof. Dr. Saon Banerjee; Prof. Aditya Wibawa Sakti. Moderated presentations and discussion.          | Moderators; IT Team                                      |

## 07

# DAY PROGRAM / RUNDOWN ACARA

*Afternoon and evening program*

| Time        | Agenda / Activity                              | Description / Flow                                                                                    | PIC / Notes                                    |
|-------------|------------------------------------------------|-------------------------------------------------------------------------------------------------------|------------------------------------------------|
| 13:00–14:00 | <b>Lunch Break &amp; Networking</b>            | Lunch and networking among speakers, participants, committee members, and institutional partners.     | Consumption Committee; Liaison Officers        |
| 14:00–17:30 | <b>Parallel Scientific Sessions</b>            | Oral presentations in five scientific chambers, delivered simultaneously in on-site and online rooms. | Room Chairs; Co-chairs; IT Team                |
| 17:30–18:00 | <b>Coffee Break</b>                            | Coffee break and preparation for the closing session.                                                 | Consumption Committee                          |
| 18:00–19:00 | <b>Closing Ceremony &amp; 22nd Anniversary</b> | Closing program and Dies Natalis XXII of the Postgraduate Program, Universitas Pattimura.             | MC; Organizing Committee; Scientific Committee |
| 19:00–20:00 | <b>Gala Dinner &amp; Cultural Night</b>        | Dinner, networking, appreciation, cultural performance, and institutional hospitality.                | Organizing Committee; Event Team               |

## Program operations

Keynote speakers, moderators, room chairs, co-chairs, and technical operators should report at least 30 minutes before their assigned session. All rooms must maintain attendance, timing, and technical records.

## 08

# PARALLEL SCIENTIFIC SESSIONS

*Room allocation and presentation sequence*

## ROOM / CHAMBER ALLOCATION

| Room / Chamber                                                                                                                                                                                                                                                                | Topic Scope                                                                                       | Mode           |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|----------------|
| <b>Room A / Chamber 1: ROTUNDA</b>                                                                                                                                                                                                                                            | Environmental Quality, Ecotoxicology, Pollution Control, and Ecosystem Restoration                | <b>On-site</b> |
| <b>Room B / Chamber 2: BANDA</b>                                                                                                                                                                                                                                              | Marine, Coastal, and Archipelagic Resource Sustainability                                         | <b>On-site</b> |
| <b>Room C / Chamber 3: ENTERTAIN</b>                                                                                                                                                                                                                                          | Climate-Smart Agriculture, Agrometeorology, Food Security, and Sustainable Livestock Systems      | <b>On-site</b> |
| <b>Room D / Chamber 4: SAUMLAKI</b>                                                                                                                                                                                                                                           | Renewable Energy, Advanced Materials, Carbon Capture, and Green Technology                        | <b>On-site</b> |
| <b>Room E / Chamber 5: DOBO</b>                                                                                                                                                                                                                                               | Sustainable Supply Chains, Circular Economy, Blue Economy Policy, and Natural Resource Governance | <b>On-site</b> |
| <b>Zoom Room 1</b>                                                                                                                                                                                                                                                            | Environmental Quality, Ecotoxicology, Pollution Control, and Ecosystem Restoration                | <b>Online</b>  |
| <b>Zoom Room 2</b>                                                                                                                                                                                                                                                            | Marine, Coastal, and Archipelagic Resource Sustainability                                         | <b>Online</b>  |
| <b>Zoom Room 3</b>                                                                                                                                                                                                                                                            | Climate-Smart Agriculture, Agrometeorology, Food Security, and Sustainable Livestock Systems      | <b>Online</b>  |
| <b>Zoom Room 4</b>                                                                                                                                                                                                                                                            | Renewable Energy, Advanced Materials, Carbon Capture, and Green Technology                        | <b>Online</b>  |
| <b>Zoom Room 5</b>                                                                                                                                                                                                                                                            | Sustainable Supply Chains, Circular Economy, Blue Economy Policy, and Natural Resource Governance | <b>Online</b>  |
| <b>Final presentation order</b><br><br>The paper-by-paper presentation order, Paper IDs, presenters, session chairs, and Zoom access information will be published after the final acceptance process. Presenters must follow the room assignment shown in the final program. |                                                                                                   |                |

## 08

# PARALLEL SESSION SCHEDULE TEMPLATE

## ON-SITE SCIENTIFIC SESSIONS

### Chamber 1: Environmental Quality, Ecotoxicology, Pollution Control, and Ecosystem Restoration

**Moderator: Dr. Sophia Binnendyk, M.Pd.**

| Time (WIT)  | Paper ID | Paper Title                                                                                                                                     | Authors                                                                                                                  |
|-------------|----------|-------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
| 14:00–14:15 | 39       | Effects of Sopi Mayang and Sopi Colli on Liver Function and Hepatic Necrosis in Rattus Norvegicus : In Vivo Study                               | Nathalie Elischeva Kailola; Maria Nindatu; Pamella Mercy Papilaya; Presli Glovrig Siahaya                                |
| 14:15–14:30 | 41       | The Concept of Carbon Taxation: A Comparative Legal Study of Indonesia, Finland, Sweden, and Canada                                             | Arnezul Satriawan; Arman Anwar                                                                                           |
| 14:30–14:45 | 44       | Mapping the global research landscape of educational policy and ecotheology: A bibliometric analysis of scopus-indexed publications (2020–2025) | Arsyil Waritsman; Uswatun Khasanah                                                                                       |
| 14:45–15:00 | 75       | Utilization of the Matel Plant (Clerodendrum minahasae L.) in Ambon City                                                                        | Hermina Taihuttu; Maimuna La Habi; Putri Nur Jihan Opier                                                                 |
| 15:00–15:15 | 81       | Granular Compost Production from Sago Pith Waste and Campus Leaf Litter and Its Application to Shallot Cultivation                              | Maimuna La Habi; Rudy Soplanit; VILMA LAURIEN TANASALE; Nureny Goo; Joan Joulanda Grace Kailola; Hermina Neltje Taihuttu |
| 15:15–15:30 | 108      | Analysis of The Carrying Capacity of The Wai Lola Besar Watershed in East Seram Regency, Maluku Province                                        | Silwanus Matheus Talakua; Rafael M. Osok; Cristina M. Talakua; Jenly F. Uspessy                                          |
| 15:30–15:45 | 135      | Incorporation of Customary Law and Local Wisdom in Coastal Ecosystem Protection                                                                 | Litha lithamustamu27@gmail.com; Brainstar Tontji Allamon; Jhon Albert Latuni                                             |
| 15:45–16:00 | 137      | Integrating Environmental Sustainability into English Speaking through Photovoice: Exploring Students' Engagement                               | W M Kakerissa; Wenda Marlin Kakerissa; Sophia Binnendyk; H J Maruanaya                                                   |

## Chamber 2: Marine, Coastal, and Archipelagic Resource Sustainability

**Moderator: Prof. Dr. Dra. Maria Nindatu, M.Kes.**

| Time (WIT)  | Paper ID | Paper Title                                                                                                                                                    | Authors                                                                                                                                                                                                                                                    |
|-------------|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 14:00–14:15 | 12       | Digital Learning Management for Coastal and Marine Environmental Education in Remote Archipelagic Schools: A Sustainability Framework                          | Hendelina Wael; Paul Arjanto; Prof. Dr. RUDOLF KEMPA, M.Pd; MEI DAYANTY; Wely Agus Anthonio akerina; LIYONA PUTTILEIHALAT; Risty Okta Nawangwulan; Dorteia Adriaansz; Melinda Selvia Louhanapessy; Zainul Arifin; Merlien Lessy; Ledia Siaia; Rasdin Tomia |
| 14:15–14:30 | 40       | Development of Antimalarial Phytomedicine of Clerodendrum inerme Leaves to Reduce Parasitemia : a Model as Antimalarial Drugs Discovery                        | Maria Nindatu; Abdul M.Ukratalo; Ventia Tanikwele; Hery Jotley                                                                                                                                                                                             |
| 14:30–14:45 | 67       | Physical and socio-economic components of coastal vulnerability for small-island management: a segment-scale assessment in Negeri Rutong, Ambon Island         | Lisa Meidiyanti Lautetu; J D Putuhena; B Latuamury; B B Seipalla                                                                                                                                                                                           |
| 14:45–15:00 | 116      | Escaping the Coastal Poverty Trap: How Seaweed Downstreaming Capacity Creates Value and Reduces Household Poverty Vulnerability in Southeast Maluku, Indonesia | Mohamad Ratmasa Serang; Alex Soleman Wellem Retraubun; Johanis Hiariy; Dionisius Bawole                                                                                                                                                                    |
| 15:00–15:15 | 119      | From Rehabilitation to Ecotourism: A Comparative Analysis of Governance and Co-Management in Mangrove Karangsong and Kasih Sayang Mundupesisir                 | Feti Fatimatuzzahroh; Hasrianti Hasrianti; Nurhasanah; Vita Elysia                                                                                                                                                                                         |
| 15:15–15:30 | 124      | Dynamic Model Integration of Bioecology-Management-Welfare (BMW) for Sustainable Marine Tourism in Banda Marine Conservation Area                              | Tono Mahmudin; Johanis Hiariy; Renoldy Lamberthy Papilaya; Dionisius Bawole                                                                                                                                                                                |
| 15:30–15:45 | 132      | Evaluating Critical Water Quality Stressors on Kappaphycus alvarezii Seedlings in a Laboratory-Scale RAS                                                       | Endang Jamal; Sophia N. M. Fendjalang; Joice W Loupatty; Achmad Fauzan Arifin                                                                                                                                                                              |
| 15:45–16:00 | 145      | The roles of Fisher Ecological Knowledge associated with Traditional Larval Fishery in Eastern Indonesia                                                       | Grace Hutubessy; Agustinus Tupamahu; RHS Tawari; Haruna                                                                                                                                                                                                    |
| 16:00–16:15 | 151      | Condition and seagrass ecosystem health index in the water of Poka, Inner Ambon Bay                                                                            | Charlothia Irenny Tupan; Johannes M.S. Tetelepta; JESAJA A. PATTIKAWA; Janson Hans Pietersz; Grasiano Warakano Lailossa                                                                                                                                    |
| 16:15–16:30 | 154      | Solar-LED attracted zooplankton live feed: First insight into the survival and growth of Juvenile Caranx ignobilis in Tropical floating net cages              | Jacobus mosse; B.G. Hutubessy; Izzanudin Pary; Michelle Bairatnissa                                                                                                                                                                                        |

### Chamber 3: Climate-Smart Agriculture, Agrometeorology, Food Security, and Sustainable Livestock Systems

**Moderator: Dr. Wenda M. Kakerissa, S.S., M.Hum.**

| Time (WIT)  | Paper ID | Paper Title                                                                                                                                                                                                         | Authors                                                      |
|-------------|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|
| 14:00–14:15 | 105      | Land Suitability Evaluation for Nutmeg ( <i>Myristica fragran</i> HOUTT) and Coconut ( <i>Cocos nucifera</i> L.) Based on Geographic Information System in Wai Ela Watershed Centra Maluku Regency, Maluku Province | Silwanus Matheus Talakua; Sally Gabrielle Waemese            |
| 14:15–14:30 | 155      | MULTI-SOURCE HOUSEHOLD LIVELIHOOD SYSTEMS IN OUTERMOST SMALL ISLAND REGIONS (A STUDY IN UHAK VILLAGE, WETAR ISLAND, SOUTHWEST MALUKU)                                                                               | Mersi Sahureka; Supratman Supratman; Muhammad Alif K. Sahide |

### Chamber 4: Renewable Energy, Advanced Materials, Carbon Capture, and Green Technology

**Moderator: Agapery Yoane Pattinasarany, S.Pi., M.App.Sc.**

| Time (WIT)  | Paper ID | Paper Title                                                                                                                                                                     | Authors                                                                                                       |
|-------------|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| 14:00–14:15 | 140      | Synthesis of Silver Nanoparticles (AgNPs) Using Aqueous Extract of Gandaria ( <i>Bouea macrophylla</i> G.) Bark and Their Application in the Photodegradation of Methylene Blue | Catherina M. Bijang; Catherina Bijang; Nelson Gaspersz; Refandi Rachmad; Mimi Salmawati                       |
| 14:15–14:30 | 146      | Characterization of Natural Dye Extracts from the Seaweed <i>Dictyosphaeria versluysii</i> as Photosensitizers in Dye Sensitized Solar Cell Applications                        | Semuel Unwakoly; Noni Noviana, S.Pd.,M.Pd; Wisye Hehakaya; Eka Cahya Prima; Pieter Kakisina; Sherly Lewerissa |
| 14:30–14:45 | 150      | Lonthoir Natural Clay-Based Composite Phase Change Materials: Synthesis, Characterization, Latent Heat Storage, and Thermal Stability                                           | Serly Sekewael; Priska Marisa Pattiasina; Mimi Salmawati                                                      |

## Chamber 5: Sustainable Supply Chains, Circular Economy, Blue Economy Policy, and Natural Resource Governance

**Moderator: Inggrit O. Tanasale, M.Ed., Ph.D.**

| Time (WIT)  | Paper ID | Paper Title                                                                                                                                                           | Authors                                                                                                                                                                                             |
|-------------|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 14:00–14:15 | 25       | Maluku's Circular Economy Perspective: An Archipelago-Based MSME's Competitiveness Framework                                                                          | Aisah Asnawi; Faras Ayunani                                                                                                                                                                         |
| 14:15–14:30 | 11       | Environmental Capacity Building for Archipelagic Sustainability: A Training Needs Analysis of Teachers and Education Staff                                            | Suraya Dahlan; Paul Arjanto; Maria Tience Yulianingsih; Abdul Rasid Tuharea; Wahyu Parhitean Butar Butar; Irwin Tabang; Meria; Sundun Triwardani; Moy Phin Batmomolin; Prof. Dr. RUDOLF KEMPA, M.Pd |
| 14:30–14:45 | 14       | THE ROLE OF REGIONAL LEGISLATURES IN SUPPORTING SUSTAINABLE DEVELOPMENT BASED ON ARCHIPELAGIC NATURAL RESOURCES                                                       | Jamaludin Samak; MEI DAYANTY                                                                                                                                                                        |
| 14:45–15:00 | 73       | Public Participation in Community Based Waste Management Through the Waste Bank Program in Supporting the Circular Economy                                            | Vita Elysia; Feti Fatimatuazzahroh; Hasrianti Hasrianti; Nurhasanah                                                                                                                                 |
| 15:00–15:15 | 97       | Digital Twins for Supply Chain Resilience: A Bibliometric and Thematic Analysis of Research Trends, Knowledge Structure, and Future Research Directions               | Daniel B. Paillin; Wilma Latuny; J. M. Tupan; V.O. Lawalata; Kristina Hutapea; J. B. Paillin; Ferdy Patikayhatu                                                                                     |
| 15:15–15:30 | 129      | Social and Environmental Accountability for the Sustainability of Merah Putih Cooperatives in Ambon City                                                              | Selva Temalagi; Ervan Togatorop; Christy Clayde                                                                                                                                                     |
| 15:30–15:45 | 144      | Risk Mitigation Cost Estimation in the Tuna Loin Agro-Industrial Supply Chain Using Monte Carlo Simulation                                                            | Daniel B. Paillin; Wilma Latuny; J. B. Paillin; F. Pattykayhattu; J. M. Tupan; V.O. Lawalata; Kristina Hutapea                                                                                      |
| 15:45–16:00 | 147      | The Effectiveness of the Implementation of Corporate Social Responsibility Funds and Their Impact on the Sustainability of Villages Supported by Pattimura University | stenly ferdinandus                                                                                                                                                                                  |

## ONLINE SCIENTIFIC SESSIONS

### Chamber 1: Environmental Quality, Ecotoxicology, Pollution Control, and Ecosystem Restoration

**Moderator: dr. Farah Christina Noya, M.HPEd., Ph.D.**

| Time (WIT)  | Paper ID | Paper Title                                                                                                                                                      | Authors                                                                                                                                                                                                      |
|-------------|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 14:00–14:15 | 6        | Climate Change Disclosure and Board Characteristics: The Moderating Role of Debt                                                                                 | Hasan Mukhibad; Heri Yanto; Ahmad Nurkhin; Indah Anisykurlillah; Risqie Nur Salsabila Ilman                                                                                                                  |
| 14:15–14:30 | 7        | The Role of The Board and Financial Resources on Climate Change Performance                                                                                      | Indah Anisykurlillah; Hasan Mukhibad; Kusumantoro; Sintaina Nur Fadila                                                                                                                                       |
| 14:30–14:45 | 8        | ENVIRONMENTAL SUSTAINABILITY PERFORMANCE AND AMIL ZAKAT INSTITUTIONS - DOES GREEN INTELLECTUAL CAPITAL MATTER?                                                   | Heri Yanto; Ahmad Nurkhin; Hasan Mukhibad; Dessy Ekaviana; Adang Suherman; Bachtiar Sjaiful Bachri                                                                                                           |
| 14:45–15:00 | 16       | Traditional Ecological Knowledge in Sustainable Clay Resource Management for Pottery Production in Bayat, Klaten, Indonesia                                      | Slamet Subiyantoro; dimas fahrudin; Mulyanto; Krisna Ramadhan                                                                                                                                                |
| 15:00–15:15 | 17       | PAPEDA: Development of Learning Modules Literacy and Numeracy For Elementary School Students in Nabire, Papua                                                    | RIVALDO PAUL TELUSSA; JERMANTO SUBENO LASAMAHU; SANTJI AFI RANGKOLY; JASMARI; TUT HIDAYATILLAH; Julvani Ayuningsih Warsito; ANTONIUS AWAN ASTA ADHIPRANA WHISNUBRATA; DEBY SISKI BOGAR; Kevin Andrea Tamaela |
| 15:15–15:30 | 22       | Synergy of the Sound of Green, STEAM, and SDGs Models in Improving Students' Environmental Literacy towards Sustainability of Ambon City's Music Tourism Village | Pamella Mercy Papilaya; Chtherine Pauline Salhuteru                                                                                                                                                          |
| 15:30–15:45 | 23       | QUAL2Kw-Based Simulation of Coal Mining Wastewater Dispersion and Water Quality Response in the Segah River, Berau Regency, Indonesia                            | Irwan Mulyadi; Indang Dewata; Mulya Gusman                                                                                                                                                                   |

| Time (WIT)  | Paper ID | Paper Title                                                                                                                                     | Authors                                                                    |
|-------------|----------|-------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| 15:45–16:00 | 45       | Polymer-Specific Microplastic Contamination and Potential Environmental Risks in Mangrove Ecosystems of Ternate Island, North Maluku, Indonesia | Badrun Ahmad; Indah R S Salami; Alamsyah Kurniawan; Mariana Marselina      |
| 16:00–16:15 | 127      | Spatiotemporal changes in green open space and surface water extent for sustainable urban planning in Tembalang Indonesia                       | wahid sidiq; Inaya Sari Melati; Erwando Tommy Al-Hanif; Latri Setyaningrum |
| 16:15–16:30 | 149      | The Effectiveness of a Project-Based Learning Approach Integrated with Ain Ni Ain Values on Students' Critical Thinking Skills                  | Janaba Renngiwur; Ali Awan; Pamela Mercy Papilaya; Domingus Rumahlatu      |

## Chamber 2: Marine, Coastal, and Archipelagic Resource Sustainability

**Moderator: drg. Christiana Rialine Titaley, MPH., Ph.D.**

| Time (WIT)  | Paper ID | Paper Title                                                                                                                                                            | Authors                                                                                                              |
|-------------|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|
| 14:00–14:15 | 31       | Managing Tourism Pressure and Coastal Carrying Capacity in a Small Island System: A Bayesian Belief Network Analysis of Bali, Indonesia                                | Ni Nyoman Reni Suasih; Putu Yudy Wijaya; [Nama tidak tercantum — saskara@unud.ac.id]; Apsari Anandari; I Komang Gede |
| 14:15–14:30 | 51       | Community Structure and Distribution of Mangroves along the Lateri Coast, Ambon, Indonesia                                                                             | Yona Aksa Lewerissa; Johannes M.S. Tetelepta; Charlothia I.Tupan; Simon Tubalawony                                   |
| 14:30–14:45 | 71       | Salinity and Light Effects on the Germination and Seedling Establishment of <i>Thalassia hemprichii</i>                                                                | John Carlo Garcia; Anabelle Dece Espadero; Lovella Calala; Wilfredo H. Uy                                            |
| 14:45–15:00 | 77       | Mapping Penta Helix Collaboration for Sustainable Coastal Flood Management in Genuk, Semarang                                                                          | Dewi Ramadhani                                                                                                       |
| 15:00–15:15 | 83       | Women in Sustainable Marine Supply Chains: Papalele Networks in Saparua Island                                                                                         | Prapti Murwani; Simona Ch.H. Litaay; Hermien Lola Sospelisa                                                          |
| 15:15–15:30 | 88       | The Blue Economy Trap: Does Marine Resource Dependence Improve Welfare in Indonesia's Archipelagic Regions?                                                            | Muhammad Habibi; Rizky Dwi Kusuma; Saepudin                                                                          |
| 15:30–15:45 | 100      | Analysis Of Occupational Health And Safety (OHS) Implementation In Loading And Unloading Activities At Ambon Nusantara Fishing Port To Improve Operational Performance | Ruth Phetrosina Soumokil; Monalisa Manuputty; Juliet Gracea Metekohy; Gertruida S. Norimarna                         |
| 15:45–16:00 | 111      | Observation of Coral Spawning at Tobelo Seashore, North Halmahera, Indonesia                                                                                           | Loana Jeanete Totoda; JESAJA A. PATTIKAWA; Gino Valentino Limmon; Masudin Sangaji; Jubhar Christian Mangimbulude     |

| Time (WIT)  | Paper ID | Paper Title                                                                                                                                                 | Authors                                                                                                  |
|-------------|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|
| 16:00–16:15 | 125      | Multimodal Discourse Analysis of "Tara Bandu" in Confronting Global Blue Economy Narratives: An Intercultural Communication Perspective.                    | Vicente Sanches Soares; Soares vicentes350@gmail.com; Ambo Tuwo; Eymal B. Demmallino; Lucio Marcal Gomes |
| 16:15–16:30 | 133      | Existing Conditions and Suitability Levels of Beach Tourism on Small Islands: A Case Study of Kassa and Hokman Islands, West Seram Regency                  | Meitha Monita Kaihatu; Johanis Hiariey; Renoldy Lamberthy Papilaya; James Abrahamsz                      |
| 16:30–16:45 | 139      | Nocturnal activity states and microhabitat use of the Halmahera walking shark Hemiscyllium halmahera in shallow reef habitats of Tagalaya Island, Indonesia | Darius Arkwright; Loana Jeanete Totoda; Alberth I Pical; Sintya Oktafya Senda; Jefantris Amoro Ratmani   |

## Chamber 3: Climate-Smart Agriculture, Agrometeorology, Food Security, and Sustainable Livestock Systems

**Moderator: Dr. Inaya Sari Melati, S.Pd., M.Pd.**

| Time (WIT)  | Paper ID | Paper Title                                                                                                                                                       | Authors                                                                                                     |
|-------------|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| 14:00–14:15 | 2        | Effectiveness of Organic Matter and Secondary Metabolites of <i>Trichoderma harzianum</i> on Leaf Blight and Sweet Corn Growth and Yield                          | Ebedh Barlef Lorwens; Agustinus Marthin Kalay; J. Taribuka                                                  |
| 14:15–14:30 | 13       | Parasitoid Insect Diversity and Community Structure in <i>Elaeis guineensis</i> Intercropping with Zea mays and <i>Oryza sativa</i> var. upland, East Aceh        | Aidil Amar; Nurul Fajriyani; Vinny Pratiwi; Teungku Dheyana; Reza Fahmi; Diah Fridayati; Desyan Ria         |
| 14:30–14:45 | 30       | Genotypic and soil type effects on seed yield, calyx yield and bioactive compounds of Roselle ( <i>Hibiscus sabdariffa</i> L.)                                    | G. T. J. Al-Mafarji; Abdulmueen Hamad; M. A. M. Al-Mafarji                                                  |
| 14:45–15:00 | 42       | Potato Chips Industry Waste (Starch) and <i>Saccharomyces boulardii</i> : Effects on Egg Quality, Serum Biochemistry, and Jejunal Histomorphometry in Laying Hens | Dalal Ali Talib Al-Mafarji; Qana hussein ameen                                                              |
| 15:00–15:15 | 53       | Building climate-resilient and sustainable coffee supply chains in Sulawesi, Indonesia: A two-stage stochastic programming and mean-CVaR approach                 | Muhammad Imam Ma'ruf; Agatha W.Widati; Djuliat Dampa; Umi Yuminarti; Himaya Praptani Adys; Azwar Akhmad     |
| 15:15–15:30 | 58       | Bioactive and in vitro antifungal activity of three groups of <i>Melaleuca leucadendra</i> Linn. accessions from Buru Regency, Maluku Province, Indonesia         | Aldi Wiyantoro; Asri Subkhan Mahulette; Abdul Karim Kilkoda; Agustinus Marthin Kalay; Abraham Talahaturuson |
| 15:30–15:45 | 117      | TRANSFORMATION OF SOCIAL CAPITAL IN THE DEVELOPMENT OF ARGO- TOURISM IN FLORES, EAST NUSA TENGGARA                                                                | imaculata fatima; Falentina Patty                                                                           |
| 15:45–16:00 | 120      | Effects of Seed Coat Removal and Soaking Duration on Germination and Early Seedling Growth of Cocoa ( <i>Theobroma cacao</i> L.)                                  | Johan Riry; Simon Hadi Teguh Raharjo; Simon Raharjo; Edizon Jambormias1; Jeanne I. Nendissa                 |

| Time (WIT)  | Paper ID | Paper Title                                                                                                                                                        | Authors                                                                                                                                     |
|-------------|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| 16:00–16:15 | 126      | Black Soldier Fly Bioconversion of Indonesian Street-Food Waste for Sustainable Livestock Feed Production                                                          | Inaya Sari Melati; Nana Kariada Tri Martuti; Imam Mukhlis; Yukichika Kawata                                                                 |
| 16:15–16:30 | 136      | Organic Agriculture in Southeast Asia: A Bibliometric Analysis of Research Trends, Sustainability Outcomes, and Emerging Research Gaps                             | JASON GICA; Jay Ramonito Escabillas; Noriel Jude Sumaya                                                                                     |
| 16:30–16:45 | 138      | MODIFICATION OF INDUCTION MEDIUM AND EXPLANT TYPE TO INCREASE SOMATIC EMBRYO PRODUCTION OF CASSAVA GARUDA CLONE                                                    | fitri fitri.yelli79@gmail.com; fitri yelli; Dhanja Aprilianti; Tri Maryono; Agus Karyanto; Kuswanta F Hidayat; Agustiansyah; KUKUH SETIAWAN |
| 16:45–17:00 | 148      | Changing from conventional to aerobic irrigation systems and application of mycorrhiza biofertilizer improved black rice performance under different plant spacing | Wayan Wangiyana; I.G.P. Muliarta Aryana; Nihla Farida; Anjar Pranggawan Azhari                                                              |

## Chamber 4: Renewable Energy, Advanced Materials, Carbon Capture, and Green Technology

Moderator: Reveny Vania Rugebregt, S.H., M.H.

| Time (WIT)  | Paper ID | Paper Title                                                                                                                                              | Authors                                                                                                                                                                                    |
|-------------|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 14:00–14:15 | 26       | Utilization of Pineapple Leaf Fiber as a Sustainable Bio-Reinforcement Material to Enhance Split Tensile Strength of Soft Clay                           | Anita Widiarti; Divania Nurtopo; Zulfikri Nanda Putra Mangopa; Anita Rahmawati; Eko Riyanto                                                                                                |
| 14:15–14:30 | 28       | Soil Settlement Evaluation Based on CPTu and Oedometer Test Data with Consolidation Acceleration using Prefabricated Vertical Drains                     | Sthephani Agustina; Muhammad Fathur Rouf Hasan; Putera Agung Maha Agung; Aldo Wirastana Adinegara; [Nama tidak tercantum — andikanoza.pradiptiya@sipil.pnj.ac.id]; Sutikno; Hijrah Saputra |
| 14:30–14:45 | 29       | Sustainable stabilization of soft clay using coir fiber and rice husk ash waste: shear strength analysis                                                 | Anita Widiarti; Oktavia Nuri Wahyu Pratiwi; Prio Susilo Utomo; Anita Rahmawati; Hafidzul Azmi                                                                                              |
| 14:45–15:00 | 64       | Ground Movement Caused by Coupled High Hydrostatic and Dynamic Pressures from Aquifer Layer                                                              | Putera Agung Maha Agung; Muhammad Fathur Rouf Hasan; Sony Pramusandi; Deny Yatmadi; Aldo Wirastana Adinegara; MUSTAFFA ANJANG AHMAD; ADNAN ZAINORABIDIN; Mohd Adib Mohammad Razi           |
| 15:00–15:15 | 85       | Creating Circular Economy Regulatory Sandbox for Renewable Energy Communities to Shape a Sustainable Energy Future                                       | Dararida Fandra Mahira; Lego Karjoko; I Gusti Ayu Ketut Rachmi Handayani                                                                                                                   |
| 15:15–15:30 | 121      | Smart-Lead Virtual Reality Simulation for Strengthening Prospective School Principals' Managerial Competence in Facilities and Infrastructure Management | Hasan Argadinata; Novika Adi Wibowo; Ibrahim Bafadal; Ahmad Nurabadi; Marwah Athifah; Elyya Putri Fia Nurmaya; Amirul Fahmie Abdul Razak                                                   |

## Chamber 5: Sustainable Supply Chains, Circular Economy, Blue Economy Policy, and Natural Resource Governance

**Moderator: Fitriyani Yuliawati, S.IP., M.Si.**

| Time (WIT)  | Paper ID | Paper Title                                                                                                                        | Authors                                                                                                                                      |
|-------------|----------|------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| 14:00–14:15 | 19       | A New Paradigm for Sustainable Cities? Solving the Problem of Slums Through Urban Genome Analysis                                  | Lego Karjoko; I Gusti Ayu Ketut Rachmi Handayani; Elizabeth Ayu Puspita Adi; Dararida Fandra Mahira; Nabila Rahma Safitri                    |
| 14:15–14:30 | 21       | Indigenous women's ecological knowledge and its integration into collaborative environmental governance in Kampung Naga, Indonesia | Fitriyani Yuliawati; Endang Larasati; Dyah Lituhau; Budi Nugraha                                                                             |
| 14:30–14:45 | 46       | System dynamics modelling of population and infrastructure drivers for sustainable C&D waste management in archipelagic region     | Meidy Kempa; Mansye Ronal Ayal; Felix Taihuttu; Sammy. G.M. Amaheka; Vicardy Kempa                                                           |
| 14:45–15:00 | 47       | Liveability, Resilience and Sustainability in a Transmigration Settlement: A Qualitative Study in the Petata Transmigration Area   | Nabil El Fikri; R. Slamet Santoso                                                                                                            |
| 15:00–15:15 | 49       | Rural Leadership Paradox for Sustainable Community and Business Resilience A Multiple Case Study of Tourism Villages in Java       | Sofi Koidatul Maqfiroh; Kismartini Kismartini                                                                                                |
| 15:15–15:30 | 50       | From resources to agency: Women's empowerment pathways in Delta Kapuas Project's community carbon governance                       | Seifaa Azallea Efendi; Paksi Lalang Sambegana; Ignatius De Loyola Wisagni Bagas Wisesa                                                       |
| 15:30–15:45 | 70       | Mapping Eco-Anxiety among Indonesian University Students: A Rasch-Based Validation of the Hogg Eco-Anxiety Scale                   | Santy Andrianie; Elwas Berdha Krismona; Arifah Wulandari; Cynthia Permata Sari; Khairul Bariyyah; Restu Dwi Ariyanto; Laily Tiarani Soejanto |
| 15:45–16:00 | 84       | From Policy Adoption to Circular Transformation: Institutional Capacity and Community Engagement in Depok City's Waste Governance  | Medina Lutfiani; Ida Hayu Dwimawanti                                                                                                         |

| Time (WIT)  | Paper ID | Paper Title                                                                                                                                                                                         | Authors                                                                                                           |
|-------------|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
| 16:00–16:15 | 113      | Beyond Bromo and Semeru: A netnographic study of Ngadas Village as a cultural landscape                                                                                                             | Rizki Alfian; Soemarno Soemarno; Gatot Ciptadi; Bambang Hendroyono                                                |
| 16:15–16:30 | 114      | Local Wisdom as a Foundation for Sustainable Batik: Linking Cultural Heritage, Competitiveness of Batik MSMEs and Environmental Sustainability Indonesia                                            | Yufita Listiana; Kurniyati Indahsari; Kinnatus Zahrah                                                             |
| 16:30–16:45 | 130      | THE INFLUENCE OF PRINCIPAL LEADERSHIP STYLE, SCHOOL CLIMATE, WORKDISCIPLINE, AND WORK MOTIVATION ON THE PERFORMANCE OF ELEMENTARY SCHOOL TEACHERS IN THE ISLANDS OF AMBON CITY                      | Wiliem Hetharion; Rudolf Kempa; Patrisius Rahabav                                                                 |
| 16:45–17:00 | 134      | Analysis of the Community of Inquiry Model in Distance Education Supervision by the Education Office: A Multisite Study in Gowa Regency                                                             | Sirajuddin Saleh; Elfira Elfira; Andi Rizka Ekaputri                                                              |
| 17:00–17:15 | 143      | Efficiency in BUMDes Management and Its Implications for the Welfare of Rural Communities: A Quantitative Approach                                                                                  | Alifah Rokhmah Idialis                                                                                            |
| 17:15–17:30 | 153      | STRENGTHENING CHARACTER EDUCATION THROUGH A HEUTAGOGICAL APPROACH: A SYSTEMATIC REVIEW OF THE INTEGRATION OF PROJECT-BASED LEARNING, PROBLEM-BASED LEARNING, AND LOCAL WISDOM IN ELEMENTARY SCHOOLS | nining andriani; Zaqueu António Freitas; Naseehah Hajido; Subaedah; Enik Chairul Umah; Rosmiati; Kartika Hidayana |

## Standard Oral Presentation

|                                 |                                                                  |
|---------------------------------|------------------------------------------------------------------|
| <b>Total allocation</b>         | 15 minutes per paper                                             |
| <b>Presentation</b>             | 10 minutes                                                       |
| <b>Questions and discussion</b> | 5 minutes                                                        |
| <b>Language</b>                 | English                                                          |
| <b>Slides</b>                   | 16:9 widescreen; recommended 10–15 slides; minimum 20-point font |
| <b>File formats</b>             | PowerPoint and a PDF backup                                      |
| <b>File naming</b>              | PaperID_FirstAuthorName_ICESAS2026.pptx                          |
| <b>Final slide submission</b>   | No later than 24 hours before the conference                     |

## Recommended Slide Structure

1. Title: paper title, presenter, all authors, affiliation, country, and Paper ID.
2. Background and research problem.
3. Research objectives or research questions.
4. Literature or conceptual framework, where relevant.
5. Methodology: design, data/sample, instruments, procedures, and analysis.
6. Main findings presented with readable tables, figures, maps, or diagrams.
7. Discussion and contribution.
8. Conclusions, implications, recommendations, and limitations.
9. Acknowledgements and contact information.

## On-site Presenters

- Report to the assigned room at least 20 minutes before the session.
- Provide the final slide file to the room operator or have it ready on the designated computer.
- Follow the Session Chair's instructions and remain for the full assigned panel.
- Do not exceed the allocated time; the Session Chair may stop an overrun presentation.

## Online Presenters

- Join the assigned Zoom room at least 30 minutes before the session.
- Use the display name format: Paper ID – Full Name – Institution.
- Use a laptop/desktop, stable internet, functioning webcam, headset or microphone, updated Zoom application, and backup connection where possible.
- Keep the microphone muted when not speaking and turn on the camera during introduction, presentation, and discussion when bandwidth permits.
- Open the presentation in advance, close unrelated applications, disable notifications, and share only the presentation window.
- Prepare an 8–10 minute MP4 backup recording for emergency use, subject to committee approval.

# 09

## PRESENTER CHECKLIST

*Final preparation and conference-day readiness*

### BEFORE CONFERENCE DAY

- ☐ Registration and payment completed
- ☐ Presentation status confirmed
- ☐ Slides prepared in English and 16:9 format
- ☐ PowerPoint and PDF backup files available
- ☐ Presentation can be delivered within 10 minutes
- ☐ Figures, labels, author names, and affiliations checked
- ☐ Internet, camera, microphone, and screen sharing tested
- ☐ Final file submitted to the committee
- ☐ Conference time converted correctly to local time
- ☐ Technical rehearsal attended, where applicable

### ON CONFERENCE DAY

- ☐ Arrive at the room / join Zoom early
- ☐ Use the required identity/display name
- ☐ Keep the presentation file open and ready
- ☐ Follow the Session Chair and technical team
- ☐ Observe the time limit
- ☐ Respond concisely and respectfully during Q&A

## 09

**PROFESSIONAL CONDUCT AND CONTINGENCIES***Standards for safe, respectful, and reliable sessions***Professional conduct**

Respectful academic conduct is required. Disruption, discriminatory or offensive language, unauthorized recording or distribution, unrelated advertising, sharing protected access credentials, and presenting another person's work without acknowledgement are prohibited.

**If Technical Problems Occur**

- Remain calm and attempt to reconnect using the same registered identity.
- Check the microphone, speaker, camera, screen sharing, and internet connection.
- Contact the assigned IT support person through the official communication channel.
- Use a backup connection or device where possible.
- Send the slide file to the Session Chair or technical operator if screen sharing fails.
- The Session Chair may move to the next paper and return to the affected presenter when technically possible.
- An approved co-author or pre-recorded backup may be used only with committee authorization.

**Recording and Documentation**

The Organizing Committee may photograph, record, or document sessions for academic reporting, conference documentation, promotion, and institutional archives. Presenters should notify the committee in advance when confidential or restricted material must not be recorded. Participants may not independently record or distribute presentations without authorization.

**Authority of the Session Chair**

The Session Chair controls the speaking order, timing, question-and-answer process, and reasonable adjustments required to keep the session academically fair and on schedule.

## 10

# PUBLICATION AND EDITORIAL POLICY

*IOP EES publication opportunity and scholarly standards*

## PROCEEDINGS PUBLICATION

The ICESAS 2026 committee has received an official publication offer from IOP Publishing for selected proceedings articles in IOP Conference Series: Earth and Environmental Science (EES). Publication is not automatic. Every full paper must pass peer review, editorial screening, ethical checks, scope evaluation, revision, and final publisher acceptance.

### Mandatory Requirements

- The paper must fall within the scope of IOP Conference Series: Earth and Environmental Science and ICESAS 2026.
- The manuscript must follow the IOP Conference Series author guidelines and conference instructions.
- The manuscript must comply with IOP Publishing ethical policies.
- The work must be original, accurately reported, and free from fabrication, falsification, plagiarism, duplicate submission, and unethical authorship.
- At least one registered author must present the paper at ICESAS 2026.
- Authors must complete all revisions and editorial requirements by the stated deadlines.
- Each author is recommended to submit a maximum of two papers, including papers in which the person is a co-author.

### Review Criteria

- Relevance to the conference scientific scopes
- Originality and contribution to knowledge
- Clarity of the research problem and objectives
- Methodological rigor and appropriateness
- Quality of data analysis and interpretation
- Relevance of findings to sustainability, resource management, or inclusive development
- Quality of academic writing and structure
- Compliance with publication ethics
- Suitability for the prospective proceedings publisher

### Use of AI Tools

AI-assisted tools may be used for language improvement, formatting assistance, or technical editing, but they must not replace the authors' intellectual contribution. Authors remain fully responsible for accuracy, originality, validity, references, data, and research integrity. Fabricated data, unsupported references, and misleading AI-generated content are prohibited.

#### Important publication disclaimer

Acceptance of an abstract or conference presentation does not guarantee proceedings publication. Final publication depends on full-paper quality, peer review, revision, editorial approval, policy compliance, and acceptance by IOP Publishing.

## 11

# IMPORTANT DATES AND FEES

*Submission, review, conference, and publication milestones*

## Conference Timeline

| Date                          | Activity                                                                            |
|-------------------------------|-------------------------------------------------------------------------------------|
| 1 May – 14 September 2026     | Online registration and abstract submission                                         |
| 15–21 September 2026          | Abstract screening by committee                                                     |
| 22–28 September 2026          | Full-paper submission                                                               |
| 29 September – 5 October 2026 | Review by Scientific Committee                                                      |
| 6 October 2026                | Notification of acceptance                                                          |
| 1 May – 20 October 2026       | Conference payment                                                                  |
| 28 October 2026               | Conference day                                                                      |
| 1–28 February 2027            | Proceedings compilation and submission to IOP EES                                   |
| To be announced               | Article Processing Charge payment for papers approved for publication consideration |

## Conference Fees

|                                                                                                                                                                                                                                                          |                      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
| On-site Presenter                                                                                                                                                                                                                                        | USD 75 / IDR 750,000 |
| Online Presenter                                                                                                                                                                                                                                         | USD 55 / IDR 550,000 |
| On-site Participant                                                                                                                                                                                                                                      | USD 55 / IDR 550,000 |
| Online Participant                                                                                                                                                                                                                                       | USD 25 / IDR 250,000 |
| Article Processing Charge – International                                                                                                                                                                                                                | USD 150              |
| Article Processing Charge – Domestic                                                                                                                                                                                                                     | IDR 2,500,000        |
| <b>Fee note</b><br><br>The publication charge applies only according to the publication arrangement and instructions issued to authors whose papers pass review and editorial evaluation. Payment does not replace scientific or publisher requirements. |                      |

## 12

## VENUE AND DELEGATE INFORMATION

*The Natsepa Hotel & Resort, Ambon, Maluku, Indonesia*



### THE NATSEPA HOTEL & RESORT

**Ambon, Maluku, Indonesia**

Ambon provides a highly relevant setting for a conference on sustainable marine, agricultural, coastal, and archipelagic resources. Delegates are encouraged to allow sufficient travel time, keep official identification and conference confirmation available, and follow all venue, safety, and committee instructions.

### Delegate Reminders

- Registration opens at 08:00 WIT.
- Wear the conference identification badge throughout the program.
- Keep personal belongings secure and follow venue safety guidance.
- Inform the committee in advance about accessibility, dietary, or special assistance requirements.
- Check official communication channels for any changes to rooms, links, or timing.
- Photography and documentation may be conducted for institutional reporting and promotion.

# 12

## OFFICIAL CONTACTS AND ACCESS

*Verified conference channels*

### SCAN OR USE THE OFFICIAL LINKS



#### Conference Website

ICESAS information, topics, speakers, publication, schedule, and venue.

<https://icesas.pasca.unpatti.ac.id/>

#### Abstract Submission

Call for abstracts and submission through Morressier.

[www.morressier.com/call-for-abstracts/ICESAS-2026](http://www.morressier.com/call-for-abstracts/ICESAS-2026)

#### Presenter Registration

Registration and payment form for accepted presenters.

[forms.gle/H8h1o7oyvaD KHmUc9](https://forms.gle/H8h1o7oyvaD KHmUc9)

#### Official Email

Conference correspondence and administrative enquiries.

[icesas@mail.unpatti.ac.id](mailto:icesas@mail.unpatti.ac.id)

### Access security

Zoom links, Meeting IDs, passcodes, presenter-group links, and technical rehearsal information are distributed directly to registered participants and must not be shared publicly or with unauthorized persons.

### Official Communication Principles

- Use only the official website, official email, Morressier, and committee-issued communication channels.
- Verify any payment or publication request before transferring funds.
- Report suspicious messages, duplicate invoices, or unauthorized use of conference branding to the official email.
- The latest written instruction from the Organizing Committee takes precedence over earlier draft information.

## 12

**CODE OF CONDUCT AND NOTES***A respectful, inclusive, and productive conference environment***CODE OF CONDUCT**

ICESAS 2026 is committed to professional, respectful, inclusive, and academically responsible interaction. All delegates are expected to engage constructively, acknowledge sources, protect confidential information, respect diverse perspectives, follow session and venue instructions, and avoid harassment, discrimination, disruption, or misrepresentation.

**Participant Responsibilities**

- Treat speakers, chairs, committee members, staff, and participants with courtesy.
- Ask concise and relevant questions and respect the Session Chair's moderation.
- Do not record, reproduce, or distribute presentations without authorization.
- Do not disclose confidential research, personal data, or protected access information.
- Declare potential conflicts of interest in scholarly and editorial interactions.
- Comply with ethical, authorship, and research-integrity standards.
- Immediately report serious safety, conduct, or technical concerns to the committee.

**Program changes**

The Organizing Committee may revise the sequence, rooms, speakers, chairs, or technical arrangements when necessary. Updates will be communicated through official channels.

## CHAMBER 1 — SCIENTIFIC ABSTRACTS

### Environmental Quality, Ecotoxicology, Pollution Control, and Ecosystem Restoration

23 abstracts marked PRESENTATION in this chamber. Provisional catalogue only; final speaker and room assignments require Secretariat confirmation.

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| <b>ID</b>          | <b>6</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>TITLE</b>       | <b>Corporate Climate Change Disclosure and Board Characteristic – Does High Debt Matter?</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>ABSTRACT</b>    | This study aims to provide empirical evidence on the influence of board size, board independence, and board gender on corporate climate change disclosure (CCCD). Furthermore, this study examines the moderating effect of debt on the positive relationships among the number of board members, board independence, board gender, and CCCD. The study sample comprised 254 firms in the consumer cyclical and non-cyclical sub-sectors listed on the Indonesia Stock Exchange. Data were collected over 6 years (2019-2024), yielding 901 units of analysis. This study reports that the number of board members, board independence, and board gender do not affect CCCD. We report that the impact of board size and board independence on CCCD is likely to be positive in the context of high debt. However, debt does not increase the positive relationship between board gender and CCCD. |
| <b>KEYWORDS</b>    | <i>Climate change; corporate involvement; global warming; carbon emissions</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>AUTHORS</b>     | Hasan Mukhibad; Heri Yanto; Ahmad Nurkhin; Indah Anisykurlillah; Risqie Nur Salsabila Ilman                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>AFFILIATION</b> | Universitas Negeri Semarang                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

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| <b>ID</b>          | <b>7</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>TITLE</b>       | <b>The Role of The Board and Financial Resources on Climate Change Performance</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>ABSTRACT</b>    | Industrial activities that drive a country's economic progress contribute to climate change, which negatively impacts society. The purpose of this study is to empirically demonstrate the influence of board gender diversity, board independence, the number of board members, and profitability on climate change performance. The research sample was 53 manufacturing firms in Indonesia observed from 2019 to 2024. This study used unbalanced data, resulting in 249 firm-years. The results show that the number of board members has a positive effect on climate change performance. However, board gender diversity and independence have no effect on climate change performance. This study clarifies the importance of board and financial resources to improve climate change performance. Our results remain robust when we use alternative model specifications and account for firm age |
| <b>KEYWORDS</b>    | <i>Climate change; Firm resources; Environmental damage; Economic activity</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>AUTHORS</b>     | Indah Anisykurlillah; Hasan Mukhibad; Kusumantoro; Sintaina Nur Fadila                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>AFFILIATION</b> | Universitas Negeri Semarang                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

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| <b>ID</b>          | <b>8</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>TITLE</b>       | <b>ENVIRONMENTAL SUSTAINABILITY PERFORMANCE AND AMIL ZAKAT INSTITUTIONS - DOES GREEN INTELLECTUAL CAPITAL MATTER?</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>ABSTRACT</b>    | <p>The objective of this study is to examine the influence of green human resources management practices, green innovation, and green intellectual capital on environmental sustainability performance. The sample consisted of amil zakat institutions in Indonesia, selected using convenience sampling. All variables were measured using a 5-point Likert scale questionnaire, with indicators adopted from previous research, to form the latent variables. Data were analyzed using SEM-PLS. The results indicate that environmental sustainability performance has become a new business orientation for Amil Zakat institutions because their primary focus is managing zakat funds in accordance with Islamic law. Although environmental sustainability performance is in accordance with Shariah, zakat fund management requires product and service innovation for the eight asnaf(zakat recipients) and supports environmental sustainability performance. Organizational investment in green intellectual capital is a crucial factor in supporting environmental sustainability performance in Amil Zakat institutions.</p> |
| <b>KEYWORDS</b>    | <i>Environmental degradation; Economic Empowerment; Poverty; Islamic Philanthropy; Islamic compliance</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>AUTHORS</b>     | Heri Yanto; Hasan Mukhibad; Ahmad Nurkhin; Dessy Ekaviana; Adang Suherman; Bachtiar Sjaiful Bachri                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>AFFILIATION</b> | Universitas Negeri Semarang                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

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| <b>ID</b>          | <b>12</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>TITLE</b>       | <b>Digital Learning Management for Environmental Education in Schools on the Remote Islands of Southwest Maluku</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>ABSTRACT</b>    | <p>Southwest Maluku Regency (Maluku Barat Daya/MBD) is an outermost region of Maluku Province, with a total area of 72,427.2 km<sup>2</sup>, of which 88.1% is sea and only 11.9% is land, spread across 17 sub-districts in three island clusters: Terselatan, Lemola, and Babar. Its isolated geography, low population density, and sea-dependent economy make environmental education urgent, while limited electricity, signal coverage, and teaching staff remain major obstacles to digital learning. This study formulates a digital learning management framework for environmental education in schools on MBD remote islands. Using a descriptive qualitative approach, the study analyzes secondary data from the Central Statistics Agency (BPS) of Southwest Maluku Regency, the Education Reference Data of the Ministry of Primary and Secondary Education (Kemendikdasmen), and digital connectivity policy documents from BAKTI Komdigi. Findings show that digital learning management in this region should be built around four functions: planning environmental content grounded in maritime local wisdom, organizing digital resources on an offline-first basis, implementing hybrid learning that uses BAKTI internet access points, and conducting participatory controlling and evaluation with coastal communities. This framework is intended as a practical reference for schools and policymakers integrating digital and environmental literacy in underdeveloped, frontier, and outermost (3T) archipelagic regions.</p> |
| <b>KEYWORDS</b>    | <i>digital learning management, environmental education, remote islands, Southwest Maluku, 3T regions</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>AUTHORS</b>     | Wely Agus Anthonio akerina; MEI DAYANTY; LIYONA PUTTILEIHALAT; Risty Okta Nawangwulan; Melinda Selvia Louhanapessy; Wely Agus Anthonio Akerina; Dorthea Adriaansz; Zainul Arifin; Merlien Lessy; Rasdin Tomia; Ledia Sialia; Prof. Dr. RUDOLF KEMPA, M.Pd; Paul Arjanto                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>AFFILIATION</b> | Universitas Pattimura                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

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| <b>ID</b>          | <b>16</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>TITLE</b>       | <b>Traditional Ecological Knowledge in Sustainable Clay Resource Management: Toward Low-Carbon Pottery Development and Its Educational Implications in Bayat, Klaten, Indonesia</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>ABSTRACT</b>    | <p>Traditional pottery craft is a cultural heritage closely linked to natural resource use and local ecological knowledge. This study examines the role of Traditional Ecological Knowledge (TEK) in managing and conserving clay resources used in pottery craft in Bayat, Klaten, Indonesia, and its implications for low-carbon pottery development and art education. This matters because the clay-based pottery industry faces challenges from limited raw materials, environmental change, and demands for more sustainable production, while artisans' ecological knowledge remains poorly documented. An ethnographic approach was used, involving field observation, semi-structured interviews, and documentation of the production process. Data were analyzed thematically through data reduction, open coding, and theme categorization, with triangulation across informants and observations to ensure validity. Findings show that Bayat artisans possess ecological knowledge in selecting clay sources, managing material reserves, and utilizing clay efficiently, reflected in material efficiency, waste reuse, and adaptation to fluctuating resource availability. These practices support low-carbon craft development through local material optimization and waste reduction. The ecological values embedded in pottery traditions can also serve as a learning resource for sustainability-oriented art education. This study affirms that traditional pottery centers can function as living laboratories connecting cultural preservation, resource conservation, and sustainable development.</p> |
| <b>KEYWORDS</b>    | <i>Traditional Ecological Knowledge, clay resource conservation, low-carbon pottery, sustainability education</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>AUTHORS</b>     | Slamet Subiyantoro; Mulyanto; dimas fahrudin; Krisna Ramadhan                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>AFFILIATION</b> | Universitas Sebelas Maret                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

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| <b>ID</b>          | <b>17</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>TITLE</b>       | <b>DEVELOPMENT OF PAPEDA LEARNING MODULES (LEARNING, WRITING, AND ARIZING WITH PAPUAN CULTURE) IN LEARNING FOR ELEMENTARY SCHOOL STUDENTS IN NABIRE</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>ABSTRACT</b>    | <p>This study aims to develop the PAPEDA (Reading, Writing, and Arithmetic with Papuan Culture) Module that integrates literacy, numeracy, and Papuan local wisdom as contextual teaching materials for elementary school students. The study used the Research and Development (R&amp;D) method with the ADDIE model which includes the stages of analysis, design, development, implementation, and evaluation. Data were collected through observation, interviews, questionnaires, tests, and documentation, then analyzed qualitatively and quantitatively to assess the module's needs, validity, practicality, and effectiveness. The results showed that the PAPEDA Module met the criteria of being very valid, very practical, and effective in improving students' literacy and numeracy skills through local culture-based learning. The integration of the Papuan cultural context makes learning more meaningful, increases student engagement, and supports the implementation of the Merdeka Curriculum. Thus, the PAPEDA Module is a relevant teaching material innovation to strengthen literacy and numeracy learning in elementary schools, especially in the 3T (Underdeveloped, 3T) regions.</p> |
| <b>KEYWORDS</b>    | <i>Papuan Local Culture; Literacy; PAPEDA Module; Numeracy; Elementary School</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>AUTHORS</b>     | RIVALDO PAUL TELUSSA; JERMANTO SUBENO LASAMAHU; SANTJI AFI RANGKOLY; JASMARI; TUT HIDAYATILLAH; ANTONIUS AWAN ASTA ADHIPRANA WHISNUBRATA; DEBY SISKI BOGAR; KEVIN ANDREA TAMAELA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>AFFILIATION</b> | Universitas Satya Wiyata Mandala                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

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| <b>ID</b>          | <b>18</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>TITLE</b>       | <b>Fostering Environmental Literacy and Civic Action: Evaluating the “My Voice, My Impact” Pedagogical Model in Higher Education</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>ABSTRACT</b>    | <p>Fostering genuine environmental awareness requires active civic engagement. This study evaluates the extent to which the “My Voice, My Impact” pedagogical model, inspired by the TAG-RELO Climate Action Virtual Exchange, fosters environmental literacy and civic action among 30 Essay Writing students in an English Department. Grounded in Project-Based Learning (PBL), the model transcends language acquisition, empowering students to compose analytical essays while designing and executing socio-environmental community actions. Working collaboratively, students tackled specific local issues, such as waste mismanagement and resource degradation. The data collection are taken from pre- and post-project reflective writing, analytical essays, and digital presentations. Data were examined using thematic analysis, involving inductive coding of recurring patterns across the reflective texts. The analysis revealed a significant shift: students who initially viewed environmental challenges as abstract ultimately demonstrated heightened empathy, a nuanced understanding of localised systemic causes, and a robust sense of personal agency. By merging composition with community execution, this replicable framework for Education for Sustainable Development (ESD) successfully transforms a writing curriculum into an effective catalyst for truly proactive environmental leadership.</p> |
| <b>KEYWORDS</b>    | <i>Education for Sustainable Development (ESD); environmental literacy; civic engagement; project-based learning; reflective writing; thematic analysis</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>AUTHORS</b>     | Inggrit Tanasale; Patrick Tuasela                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>AFFILIATION</b> | Universitas Pattimura                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

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| <b>ID</b>          | <b>22</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>TITLE</b>       | <b>Integrating Sound of Green, STEAM, and SDGs to Enhance Student Environmental Literacy in Ambon's Music Tourism Villages</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>ABSTRACT</b>    | <p>Academic Abstract (English) Environmental literacy is essential for developing students' ability to respond to ecological challenges, yet learning remains theoretical and underutilizes local biodiversity and indigenous knowledge. This Research and Development (R&amp;D) study using the 4-D model (Define, Design, Develop, Disseminate) aimed to evaluate the Sound of Green (SoG) learning model, which integrates local biodiversity conservation with Science, Technology, Engineering, Arts, and Mathematics (STEAM) and the Sustainable Development Goals (SDGs). The study involved 150 students from four junior high schools in the Music Tourism Village area of Ambon City. Data were collected through tests, questionnaires, observations, interviews, and documentation. Instrument validity was verified using Aiken's V and CVR, while reliability was measured via Cronbach's Alpha. Model effectiveness was analyzed using ANCOVA and N-Gain. Results showed high expert validation. The mean environmental literacy score significantly increased from 56.8 to 82.3, yielding a moderate N-Gain of 0.59. ANCOVA confirmed a statistically significant effect, <math>F(3,50) = 4.838</math> (<math>p = 0.005</math>) with <math>R^2 = 0.225</math>. Integrating local biodiversity, music, STEAM, and SDGs fosters contextual, interdisciplinary, and action-oriented learning. The SoG–STEAM–SDGs model serves as an innovative approach to strengthen environmental literacy through local ecological and cultural resources.</p> |
| <b>KEYWORDS</b>    | <i>Sound of Green; STEAM; SDGs; environmental literacy; Ambon City music tourism village</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>AUTHORS</b>     | Pamella Mercy Papilaya; Chtherine Pauline Salhuteru                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>AFFILIATION</b> | Universitas Pattimura                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

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| <b>TITLE</b>       | <b>QUAL2Kw-Based Simulation of Coal Mining Wastewater Dispersion and Water Quality Response in the Segah River, Berau Regency, Indonesia</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>ABSTRACT</b>    | <p>Surface coal mining operations pose severe threats to tropical freshwater ecosystems, yet predicting spatio-temporal pollutant dynamics under varying effluent discharge scenarios remains challenging. This study evaluated and predicted the water quality impacts of coal mining effluent from PT. Z on the Segah River using a dynamic QUAL2Kw modeling approach. Field measurements and lab analyses of key parameters (TSS, BOD, and DO) across three representative monitoring stations (upstream control, point-source discharge, and downstream evaluation) were used to calibrate a 1D steady-state QUAL2Kw model utilizing Runge-Kutta integration and Brent's pH solver. Model accuracy was validated against baseline observations using Root Mean Square Error (RMSE), followed by scenario simulations of a 20% load increase and a 30% load reduction. Baseline observations showed a severe downstream dissolved oxygen (DO) depletion from 4.4 mg/L to 0.62 mg/L, while total suspended solids (TSS) stabilized from 20.0 mg/L to 19.74 mg/L due to channel settling. Scenario simulations demonstrated that a 30% effluent reduction restores downstream DO levels, whereas a 20% load increase exacerbates localized hypoxia. These findings provide quantitative, model-driven evidence for establishing Total Maximum Daily Loads (TMDLs) and implementing advanced effluent aeration protocols in tropical mining catchments.</p> |
| <b>KEYWORDS</b>    | <i>QUAL2Kw modeling; Coal mining effluent; Dissolved oxygen depletion; Tropical river water quality.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>AUTHORS</b>     | Irwan Mulyadi; Indang Dewata; Mulya Gusman                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>AFFILIATION</b> | Universitas Negeri Padang                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

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| <b>ID</b>          | <b>39</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>TITLE</b>       | <b>Effects of Sopi Mayang and Sopi Colli on Liver Function and Hepatic Necrosis in Rattus Norvegicus : In Vivo Study</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>ABSTRACT</b>    | <p>Sopi is a traditional alcoholic beverage commonly consumed in parts of Eastern Indonesia, but its effects on liver function and hepatic tissue remain unclear. This study aimed to evaluate the effects of Sopi Mayang and Sopi Colli at different concentrations on liver function and histopathological changes, particularly hepatic necrosis, in adult male rats. An experimental study was conducted using adult male <i>Rattus norvegicus</i> divided into groups receiving Sopi Mayang at 20%, 30%, and 40%, Sopi Colli at 20%, 30%, and 40%, and a control group. Liver function was assessed by measuring serum aspartate aminotransferase (AST/SGOT) and alanine aminotransferase (ALT/SGPT). Liver histopathology was examined for congestion, sinusoidal dilation, hepatocellular vacuolization, inflammatory cell infiltration, and necrosis. Differences among groups were analyzed using the Kruskal–Wallis test. Mean AST/SGOT levels ranged from <math>2.02 \pm 0.45</math> to <math>6.40 \pm 3.42</math> U/L, while ALT/SGPT levels ranged from <math>3.66 \pm 1.79</math> to <math>6.13 \pm 2.86</math> U/L. No significant differences were found in AST/SGOT (<math>p = 0.080</math>), ALT/SGPT (<math>p = 0.278</math>). Histopathological examination showed preserved hepatic architecture with mild to moderate congestion, sinusoidal dilation, hepatocellular vacuolization, cellular swelling, and inflammatory infiltration. No clear hepatic necrosis was observed. Overall, Sopi Mayang and Sopi Colli caused no significant liver injury,</p> |
| <b>KEYWORDS</b>    | <i>Hepatic Necrosis, Liver Function, SGOT, SGPT, Sopi Colli, Sopi Mayang</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>AUTHORS</b>     | Nathalie Elischeva Kailola; Maria Nindatu; Pamela Mercy Papilaya; Presli Glovrig Siahaya                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>AFFILIATION</b> | Universitas Pattimura                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

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| <b>TITLE</b>       | <b>Integrating Environmental Sustainability into English Language Teaching: Exploring Students' Engagement through Speaking Activities</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>ABSTRACT</b>    | <p>Environmental sustainability has become a significant concern in education, necessitating learning activities that foster disciplinary knowledge while encouraging students to engage critically with real-world environmental issues. English Language Teaching (ELT), particularly speaking instruction, offers a meaningful context for integrating sustainability by enabling students to discuss environmental problems, exchange perspectives, evaluate solutions, and communicate responsible practices. This study aims to explore how environmental sustainability issues are integrated into English speaking activities, how students engage with and perceive these issues, and what challenges and opportunities emerge during the process. A qualitative descriptive design will be employed involving approximately 15–20 students enrolled in a Professional Speaking course in an English Language Education Study Program. Data will be collected through classroom observations, field notes, and semi-structured interviews. All students will participate in the observations, while approximately 5–7 students will be purposively selected for interviews based on varying levels of participation and engagement. Speaking activities will include discussions, presentations, and problem-solving tasks related to environmental issues. The data will be analyzed thematically. The study is expected to provide pedagogical insights into integrating environmental sustainability into communicative English speaking instruction.</p> |
| <b>KEYWORDS</b>    | <i>environmental sustainability, English Language Teaching, Professional Speaking, speaking activities, student engagement, qualitative research</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>AUTHORS</b>     | Wenda Marlin Kakerissa; Sophia Binnendyk; Hendrik Jacob Maruanya                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>AFFILIATION</b> | Universitas Pattimura                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

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| <b>TITLE</b>       | <b>Mapping the global research landscape of educational policy and ecotheology: A bibliometric analysis of scopus-indexed publications (2020–2025)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>ABSTRACT</b>    | <p>The global environmental crisis has intensified the need for educational approaches that integrate sustainability, ecological ethics, and value formation. In this context, the intersection of educational policy and ecotheology has gained scholarly attention, yet its global research development remains insufficiently mapped. This study aims to map the global research landscape of educational policy and ecotheology and identify dominant themes, research trends, and emerging directions in Scopus-indexed publications from 2020 to 2025. A bibliometric analysis was conducted on English-language, open-access journal articles published in their final stage during the period under study. Publications were retrieved from Scopus using a structured search query and analyzed through keyword co-occurrence visualization with VOSviewer. The findings indicate that climate change emerged as the most extensively studied topic. The research focus subsequently shifted toward ethics and sustainability, indicating increasing attention to value-based and sustainability-oriented dimensions of environmental issues. Future research should integrate spirituality, climate change adaptation, sustainable development, leadership, creation care, environmental sustainability, ethics, and global warming. The study contributes to the theoretical mapping of knowledge structures and research trends while providing a basis for future research agendas and informing educational policies and programs that integrate ecological and sustainability values.</p> |
| <b>KEYWORDS</b>    | <i>educational policy; ecotheology; climate change; sustainability; ecological awareness</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>AUTHORS</b>     | Arsyil Waritsman; Uswatun Khasanah                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>AFFILIATION</b> | Balai Diklat Keagamaan Ambon, Indonesia                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

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| TITLE       | <b>Polymer-Specific Microplastic Contamination and Potential Environmental Risks in Mangrove Ecosystems of Ternate Island, North Maluku, Indonesia</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| ABSTRACT    | Microplastic (MP) contamination in mangrove sediments is an increasing environmental concern, yet assessments commonly emphasize particle abundance while giving limited attention to polymer-specific hazards, particularly in tropical island ecosystems of eastern Indonesia. This study aimed to quantify temporal MP contamination in the Gambesi mangrove ecosystem, identify polymer types using Fourier-transform infrared spectroscopy (FTIR), and evaluate potential environmental risks using the Contamination Factor (CF), Polymer Hazard Index (PHI), and Potential Ecological Risk Index (PERI). Surface sediments were collected from 50 stations during September–November 2025, generating 150 station-month observations. MP abundance ranged from 450 to 1,475 particles kg <sup>-1</sup> dry sediment, with an overall mean of 949.50 ± 205.72 particles kg <sup>-1</sup> . Mean abundance increased significantly from 913.0 particles kg <sup>-1</sup> in September to 987.0 particles kg <sup>-1</sup> in November ( $p < 0.001$ ). FTIR-ATR identified polyacrylonitrile (PAN) and polyethyleneimine (PEI), with PAN predominating (60.00–66.67%). Mean CF values ranged from 2.283 to 2.468, while PHI and PERI ranged from 7,712.60–8,347.33 and 182.89–202.05, respectively. The findings reveal persistent MP contamination and very high polymer-related potential hazard. The study's novelty lies in integrating temporal monitoring, FTIR-based polymer identification, and polymer-specific risk assessment, providing evidence for targeted monitoring and source-oriented management of microplastic pollution in eastern Indonesian mangroves. |
| KEYWORDS    | <i>microplastics; mangrove sediments; FTIR; polyacrylonitrile; polyethyleneimine; polymer hazard; ecological risk</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| AUTHORS     | Badrun Ahmad; Indah R S Salami; Alamsyah Kurniawan; Mariana Marselina                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| AFFILIATION | Universitas Khairun                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

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| ID          | 61                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| TITLE       | <b>Geochemical Study and Distribution of Mercury (Hg) in ASGM in Kusubibi Area, South Halmahera Regency North Maluku Province</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| ABSTRACT    | Artisanal d Small-Scale Gold Mining (ASGM) activities in Kusubibi area, South Halmahera Regency, North Maluku Province, rely heavily on the amalgamation process, leading to the discharge of untreated toxic mercury (Hg) waste into the surrounding environment. This study aims to evaluate the current spatial distribution and contamination levels of mercury at river sediments, soil, and biological samples (local plants and agricultural crops). Environmental samples were collected across strategic sampling points near active mining, processing areas, and downstream aquatic systems. Total Mercury (THg) concentrations were quantified using Mercury analyzer instrument. The analytical results indicate severe mercury enrichment in environmental matrices adjacent to the processing units. Sediment samples exhibited high mercury accumulation exceeding international environmental quality guidelines (such as US EPA and WHO limits), acting as a long-term secondary source of contamination. These findings confirm that ASGM operations in Kusubibi Village pose a substantial environmental hazard and bio-toxicological risk to the coastal and terrestrial ecosystems of South Halmahera. Urgent remediation strategies, public health monitoring, and the enforcement of mercury-free gold processing technologies are imperative to mitigate further ecological degradation and protect local communities. |
| KEYWORDS    | <i>ASGM, mercury contamination, THg, Kusubibi area, bioaccumulation</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| AUTHORS     | yusthinus Male                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| AFFILIATION | Universitas Pattimura                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

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| ID          | 71                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| TITLE       | <b>Salinity and Light Effects on the Germination and Seedling Establishment of <i>Thalassia hemprichii</i></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| ABSTRACT    | <p><i>Thalassia hemprichii</i> is one of the most widespread seagrass species in the Philippines, yet its fruit and seed morphology and the factors influencing germination and seedling growth remain understudied. This preliminary study characterized fruit and seed morphometry of <i>T. hemprichii</i> collected from seagrass meadows in Barangay Mambayaan, Balingasag, Misamis Oriental, and evaluated effects of salinity and light on germination, seedling establishment, leaf and root morphometry, and biomass. Fruits (<math>n = 100</math>) averaged <math>13.28 \pm 1.62</math> mm in height and <math>10.33 \pm 2.14</math> mm in width, with <math>2.44 \pm 0.89</math> seeds per fruit; fruit width correlated with seed number (<math>p = 0.43</math>, <math>p &lt; 0.05</math>). A <math>3 \times 3</math> factorial experiment (salinities of 34, 28, 23 ppt) showed salinity significantly influenced germination and survival (<math>p = 0.037</math>; <math>p = 0.012</math>), while light affected survival (<math>p = 0.016</math>) but not germination, with 34 ppt and high light yielding the highest germination (85%) and survival (80%). Light significantly affected root morphology and belowground biomass (<math>p &lt; 0.05</math>), while salinity showed limited effects on leaf and root traits. These findings suggest salinity primarily drives germination and survival, while light shapes root development and biomass accumulation, providing baseline data for seed-based restoration of <i>T. hemprichii</i>.</p> |
| KEYWORDS    | <i>Thalassia hemprichii</i> , seed germination, seagrass restoration, reproductive ecology                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| AUTHORS     | John Carlo Garcia; Anabelle Dece Espadero; Wilfredo H. Uy                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| AFFILIATION | Mindanao State University at Naawan                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

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| TITLE       | <b>Utilization of the Matel Plant (<i>Clerodendrum minahasae</i> L.) in Ambon City</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| ABSTRACT    | <p>The matel plant (<i>Clerodendrum minahasae</i> L.) is endemic to Ambon City and is used as a vegetable, dietary supplement, natural antioxidant, and medicinal plant. It possesses antioxidant, antidiabetic, and anti-inflammatory properties and is traditionally used to treat anemia, mouth ulcers, and gastrointestinal ailments. This study was conducted in Ambon City using questionnaires, writing instruments, and a camera for data collection. Data were tabulated and analyzed using a qualitative research approach based on interviews with local residents. The study also included a literature review using online databases and platforms, including Web of Science, Scopus, PubMed, ScienceDirect, ResearchGate, and Google Scholar, to support the findings. Local communities consume the matel plant as a vegetable, cooking seasoning, or boiled leafy vegetable. As a vegetable, matel leaves can be consumed directly after boiling or incorporated into various dishes. As a seasoning, the leaves are commonly used to add flavor to food, particularly meat dishes. Although matel is primarily valued as a vegetable and medicinal plant, it is also cultivated as an ornamental plant in home gardens.</p> |
| KEYWORDS    | <i>traditional plant use, ornamental plant, vegetables</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| AUTHORS     | Herminda Taihutti; Maimuna La Habi                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| AFFILIATION | Universitas Pattimura                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

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| <b>TITLE</b>       | <b>Heavy Metals (Pb, Cd) in Sediment, Seagrass, and Sea Cucumber: A Baseline Study for Aquaculture Site Selection in Ambon</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>ABSTRACT</b>    | <p>Data on heavy metal contamination remain unavailable for the coastal waters of Ambon Island, despite their importance for sea cucumber aquaculture site selection. This study analyzed the spatial distribution of Pb and Cd across compartments and evaluated sediment contamination status using the Contamination Factor (CF) and Index of Geoaccumulation (Igeo). Triplicate samples of sediment, seagrass leaves, and sea cucumber tissue were collected purposively at Halong, Suli, and Poka beaches, and analyzed by Atomic Absorption Spectrophotometry (AAS). Pb was detected only in sediment and seagrass at Halong, with higher concentrations in sediment (mean 0.145 mg/kg) than in seagrass (mean 0.032 mg/kg), whereas Pb in sea cucumber tissue at Halong was below the LoQ (0.0336 mg/kg). Pb at Suli and Poka in all compartments, and Cd across all sites and compartments, were likewise below the LoQ. The CF value (0.007) and Igeo (−7.693; class 0) indicated low sediment contamination, likely related to the proximity of Halong Beach to port activity. These findings show that heavy metal contamination in the coastal waters of Ambon Island remains low and highly localized. Accordingly, all three sites are considered suitable for sea cucumber aquaculture development from the perspective of Pb and Cd contamination levels.</p> |
| <b>KEYWORDS</b>    | <i>lead (Pb); cadmium (Cd); sediment; seagrass; sea cucumber; Ambon; aquaculture safety</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>AUTHORS</b>     | Sophia N. M. Fendjalang; Endang Jamal; Krisye Pasanea                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>AFFILIATION</b> | Universitas Pattimura                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

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| <b>ID</b>          | <b>79</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>TITLE</b>       | <b>Temporal shifts in aquatic microbial communities reveal ecological reorganization under persistent environmental disturbance in Claver, Northeastern Mindanao, Philippines</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>ABSTRACT</b>    | <p>Environmental disturbances can impose persistent stress on aquatic ecosystems, yet temporal responses of planktonic and substrate-associated communities remain poorly documented in Philippine waters. This study examined temporal shifts in aquatic microbial communities in Claver, Northeastern Mindanao, Philippines, from 2021 to 2025, focusing on abundance, richness, taxonomic dominance, and community composition of phytoplankton, periphyton, and zooplankton. Samples were collected using plankton-net-based methods and analyzed through taxonomic enumeration and community-structure assessment. Phytoplankton abundance increased markedly from 1,548 cells L<sup>-1</sup> in 2021 to 118,241 cells L<sup>-1</sup> in 2025, accompanied by changes in richness and dominance, indicating that increased abundance did not necessarily reflect greater diversity. Diatoms, particularly <i>Navicula</i> and <i>Nitzschia</i>, remained prominent, while other taxa became dominant in specific years. Periphyton abundance and richness declined sharply in 2023 before increasing in subsequent years, with notable shifts in dominant diatoms. Zooplankton exhibited the greatest temporal fluctuation, peaking in 2022 and declining thereafter, while richness remained low from 2023 onward. Overall, repeated species turnover and changes in dominance indicated substantial temporal restructuring. These findings demonstrate dynamic community responses to persistent environmental disturbance and highlight the importance of long-term biological monitoring for assessing ecological change in aquatic ecosystems.</p> |
| <b>KEYWORDS</b>    | <i>Bioindicator, community succession, freshwater ecosystem, plankton dynamics</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>AUTHORS</b>     | Erwin Jones Tucong; Ramon Francisco Q. Padilla; Glewin Jay V. Laraño; Renor A. Abrea; Anabelle Dece Espadero                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>AFFILIATION</b> | Mindanao State University at Naawan                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

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| <b>ID</b>          | <b>81</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>TITLE</b>       | <b>Granular Compost Production from Sago Pith Waste and Campus Leaf Litter and Its Application to Shallot Cultivation</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>ABSTRACT</b>    | <p>Efforts to reduce farmers' dependence on urea and other inorganic fertilizers can be achieved through the utilization of locally available organic wastes as alternative fertilizer sources. Sago pith waste and campus leaf litter have the potential to be utilized as raw materials for granular compost production. This study aimed to develop granular compost from sago pith waste and campus leaf litter and evaluate its effectiveness in shallot (<i>Allium cepa</i> L. var. <i>aggregatum</i>) cultivation. The application of granular compost was designed in a Randomized Block Design with three replicates. Treatments included 1) without fertilizers (KGES1); 2) the granular compost (8 t/ha) (KGES2); 3) recommended dosage of inorganic such as Urea, SP-36, and KCl (KGES3); 4) inorganic + granular compost (8 t/ha) (KGES4); 5) <math>\frac{1}{2}</math> x dosage of inorganic + granular compost (8 t/ha) (KGES5); 6) 2x dosage of inorganic + granular compost (8 t/ha) (KGES6); 7) <math>\frac{1}{2}</math>x dosage of inorganic + granular compost (12 t/ha) (KGES7) and 8) 2x dosage of inorganic + granular compost (4 t/ha) (KGES8).</p> |
| <b>KEYWORDS</b>    | <i>Allium cepa</i> L. var. <i>aggregatum</i> , nutrient management, organic fertilizer, sustainable agriculture                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>AUTHORS</b>     | Maimuna La Habi; Rudy Soplanit; Hermina Neltje Taihuttu; Nureny Goo; Betty Sahetapy; VILMA LAURIEN TANASALE; Joan Joulanda Grace Kailola                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>AFFILIATION</b> | Universitas Pattimura                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

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| <b>TITLE</b>       | <b>An Analysis of Collaborative Governance in the Revitalization of the Kali Code Area in Jogoyudan, Yogyakarta</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>ABSTRACT</b>    | <p>This study examines Collaborative Governance in the revitalization of the Kali Code area in Yogyakarta, a densely populated urban area with high vulnerability to flooding. While collaborative governance studies in Indonesia have largely focused on public service delivery and environmental management, its application to urban riverbank revitalization through Community-Based Disaster Risk Reduction (CBDRR) remains relatively limited. This study explores how collaboration develops among local government, local communities, and non-governmental organizations (NGOs) in the revitalization process. A descriptive qualitative approach was employed, using in-depth interviews, direct observation, and document analysis for data collection. The findings indicate that collaboration among the actors has generally worked well, reflected in shared principles, motivations, and capacities for collective action. Collaboration between local government and communities has been strengthened through training, empowerment, and capacity-building activities. However, limited private-sector involvement remains a challenge, particularly for sustaining funding and supporting innovation. The study suggests that future collaborative efforts should involve a broader range of actors, especially the private sector, through investment partnerships and community-based economic development. This study contributes to Collaborative Governance literature by highlighting collaborative practices in urban riverbank revitalization in disaster-prone areas and provides practical insights for strengthening CBDRR practices in similar urban contexts in Indonesia.</p> |
| <b>KEYWORDS</b>    | <i>Collaborative Governance; revitalization; Kali Code; CBDRR; community; private sector</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>AUTHORS</b>     | Muhammad Hakam Biqy                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>AFFILIATION</b> | Universitas Diponegoro                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

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| <b>TITLE</b>       | <b>Ecological parameters of Trees Outside Forest in academic landscapes of an arid to semi-arid region: Patan District, Gujarat, India</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>ABSTRACT</b>    | <p>Trees Outside Forest contribute substantially to ecological resilience in arid and semi-arid regions, yet their conservation status within academic landscapes remains poorly documented. This study evaluates the woody flora of academic institutional landscapes in Patan District, North Gujarat, India. Four higher education institutions, distributed across four talukas and three soil-salinity classes, were selected by a stratified random procedure, and every individual with a diameter at breast height of at least 10 cm was enumerated within each delineated campus. Species were confirmed through herbarium consultation and the e-Flora of India database. The Importance Value Index, the Shannon-Wiener index, Simpson's index and Pielou's evenness index were computed, and analysis of variance tested differences in abundance and dominance among families. The inventory recorded 12 494 individuals belonging to 132 species and 45 families, of which native species accounted for 61%. Meliaceae and Apocynaceae dominated, while <i>Azadirachta indica</i> showed the highest Importance Value Index (145.42), followed by <i>Alstonia scholaris</i> (45.36) and <i>Aegle marmelos</i> (4.56). Diversity was nevertheless low and uneven (<math>H' = 0.592</math>; <math>D = 0.278</math>; <math>J' = 0.285</math>), and abundance (<math>p = 0.041</math>) and dominance (<math>p = 0.031</math>) varied significantly. Academic landscapes in drylands therefore require deliberate diversification with native, drought-adapted species.</p> |
| <b>KEYWORDS</b>    | <i>Arid zone; academic landscape; ecological parameters; biodiversity conservation; Trees Outside Forest</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>AUTHORS</b>     | sylvain voumo; Narendra Kumar Maurya; Leena PATEL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>AFFILIATION</b> | Submitting author affiliation not stated; coauthor affiliation(s): Gokul Global University, Sidhpur (Patan), Gujarat, India; Gokul Foundation Trust                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

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| <b>TITLE</b>       | <b>Analysis of the Carrying Capacity for Water and Food Supply in Eastern Indonesia</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>ABSTRACT</b>    | <p>This study analyzes the carrying capacity of water and food supply in Eastern Indonesia, specifically in the provinces of Maluku, North Sulawesi, and Papua. The research addresses increasing challenges to food security that stem from climate change, natural resource degradation, and infrastructure limitations in this archipelagic region. The study utilizes a quantitative approach, spatial analysis through GIS, and qualitative interviews to evaluate and map the carrying capacities for water and food based on nine major commodities, with a particular focus on sago as a strategic local food source. The findings suggest that, overall, the availability of clean water and food in these three provinces is projected to remain surplus through 2045, although variations in carrying capacity exist across different regions. Biophysical, socio-economic, and policy factors play a significant role in influencing the potential for water and food provision. This research recommends enhancing resource governance, promoting technological innovation, diversifying local food sources, and integrating spatial data into sustainable development planning. The findings aim to serve as a basis for strategic policy-making to improve food security and community welfare in Eastern Indonesia.</p> |
| <b>KEYWORDS</b>    | <i>carrying capacity, food security, clean water, Eastern Indonesia, sago</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>AUTHORS</b>     | Pieter Jozef Kunu; Johanna Taribuka; Hendrik Steven E. S. Aponno                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>AFFILIATION</b> | Universitas Pattimura                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

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| <b>ID</b>          | <b>108</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>TITLE</b>       | <b>ANALYSIS OF THE CARRYING CAPACITY OF THE WAI LOLA BESAR WATERSHED, EAST SERAM REGENCY, MALUKU PROVINCE</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>ABSTRACT</b>    | <p>The objective of this study was to determine the carrying capacity of the Wai Lola Besar watershed based on variables including land condition, water management condition, socio-economic condition, water infrastructure investment, and regional spatial utilization. Research materials consisted of soil and water samples, 8 years of rainfall data, and various maps (National Digital Elevation Model/Demnas, Topographic/RBI, Geological, Soil, Land Use, Watershed Boundary, Critical Land, and Spatial Pattern maps), as well as population data from village monographs. Field research was conducted based on 125 GIS-based land units generated by overlaying topographic, geological, soil, and land-use maps; the analysis of watershed carrying capacity followed the Guidelines for Watershed Management Monitoring and Evaluation (Minister of Forestry of the Republic of Indonesia, 2014). The results indicate that the Wai Lola Besar watershed has a carrying capacity score of 88.5, falling into the "Good" category (<math>70 &lt; \text{Carrying Capacity} \leq 90</math>). Influencing factors include critical land and vegetation cover; flooding and water usage index (regarding water management); population pressure and rule/norm enforcement (regarding socio-economic conditions); city status and water infrastructure index (regarding infrastructure investment); and regional spatial utilization. Conversely, factors indicating poor conditions include the erosion index; annual runoff coefficient, sediment load, flooding, population welfare levels.</p> |
| <b>KEYWORDS</b>    | <i>watershed carrying capacity, GIS, Wai Lola Besar watershed</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>AUTHORS</b>     | Silwanus Matheus Talakua                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>AFFILIATION</b> | Universitas Pattimura                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

## CHAMBER 2 — SCIENTIFIC ABSTRACTS

### Marine, Coastal, and Archipelagic Resource Sustainability

26 abstracts marked PRESENTATION in this chamber. Provisional catalogue only; final speaker and room assignments require Secretariat confirmation.

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| <b>TITLE</b>       | <b>Needs Analysis of Environmental Training for Teachers and Education Staff in Archipelagic Regions</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>ABSTRACT</b>    | This study aims to analyze the training needs in environmental education for teachers and education staff in archipelagic regions, identify priority competencies, examine the factors influencing these needs, and formulate training program recommendations suited to the characteristics of archipelagic areas. A quantitative descriptive approach was used, combined with a Training Needs Analysis (TNA). Data were collected from 92 teachers and education staff in the archipelagic areas of Ambon City and Central Maluku Regency, Maluku Province, selected through Proportionate Stratified Random Sampling, using a Likert-scale questionnaire, interviews, observation, and documentation. Data were analyzed using descriptive percentage analysis and gap analysis. The results show that the attitude aspect obtained the highest score, while the skills and supporting-facilities aspects were in the low category, and the knowledge aspect was in the moderate category. The highest training priority was the development of environment-based learning and Project Based Learning. This study concludes that environmental training programs for teachers in archipelagic regions need to be designed based on a needs analysis so that they are more contextual, practice-oriented, and accessible. |
| <b>KEYWORDS</b>    | <i>Training Needs Analysis (TNA), Archipelagic Regions, Environmental Education, Competency Gap, Project-Based Learning.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>AUTHORS</b>     | Maria Tience Yulianingsih; Suraya Dahlan; Meria; Wahyu Parhitean Butar Butar; Abdul Rasid Tuharea; Moy Phin Batmomolin; Sundun Triwardani; Irwin Tabang; Prof. Dr. RUDOLF KEMPA, M.Pd; Paul Arjanto                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>AFFILIATION</b> | Education Management, Pattimura University                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

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| TITLE       | <b>Morphological diversity and phenetic relationship of Citrus species from Kisar Island, Southwest Maluku, Indonesia</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| ABSTRACT    | <p>Citrus species on small islands may harbor unique phenotypic diversity associated with environmental adaptation and local selection. This study aimed to characterize morphological variation and determine phenetic relationships among Citrus species from Kisar Island, Southwest Maluku, Indonesia. Field surveys were conducted at Yawuru, Sumpali, and Lebelau villages from October to November 2024 using purposive sampling. Five Citrus taxa, namely Citrus spp., C. hystrix, C. aurantifolia, C. microcarpa, and C. maxima, were characterized using IPGRI descriptors. Qualitative and quantitative morphological traits of stems, leaves, and fruits were analyzed descriptively and subjected to cluster analysis using NTSYS software. The results revealed considerable interspecific variation in tree architecture, leaf morphology, thorn characteristics, fruit size, rind thickness, and pulp coloration. Citrus maxima showed the highest morphological divergence, characterized by large fruit size and thick rind, and formed a separate cluster in the dendrogram analysis. Cluster analysis grouped the taxa into two major clusters, indicating close phenetic relationships among Citrus spp., C. hystrix, C. aurantifolia, and C. microcarpa. The observed morphological diversity reflects both genetic background and adaptation to the dry tropical environment of Kisar Island. These findings provide baseline information for citrus germplasm conservation and future molecular studies</p> |
| KEYWORDS    | <i>germplasm, island citrus, morphometrics, phenetic analysis, Rutaceae</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| AUTHORS     | Hermalina Sinay; Ritha Lusian Karuwal; Estri Laras Arumingtyas                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| AFFILIATION | Universitas Pattimura                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

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| <b>TITLE</b>       | <b>Managing Tourism Pressure and Coastal Carrying Capacity in a Small Island System: A Bayesian Belief Network Analysis of Bali, Indonesia</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>ABSTRACT</b>    | Coastal tourism in small island regions faces increasing pressures arising from tourism growth, limited environmental carrying capacity, and uneven governance capacity. This study examines the key factors influencing coastal tourism sustainability in Bali and evaluates alternative policy interventions using a Bayesian Belief Network (BBN). The model integrates governance, environmental, socioeconomic, and tourism-pressure dimensions based on a literature review and expert elicitation. The analysis applies probabilistic inference, sensitivity analysis, and scenario simulation to assess how changes in key variables affect sustainability outcomes. The results indicate that area carrying capacity is a critical determinant of sustainability, while local government commitment functions as an important upstream driver through stronger monitoring and regulatory mechanisms. Tourist volume regulation reduces pressure on carrying capacity, whereas community participation strengthens governance processes and social stability. The integrated scenario combining stronger visitor regulation with increased community participation produces the highest probability of sustainable outcomes. These findings highlight the importance of integrated coastal governance that aligns tourism intensity with environmental limits while strengthening local participation and socioeconomic resilience in small-island destinations. |
| <b>KEYWORDS</b>    | <i>Bayesian Belief Network; coastal sustainability; carrying capacity; tourism pressure; coastal governance; small island tourism</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>AUTHORS</b>     | Ni Nyoman Reni Suasih; Putu Yudy Wijaya; Apsari Anandari; I Komang Gede                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>AFFILIATION</b> | Udayana University                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

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| TITLE       | <b>Population Genetic Patterns of <i>Holothuria atra</i> in Maluku Archipelago</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| ABSTRACT    | <p><i>Holothuria atra</i>, a sea cucumber species common in tropical Indo-Pacific intertidal habitats, remains poorly known genetically in the Maluku Archipelago. We collected 220 individuals from nine locations and examined a 639-bp fragment of the mitochondrial COI gene to characterize genetic diversity and population structure. We measured haplotype richness, private haplotypes, haplotype diversity (<math>H_d</math>), nucleotide diversity (<math>\pi</math>), and Watterson's theta (<math>\theta_W</math>). Population structure was assessed using <math>F_{ST}</math> and sequence-based <math>\Phi_{ST}</math>. Genetic diversity differed noticeably among locations. Some haplotypes were shared across much of the archipelago, while others occurred only at particular sites. Haplotype and nucleotide diversity also varied among populations, and no single pattern characterized all nine locations. The same was true for population differentiation. Some population pairs were genetically similar, whereas others showed much clearer separation. Overall, <i>H. atra</i> populations in Maluku share much of their genetic variation, but local differences are still apparent. These differences, including locally restricted haplotypes and varying levels of population differentiation, point to a genetic landscape that is connected but not uniform across the archipelago. This first regional baseline for <i>H. atra</i> can help identify population-level variation that should be considered in future conservation and management.</p> |
| KEYWORDS    | <i>Holothuria atra</i> ; mitochondrial COI; genetic diversity; population structure; Maluku Archipelago                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| AUTHORS     | Gratia Manuputty; Takashi Kanbe; Masayuki K. Sakata; Hitoshi Araki                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| AFFILIATION | Hokkaido Daigaku                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

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| ID          | 40                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| TITLE       | <b>Development of Antimalarial Phytomedicine of <i>Clerodendrum inerme</i> Leaves to Reduce Parasitemia : a Model as Antimalarial Drugs Discovery</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| ABSTRACT    | <p>Abstract: Phytomedicines for the treatment of various diseases including malaria are an important part of the cultural diversity of which Indonesia's biodiversity has been an integral part. This study aims to evaluate the antimalarial activity of <i>Clerodendrum inerme</i> aqueous leaf extract in reducing parasitemia . An experimental study was conducted using mice weighing 20–30 grams were inoculated with <i>Plasmodium berghei</i> ANKA (0.1 mL per animal) and monitored until their parasitemia levels reached 1–5%. Research results that the aqueous extract of <i>Clerodendrum inerme</i> leaves effectively reduced parasitemia in <i>Plasmodium berghei</i> ANKA-infected mice. Conclusion : On average, the 10% (10 g/100 mL) of <i>Clerodendrum inerme</i> leaves concentration yielded the most effective outcome, bringing neutrophil, lymphocyte, monocyte, and eosinophil. So <i>Clerodendrum inerme</i> can development as antimalarial drugs discovery.</p> |
| KEYWORDS    | <i>Keywords: Clerodendrum inerme, leaves extract, antimalarial drugs discovery</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| AUTHORS     | Maria Nindatu; Abdul M.Ukratalo; Ventia Tanikwele; Hery Jotley                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| AFFILIATION | Universitas Pattimura                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

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| <b>TITLE</b>       | <b>Adaptive Governance in Managing Tidal Floods in Coastal Java: A Qualitative Content Analysis</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>ABSTRACT</b>    | <p>Coastal regions along the island of Java, Indonesia, face acute structural vulnerabilities intensified by chronic and worsening tidal inundation. Addressing such complex environmental hazards necessitates highly flexible, inclusive, and collaborative institutional arrangements. This paper critically examines the practical realization and systemic barriers of adaptive governance in managing tidal floods across Java's coastal municipalities. Utilizing a qualitative content analysis design, a systematic corpus of 20 peer-reviewed journal articles was synthesized and coded via ATLAS.ti software. The network analysis reveals that existing disaster management interventions remain predominantly reactive, fragmented, and sporadic rather than strategically proactive. Governance execution is severely constrained by entrenched institutional silos, overlapping agency mandates, and the persistent marginalization of key community stakeholders most notably women's groups, whose localized adaptive capacities remain vastly underutilized. Furthermore, a paucity of deliberative dialogue among state and non-state actors continuously stifles institutional flexibility and collective decision-making. The absence of institutionalized disaster resilience further exacerbates local socioeconomic vulnerabilities, leaving grassroots adaptation mechanisms largely isolated from formal policy architecture. Consequently, this study underlines the imperative to cultivate inclusive deliberative spaces, institutionalize gender-responsive perspectives into policy planning, and formalize continuous adaptive learning mechanisms to fortify long-term coastal resilience across Java's vulnerable shorelines.</p> |
| <b>KEYWORDS</b>    | <i>Adaptive governance, Tidal flood management, Coastal resilience, Qualitative content analysis</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>AUTHORS</b>     | Sofi Koidatul Maqfiroh; Kismartini Kismartini                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>AFFILIATION</b> | Universitas Diponegoro                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

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| <b>TITLE</b>       | <b>Community Structure and Distribution of Mangroves along the Lateri Coast, Ambon, Indonesia</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>ABSTRACT</b>    | <p>Mangroves provide a wide range of ecological, biological, physical, and economic functions. This study assessed the community structure and distribution of mangroves along the coastal area of Lateri, Ambon City, using the belt transect method. The results revealed eight mangrove species distributed across four distinct substrate types: fine sand–very fine sand, which was the dominant substrate type; fine sand–medium sand; mud–clay; and very fine sand–mud. The tree category had the highest density for <i>Bruguiera parviflora</i>, whereas <i>Rhizophora apiculata</i> had the highest density in both the sapling and seedling categories. The highest species frequency and coverage in the tree category were recorded for <i>Sonneratia alba</i>, while <i>Rhizophora apiculata</i> exhibited the highest frequency and coverage in the sapling category. <i>Bruguiera parviflora</i> showed the highest species frequency in the seedling category. Based on the Importance Value Index (IVI), <i>Sonneratia alba</i> had the highest IVI in the tree category, whereas <i>Rhizophora apiculata</i> had the highest IVI in the sapling category. <i>Sonneratia alba</i> was distributed across all four substrate types, whereas <i>Bruguiera gymnorrhiza</i> and <i>Camptostemon schultzei</i> were each recorded in only one substrate type. The measured environmental parameters, including temperature, salinity, and pH, were within suitable ranges for mangrove growth along the Lateri coast, Ambon.</p> |
| <b>KEYWORDS</b>    | <i>Community Structure, Distribution, Mangroves, Lateri, Ambon</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>AUTHORS</b>     | Yona Aksa Lewerissa                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>AFFILIATION</b> | Universitas Pattimura                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

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| <b>TITLE</b>       | <b>Current Conditions and Suitability Levels for Beach Tourism on Small Islands Case Study: Kassa and Hokman Islands, West Seram Regency</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>ABSTRACT</b>    | <p>The development of coastal tourism on small islands must take into account ecological constraints, environmental dynamics and the biophysical characteristics of the area in order to support the local economy in a sustainable manner. This study aims to identify existing conditions and analyze the suitability of coastal tourism on Kassa Island and Hokman Island West Seram Regency. The study was conducted in January–February 2025 to represent the west monsoon and in June–August 2025 to represent the east monsoon. The analysis was performed using a quantitative descriptive method, applying 22 subparameters in a modified tourism suitability index matrix that accounts for seasonal variations. The results show that both islands have white sand beaches with substrates dominated by sand and gravel. Kassa Island has a wider beach, while Hokman Island has better freshwater availability and a lower level of coastal vulnerability. Kassa Island's suitability index reached 91.33% during the west monsoon and 88.67% during the east monsoon, while Hokman Island's reached 96.67% and 92.67%, respectively. Both areas fall into category S1 (highly suitable). Coastal tourism development on small islands must take into account existing conditions, seasonal sensitivities, and environmental carrying capacity to enhance the effectiveness and sustainability of tourism use.</p> |
| <b>KEYWORDS</b>    | <i>Beach tourism, Small islands, Existing conditions, Tourism suitability index</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>AUTHORS</b>     | Meitha Monita Kaihatu                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>AFFILIATION</b> | Universitas Terbuka                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

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| <b>TITLE</b>       | <b>Environmental education based on local wisdom in Simeulue Island</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>ABSTRACT</b>    | <p>Environmental education in remote areas is often transmitted through indigenous knowledge passed down from previous generations. In small island communities, environmental conservation and natural resource management are closely connected to local wisdom, cultural values, and ecological balance. This study aims to explain the role of local wisdom in environmental education among the people of Simeulue Island, Indonesia. An ethnographic approach was employed to explore environmental values embedded in Simeulue folklore. The data were collected through documentation of folklore, including stories and traditional poetry, as well as in-depth interviews with local leaders and native speakers to confirm cultural meanings and environmental practices. The findings reveal that Simeulue folklore contains extensive environmental knowledge related to biodiversity, sustainable farming and fishing techniques, natural resource conservation, disaster mitigation, and social awareness of living in a small island ecosystem. Folklore also functions as a medium for transmitting ethical values and ecological responsibility to younger generations. The study concludes that Simeuluenese local wisdom plays a significant role in strengthening environmental education and supporting environmental sustainability. Community obedience toward traditional values contributes positively to sustainable environmental management and the welfare of local society.</p> |
| <b>KEYWORDS</b>    | <i>Environmental education; natural resource; local wisdom; Simeulue Island</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>AUTHORS</b>     | Tasnim Lubis; Alemina Br Perangin-angin; Nurhayati Harahap; Niza Ayuningtias; Stefanie Pillai                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>AFFILIATION</b> | Universitas Sumatera Utara                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

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| <b>TITLE</b>       | <b>Sustainable management of coastal and marine environmental resources in the Banyak Island, Aceh Singkil</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>ABSTRACT</b>    | <p>Banyak Island in Aceh Singkil, Indonesia, possesses rich coastal and marine resources that provide ecological, economic, and social benefits for local communities. This study explores sustainable management alternatives for coastal and marine resources on Banyak Island by integrating ecological conservation, community empowerment, and economic sustainability. A qualitative and spatial methodology was employed, using field observations, stakeholder interviews, secondary data analysis, and environmental asset assessment. The study identifies key environmental assets, including biodiversity, coral reefs, mangrove forests, seagrass beds, coastal fisheries, shoreline protection, and livelihoods. The findings indicate that resource management requires an integrated framework in which conservation objectives are balanced with community needs. Key strategies include community-based resource management, ecosystem restoration, sustainable tourism development, and strengthened environmental governance to enhance ecosystem resilience and support livelihoods. Integrating traditional ecological knowledge with community-based approaches is essential for achieving long-term sustainability. Furthermore, sustainable resource use requires collaborative partnerships among government agencies, local communities, non-governmental organizations, and the private sector. Sustainable coastal and marine resource management can effectively safeguard biodiversity, address climate impacts, strengthen community resilience, and support socioeconomic sustainability. These findings provide useful guidance for developing integrated coastal management policies and sustainable development plans for small islands in Indonesia.</p> |
| <b>KEYWORDS</b>    | <i>Management of coastal; marine; environmental resources; Banyak Island</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>AUTHORS</b>     | Tasnim Lubis; Nurul Adilla Alatas Abus; Andi Pratama Lubis; Raden Syahid Carmelia Ulina Samosir; Kamsinah; Liesna Andriany; Achdial Farhan Abus                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>AFFILIATION</b> | Universitas Sumatera Utara                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

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| <b>TITLE</b>       | <b>OPTIMIZATION MODEL OF FISHING PORTS TO ENHANCE THE EFFECTIVENESS OF MEASURED FISHING IMPLEMENTATION</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>ABSTRACT</b>    | <p>This study aims to develop an optimization model for fishing ports to enhance the effectiveness of Measured Fishing (Penangkapan Ikan Terukur/PIT) implementation. Fishing ports serve as hubs for catch landing, vessel services, logistics distribution, and quota-based production control and recording. The successful implementation of PIT depends not only on regulatory frameworks but also on the readiness and operational capacity of fishing ports. However, empirical model integrating infrastructure, logistics support, operational efficiency, and productivity to comprehensively explain PIT effectiveness remains unavailable. This study employs a quantitative approach using Structural Equation Modeling based on Partial Least Squares (SEM-PLS). The research stages include conceptual model development, instrument development based on latent constructs, data collection from port respondents, measurement model (outer model) evaluation, and structural model (inner model) testing. The analysis identifies causal relationships among variables and determines dominant pathways of influence within the port operational system. The study is expected to produce a structural model explaining factors affecting port capacity optimization and PIT effectiveness. The model will support evidence-based policy recommendations to improve operational efficiency, quota control accuracy, and sustainable capture fisheries management, particularly in archipelagic regions. The study contributes theoretically to fishing port management literature and practically to sustainable, adaptive fisheries governance.</p> |
| <b>KEYWORDS</b>    | <i>Fishing Ports, Optimization Model, Measured Fishing, SEM-PLS.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>AUTHORS</b>     | Ruth Phetrosina Soumokil                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>AFFILIATION</b> | Not stated in the submission data.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

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| <b>TITLE</b>       | <b>ANALYSIS OF OCCUPATIONAL SAFETY AND HEALTH IMPLEMENTATION IN CARGO HANDLING ACTIVITIES AT ERIE FISH LANDING BASE TO IMPROVE OPERATIONAL PERFORMANCE</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>ABSTRACT</b>    | <p>Erie Fish Landing Base (PPI Erie) in Ambon City plays an important role in supporting capture fisheries, particularly catch loading and unloading activities. These operations involve considerable occupational accident risks due to slippery working surfaces, the use of manual handling equipment, inadequate use of personal protective equipment (PPE), and limited safety-support facilities. Effective Occupational Safety and Health (OSH) implementation is therefore essential to ensure operational continuity and improve the efficiency of cargo handling activities. This study aims to assess OSH implementation in cargo handling activities at PPI Erie and identify occupational risk levels using the HIRARC (Hazard Identification, Risk Assessment and Risk Control) method. A descriptive research design with a risk management approach was employed. Data were collected through direct observation, interviews, and documentation. The analysis involved descriptive assessment and the development of a risk matrix based on the likelihood and severity of identified hazards. The study is expected to provide a comprehensive occupational risk profile, assess the level of OSH implementation, and formulate appropriate risk control recommendations. The findings are expected to support improvements in workplace safety, operational efficiency, and overall operational performance at PPI Erie.</p> |
| <b>KEYWORDS</b>    | <i>fishing port, occupational accident risk, Occupational Safety and Health (OSH), HIRARC, risk assessment, cargo handling</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>AUTHORS</b>     | Ruth Phetrosina Soumokil; Monalisa Manuputty; Juliet Gracea Metekohy                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>AFFILIATION</b> | Submitting author affiliation not stated; coauthor affiliation(s): Universitas Pattimura                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

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| <b>TITLE</b>       | <b>Component-Based Coastal Vulnerability Assessment for Small-Island Coastal Management: Physical and Social Dimensions in Negeri Rutong, Maluku</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>ABSTRACT</b>    | <p>Abstract Small-island coastal areas often face physical and socio-economic vulnerabilities that are assessed separately, limiting integrated coastal management. This study assesses the physical and social dimensions of coastal vulnerability in Negeri Rutong, Ambon Island, Indonesia, using two independent sub-indices: a Physical Vulnerability Index (PVI) and a Social Vulnerability Index (SVI). The PVI incorporates seven geomorphological and hydrodynamic parameters, while the SVI incorporates three socio-economic parameters: coastal land cover, population density, and road network proximity. Each parameter was standardised on a 1–5 vulnerability scale based on established coastal vulnerability assessment literature, and sub-index scores were calculated using equal weighting. Results indicate a PVI of 3.57 (high vulnerability), driven primarily by shoreline erosion rate and geomorphological exposure. In contrast, the SVI of 2.33 indicates lower socio-economic vulnerability, reflecting relatively low population density and vegetated land cover despite vulnerable road networks near the shoreline. The contrast between the two dimensions indicates that Rutong's current vulnerability profile is dominated by physical coastal conditions. These findings provide an empirical baseline for prioritising coastal management and establish component-level indicators for the subsequent development of an integrated coastal vulnerability index.</p> |
| <b>KEYWORDS</b>    | <i>coastal geomorphology; coastal risk assessment; physical vulnerability; small island management; social vulnerability</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>AUTHORS</b>     | Lisa Meidiyanti Lautetu                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>AFFILIATION</b> | Universitas Pattimura                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

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| <b>TITLE</b>       | <b>The roles of fishers, ecological knowledge from traditional larval fishery in eastern Indonesia</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>ABSTRACT</b>    | <p>Larval fisheries in eastern Indonesia are traditional operations that have existed for decades. While these fisheries are a critical factor in maintaining fish population sustainability, research on the practice remains limited. This study aims to examine the sustainability of larval fisheries through the perspectives of traditional fishers and the history of the fishery's development. We observed larval fishing activities and interviewed fishers from Hative Besar village on Ambon Island between October 2025 and September 2026. Data collected included the fishers' years of experience, the history of the *siru-siru* larval fishery, and catch results. Twenty interviewed fishers varied in fishing experience years and catch. Observations revealed that greater experience did not necessarily result in larger catches; however, fishers integrated four aspects of ecological knowledge—spatial, temporal, physical processes, and organism behavior—into their fishing decisions. We conclude that the fishers' ecological and historical ecological knowledge illustrates the connectivity between larvae and the land, a factor that must be considered in efforts to sustain fish populations.</p> |
| <b>KEYWORDS</b>    | <i>Ambon Bay, fishers' ecological knowledge, fish larvae, Siru-siru fisheries</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>AUTHORS</b>     | Grace Hutubessy; Agustinus Tupamahu; Haruna                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>AFFILIATION</b> | Universitas Pattimura                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

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| <b>TITLE</b>       | <b>Mapping Penta Helix Collaboration for Sustainable Coastal Flood Management in Genuk, Semarang</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>ABSTRACT</b>    | Coastal flooding in urbanizing coastal areas is a complex governance problem. Genuk Sub-district in Semarang City is repeatedly affected by coastal flooding and tidal inundation, posing risks to settlements, infrastructure, and communities. This study maps Penta Helix actors and examines documented forms of collaboration and gaps in coastal flood management in Genuk. The study used Qualitative Document Analysis of 16 core documents from government websites, academic repositories, corporate social responsibility records, community-related sources, and media reports, analyzed through thematic coding and actor mapping. Government, academia, business, community, and media are all represented in the documented flood management activities. Government is the most dominant actor, with roles spanning emergency response, infrastructure management, and inter-agency coordination. Community involvement includes local adaptation, self-mitigation, and collective action, while business participation is mainly found in CSR and social assistance. Academia contributes through flood-risk mapping and flood modelling, while media mainly supports public communication. The documented network remains government-centered and issue-based, with relationships most visible among government actors and between government and community, while linkages among non-government actors are less documented. The findings highlight the need to better integrate knowledge, resources, community capacity, and public communication in long-term coastal flood governance. |
| <b>KEYWORDS</b>    | <i>Penta Helix; collaborative governance; coastal flood management; actor mapping; Genuk; Semarang</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>AUTHORS</b>     | Dewi Ramadhani; Dyah Lituhayu                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>AFFILIATION</b> | Universitas Diponegoro                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

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| <b>TITLE</b>       | <b>Temporal and Spatial Patterns of Seagrass Assemblages in Claver and Socorro, Surigao del Norte, Philippines: A Five-Year Assessment</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>ABSTRACT</b>    | <p>Seagrass beds provide essential ecosystem services that support diverse faunal communities, sustain fisheries, and stabilize coastal sediments. This study examined the temporal and spatial patterns of seagrass communities across eight monitoring sites in Claver and Socorro, Surigao del Norte, Philippines, using seagrass assessment data collected from 2021 to 2025 through a modified transect-quadrat method. Seagrass community structure exhibited temporal and spatial variations. <i>Cymodocea rotundata</i> and <i>Thalassia hemprichii</i> were recorded throughout the five-year monitoring period. In the 2025 assessment, nine seagrass species were documented. Alingkakajaw South had the highest mean seagrass cover (69.1%), dominated by <i>T. hemprichii</i>. Similarly, this site also recorded fair to excellent seagrass cover in 2023 (37.9%) and 2024 (76.8%), respectively. Lapinigan West demonstrated a notable trend, with mean seagrass cover increasing from 34.3% in 2024 to 53.1% in 2025. The presence of <i>T. hemprichii</i> at the Wharf site, where seagrasses had not been observed from 2021 to 2024, further suggests an early stage of natural recovery. Alingkakajaw South exhibited the highest shoot density, while Lapinigan West had the tallest seagrass canopy. These patterns suggest potential improvements in habitat complexity and ecological resilience. Continued long-term monitoring is essential to track changes and assess ecosystem health in seagrass communities.</p> |
| <b>KEYWORDS</b>    | <i>Seagrass diversity, Temporal variation, Community structure, Ecological resilience</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>AUTHORS</b>     | Lovella Calala; Harry Kenn T. De La Rosa; Renor A. Abrea; Ed Vince A. Ruiz; Anabelle Dece Espadero                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
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| <b>TITLE</b>       | <b>STATUS AND HEALTH INDEX OF THE SEAGRASS ECOSYSTEM IN THE COASTAL WATERS OF POKA, INNER AMBON BAY</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>ABSTRACT</b>    | <p>Seagrass ecosystems are important coastal ecosystems that provide essential ecological functions, making regular assessment of their condition and health status necessary. This study aimed to assess the condition and status of seagrass meadows, determine the Seagrass Ecosystem Health Index (SEHI), and spatially map seagrass ecosystem health in the coastal waters of Poka Village, Inner Ambon Bay. The study employed purposive sampling based on seagrass distribution. Data were collected at 23 observation stations using 10 × 10 m plots, with five replicate 0.5 × 0.5 m subplots positioned at the center and four corners of each plot. Spatial mapping was conducted using Sentinel-2C imagery and QGIS 3.40.5. Seagrass cover ranged from 42.50–89.38%, with a mean of 67.63%. Based on seagrass cover, 4 stations were classified as moderate, 14 as dense, and 5 as very dense. Seagrass meadow status indicated that 19 stations were classified as good/rich-healthy, while 4 were damaged/less rich-less healthy. SEHI values ranged from 0.63–0.81, with a mean of 0.73. Overall, 15 stations had good ecosystem health and 8 had moderate health. The Poka seagrass meadows were predominantly dense, good/rich-healthy, and in good ecosystem health, providing a baseline for ecosystem monitoring and management in Inner Ambon Bay.</p> |
| <b>KEYWORDS</b>    | <i>seagrass ecosystem; seagrass cover; seagrass meadow status; Seagrass Ecosystem Health Index; Poka Village</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>AUTHORS</b>     | Charlothia Irenny Tupan; Johannes M.S. Tetelepta; JESAJA A. PATTIKAWA; Janson Hans Pietersz; Grasioano Warakano Lailossa                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>AFFILIATION</b> | Universitas Pattimura                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

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| <b>ID</b>          | <b>87</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>TITLE</b>       | <b>First insights into Solar-LED-induced survival and growth of juvenile <i>Caranx ignobilis</i> (Carangidae) in Tropical floating net cages</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>ABSTRACT</b>    | <p>This study was conducted to test the effects of solar-powered light through the use of LED lamps on juvenile Giant Trevally (<i>Caranx ignobilis</i>) reared in floating net cages. This field experiment lasted for 70 days involving 450 fish under three replicates of 4 treatments: (A), solar-powered LED lamps without additional feeding; (B), solar-powered LED lamps combined with fresh fish feeding; and (C), fresh fish feeding without solar-powered LED lamps as a control. Fresh fish was administered twice a day. The experimental results showed that the combination of solar-powered LED light and fresh fish feeding significantly contributed to the weight gain rate (WGR) and specific growth rate (SGR), reaching 73.67% and 1.84%/day, respectively. In addition, the test fish group receiving only fresh fish feeding as a control also showed a high weight gain rate (WGR) of 69.81% and a specific growth rate (SGR) of 1.64%/day. By comparison, the test fish group receiving only LED light produced growth performances (WGR and SGR) of 41.71% and 0.79%/day, respectively. A survival rate of 90% for Treatment B indicates that the solar-powered LED light did not cause stress or significant mortality thus provides a new insight for future inexpensive natural feed source.</p> |
| <b>KEYWORDS</b>    | <i>Renewable energy, Natural feeding, Grow-out</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>AUTHORS</b>     | Michelle Bairatnissa; Jacobus mosse; Grace Hutubessy; Izzanudin Pary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>AFFILIATION</b> | Universitas Pattimura                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

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| <b>TITLE</b>       | <b>The Blue Economy Trap: Does Marine Resource Dependence Improve Welfare in Indonesia's Archipelagic Regions?</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>ABSTRACT</b>    | <p>The blue economy is increasingly promoted as a pathway for sustainable development in archipelagic countries. In Indonesia, it is linked to marine resource governance, regional development, and welfare in island regions. However, whether dependence on marine resources contributes to poverty reduction remains an empirical and political-economic question. This study examines whether marine resource dependence reduces poverty across districts and cities across eight archipelagic provinces. Using district-level panel data from 2020 to 2024, marine resource dependence is measured as the ratio of marine capture fishery production value to current-price gross regional domestic product, with welfare proxied by the poverty rate. Fixed-effects models with district/city and year fixed effects are employed. The findings show that marine resource dependence does not provide robust evidence of poverty reduction. In the baseline model, marine dependence is positively associated with poverty, while alternative logarithmic specifications produce statistically insignificant results. The study introduces the concept of the blue economy trap: marine wealth may generate economic activity but fail to improve welfare when regions remain dependent on primary production without sufficient control over value chains, market access, and distributional governance. The findings call for blue economy policies focused on value distribution, institutional capacity, and coastal welfare.</p> |
| <b>KEYWORDS</b>    | <i>Blue Economy; Marine Resource Dependence; Poverty</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>AUTHORS</b>     | Muhammad Habibi; Rizky Dwi Kusuma; Saepudin                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>AFFILIATION</b> | Badan Pengawas Pemilihan Umum                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

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| <b>TITLE</b>       | <b>From Rehabilitation to Ecotourism: A Comparative Analysis of Community Typology and Co-Management in Mangrove Karangsong and Mangrove Kasih Sayang Mundupesisir</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>ABSTRACT</b>    | <p>Community-based mangrove rehabilitation has increasingly evolved into mangrove ecotourism, yet this transition is shaped by differences in governance, participation, and institutional formality. This article compares Mangrove Karangsong (MK) and Mangrove Kasih Sayang Mundupesisir (MKSM) to examine how community-based mangrove rehabilitation develops into tourism and how each site can be interpreted through Matarrita-Cascante and Brennan's imposed-directed-self-help typology. The study applies a comparative qualitative case study design using thematic analysis of interviews, observation, and documents, with attention to initiation, stakeholder roles, decision-making, benefit distribution, ecological change, and governance structure. Mangrove Karangsong demonstrates a rehabilitation-to-ecotourism transition characterized by stronger authority-led steering and reduced community influence during the tourism phase, aligning more closely with a directed pattern. MKSM, by contrast, reflects a community-initiated model with dual institutions for conservation and tourism, strong local participation, and limited formal regulation, which corresponds more closely to a self-help pattern, although some directed elements remain. Overall, the comparison indicates that the shift from mangrove rehabilitation to ecotourism depends not only on ecological recovery but also on leadership structure and the clarity of institutional responsibilities. Sustainable mangrove ecotourism therefore requires both local ownership and stronger coordination so that conservation and tourism can be managed with more integrated and effective.</p> |
| <b>KEYWORDS</b>    | <i>Mangrove rehabilitation; mangrove ecotourism; community-based ecotourism; community typology; Matarrita-Cascante and Brennan; co-management</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
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| <b>AFFILIATION</b> | Universitas Terbuka                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

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| TITLE       | <b>Evaluating Critical Water Quality Stressors on <i>Kappaphycus alvarezii</i> Seedlings in a Laboratory-Scale RAS</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| ABSTRACT    | <p>This study evaluated water quality dynamics over 9 months (August–April) to identify critical environmental stressors affecting <i>Kappaphycus alvarezii</i> seedling health in a laboratory-scale Recirculating Aquaculture System (RAS). Physical, chemical, and microbiological parameters were monitored alongside qualitative seedling condition assessments. Optimal seedling health (Good to Very Good) occurred from October to January, supported by stable salinity (32.0–34.5 ppt), balanced phosphate (0.365–0.408 mg/L), and moderate hardness (322–372 mg/L). In contrast, severe seedling degradation (Poor to Very Poor) occurred from February to April. Hypersalinity (44.0–52.0 ppt) and elevated hardness (up to 530 mg/L) served as primary abiotic stressors, triggering osmotic stress. Additionally, heavy organic accumulation in April (TOM: 107.44 mg/L) coincided with high bacterial proliferation (Total Bacteria: <math>2.5 \times 10^4</math> cfu/ml; <i>Vibrio</i> spp.: <math>0.25 \times 10^2</math> cfu/ml), accelerating tissue decay. In conclusion, hypersalinity and organic accumulation are key limiting factors for <i>K. alvarezii</i> seedlings in closed RAS setups. Maintaining seedling viability requires strict salinity regulation via freshwater replenishment and optimised biofiltration to control organic load.</p> |
| KEYWORDS    | <i>Red seaweed, Recirculating Aquaculture System (RAS), hypersalinity, Total Organic Matter, water quality stressors, seedling production.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| AUTHORS     | Endang Jamal; Sophia N. M. Fendjatang; Achmad Fauzan Arifin                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| AFFILIATION | Universitas Pattimura                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

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| <b>TITLE</b>       | <b>Risk and Vulnerability of Small-Scale Tuna and Skipjack Fisheries on Ambon Island, Indonesia</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>ABSTRACT</b>    | <p>Small-scale tuna and skipjack tuna fisheries sustain Ambon Island's coastal economy, yet remain vulnerable to risks threatening their sustainability. This study identified and prioritized principal risks and explored fishers' socioeconomic vulnerability using two independent methods: an Impact-Likelihood Matrix and Principal Component Analysis. A survey of 211 small-scale fishers (<math>\leq 10</math> GT) on Ambon Island was complemented by interviews and observation for triangulation. Nine principal risks were identified; all three Very High risks were rooted in operational costs: rising operational costs (score 13.71), gear damage (13.60), and fuel access difficulty (13.31), while conflict among fishers ranked lowest (1.81), indicating cohesive social relations. Likelihood and impact were strongly correlated (<math>r = 0.94</math>), showing frequent risks were also most consequential. Principal Component Analysis of 20 vulnerability indicators independently confirmed this: "Economic Marginalization and Institutional Assistance Exposure" correlated positively with real five-year economic impact (<math>r = 0.49</math>), whereas "Operational Independence and Fishing Range" correlated negatively (<math>r = -0.36</math>), indicating a protective effect. This convergence confirms that market access and economic stability, rather than ecological or social factors, dominate fisheries sustainability on Ambon Island, with financial independence buffering economic pressure. Management should prioritize cost efficiency, fuel access, gear maintenance, and market access.</p> |
| <b>KEYWORDS</b>    | <i>impact–likelihood matrix; principal component analysis; small-scale fisheries; tuna and skipjack; vulnerability;</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>AUTHORS</b>     | Welem Waileruny; Wulan A. Legohiwo; Taufiniringsih Kesaulya; Stany R. Siahainenia,; Alberth Ch. Nanlohy                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>AFFILIATION</b> | Universitas Pattimura                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

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| <b>TITLE</b>       | <b>The Effectiveness of a Project-Based Learning Approach Integrated with Ain Ni Ain Values on Students' Critical Thinking Skills</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>ABSTRACT</b>    | <p>Students' critical thinking skills remain relatively low, partly because instruction has not been fully contextualized and has not engaged students' real-life experiences. Although project based learning has been extensively studied as an approach to enhancing critical thinking skills, research examining the effectiveness of project based learning specifically integrated with the local wisdom values of Ain Ni Ain in improving critical thinking skills has yet to be identified. This study aims to determine the effectiveness of project-based learning integrated with Ain Ni Ain values on students' critical thinking skills. A. quasi experiment pretest posttest nonequivalent control group design was employed with 30 tenth-grade students at SMAS Muhammadiyah Tual city, divided equally into experimental and control groups. Data collected through a 14-item test based on Ennis's indicators and analyzed using ANCOVA with SPSS 27. The results showed an N-Gain of 0.42 (moderate) for the experimental group and 0.23 (low) for the control group, The ANCOVA results indicated a significant treatment effect (<math>F = 13.808</math>; <math>p &lt; 0.001</math>), meaning that there was a highly significant difference in the mean critical thinking skills scores between the experimental group and the control group, with an effect size of 48.40%, while 51.60% by other factors.</p> |
| <b>KEYWORDS</b>    | <i>Project-Based Learning, Ain Ni Ain, critical thinking skills</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>AUTHORS</b>     | Janaba Renngiwur; Ali Awan; Pamella Mercy Papilaya; Dominggus Rumahlatu                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>AFFILIATION</b> | Universitas Pattimura                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

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| <b>TITLE</b>       | <b>Analysis of Occupational Health and Safety (OHS) Implementation in Loading and Unloading Activities at PPN Ambon to Improve Operational Performance</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>ABSTRACT</b>    | <p>Fish loading and unloading activities at fishing ports involve various potential hazards that may affect worker safety and operational efficiency. This study aims to analyze the implementation of Occupational Health and Safety (OHS), identify potential hazards, assess risk levels using the Hazard Identification, Risk Assessment, and Risk Control (HIRARC) method, and formulate risk control recommendations for loading and unloading activities at PPN Ambon. The study employed a descriptive approach using questionnaires, observations, and documentation. The 50 respondents consisted of loading and unloading workers, fishermen, captains, crew members, and relevant managers or personnel. Data were analyzed using descriptive statistics, validity and reliability tests, correlation, regression, and HIRARC. The results show that OHS implementation achieved an average score of 3.639, while operational performance scored 3.827; both were categorized as good. A positive relationship was found between OHS implementation and operational performance (<math>r = 0.367</math>, <math>p = 0.009</math>), with OHS implementation contributing 13.4% to variation in operational performance. HIRARC identified potential hazards including manual lifting, exposure to heat, rain, fatigue, water, and fish waste. Recommended controls include increasing PPE use, implementing safe work procedures, improving lifting techniques, managing environmental conditions, maintaining unloading-area cleanliness, and strengthening safety supervision and coordination during routine port operations.</p> |
| <b>KEYWORDS</b>    | <i>Occupational Health and Safety, loading and unloading, HIRARC, occupational risk, operational performance, PPN Ambon</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>AUTHORS</b>     | Ruth Phetrosina Soumokil                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>AFFILIATION</b> | Not stated in the submission data.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

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| <b>TITLE</b>       | <b>Cultivable Bacteria from Tropical Seaweed Phycospheres in Ambon: Building a Strain Resource for Functional Holobiont Research</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>ABSTRACT</b>    | <p>Seaweed-associated bacteria may contribute to nutrient transformation and host function, but cultivable microbial resources from tropical seaweed phycospheres remain poorly characterized in eastern Indonesia. This study established a culture collection of bacteria associated with <i>Gracilaria</i> sp., <i>Ulva</i> sp., and <i>Padina</i> sp. collected from Laha waters, Ambon, Indonesia, and conducted preliminary screening for phytate-related activity. Surface-associated bacterial suspensions were cultured, morphologically distinct colonies were purified, and isolates were screened on calcium-phytate medium before preservation as working cultures. A total of 43 cultivable bacterial isolates were retained, comprising 21 from <i>Gracilaria</i>, 13 from <i>Ulva</i>, and nine from <i>Padina</i>. Preliminary calcium-phytate screening produced only limited and poorly resolved clearing because substrate precipitation made the medium highly opaque. Therefore, the isolates are treated as functional candidates rather than confirmed phytase-producing bacteria. The collection provides a resource for standardized re-screening using sodium-phytate-based media, quantitative phosphate-release assays, and molecular identification. Integration with 16S rRNA-based identification and future community profiling may help resolve host-associated microbial functions across tropical seaweed holobionts and support development of functional microbiome research in Maluku.</p> |
| <b>KEYWORDS</b>    | <i>seaweed holobiont; phycosphere; cultivable bacteria; functional microbiology; Maluku</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>AUTHORS</b>     | Agapery Yoane Pattinasarany; Joice W Loupatty; Bethsy J Pattiasina; Megy N Mailoa                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>AFFILIATION</b> | University of Plymouth                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

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| <b>TITLE</b>       | <b>Observation of Coral Spawning at Tobelo Seashore, North Halmahera, Indonesia</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>ABSTRACT</b>    | <p>In tropical regions, the role of environmental factors in the reproductive scheduling of tropical corals remains interesting topics for study. Multi-specific spawning has been observed in these regions, despite a lack of strong fluctuations in the environment. Better understanding coral spawning is crucial for conservation efforts to protect coral reef ecosystems. This study aims to understand coral spawning events at seashore of Tobelo, North Moluccas, Indonesia. Temporal observations of coral spawning were carried out by diving at selected coral reef locations at various days, from April 2025-Mei 2026, 1-6 days after full moon. The results shown that multi species coral spawning were dominated by genus <i>Acropora</i> and we found other species. Mostly, major spawning events were found up to 2 days after full moon, in the period of April-May-November in 2025 and April -May in 2026. These were different with other spawning events have been reported which is found in the period March-April and September -October. Over all, this finding shown spawning event took place under lunar cycle such as DAF and in the temperature ranging from 30 – 30,44o C.</p> |
| <b>KEYWORDS</b>    | <i>Tobelo Seashore, Coral Reefs, Coral Spawning</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>AUTHORS</b>     | Loana Jeanete Totoda; JESAJA A. PATTIKAWA; Gino Valentino Limmon; Masudin Sangaji; Jubhar Christian Mangimbulude                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>AFFILIATION</b> | Universitas Halmahera                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

## CHAMBER 3 — SCIENTIFIC ABSTRACTS

### Climate-Smart Agriculture, Agrometeorology, Food Security, and Sustainable Livestock Systems

18 abstracts marked PRESENTATION in this chamber. Provisional catalogue only; final speaker and room assignments require Secretariat confirmation.

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| <b>TITLE</b>       | <b>Effectiveness of Organic Materials and Trichoderma harzianum Secondary Metabolites on Leaf Blight and Sweet Corn Yield</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>ABSTRACT</b>    | Sweet corn is one of the food crops that is frequently affected by leaf blight disease. This study aimed to evaluate the effectiveness of organic materials, compost and the application methods of secondary metabolites of Trichoderma harzianum on leaf blight disease intensity, growth and yield of sweet corn, as well as to determine the best combination of organic material, compost and T. harzianum application. This quantitative study employed statistical analysis and was designed using a Completely Randomized Design with a total of 48 sample plants. Data were collected through direct observation of the measured variables and documentation of each observation. The collected data were analyzed using Minitab 22 software. The best treatment combination was obtained from the application of eucalyptus leaf compost combined with foliar spraying of secondary metabolites. This treatment reduced leaf blight disease intensity by 54.35% compared to the control. The same treatment also increased plant height by 12.44% and leaf area by 11.72% compared to the control. The same treatment it improved ear weight by 6.65%, ear length by 14.84%, and ear diameter by 18.55% compared to the control. |
| <b>KEYWORDS</b>    | <i>Biological control, cajuput leaves, disease intensity</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>AUTHORS</b>     | Ebedh Barlef Lorwens                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>AFFILIATION</b> | Universitas Pattimura                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

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| <b>TITLE</b>       | <b>A Study on the Compliance of Source Seed Garden Standards for Nutmeg Liat Variety</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>ABSTRACT</b>    | <p>Nutmeg (<i>Myristica fragrans</i>) Liat has been registered as a variety at the Plant Variety Protection and Agricultural Licensing Center since 2017 and was officially released as a superior variety by the Ministry of Agriculture in May 2023. This study was conducted on Gorom Island, East Seram, Maluku, with the objectives of mapping the GPS coordinates of Liat nutmeg gardens and mother trees, and assessing their key characteristics as sources of high-quality seeds. Three gardens were observed (Dulak, Kataloka, and Buan Kataloka; each 1.5 ha), with purposive sampling of 15 trees per garden (45 total). GPS positions and traits including agromorphology, yield productivity, and seed potential were recorded. Results showed that the mother gardens met the Ministry's standards, with tree age and height within acceptable ranges. Average productivity was 5,924–6,771 fruits per tree. Essential oil yield ranged from 2.12–2.35%, meeting Indonesian National Standards, although myristicin content was below standard (1.15%). Overall, the three gardens and their mother trees fulfill the requirements as source seed gardens for quality nutmeg, supporting seed production at local and national levels. This designation has been reinforced by the Decree of the Director General of Plantations No. 199/Kpts./KB.020/E/12/2025.</p> |
| <b>KEYWORDS</b>    | <i>agromorphology, myristicin, nutmeg, source garden.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>AUTHORS</b>     | Ilyas Marzuki                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>AFFILIATION</b> | Not stated in the submission data.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

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| <b>TITLE</b>       | <b>Phenotypic Diversity, Genetic Resources and Production Performance of Four Philippine Native Chicken Genetic Groups: A Review</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>ABSTRACT</b>    | <p>The Philippines is a recognised hotspot for poultry genetic resources, yet its indigenous chickens remain among the least systematically documented in Southeast Asia. This review synthesises the literature on four native chicken genetic groups: the Boholano of Bohol, Camarines of Bicol, Darag of Panay Island, and ZamPen of the Zamboanga Peninsula, emphasising phenotypic characterisation, genetic diversity and production performance. All four derive predominantly from the maternal haplogroup D lineage common to Southeast Asian junglefowl, retain high within-population genetic diversity, and express the slow growth, low-to-moderate egg output and superior product quality typical of tropically adapted indigenous fowl. The Darag is the most thoroughly studied, owing to a sustained institutional improvement programme, whereas the Camarines remains effectively uncharacterised. Production performance is constrained more by management, nutrition and disease exposure than by genotype alone. Persistent gaps include absent pedigreed heritability estimates, fragmented meat and egg quality data, limited genomic work and weak market integration. The review concludes that conservation-based genetic improvement, anchored on community-based breeding, standardised phenotyping and genomic tools, offers the most sustainable route to capturing the economic and cultural value of these resources. Priority research directions are proposed across phenotyping, quantitative and molecular genetics, nutrition, product quality and value-chain development.</p> |
| <b>KEYWORDS</b>    | <i>Philippine Native Chicken, Phenotypic Diversity, Genetic Resources, Production Performance</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>AUTHORS</b>     | Karl Louisse Obispo                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>AFFILIATION</b> | Cavite State University                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

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| TITLE       | <b>Parasitoid Insect Diversity and Community Structure in <i>Elaeis guineensis</i> Intercropping with <i>Zea mays</i> and <i>Oryza sativa</i> var. upland, East Aceh</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| ABSTRACT    | <p>This study examined the diversity and community structure of Hymenoptera parasitoids in two oil palm (<i>Elaeis guineensis</i>) intercropping systems: oil palm maize (<i>Zea mays</i>) and oil palm upland rice (<i>Oryza sativa</i> var. upland) in East Aceh, Indonesia. Sampling used yellow pan and light traps. The oil palm–maize intercropping system supported higher parasitoid diversity (Shannon–Wiener index, <math>H' = 2.34</math>; Pielou's evenness, <math>E = 0.90</math>) than the oil palm-upland rice system (<math>H' = 1.34</math>; <math>E = 0.70</math>). A Mann-Whitney U test revealed a significant difference in the number of individuals per plot between the two intercropping systems (<math>U = 0</math>, <math>p = 0.025</math>, one-tailed). The higher diversity observed in the oil palm maize system was associated with greater canopy heterogeneity, increased floral resource availability, lower pesticide pressure, and higher host diversity. These findings provide the first systematic baseline assessment of Hymenoptera parasitoid communities in oil palm intercropping systems in East Aceh. Oil palm maize intercropping is therefore recommended as a priority agroecological strategy to enhance biological control and promote sustainable crop production in Indonesian tropical smallholder plantations.</p> |
| KEYWORDS    | <i>Aceh Timur; biological control; Hymenoptera parasitoids; morphospecies; oil palm intercropping; Shannon Wiener index.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| AUTHORS     | Nurul Fajriyani; Aidil Amar; Diah Fridayati; Teungku Dheyani; Vinny Pratiwi; Reza Fahmi                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| AFFILIATION | Universitas Syiah Kuala                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

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| <b>TITLE</b>       | <b>Black Soldier Fly Bioconversion of Indonesian Street-Food Waste for Sustainable Livestock Feed Production</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>ABSTRACT</b>    | <p>Food waste generated from urban street-food activities presents a growing environmental challenge while offering opportunities for sustainable resource utilization. This study evaluated the potential of waste from mie ayam ceker, one of Indonesia's most popular street foods, as a substrate for Black Soldier Fly (<i>Hermetia illucens</i>) larvae to produce sustainable livestock feed. A completely randomized design was employed using three substrates representing the principal waste fractions of mie ayam ceker: 100% noodle waste, 100% chicken feet waste, and a 50:50 mixture. Larval biomass, survival rate, Waste Reduction Index (WRI), crude protein, and lipid contents were analyzed to evaluate bioconversion efficiency and nutritional quality. Noodle waste produced the highest larval biomass, survival rate, and waste reduction efficiency, whereas chicken feet yielded larvae with the highest crude protein content. The mixed substrate achieved balanced growth performance and nutritional quality, demonstrating that complementary food waste fractions enhance both bioconversion efficiency and feed quality. These findings indicate that mie ayam ceker waste is a promising substrate for Black Soldier Fly cultivation. Integrating street-food waste with insect bioconversion provides an environmentally friendly strategy to reduce organic waste, improve resource efficiency, and produce high-quality alternative protein for sustainable livestock feed.</p> |
| <b>KEYWORDS</b>    | <i>Black Soldier Fly; Hermetia illucens; food waste valorization; sustainable livestock feed; circular agriculture; alternative protein</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>AUTHORS</b>     | Inaya Sari Melati; Nana Kariada Tri Martuti; Imam Mukhlis                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>AFFILIATION</b> | Universitas Negeri Semarang                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

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| TITLE       | <b>MODIFICATION OF INDUCTION MEDIUM AND EXPLANT TYPE TO INCREASE SOMATIC EMBRYO PRODUCTION OF CASSAVA GARUDA CLONE</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| ABSTRACT    | Cassava ( <i>Manihot esculenta</i> Crantz) is an important food crop in Indonesia, with Lampung as the largest producing province and the Garuda clone as the most widely cultivated local clone. This study aimed to determine the effect of explant type and induction medium composition on somatic embryo production of cassava Garuda clone. A Completely Randomized Design was arranged factorially (2 x 5) with four replications, using explant type (shoot leaf and internode) as the first factor and five induction media containing MS supplemented with NAA, Picloram, and 2,4-D combinations as the second factor. Results showed that explant type significantly affected callus emergence time, fresh callus weight, and embryo formation. Shoot leaf explants were heavier (1.835 g vs 0.940 g) and were the only explant capable of forming somatic embryos (4.58% embryogenic callus); internode failed on all media. Picloram 8 mg/l + NAA 6 mg/l gave the highest callus weight and embryogenic callus percentage (11.11%). The interaction between factors was not significant. Shoot leaf explants on this medium are recommended as an initial protocol supporting genetic transformation of local Lampung cassava. |
| KEYWORDS    | <i>cassava, Garuda clone, somatic embryogenesis, explant type, auxin</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| AUTHORS     | Dhanita Aprilianti; fitri fitri.yelli79@gmail.com; Agus Karyanto                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| AFFILIATION | Universitas Lampung                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

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| TITLE       | <b>Genotypic and soil type effects on seed yield, calyx yield and bioactive compounds of Roselle (<i>Hibiscus sabdariffa</i> L.)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| ABSTRACT    | This study evaluated the effects of soil type, genotype, and their interaction on seed yield, calyx yield, and rutin, quercetin, kaempferol, and apigenin contents in roselle. Four genotypes (G1–G4) and four soil types (loamy, S1; sandy, S2; clayey, S3; mixed, S4) were evaluated in a factorial experiment using a Randomized Complete Block Design with three replications. G4 recorded the highest seed yield (2.376 g plant <sup>-1</sup> ), rutin (518.58 mg kg <sup>-1</sup> ), kaempferol (324.19 mg kg <sup>-1</sup> ), and apigenin (796.43 mg kg <sup>-1</sup> ), whereas G2 produced the highest calyx yield (1.8092 g plant <sup>-1</sup> ) and quercetin (5.3358 mg kg <sup>-1</sup> ). S1 produced the highest seed yield (2.514 g plant <sup>-1</sup> ), S3 the highest calyx yield (1.9367 g plant <sup>-1</sup> ) and rutin (509.98 mg kg <sup>-1</sup> ), and S2 the highest quercetin (5.7133 mg kg <sup>-1</sup> ) and kaempferol (323.54 mg kg <sup>-1</sup> ). Genotype × soil interactions were significant. G3 × S1 produced the highest seed yield (3.717 g plant <sup>-1</sup> ), G3 × S3 the highest calyx yield (2.1833 g plant <sup>-1</sup> ), G4 × S1 the highest rutin (526.20 mg kg <sup>-1</sup> ) and apigenin (835.40 mg kg <sup>-1</sup> ), G2 × S2 the highest quercetin (7.4900 mg kg <sup>-1</sup> ), and G4 × S2 the highest kaempferol (345.03 mg kg <sup>-1</sup> ). Overall, genotype selection should be matched with soil conditions and target traits. |
| KEYWORDS    | <i>Roselle; genotypes; soil type; calyx yield; secondary metabolites</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| AUTHORS     | G. T. J. Al-Mafarji; Abdulmueen Hamad; M. A. M. Al-Mafarji                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| AFFILIATION | University of Kirkuk                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

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| <b>TITLE</b>       | <b>Effects of Seed Coat Removal and Soaking Duration on Germination and Early Seedling Growth of Cocoa (<i>Theobroma cacao</i> L.)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>ABSTRACT</b>    | Seed quality determines cocoa seedling success during germination and early vegetative growth. This study evaluated effects of soaking duration, seed coat removal, and their interaction on the quality of <i>Theobroma cacao</i> L. (Sulawesi 01) seedlings. A 2 × 5 factorial completely randomised design was employed, with two seed-coat treatments (removed vs. intact) and five soaking durations (0, 12, 24, 36, 48 hours), with two replications across 20 experimental units using 1,000 total seeds. Data for germination percentage, germination time, seedling emergence percentage, seedling height, and leaf number were analysed using ANOVA and DMRT at $\alpha = 0.05$ . Seed coat removal significantly influenced germination percentage and very significantly affected germination time and emergence. Removed coats yielded 94.80% germination (vs. 85.60%), a germination time of 7.75 days (vs. 9.09 days), and 12.07% emergence (vs. 8.45%). Soaking duration alone significantly affected seedling height, whereas the two-factor interaction significantly affected leaf number, with the maximum recorded value of 4.35 leaves observed under the combination of coat removal plus a 12-hour soak. These results indicate that treatment responses are highly parameter-specific and vary across developmental stages; however, seed coat removal consistently gives more reliable improvements in early germination performance compared with soaking duration alone. |
| <b>KEYWORDS</b>    | <i>cocoa seeds; seed coat removal; germination; seed vigor</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>AUTHORS</b>     | Simon Raharjo; Johan Riry; Edizon Jambormias <sup>1</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>AFFILIATION</b> | Universitas Pattimura                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

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| <b>TITLE</b>       | <b>IoT-Based Ammonia and Moisture Monitoring with Automated Sprinkler for Pre-Harvest Poultry Fly Control</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>ABSTRACT</b>    | <p>Poorly managed poultry manure in the Philippines serves as a critical breeding ground for house flies (<i>Musca domestica</i>), leading to pathogenic transmission and community health grievances. This study developed and evaluated an IoT-based Ammonia and Moisture Monitoring System with Automated Sprinkler to proactively mitigate fly-breeding conditions during the pre-harvest finishing stage. Using an experimental-developmental design, a modular prototype was tested at a commercial poultry site in Sariaya, Quezon, Philippines. The system integrated an Arduino Uno R4 Wi-Fi with MQ-135 ammonia sensors and capacitive moisture sensors for real-time monitoring. An automated threshold logic dispensed an eco-friendly Diatomaceous Earth (DE) solution when ammonia levels reached <math>\geq 20</math> ppm. Baseline data recorded on March 24, 2026, showed ammonia <math>\sim 30</math> ppm, moisture 80%, and fly activity index of <math>\sim 50</math>–<math>60</math>. After two weeks (March 25 – April 3, 2026), ammonia levels were reduced to 3–8 ppm, moisture to 21–30%, and relative fly abundance decreased by <math>\sim 70\%</math> (post-treatment count: 14–18 flies). The Blynk IoT dashboard enabled continuous visualization and biosecurity. Automated regulation of manure microclimates effectively disrupts the ecological substrates required for fly proliferation. This low-cost system (11.68% of commercial costs) offers a scalable blueprint for sustainable, precision waste management in small-to-medium-scale poultry operations.</p> |
| <b>KEYWORDS</b>    | <i>IoT, Poultry Waste Management, Musca domestica, Ammonia Monitoring, Precision Agriculture, Diatomaceous Earth</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>AUTHORS</b>     | Emelix Cortez; Renz Lemuel Silang; Jaycee Hennesy A. Perreras; Kieffer Andrei R. Guiang; Lorenzo Nova; Ronaldo Maaño; Hannah Shamira Santonil; Dhon Nino Canela                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>AFFILIATION</b> | Manuel S Enverga University Foundation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

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| <b>TITLE</b>       | <b>Design of a Web-Based Deep Learning for Image-Based Disease Detection in Rice Variety RC 18 “ALA”</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>ABSTRACT</b>    | <p>Rice is one of the most important staple crops in the Philippines, yet production is continually threatened by sheath blight, tungro, rice blast, and bacterial leaf blight, which significantly reduce crop yield and quality. Traditional manual field inspection for disease diagnosis is time-consuming, subjective, and dependent on expert knowledge, hindering early intervention. To address this limitation, this study developed a web-based rice disease detection system for the RC18 (“ALA”) variety using image processing and YOLOv11 deep learning model. The system enables users to capture or upload images of rice leaf via smartphone, providing real-time disease identification and treatment recommendations. A comprehensive annotated dataset was compiled through field surveys in Lucena City, Philippines and used to train the model on the Roboflow. The model classified four common diseases and demonstrated strong detection performance, achieving precision score of 0.835 (tungro), 0.823 (rice blast), 0.709 (sheath blight), and 0.702 (bacterial blight), with corresponding F1-scores of 0.777, 0.684, 0.663, and 0.678. The results performed well, achieving high accuracy scores in functionality (4.75) and effectiveness (4.64). Overall, the findings indicate that the proposed system provides an accurate, accessible, and practical solution for early rice disease detection, supporting timely disease management and improved agricultural productivity.</p> |
| <b>KEYWORDS</b>    | <i>Artificial intelligence, rice blast, sheath blight, tungro, bacterial leaf blight, deep learning, YOLOv11</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>AUTHORS</b>     | Emalex Cortez; John Dominic B. Dualin; Rayson D. Remolona; Grant Lester B. Norbe; Ronaldo Maaño; Hannah Shamira Santonil; Dhon Nino Canela                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>AFFILIATION</b> | Manuel S Enverga University Foundation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

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| TITLE       | <b>Potato Chips Industry Waste (Starch) and <i>Saccharomyces boulardii</i>: Effects on Egg Quality, Serum Biochemistry, and Jejunal Histomorphometry in Laying Hens</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| ABSTRACT    | To investigate the potential of potato chips industry waste (starch) in late-phase laying hen diets, this study evaluated its effects, alone or in combination with <i>Saccharomyces boulardii</i> , on egg quality, serum biochemistry, and jejunal histomorphometry. A total of 160 Lohmann White hens, 57 weeks of age, were assigned to eight dietary treatments in a completely randomized design, with five replicates of four hens each, and studied over four 28-day periods. Diets contained 0, 5, 10, or 15% potato starch without <i>S. boulardii</i> (T1–T4) or with <i>S. boulardii</i> supplementation (T5–T8). Most major egg-quality traits were not significantly affected, whereas egg shape index differed significantly among treatments in several periods and in the overall mean. Serum glucose, cholesterol, total protein, ALT, and AST were not significantly affected, while triglyceride concentrations differed among treatments, with T4 and T8 showing some of the lowest values. Jejunal villus height, crypt depth, and VH:CD ratio were significantly affected by diet. T4 and T8 showed the greatest villus heights, while T4, T6, and T8 had the highest VH:CD ratios. Overall, the treatments produced selective intestinal and metabolic responses rather than broad changes in egg quality, and the response pattern was not consistently dose-dependent. |
| KEYWORDS    | <i>Potato starch, Saccharomyces boulardii, Laying hens, Egg quality</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| AUTHORS     | Dalal Ali Talib Al-Mafarji; Qana hussein ameen                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| AFFILIATION | University of Kirkuk                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

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| <b>TITLE</b>       | <b>Changing from conventional to aerobic irrigation systems and application of mycorrhiza biofertilizer improved black rice performance under different plant spacing</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>ABSTRACT</b>    | <p>Arbuscular Mycorrhizal Fungi are capable of improving growth and yield of their host plants. This study aimed to examine the effects of mycorrhiza biofertilizer application on growth and yield of black rice between conventional and aerobic irrigation systems (AIS) in two plant spacings. The experiment was conducted in an irrigated experimental farm belonging to University of Mataram, which was designed using Split-Split Plot design with three blocks and three treatment factors: rice cultivation techniques (T0: conventional, T1: AIS) as the main plots; mycorrhiza biofertilizer (without or with biofertilizer) as the subplots; and rice plant spacing (10 or 20 cm) as the sub-subplots. The results indicated that, among those treatment factors, mycorrhiza biofertilizer resulted in significant effects on almost all measurement variables, followed by plant spacing and cultivation techniques, in which AIS in general resulted in better performance of black rice compared to the conventional system. However, there were two-way and three-way interaction effects of the treatment factors especially on grain yield, which was highest (5.29 kg/plot) under AIS at 10 cm spacing and supplied with mycorrhiza biofertilizer and lowest (1.86 kg/plot) under conventional rice at 20 cm spacing without biofertilizer, which indicates improved performance of rice under AIS.</p> |
| <b>KEYWORDS</b>    | <i>black rice mycorrhiza biofertilizer aerobic irrigation systems conventional rice</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>AUTHORS</b>     | Wayan Wangiyana; I Gusti Putu Muliarta Aryana; Nihla Farida; Anjar Pranggawan Azhari                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>AFFILIATION</b> | Universitas Mataram                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

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| <b>ID</b>          | <b>58</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>TITLE</b>       | <b>Bioactive and In Vitro Antifungal Activity of Three Groups of <i>Melaleuca leucadendra</i> Linn. Accessions from Buru Regency, Maluku Province, Indonesia</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>ABSTRACT</b>    | <p>Morphological exploration of <i>Melaleuca leucadendra</i> Linn plants. in Buru Regency, Maluku Province has identified three accession groups: Group Ia, Group Ib, and Group II. To date, information regarding the bioactive compound composition and antifungal activity of these three accession groups remains unreported. This study aimed to determine the composition of bioactive compounds and the in vitro antifungal activity of these three <i>Melaleuca leucadendra</i> (Linn.) accession groups from Buru Regency. Bioactive compound composition was analyzed by GC-MS, and antifungal activity was evaluated in vitro against the pathogenic fungi <i>Fusarium</i> sp. and <i>Sclerotium</i> sp. GC-MS analysis of the essential oils revealed 12 components in Group Ia, 20 components in Group Ib, and 14 components in Group II. Eucalyptol was the major component across all three groups, present at the highest percentages (21.73%–49.38%), followed by <math>\alpha</math>-terpineol (6.54%–9.32%). The highest antifungal activity against <i>Fusarium</i> sp. across all accessions was observed at a 1% essential oil concentration; at this level, inhibition rates were 98.74% for Group Ia, 98.15% for Group Ib, and 98.81% for Group II. Inhibition of <i>Sclerotium</i> sp. was also greatest at the 1% concentration, with inhibition rates of 90.06% for Group Ia, 96.59% for Group Ib, and 96.59% for Group II.</p> |
| <b>KEYWORDS</b>    | <i>accession, antifungal, essential oil, GC-MS, in vitro</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>AUTHORS</b>     | Aldi Wiyantoro; Asri Subkhan Mahulette; Abdul Karim Kilkoda; Agusthinus Marthin Kalay; Abraham Talahaturuson                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>AFFILIATION</b> | Universitas Pattimura                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

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| <b>TITLE</b>       | <b>Design and Development of a Cacao Processing Machine for Sustainable Community-Based Production</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>ABSTRACT</b>    | <p>The conventional techniques of cacao processing after the harvest do not perform well enough, specifically in terms of drying, roasting and grinding. The conventional process of drying cacao can last from 5 to 10 days, while both roasting and grinding processes lack proper temperature control over roasting and consistency of the size of the particles. This project aims to present the design, construction and assessment of the new cacao processing machine that combines all the three functions of cacao collection. This machine includes the forced-desiccation chamber (35-45 degrees), chamber for roasting with the involvement of a thermocouple (120-140 degree Celsius) and grinding unit driven by motor with its power of 2.5 kilowatts. The structural components of the machine consist of mild steel frames along with food-grade stainless steel for surfaces. Basically, all the calculations show that the processing will require 127.5 kJ in certain conditions. Moreover, as it was calculated, the drying capacity of the machine equals 0.625 kg/h, while grinding equals 12 kg/h. The results of three tests show that as time passed, the results changed significantly: during the third test the machine was able to dry cacao and make the moisture level equal to 6%.</p> |
| <b>KEYWORDS</b>    | <i>Cacao, Cacao Processing Machine, Post-harvest Mechanization, Sustainable Agriculture</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>AUTHORS</b>     | Gervin Espinosa; Carl Michael N. Sante; Ronell Nathaniel U. Jordan; John Kenneth P. Inoc; Danielle Joseph Buban                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>AFFILIATION</b> | Manuel S Enverga University Foundation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

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| <b>TITLE</b>       | <b>Enhancing Operational Efficiency of Coconut Husk Removal and Shredding Machine through Design Modification</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>ABSTRACT</b>    | <p>There are many major problems with the coconut production in the Philippines and these obstacles noticed in Sitio Malbog, Tagkawayan, Quezon. The husking of coconut uses a lot of manual labor which is dangerous for farmers' health, pollutes the environment due to burning husks and makes it impossible to use a valuable resource which leads to unsustainable farming methods. These problems will be solved thanks to the development of the combined husker and coconut shredder machine that was invented and tested by the researchers. After performing all the mechanical calculations researchers were able to find the most important parameters of the machine including the speed of the shaft (547 rpm and 53 rpm respectively), the torque for shredding and de-husking (345 lb-in and 3567 lb-in respectively), and shear stresses (1757 psi and 9083 psi respectively). All the experience showed that the machine can husk 215 coconuts per hour and shred 160 kilograms, which is more than 72.22% higher than the production rate of the previous technology. The research resulted in the fact that the machine got mean weighted scores of 4.68 for the functionality, 4.76 for effectiveness and 4.6 for excess of costs which made people happy with the device.</p> |
| <b>KEYWORDS</b>    | <i>Coconut, Coconut De-husker, Coconut Shredder, Coconut Farming</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>AUTHORS</b>     | Gervin Espinosa; Benard Atienza; Rudje Gabrielle V. Cantara; Russel Kris Rosales; Philip Acabado; Anne Christine Maaño                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>AFFILIATION</b> | Manuel S Enverga University Foundation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

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| <b>ID</b>          | <b>94</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>TITLE</b>       | <b>Sukun (<i>Artocarpus altilis</i>) in Latuhalat Homegardens: an eco-cultural perspective on Malukan coastal agriculture</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>ABSTRACT</b>    | <p>Home gardens represent an integral agroecological system widely maintained across the Maluku archipelago. However, these traditional land-use practices are increasingly vulnerable to demographic pressures and population growth, resulting in the spatial constraint of home garden plots. This study examines the local ecological knowledge, perceptions, and management strategies of the Latuhalat community regarding sukun breadfruit (<i>Artocarpus altilis</i>), focusing on cultivation techniques, harvest processing and the social dynamics governing access between tree owners and non-owners. Additionally, it analyzes the community-level adaptation strategies to ongoing socio-environmental transformations, including perceived climate change impacts over the past decade. Findings demonstrate that although breadfruit does not serve as a primary income source, as a home-garden commodity, it supports sustainable agricultural systems by delivering integrated ecological, economic, and socio-cultural benefits. By analyzing the socio-ecological interactions between the Latuhalat community and breadfruit cultivation, this research contributes to the literature on Maluku coastal resource management, agroecology, and rural food sovereignty in island contexts.</p> |
| <b>KEYWORDS</b>    | <i>home garden, Artocarpus altilis, coastal resource management, sustainable agriculture</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>AUTHORS</b>     | hermien soselisa; Prapti Murwani; Simona Ch.H. Litaay                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>AFFILIATION</b> | Universitas Pattimura                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

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| <b>TITLE</b>       | <b>Assessment of Physiological Workload and Rest-Time Requirements among Tuna Handline Fishers Based on Cardiovascular Load</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>ABSTRACT</b>    | <p>Tuna handline fishing involves intensive manual work under dynamic marine conditions, potentially imposing substantial physiological demands on fishers. This study aimed to assess physiological workload using Cardiovascular Load (CVL), examine its distribution across age groups, and estimate rest-time requirements among tuna handline fishers. A quantitative observational study involved 100 male fishers. CVL was calculated from resting heart rate, working heart rate, and age-predicted maximum heart rate. Respondents were grouped into four age categories: 20–29, 30–39, 40–49, and ≥50 years. Energy expenditure was estimated from working heart rate using a quadratic regression equation, while rest-time requirements were calculated using an energy-balance approach. The mean CVL was <math>72.34 \pm 20.05\%</math>, with 78% of fishers showing CVL values <math>\geq 60\%</math>. Mean CVL increased across age groups from 37.70% to 61.56%, 83.19%, and 94.94%, respectively. Mean estimated energy expenditure was <math>8.89 \pm 1.82</math> kcal/min, while the estimated rest-time requirement averaged <math>29.24 \pm 10.04</math> minutes per 60-minute work period. These findings indicate substantial physiological workload and support age- and workload-sensitive work–rest scheduling for safer fishing operations.</p> |
| <b>KEYWORDS</b>    | <i>Cardiovascular Load; physiological workload; rest-time requirement; tuna handline fishers; occupational ergonomics.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>AUTHORS</b>     | Aminah Soleman; Agustinus Tupamahu; Haruna; Wilma Latuny                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>AFFILIATION</b> | Universitas Pattimura                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

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| <b>TITLE</b>       | <b>Land Suitability Evaluation for Nutmeg and Coconut Based on Geographic Information System in Wai Ela Watershed Central Maluku Regency</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>ABSTRACT</b>    | <p>This study aims to determine the relationship between characteristics and land suitability of Wai Ela Watershed, and to determine their suitability classes, sub classes and limiting factors for Nutmeg and Coconut plants. The method used was a survey with land unit approach. Seventy-two land units were resulted by overlaying topography, geology, soil and land use unit maps, and 15 representative sample areas were defined for field observation and data collection. The preparation and data management were carried out in GIS framework. The research results showed a relationship between characteristics and land suitability class, namely: solum depth (<math>r=-0.69</math>), soil texture (<math>r=+0.14</math>), base saturation and pH (<math>r=-0.43</math> and <math>r=-0.14</math>). The fairly suitable class (S2) covered an area of 13.88%, the marginally suitable class (S3) covered an area of 66.06%, and the unsuitable class (N) covered an area of 15.09% of the total area of the research location, and there was no land that was truly very suitable for both commodities at the research location. The limiting factors are water availability(wa), humidity(rh), oxygen availability(oa), rooting media (rc), nutrient retention (nr), erosion hazard (eh), flood hazard (fh) and land preparation (lp) for the development of nutmeg plants.</p> |
| <b>KEYWORDS</b>    | <i>land suitability, limiting factor, nutmeg, coconut, GIS, Wai Ela watershed</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>AUTHORS</b>     | Silwanus Matheus Talakua                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>AFFILIATION</b> | Universitas Pattimura                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

## CHAMBER 4 — SCIENTIFIC ABSTRACTS

### Renewable Energy, Advanced Materials, Carbon Capture, and Green Technology

14 abstracts marked PRESENTATION in this chamber. Provisional catalogue only; final speaker and room assignments require Secretariat confirmation.

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| <b>TITLE</b>       | <b>Utilization of Pineapple Leaf Fiber as a Sustainable Bio-Reinforcement Material to Enhance Split Tensile Strength of Soft Clay</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>ABSTRACT</b>    | Soft clay has poor engineering properties and is susceptible to cracking under tensile stress, necessitating stabilization methods to enhance its strength. Utilizing waste pineapple leaf fiber (PALF) as a bio-reinforcement material offers a low-carbon, circular economy solution to improve soil tensile strength while promoting sustainable agricultural waste management. This study investigates the effect of PALF inclusion on the split tensile strength of soft clay. The fibers were cut to 30–50 mm in length and randomly mixed into the soil. The fiber content was varied from 0.2% to 1.0% at 0.2% intervals. Specimens were compacted into cylindrical molds measuring 70 mm x 35 mm, cured for 28 days, and subsequently subjected to split tensile strength testing using an unconfined compression strength machine in accordance with ASTM C496. The results indicated that the soil's tensile strength increased significantly with the addition of fibers. The maximum tensile strength of 97.90 kPa was achieved at a fiber content of 0.6%, representing a sharp increase over the unreinforced clay, which was only 7.14 kPa (a 12.7-fold increase). In addition to enhancing strength, the application of these fibers effectively reduced lateral deformation. These findings demonstrate that PALF-reinforced soil is an eco-friendly material for sustainable infrastructure development. |
| <b>KEYWORDS</b>    | <i>Pineapple Leaf Fiber, Soft Clay, Split Tensile Strength</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>AUTHORS</b>     | Anita Widiarti; Divania Nurtopo; Zulfikri Nanda Putra Mangopa; Anita Rahmawati; Eko Riyanto                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>AFFILIATION</b> | Persyarikatan Muhammadiyah                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

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| <b>TITLE</b>       | <b>Soil Settlement Evaluation Based on CPTu and Oedometer Test Data with Consolidation Acceleration using Prefabricated Vertical Drains</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>ABSTRACT</b>    | <p>Soft soils with high compressibility can cause significant settlement and long consolidation times in construction projects. This study aims to compare soil settlement based on CPTu and oedometer data to evaluate the acceleration of consolidation time with PVD. Data were obtained from CPTu-01 down to a depth of 14.75 m, and oedometer samples from BH-03 at a depth of 6.50–7.00 m in the PIK 2 area, Indonesia. CPTu-based settlement was calculated using the constrained modulus approach, while oedometer-based settlement was calculated using Terzaghi's one-dimensional consolidation theory. The embankment load was 54 kPa with a height of 3 m. CPTu-based settlements ranged from 0.043–0.256 m, while oedometer results ranged from 0.224–0.934 m, a difference of 72.6–87.4%. For a 3.0 m embankment, the oedometer settlement of 0.934 m exceeded the CPTu result of 0.256 m. The time to reach 90% consolidation without PVD was 6,780.5 days, which was reduced to 2.5–3.5 days based on evaluating the acceleration of consolidation time with PVD, and to 140–195 days based on oedometer data for PVD spacing of 1.2–1.4 m. These results indicate that oedometer parameters provide more conservative settlement estimates, while PVDs effectively accelerate soft-soil consolidation.</p> |
| <b>KEYWORDS</b>    | <i>consolidation settlement; CPTu; oedometer; prefabricated vertical drain; soft soil</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>AUTHORS</b>     | Muhammad Fathur Rouf Hasan; Sthephani Agustina; Putera Agung Maha Agung; Aldo Wirastana Adinegara; Sutikno                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>AFFILIATION</b> | Universitas Brawijaya                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

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| <b>ID</b>          | <b>29</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>TITLE</b>       | <b>Sustainable stabilization of soft clay using coir fiber and rice husk ash waste: shear strength analysis</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>ABSTRACT</b>    | <p>Soft clay is a type of soil characterized by low shear strength and low bearing capacity. These characteristics can damage the structures built above it. To mitigate this issue, soil stabilization is required. Plant waste-based stabilization methods are currently being widely explored because they are biodegradable, eco-friendly, cost-effective, and readily available. This study aims to analyze the effects of adding 0.75% coir fiber and varying the content of rice husk ash (RHA) (0%, 2%, 4%, 6%, 8%, and 10%) on shear strength and its parameters, namely cohesion and internal friction angle. The shear strength was evaluated using the unconsolidated-undrained triaxial test in accordance with ASTM D2850-03, after a 28-day curing period. The research results show that adding coir fiber and RHA can increase the shear strength parameters of soft clay. Maximum cohesion reaches 312.20 kPa at 8% RHA content, while the maximum friction angle is 10.72° at 6% RHA content. Overall, the maximum shear strength was achieved with the addition of 0.75% coir fiber and 8% RHA (a 6-fold increase in the shear strength of soft clay). These results show that coir fiber and RHA have great potential as environmentally friendly materials for sustainable infrastructure, especially in soft soils.</p> |
| <b>KEYWORDS</b>    | <i>soft clay, coir fiber, rice husk ash, shear strength</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>AUTHORS</b>     | Anita Widiarti; Oktavia Nuri Wahyu Pratiwi; Prio Susilo Utomo; Anita Rahmawati; Hafidzul Azmi                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>AFFILIATION</b> | Persyarikatan Muhammadiyah                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

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| <b>ID</b>          | <b>33</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>TITLE</b>       | <b>Characterization of Natural Dye Extracts from the Seaweed <i>Dictyosphaeria versluysii</i> as Photosensitizers in Dye-Sensitized Solar Cell Applications.</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>ABSTRACT</b>    | <p>The purpose of this study is to evaluate the performance of a dye-sensitized solar cell (DSSC) that uses natural chlorophyll pigment from the seaweed <i>Dictyosphaeria versluysii</i>, obtained from the waters around Ambon Island, as a photosensitizer. The experimental method involved analyzing wavelength absorption, calculating the bandgap energy, and evaluating DSSC performance using a solar simulator. The results show that the chlorophyll pigment was identified in the 380–700 nm wavelength range, with a high peak absorbance at 449 nm. FTIR spectroscopy identified several important functional groups, including hydroxyl groups (O–H) at wavenumbers of 3430 cm<sup>-1</sup>, C–H stretching (alkanes) at 2938 cm<sup>-1</sup>, carbonyl C=O (esters) at 1705 cm<sup>-1</sup>, and C=C bonds (aromatics) at 1490 cm<sup>-1</sup>. The energy gap (HOMO/LUMO) was determined to be 1.2 eV and 2.2 eV. Meanwhile, the results of the performance evaluation of solar cells made from <i>Dictyosphaeria versluysii</i> ethanol extract yielded the following photovoltaic parameters: J<sub>sc</sub> of 0.167 mA/cm<sup>2</sup>, V<sub>oc</sub> of 0.12 V, a Fill Factor (FF) of 24.56%, and a conversion efficiency (η) of 0.36 × 10<sup>-2</sup> %. These findings indicate that the seaweed <i>Dictyosphaeria versluysii</i> has the potential to be developed as a photosensitizer in future DSSC technology</p> |
| <b>KEYWORDS</b>    | <i>Natural dye, Seaweed, Dictyosphaeria versluysii, Photosensitizers, DSSC</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>AUTHORS</b>     | Semuel Unwakoly; Noni Noviana, S.Pd.,M.Pd; Wisye Hehakaya, S.Pd.,M.Pd; Dr. Sherly Lewerissa, S.Pi.,M.P                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>AFFILIATION</b> | Universitas Pattimura                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

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| ID          | 35                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| TITLE       | <b>SYNTHESIS OF SILVER NANOPARTICLES (AgNPs) USING GANDARIA (<i>Bouea macrophylla</i> G.) STEM BARK AND ITS APPLICATION IN METHYLENE BLUE PHOTODEGRADATION.</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| ABSTRACT    | Silver nanoparticles (AgNPs) were synthesized using an aqueous extract of gandaria ( <i>Bouea macrophylla</i> G.) stem bark, which acted as a reducing agent for the $\text{AgNO}_3$ precursor, reducing $\text{Ag}^+$ to $\text{Ag}^0$ . AgNPs tend to undergo agglomeration, resulting in unstable particle-size distribution and absorption spectra. Therefore, 1% (w/v) polyvinyl alcohol (PVA) was added as a stabilizing agent. The formation of AgNPs was monitored through color changes and analyzed using UV-Vis spectrophotometry. The optimal $\text{AgNO}_3$ concentration for AgNP synthesis was 2.0 mM. The formation of AgNPs synthesized using the aqueous gandaria stem bark extract, both without and with PVA, occurred on the fifth day (D5). Particle characterization using a Particle Size Analyzer (PSA) showed particle sizes of 60.2 nm and 90.8 nm for AgNPs without and with PVA, respectively. The optimum photodegradation time for methylene blue using AgNPs without and with PVA was 2 h, achieving degradation percentages of 73.84% and 90.03%, respectively. The samples with the highest degradation percentages were further analyzed using liquid chromatography-mass spectrometry (LC-MS), which produced 17 peaks, with methylene blue identified at peak 11. |
| KEYWORDS    | <i>Silver nanoparticles, gandaria (<i>Bouea macrophylla</i> G.), methylene blue photodegradation.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| AUTHORS     | Catherina Bijang; Nelson Gaspersz; Refandi Rachmad                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| AFFILIATION | Universitas Pattimura                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

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| <b>ID</b>          | <b>43</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>TITLE</b>       | <b>Governance Gaps and Environmental Externalities in Indonesia's Free Nutritious Meal Program</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>ABSTRACT</b>    | <p>Food waste is a global crisis. The UNEP Food Waste Index Report 2024 estimates that 1.05 billion tonnes of food were wasted globally in 2022, nearly one-fifth of food available to consumers, contributing to greenhouse gas emissions and resource depletion amid persistent food insecurity. Indonesia's Free Nutritious Meal Program (Makan Bergizi Gratis/MBG) risks adding to this burden. Bappenas estimates that the program generates 1.1–1.4 million tonnes of food residue annually, including 451,000–603,000 tonnes of edible food discarded as waste. This qualitative study examines this risk through document analysis, field observation, and case phenomena from MBG implementation across Indonesia. Preliminary findings indicate that the risk has materialized at scale. By May 2026, the National Nutrition Agency (BGN) reported that 8,182 kitchen units (SPPG) had been suspended at least once, with 2,213 still suspended, largely due to inadequate wastewater treatment facilities (IPAL) and sanitation certification, while food-tray leftovers remain a recurring operational problem. These implementation failures constitute governance gaps that generate negative environmental externalities for communities surrounding SPPG kitchens. The study concludes that ESG provides a relevant framework for evaluating state-led food welfare programs and recommends accelerating IPAL infrastructure, strengthening sanitation oversight, and redesigning menus around beneficiary preferences to reduce food waste.</p> |
| <b>KEYWORDS</b>    | <i>ESG, Food Waste, Environmental Externality, Public Nutrition Program, MBG.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>AUTHORS</b>     | RIFKA NAFICHAH; Seifaa Azallea Efendi                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>AFFILIATION</b> | Universitas Diponegoro                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

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| <b>TITLE</b>       | <b>Development and Performance Evaluation of a Decentralized Biogas-Powered AC Generation System Utilizing Fish Waste</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>ABSTRACT</b>    | <p>This study evaluated the design and feasibility of a decentralized biogas-powered AC generation system utilizing fish waste at the ABC Fish Port Complex. Based on preliminary waste data, the port generates an average of 141.74 kg of fish waste daily. Batch testing of a 48-liter fish waste sample conducted over a 30-day monitoring period showed a three-day lag phase at 0 psi during microbial acclimatization, followed by a steady gas accumulation peaking at 0.42 psi on Day 18 before declining to 0.22 psi by Day 30. The fabricated prototype, consisting of a digester tank, gas holder, pressure booster pump, modified spark-ignition engine, and AC generator successfully generated an AC output voltage ranging from 200 V to 220 V. Baseline testing of the 3,500 W generator exhibited a no-load consumption rate of approximately 0.78m<sup>3</sup>/hr (13.03L/min) across a 9 watts parasitic load at 3,600 rpm. The prototype achieved an overall acceptance rating of 3.56 on a four-point scale among port workers, maintenance technicians, electrical practitioner, and vendors. The study concludes that fish-waste biogas generation is a viable decentralized energy solution for port facilities.</p> |
| <b>KEYWORDS</b>    | <i>Biogas, anaerobic digestion, fish waste, renewable energy</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>AUTHORS</b>     | HANNAH BALMES; Kurt Immanuel B. Morella; Rommel Y. Celmar; Adrian C. Aclan; MELISSA SERRANO; Darwin Arcelo; Mark Nel A. Inojosa                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>AFFILIATION</b> | Manuel S Enverga University Foundation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

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| <b>ID</b>          | <b>62</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>TITLE</b>       | <b>Design and Development of a Bioethanol Production System Utilizing Rice Straw for a Sustainable Approach to Agricultural Waste Management</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>ABSTRACT</b>    | <p>The research relates to the design, manufacture, and assessment of a bioethanol generation system from NSIC Rc222 rice straw. It's typically burned as waste, this creates air pollution and affects residents living in nearby areas. Rice straw could potentially be used for production of renewable energy. This research is devoted to halting this issue by coming up with a bioethanol generation system that could make use of rice straw waste. The prototype developed was fit for all stages of bioethanol production: cutting, enzymatic pretreatment, hydrolysis, fermentation, and distillation. After a number of improvements and optimization processes, the system was able to generate 250 mL of bioethanol with an ethanol concentration of about 75%. As a result of combustion, the product yielded a blue flame lasting for 8 seconds, which is considered favorable. Changing the ratio of cellulase enzyme and water in hydrolysis caused higher efficiency of hydrolysis, thus increasing the yield of ethanol. The total time for the production process was 76 hours, 24 minutes, and 40 seconds. The system has been shown to be successful in converting agricultural residues into a source of renewable energy. Its success demonstrates the feasibility of using rice straw for the production of bioethanol.</p> |
| <b>KEYWORDS</b>    | <i>NSIC Rc222, Rice Straw, Bioethanol, Cellulose, Sustainability</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>AUTHORS</b>     | Gervin Espinosa; Jhanna Lizbeth Hermedilla; Lawrence Jacob Obcemea; Johnre Roces; Danielle Joseph Buban                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>AFFILIATION</b> | Manuel S Enverga University Foundation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

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| TITLE       | <b>Lonthoir Natural Clay-Based Composite Phase Change Materials: Synthesis, Characterization, and Thermal Analysis</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| ABSTRACT    | <p>Phase change materials (PCMs) are gaining attention as thermal energy storage because they can store and release significant heat through phase changes. We developed a new composite PCM using Lonthoir natural clay (LAL) as the support matrix and a multi-component system of Glauber's salt, paraffin, stearic acid, and borax, with activated carbon to improve thermal stability. FTIR, XRD, SEM, and BET surface area measurements indicate that the PCM has been integrated into the clay matrix. DSC results indicate that adding LAL and activated carbon reduces latent heat and effective heat capacity during phase transition, suggesting that the clay structural framework confines the PCM and restricts its mobility while enhancing thermal stability and PCM immobilization. DTA/TGA/DTG analysis clearly distinguishes between pure PCM and LAL-based PCM composites. PCM-S10 reaches the highest peak degradation rate of 0.01241 mg/s at around 283.9 °C. In contrast, adding activated carbon to PCM-A10 cuts this rate approximately in half to 0.00612 mg/s. For LAL-based composites, the decrease is even more significant: around 79.5% for LLP-S10 and 90.3% for LLP-A10. These findings suggest that Lonthoir clay is a promising, locally available support material for composite PCMs, offering a foundation for further research into clay-based thermal energy storage materials.</p> |
| KEYWORDS    | <i>Lonthoir natural clay; phase change material; latent heat; thermal analysis.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| AUTHORS     | Serly Sekewael; Priska Marisa Pattiasina; Mimi Salmawati                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| AFFILIATION | Universitas Pattimura                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

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| <b>TITLE</b>       | <b>Ground Movement Caused by Coupled High Hydrostatic and Dynamic Pressures from Aquifer Layer</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>ABSTRACT</b>    | <p>Particularly, expansive residual soils have the potential to shrink and swell in response to changes in moisture content. In highway infrastructure, significant volume changes in expansive residual soils can lead to structural failure. The research aims to evaluate ground movement caused by coupled high hydrostatic and dynamic pressures in the aquifer layer. This study adopts an integrated hydrogeological and geotechnical approach to investigate ground movement induced by dynamic hydrostatic pressure within the aquifer system. Research results showed that a gradual increase in pore water pressure would exceed total stress, drastically reducing effective stress and creating an initial ground movement at the toe of the slope around the infrastructure area. A high dynamic of hydrostatic pressure from the aquifer due to an increase in water volume in the aquifer layer can push down soil layers with a safety factor (SF) &lt; 1.0. Increased groundwater pressure from an aquifer layer is a primary trigger of landslides. At the same time, ground movement would generate cracks &gt; 10 cm in width on the concrete road surface layer within two and/or three weeks, which would subsequently cause fatal damage, to the extent that the entire pavement system had to be removed.</p> |
| <b>KEYWORDS</b>    | <i>Expansive Soils, Highway Infrastructure, Hydrostatic and Dynamic Pressures, Ground Movement</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>AUTHORS</b>     | Muhammad Fathur Rouf Hasan; Putera Agung Maha Agung; Sony Pramusandi; Deny Yatmadi; Aldo Wirastana Adinegara; MUSTAFFA ANJANG AHMAD; ADNAN ZAINORABIDIN; Mohd Adib Mohammad Razi                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>AFFILIATION</b> | Universitas Brawijaya                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

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| <b>TITLE</b>       | <b>Smart-Lead Virtual Reality Simulation for Strengthening Prospective School Principals' Managerial Competence in Facilities and Infrastructure Management</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>ABSTRACT</b>    | <p>This study aims to synthesize empirical evidence regarding the use of Virtual Reality (VR) in developing the managerial competencies of prospective school principals and to formulate a conceptual framework for immersive simulation-based training. The method employed is a Systematic Literature Review (SLR) guided by PRISMA 2020 guidelines, analyzing 49 Scopus-indexed articles from 2016–2025 selected based on predefined inclusion and exclusion criteria. The synthesis identified four main themes: VR as an immersive learning environment, school leadership simulation, managerial competency, and management of educational facilities and infrastructure. The findings indicate that VR demonstrates potential to enhance experiential learning through authentic simulations that support decision-making, problem-solving, and professional competency development. However, the integration of these four themes remains limited in prior research. As a contribution, this study proposes a Smart-Lead Virtual Reality (Smart-Lead VR) conceptual framework as a basis for developing more authentic, contextual, and adaptive training for prospective school principals. Although inherently conceptual and confined to Scopus-indexed articles, this study provides direction for future research to develop and validate the effectiveness of Smart-Lead VR in the context of educational leadership.</p> |
| <b>KEYWORDS</b>    | <i>virtual reality; managerial competence; educational leadership; facilities and infrastructure management</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>AUTHORS</b>     | Hasan Argadinata; Novika Adi Wibowo; Ibrahim Bafadal; Ahmad Nurabadi; Marwah Athifah; Elyya Putri Fia Nurmaya; Amirul Fahmie Abdul Razak                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>AFFILIATION</b> | Universitas Negeri Malang                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

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| <b>TITLE</b>       | <b>The Impact of Coconut Fiber on the Compressive Strength of Concrete and Mortar with Various Curing Methods</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>ABSTRACT</b>    | This study aims to use coconut fiber as a waste-reduction method by adding 2% to concrete and mortar mixes. Its effect on compressive strength was tested using four curing methods: soaking, gunny covering, spraying, and room temperature for 28 days. Results showed that the soaking method produced the greatest increase in compressive strength, with coconut fiber concrete reaching 22.62 MPa, compared to the room-temperature curing method, which reached only 9.88 MPa. For mortar, the soaking method produced the highest average density: 2404.83 kg/m <sup>3</sup> for normal mortar, 2304.77 kg/m <sup>3</sup> for mortar with 25 mm-long coconut fiber, and 2144.12 kg/m <sup>3</sup> for mortar with 50 mm-long coconut fiber. Although the compressive strength has not reached the optimum level, this finding can help future research to determine the optimum percentage and proper processing of coconut fiber. The use of coconut fiber in concrete and mortar shows potential as an economical and environmentally friendly solution. |
| <b>KEYWORDS</b>    | <i>Concrete, Coconut Fibre, Compressive Strength</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>AUTHORS</b>     | Ahmad Zaki; M Iqbal Asshidiqi; Muhammad Falih Ardi; Khairil Mahbubi                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>AFFILIATION</b> | Persyarikatan Muhammadiyah                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

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| <b>ID</b>          | <b>107</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>TITLE</b>       | <b>Effect of Coconut Fiber on the Flexural Strength of Corroded Reinforced Concrete at Different Corrosion Levels</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>ABSTRACT</b>    | This study investigates the effect of coconut fiber on the flexural strength of reinforced concrete under varying corrosion levels, while promoting the utilization of coconut fiber waste as a sustainable construction material. Ten concrete specimens measuring 100 × 100 × 150 mm were prepared by incorporating coconut fiber at 2% of the cement weight. After 28 days of curing, corrosion was accelerated using the galvanostatic method to achieve reinforcement corrosion levels of 0%, 3%, 7%, and 11%. The specimens were subsequently tested to evaluate their flexural strength. The results showed that concrete containing 2% coconut fiber, with a corrosion level of 7%, achieved the highest flexural strength of 2.61 MPa. This performance was associated with the relatively high concrete density at this corrosion level, reaching 2370 kg/m <sup>3</sup> . The findings indicate that the flexural response of coconut fiber-reinforced concrete varies with the degree of corrosion in the reinforcement and that a 7% corrosion level yields the highest flexural strength among the investigated conditions. The incorporation of coconut fiber also demonstrates its potential as a sustainable alternative for concrete while contributing to the utilization of agricultural waste. |
| <b>KEYWORDS</b>    | <i>concrete, coconut fiber, corrosion, flexural strength</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>AUTHORS</b>     | Ahmad Zaki                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>AFFILIATION</b> | Persyarikatan Muhammadiyah                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

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| <b>TITLE</b>       | <b>Multi-Level Governance and Policy Coherence to Waste-to-Energy: Critical Review</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>ABSTRACT</b>    | <p>Abstract. As countries push toward circular economy models and more sustainable waste management, waste-to-energy (WtE) systems have gained traction as a way to cut landfill reliance while producing renewable power. Yet most WtE research still centers on technical performance and environmental outcomes. The governance and policy side of implementation has received comparatively little scrutiny. This paper offers a critical review of the literature on multi-level governance and policy coherence in WtE, with the goal of mapping where the gaps lie and where research should head next. What emerges from the review is that governance structures and policy instruments tend to be studied separately, which obscures how national, regional, and local levels actually interact and often clash in practice. Policy frameworks, moreover, are frequently fragmented and inconsistent, undermining coordination among stakeholders and dragging down overall system efficiency. This review argues for a socio-technical lens that brings governance analysis together with systems-based approaches, better capturing how policy, institutional actors, and technology are entangled with one another. The result is a conceptual groundwork for future work aimed at building governance frameworks coherent enough to make WtE systems more effective and scalable, particularly in developing country context.</p> |
| <b>KEYWORDS</b>    | <i>waste-to-energy, circular economy, multi-level governance, policy coherence, sustainable waste management</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
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| <b>AFFILIATION</b> | Universitas Diponegoro                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

## CHAMBER 5 — SCIENTIFIC ABSTRACTS

### Sustainable Supply Chains, Circular Economy, Blue Economy Policy, and Natural Resource Governance

25 abstracts marked PRESENTATION in this chamber. Provisional catalogue only; final speaker and room assignments require Secretariat confirmation.

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| <b>TITLE</b>       | <b>THE ROLE OF REGIONAL LEGISLATURES IN SUPPORTING SUSTAINABLE DEVELOPMENT BASED ON ARCHIPELAGIC NATURAL RESOURCES</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>ABSTRACT</b>    | Buru Regency, an archipelagic district in Maluku Province, holds substantial natural resource wealth gold deposits, 120,000 hectares of cajuput plantations, and a plantation sector yet this potential remains poorly translated into sustainable outcomes, evident in the unresolved illegal gold mining (PETI) crisis at Gunung Botak since 2009. This study critically examines how the Buru Regency Regional People's Representative Council (DPRD) exercises its legislative, budgetary, and oversight functions supporting archipelagic resource-based sustainable development. Data were drawn from DPRD meeting minutes (Joint Committee Working Meeting on Gunung Botak Mine Management, 25 June 2026; Plenary Session on the 2026 Legislation Program, 2 June 2026), DPRD Decision No. 05/2026, and interviews with council members and the Head of the Minutes and Session Division, analyzed via a qualitative case study. Findings show the DPRD has activated all three functions only 5 of 16 drafted regulations address natural resource issues, a cross-agency committee was convened, and accountability was demanded over mining-derived revenue yet its role remains largely facilitative, constrained by authority asymmetry with provincial and central governments, thin legislative capacity, low participation, and unresolved customary land rights. The study contributes to collaborative governance theory and offers recommendations for strengthening legislative agency in Eastern Indonesia's archipelagic regions. |
| <b>KEYWORDS</b>    | <i>regional legislature; sustainable development; natural resources; archipelago; mining governance</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>AUTHORS</b>     | Jamaludin Samak; MEI DAYANTY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>AFFILIATION</b> | Universitas Pattimura                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

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| <b>TITLE</b>       | <b>A New Paradigm for Sustainable Cities? Solving the Problem of Slums Through Urban Genome Analysis</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>ABSTRACT</b>    | <p>Slum settlements remain a major challenge for developing countries. Various efforts have been made to address slum settlements. However, the number of slums continues to grow. One of the reasons this problem remains unresolved is because policymakers focus solely on population growth. Therefore, this study attempts to analyze the impact of the Urban Genome, which equates cities with Deoxyribonucleic Acid, to support sustainable, resilient, and inclusive urban environments, directly addressing the pressing challenges facing cities worldwide. This study utilizes a socio-legal study method that integrates opinions from the Surakarta and Tabanan City Governments, Bali, and communities living in slums, as well as secondary data in the field of urban law. The research findings show that an urban genome analysis of slum settlements in Surakarta and Tabanan, Bali, which have similar planning issues related to population density, biome (humans, climate, terrain, and geology), land use, and services such as energy, transportation, water, waste management, the environment, and communication, as well as social services such as health, safety, education, government, housing, and employment, is necessary. Rather than carrying out redevelopment piecemeal, as policymakers currently do, this study recommends integrating redevelopment into the Urban Genome mechanism.</p> |
| <b>KEYWORDS</b>    | <i>Urban Genome; Sustainability; Developing Countries; Urban Areas; Slums.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>AUTHORS</b>     | Lego Karjoko; I Gusti Ayu Ketut Rachmi Handayani; Elizabeth Ayu Puspita Adi; Dararida Fandra Mahira; Nabila Rahma Safitri                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>AFFILIATION</b> | Universitas Sebelas Maret                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

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| <b>TITLE</b>       | <b>From Participation to Policy Integration: Indigenous Women's Ecological Knowledge and Collaborative Environmental Governance in Kampung Naga, Indonesia</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>ABSTRACT</b>    | <p>This study examines the role of Indigenous women in Kampung Naga, West Java, in building socio ecological resilience through every day, collective, and sustained environmental practices. Using a qualitative case study approach with in depth interviews using purposive sampling techniques involving 10 informants from Kampung Naga, Governments, and Academics, the research draws on three theoretical frameworks: Feminist Political Ecology, to understand the relationship between gender, knowledge, and power in natural resource management; Socio Ecological Resilience, to explain the adaptive mechanisms behind local practices; and Collaborative Governance, to analyze the institutional changes needed in environmental policy. Findings show that women's daily activities such as safeguarding the hutan larangan (forbidden forest) and preserving traditional food storage systems constitute a form of situated ecological knowledge historically excluded from formal environmental governance. These practices are not merely domestic routines but active, intergenerational strategies that sustain ecological balance while reinforcing social cohesion. Despite their significance, this knowledge remains largely unrecognized in local environmental policy, positioning women as participants rather than co authors of governance decisions. This study argues for a shift from participatory involvement toward substantive policy integration, wherein local governments formally acknowledge and incorporate Indigenous women's ecological knowledge into environmental governance frameworks.</p> |
| <b>KEYWORDS</b>    | <i>Indigenous Women, Ecological Knowledge, Environmental Governance, Policy Integration, Kampung Naga</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>AUTHORS</b>     | Fitriyani Yuliawati                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>AFFILIATION</b> | Universitas Siliwangi                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

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| <b>TITLE</b>       | <b>Maluku's Circular Economy Perspective: An Archipelago-Based MSME's Competitiveness Framework</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>ABSTRACT</b>    | <p>The transition from a linear economy to a circular economy is essential for improving the operational efficiency and long-term competitiveness of Micro, Small, and Medium Enterprises (MSMEs), particularly in the archipelagic context of Maluku. This study examines the role of Managerial Capacity, Coordination and Collaboration, and Regulation in supporting MSME Circular Economy Sustainability Practices in Ambon City. Managerial capacity, including sustainable leadership, financial and business planning, promotion, and problem-solving skills, serves as an internal driver of green innovation and waste valorization. Meanwhile, coordination and collaboration strengthen knowledge sharing, supply chain networks, and waste minimization, while government regulation provides strategic support through facilitation, regulation, and environmentally friendly business licensing. The findings indicate that Managerial Capacity, Coordination and Collaboration, and Regulation jointly explain 51.4% of the variance in MSME Circular Economy Sustainability Practices, while 48.6% is explained by factors outside the research model. These findings demonstrate that the successful implementation of circular economy practices depends on the synergy between internal managerial readiness and an enabling external ecosystem. Strengthening these three dimensions can therefore accelerate sustainable MSME transformation and support the development of a circular economy suited to the characteristics of archipelagic regions.</p> |
| <b>KEYWORDS</b>    | <i>Circular Economy, MSMEs, Sustainability Practices, Managerial Capacity, Coordination and Collaboration, Regulation</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>AUTHORS</b>     | Aisah Asnawi; Faras Ayunani                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>AFFILIATION</b> | Universitas Pattimura                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

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| <b>TITLE</b>       | <b>STRENGTHENING CHARACTER EDUCATION THROUGH A HEUTAGOGICAL APPROACH: INTEGRATION OF PROJECT-BASED LEARNING, PROBLEM-BASED LEARNING, AND LOCAL WISDOM: A SYSTEMATIC REVIEW</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>ABSTRACT</b>    | <p>Strengthening character education has become a fundamental priority in twenty-first-century education in response to the rapid advancement of technology, the changing characteristics of learners, and the increasing demand for student-centered learning. The heutagogical approach is considered a promising framework for fostering character development through self-determined learning and can be effectively integrated with Project-Based Learning (PjBL), Problem-Based Learning (PBL), and local wisdom. This study aims to systematically analyze previous research concerning the integration of these four approaches in strengthening character education in elementary schools. This study employed a Systematic Literature Review (SLR) following the PRISMA 2020 guidelines. The collected studies were analyzed using a thematic synthesis approach to identify implementation patterns, research trends, educational contributions, and conceptual relationships among the four approaches. The findings reveal that the heutagogical approach significantly promotes learners' autonomy and self-determined learning, while Project-Based Learning and Problem-Based Learning effectively foster creativity, critical thinking, collaboration, communication, and responsibility. Furthermore, integrating local wisdom facilitates the internalization of cultural and moral values, resulting in more contextual, meaningful, and culturally responsive learning experiences. Overall, the synthesis demonstrates that integrating heutagogy, Project-Based Learning, Problem-Based Learning, and local wisdom provides a comprehensive strategy for strengthening character education while addressing the competencies required for twenty-first-century learning.</p> |
| <b>KEYWORDS</b>    | <i>Heutagogy; Character Education; Project-Based Learning; Problem-Based Learning; Local Wisdom; Elementary School.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>AUTHORS</b>     | Nining Andriani; Nining Andriani                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>AFFILIATION</b> | Universitas Samawa                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

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| <b>TITLE</b>       | <b>System dynamics modelling of population and infrastructure drivers for sustainable C&amp;D waste management in archipelagic region</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>ABSTRACT</b>    | <p>Construction and demolition waste (C&amp;D waste) management in archipelagic regions is strongly influenced by demographic and infrastructure development dynamics. Population growth increases infrastructure demand, stimulates construction activities, and may subsequently intensify pressure on C&amp;D waste management systems. This study develops a system dynamics model to examine the relationships among population growth, gross domestic product (GDP), infrastructure demand, construction projects, and construction business activities as upstream drivers of sustainable C&amp;D waste management. The model was developed using Vensim software and simulated using historical data from the previous ten years to examine the dynamic behaviour of population and infrastructure development over time. The results indicate a gradual increase in population, which contributes to increasing infrastructure demand and influences construction activity. These interactions demonstrate the importance of demographic and infrastructure dynamics in anticipating future C&amp;D waste generation and management requirements. The model provides a systemic basis for integrating long-term development trends into sustainable C&amp;D waste management planning in geographically fragmented archipelagic regions.</p> |
| <b>KEYWORDS</b>    | <i>System Dynamics, C&amp;D waste management, Sustainable C&amp;D waste, Archipelagic Regions</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>AUTHORS</b>     | Meidy Kempa; Felix Taihuttu; Mansye Ronal Ayal; Sammy. G.M. Amaheka                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>AFFILIATION</b> | Universitas Pattimura                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

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| <b>TITLE</b>       | <b>Liveability, Resiliency and Sustainability in Transmigration Settlements: A Qualitative Study in the Petata Transmigration Area</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>ABSTRACT</b>    | <p>This study evaluates the liveability, resiliency and sustainability of the newest transmigration placement (2022 batch) within the Petata area, Penukal Abab Lematang Ilir (PALI) Regency, South Sumatra region transitioning to accelerate economic growth post-autonomy from Muara Enim Regency. Grounded in integrated regional planning frameworks, this qualitative research draws on a 4-month field study (August–November) involving 35 key informants from local government agencies, community leaders, and transmigrant households, analyzed via thematic analysis. The findings reveal a critical misalignment between spatial planning and ecological conditions. The settlement was developed on natural drainage basins and uncleaned peatlands, triggering severe seasonal flooding and chronic crop failures. Consequently, a forced livelihood shift occurred, compelling transmigrants to abandon food-crop farming and work as off-farm daily laborers in private oil palm plantations. Furthermore, basic liveability is severely compromised by acute infrastructure deficits: unpalatable acidic groundwater (low pH), rusted rainwater harvesting systems, absence of grid electricity (forcing battery reliance), and poor road accessibility. This paper highlights how top-down site selection reinforces spatial injustice and marginalizes transmigrant communities. Urgent policy interventions specifically drainage redesign, clean water infrastructure, power grid extension, and site-suitability re-evaluation are imperative to prevent total settlement abandonment</p> |
| <b>KEYWORDS</b>    | <i>Sustainability, Liveability, Resiliency, Rural Governance, Transmigration Area</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>AUTHORS</b>     | Nabil El Fikri; R. Slamet Santoso                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>AFFILIATION</b> | Universitas Diponegoro                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

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| <b>TITLE</b>       | <b>Rural Leadership Paradox for Sustainable Community and Business Resilience A Multiple Case Study of Tourism Villages in Java</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>ABSTRACT</b>    | <p>Community-Based Tourism (CBT) across Java relies fundamentally on local leadership capabilities to balance commercial profitability with ecological and social preservation. Drawing upon a qualitative comparative case study of 15 tourism villages in Central Java, this study examines the structural leadership paradox between Laissez-Faire and Democratic leadership styles in driving Sustainable Community Resilience (SCR). Utilizing in-depth interviews with key institutional stakeholders including Tourism Awareness Groups (Pokdarwis), local community leaders, and Village-Owned Enterprises (BUMDes) the empirical findings reveal a distinct trade-off. Laissez-Faire leadership accelerates short-term economic gains and grants operational flexibility to local actors; however, it severely compromises long-term environmental sustainability, induces resource conflicts, and degrades institutional stability due to missing strategic governance constraints. Conversely, Democratic leadership fosters ecological conservation, social cohesion, and structured policy alignment, yet it frequently induces institutional inertia and limits grassroots entrepreneurial innovation due to passive community engagement. To bridge this divide, this paper introduces the Guided-Participatory Leadership framework a hybrid governance mechanism combining top-down sustainability boundaries with bottom-up operational autonomy. This study provides crucial empirical insights for public administrators and rural development practitioners, illustrating how hybrid leadership configurations can simultaneously fortify socio-ecological endurance and business viability in rural tourism destinations.</p> |
| <b>KEYWORDS</b>    | <i>Rural leadership paradox, Community-Based Tourism (CBT), Sustainable community resilience, Tourism villages</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>AUTHORS</b>     | Sofi Koidatul Maqfiroh; Kismartini Kismartini                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>AFFILIATION</b> | Universitas Diponegoro                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

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| <b>TITLE</b>       | <b>From Resources to Agency: Women's Empowerment Pathways in Delta Kapuas Project's Community Carbon Governance</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>ABSTRACT</b>    | <p>Community carbon initiatives are expected to link forest protection with new livelihood opportunities, yet providing training, capital, or organizational membership does not necessarily enable women to make and act on strategic choices. This study examines how women in different roles within the Delta Kapuas Project convert project-based and pre-existing resources into agency and valued achievements. The research is designed as a qualitative case study combining project design and monitoring documents with interviews involving women in village institutions, patrol and facilitation teams, government agencies, and beneficiaries. Interview data is coded in ATLAS.ti and compared across roles using Kabeer's resources–agency–achievements framework. Documentary analysis indicates that women receive different combinations of training, organizational access, and formal positions, while available records provide limited evidence about decision-making influence, control over programmes, and achievements defined by women themselves. The interviews therefore trace critical decisions, negotiations, and institutional constraints. The study treats empowerment as a contingent conversion process: resources can support valued achievements when women can exercise individual or collective agency within household and institutional power relations. By identifying the conditions under which this conversion occurs or fails, the case seeks to generate transferable lessons for other gender-responsive community carbon and livelihood programmes.</p> |
| <b>KEYWORDS</b>    | <i>women's empowerment, community carbon, agency, social forestry, gender-responsive governance</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>AUTHORS</b>     | Seifaa Azallea Efendi; Paksi Lalang Sambegana; Ignatius De Loyola Wisagni Bagas Wisesa                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>AFFILIATION</b> | Universitas Diponegoro                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

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| TITLE       | <b>Building Climate-Resilient and Sustainable Coffee Supply Chains in Celebes, Indonesia: A Two-Stage Stochastic Programming and Mean-CVaR Approach</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| ABSTRACT    | <p>Climate variability and market uncertainty challenge the resilience and sustainability of agricultural supply chains. This study develops a risk-aware optimization framework for climate-resilient coffee supply chains in Sulawesi, Indonesia. Annual data from six provinces during 2011–2024, including Arabica and Robusta production, coffee prices, ENSO, and the Indian Ocean Dipole (IOD), are represented as 14 equiprobable stochastic scenarios. A two-stage stochastic programming model integrated with Mean-CVaR is developed to determine supply commitments and scenario-dependent allocation decisions under uncertainty. Five risk-aversion levels (<math>\lambda = 0, 0.25, 0.50, 0.75, \text{ and } 1.00</math>) are evaluated at a 95% CVaR confidence level. Results reveal substantial spatial and varietal heterogeneity. South Sulawesi contributes approximately 68.43% of total production, while West Sulawesi provides an important diversification function. El Niño reduces aggregate Robusta production by approximately 4.1% but increases Arabica production by approximately 5.3%, resulting in limited change in total production. At <math>\lambda = 0.75</math>, expected profit decreases by approximately 3.16%, while CVaR loss declines by approximately 99.06% relative to the risk-neutral solution. These findings demonstrate that integrating climate-risk management, geographic and varietal diversification, and risk-aware optimization can strengthen the resilience and sustainability of coffee supply chains in climate-sensitive agricultural regions.</p> |
| KEYWORDS    | <i>agricultural risk management, climate uncertainty, geographic diversification, resilient sourcing, sustainable development</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| AUTHORS     | Muhammad Imam Ma'ruf; Agatha W.Widati; Djuliaty Dampa; Umi Yuminarti; Himaya Praptani Adys; Azwar Akhmad                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| AFFILIATION | Universitas Negeri Makassar                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

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| <b>TITLE</b>       | <b>Mapping Eco-Anxiety among Indonesian University Students: A Rasch-Based Validation Study of the Hogg Eco-Anxiety Scale</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>ABSTRACT</b>    | <p>The climate and environmental crisis has intensified concerns about eco-anxiety among university students. However, culturally appropriate assessment instruments remain limited in Indonesia. This study adapted the Hogg Eco-Anxiety Scale (HEAS-13) into Indonesian and evaluated its psychometric properties using Rasch analysis. Adaptation followed Beaton's framework: forward translation, synthesis, back-translation, expert review, and pretesting. Participants were 612 students from 12 universities across six Indonesian provinces. The Rasch Rating Scale Model assessed category functioning, fit, reliability, separation, dimensionality, local independence, targeting, and gender-related differential item functioning. All 13 items demonstrated acceptable fit, with mean-square values ranging from 0.72 to 1.38. Item reliability was 0.99 (separation = 8.21), person reliability was 0.88 (separation = 2.66), and Cronbach's alpha was 0.89. The Rasch dimension explained 46.7% of raw variance, and the first residual contrast eigenvalue was 1.86, supporting essential unidimensionality. Five response categories displayed ordered thresholds. The person mean of -0.74 logits indicated relatively low endorsement compared with item locations. No substantial gender-related item bias was identified. These findings support the instrument's reliability and structural validity for eco-anxiety research and mental health and counselling initiatives in Indonesian higher education. Further investigation is needed to establish cross-cultural equivalence.</p> |
| <b>KEYWORDS</b>    | <i>eco-anxiety; Hogg Eco-Anxiety Scale; university students; mental health; cross-cultural adaptation; Rasch measurement.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>AUTHORS</b>     | Santy Andrianie; Elwas Berdha Krismona; Arifah Wulandari; Cynthia Permata Sari; Khairul Bariyyah; Restu Dwi Ariyanto; Laily Tiarani Soejanto                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>AFFILIATION</b> | Universitas Sebelas Maret                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

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| <b>TITLE</b>       | <b>Public Participation in Community Based Waste Management Through the Waste Bank Program in Supporting the Circular Economy</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>ABSTRACT</b>    | <p>Community-based waste management through the Waste Bank program is a strategic solution in addressing environmental issues. This study aims to analyze the influence of Perception of Waste Management (PPS), Perception of Waste Banks (PBS), Knowledge and Understanding of Waste Banks (PPBS), and Supporting and Inhibiting Factors (PPH) on Community Participation (PM) as well as Community Impact and Expectations (DHM). Using Partial Least Squares Structural Equation Modeling (PLS-SEM) on a sample of 57 respondents, the results show that Knowledge and Understanding of Waste Banks (PPBS) as well as Perception of Waste Banks (PBS) have a positive and direct significant effect on Community Participation (PM). Conversely, Perception of Waste Management (PPS) and Supporting/Inhibiting Factors (PPH) do not significantly affect PM. Furthermore, Community Participation does not significantly affect DHM and does not significantly mediate the relationships between variables. Descriptively, although general public perception of waste management is very high (98.2%), actual participation (89.5%) and technical understanding of waste banks (87.7%) remain in the low category.</p> |
| <b>KEYWORDS</b>    | <i>Circular economy, public participation, waste bank, waste management</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>AUTHORS</b>     | Hasrianti Hasrianti; Nurhasanah; Lina Warlina; Feti Fatimatuzzahroh; Vita Elysia                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>AFFILIATION</b> | Universitas Terbuka                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

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| TITLE       | <b>“Women in Sustainable Marine Supply Chains: Papalele Networks, Circular Economy, and Blue Economy Governance in Saparua Island.”</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| ABSTRACT    | <p>Women play a crucial yet often overlooked role in sustaining small-scale fisheries and marine supply chains in island communities. This study examines the role of papalele, inter-island trade, and household livelihoods within the broader context of circular economy practices and blue economy governance. The study employed a qualitative approach based on in-depth interviews with six informants involved in fish trading and fishing-household activities. The findings show that papalele are not merely fish retailers, but key actors who organize the circulation of fish from landing sites to local and inter-island markets. They purchase fish from fishers and other traders, negotiate prices, monitor market conditions, process and smoke fish, use cold storage, and redirect products to alternative markets when local supply is abundant. Women also rely on jibu-jibu networks, rotating savings groups, kinship, religious associations, and reciprocal inter-island relationships as sources of working capital, market information, and social protection. More importantly, the findings demonstrate that sustainable blue economy governance in small-island regions cannot focus solely on fisheries production. It must also recognize women’s agency, informal institutions, inter-island market networks, and community-based resource governance as essential elements of sustainable marine supply chains.</p> |
| KEYWORDS    | <i>women; papalele; sustainable marine supply chains; circular economy; blue economy governance; small-scale fisheries; Saparua Island</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| AUTHORS     | Prapti Murwani; Hermien Lola Soselisa; Simona Ch.H. Litaay                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| AFFILIATION | Universitas Pattimura                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

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| <b>TITLE</b>       | <b>From Policy Adoption to Circular Transformation: Institutional Capacity and Community Engagement in Depok City's Waste Governance</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>ABSTRACT</b>    | <p>The transition toward a circular economy requires more than the adoption of progressive environmental policies; it depends on the institutional capacity and societal engagement necessary to translate policy commitments into transformative practices. This study examines the gap between policy adoption and circular transformation in urban waste governance in Depok City, Indonesia, with particular attention to institutional capacity and community engagement. Using a qualitative descriptive approach, the study analyzes secondary data from local government policy document, waste management reports, the National Waste Management Information System (SIPSN), and relevant institutional and community based initiatives. The findings reveal that Depok City has developed an increasingly comprehensive policy framework, particularly through Regional Regulation No.7 of 2025 on Waste Management, which promotes waste Management which promotes waste reduction, reuse, recycling, community participation, and collaborative governance. These findings indicate a persistent implementation gap between institutional arrangement, community participation, and measurable circular economy outcomes. The study contributes to the circular economy governance literature by highlighting the importance of moving beyond policy adoption toward institutional transformation and meaningful community engagement as prerequisites for sustainable urban waste governance.</p> |
| <b>KEYWORDS</b>    | <i>Circular Economy Governance, Institutional Capacity, Community Engagement, Policy Implementation, Urban Waste Governance.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>AUTHORS</b>     | Medina Lutfiani; Ida Hayu Dwimawanti                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>AFFILIATION</b> | Universitas Diponegoro                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

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| <b>TITLE</b>       | <b>Creating Circular Economy Regulatory Sandbox for Renewable Energy Communities to Shape a Sustainable Energy Future</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>ABSTRACT</b>    | <p>Although some Indonesian villages have successfully implemented innovations in waste management, most communities still view waste treatment primarily as a means to preserve the environment and foster community innovation rather than as a valuable component of the circular economy, particularly in renewable energy. This is also the case in Sanan Village in Malang, where the community successfully manages soybean skins and cooking water for direct use by cattle farmers as feed. This feed is then further processed into biogas. However, the community still primarily views this initiative through the lens of environmental sustainability and community innovation. The community's main obstacle in managing a renewable energy-based circular economy is fear of criminal penalties, which causes hesitation. This is evident in Sanan Village, where the biogas management process does not involve the community. Therefore, a flexible sandbox policy is needed, though it must be subject to oversight. This socio-legal study examines the results of integrating community and government perspectives. The findings indicate the need to emphasize that community innovations do not warrant criminal sanctions and that the community should have easier access to facilities. The study recommends establishing a sandbox-based policy to help lawmakers understand community conditions before amending or formulating policies.</p> |
| <b>KEYWORDS</b>    | <i>Circular Economy; Community Innovation; Regulatory Sandbox; Renewable Energy Community; Waste Management</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>AUTHORS</b>     | Dararida Fandra Mahira; Lego Karjoko; I Gusti Ayu Ketut Rachmi Handayani                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>AFFILIATION</b> | Universitas Sebelas Maret                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

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| <b>TITLE</b>       | <b>Digital Environmental Communication and Coastal Community Resilience: A Community Collective Action Model for Supporting Blue Economy Participation in Semarang, Indonesia</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>ABSTRACT</b>    | Coastal communities face increasing sustainability challenges due to climate-related hazards, environmental degradation, and socio-economic vulnerability. In Semarang, Indonesia, tidal flooding, land subsidence, and coastal erosion create not only physical risks but also communication challenges related to public perception, trust, and community resilience. This study examines how digital environmental communication contributes to strengthening coastal community resilience through collective action and participation in the blue economy. Using qualitative content analysis, the study analyzes environmental communication practices on Instagram from selected coastal and environmental community accounts in Semarang during January 2025–June 2026. The analysis focuses on communication themes, media formats, audience engagement, public sentiment, and new social movement characteristics. Findings show that environmental education and social campaigns are the dominant communication themes, while visual formats, particularly photographs, videos, and carousels, are widely used to communicate environmental issues and mobilize public attention. Public sentiment reveals a dynamic relationship between environmental solidarity and climate anxiety, reflecting collective support alongside concerns about ecological degradation and livelihood threats. The findings emphasize that social media functions not only as an information channel but also as a governance space for building trust, collective identity, community networks, and sustained participation. |
| <b>KEYWORDS</b>    | <i>Digital Environmental Communication; Coastal Community Resilience; Blue Economy</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>AUTHORS</b>     | Yofiendi Indah Indainanto; Rizki Halim; Nila Rofita Ayudiya; Citra Safira fisip                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>AFFILIATION</b> | Universitas Diponegoro                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

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| <b>TITLE</b>       | <b>How Coastal Environmental Issues Gain Attention: A Model of Local Government Instagram Communication Strategy in Central Java</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>ABSTRACT</b>    | <p>This study employs Social Movement Theory to explain how government digital communication shapes public awareness and narrates environmental crisis issues. Coastal degradation—including abrasion, marine pollution, and mangrove decline—requires effective public communication to gain visibility and become a shared concern. This research examines how local governments in Central Java perceive coastal environmental crises and narrate these issues through official Instagram accounts. Using content analysis, the study examines posts from ten Instagram accounts managed by local government institutions and related stakeholders that actively publish coastal environmental content, relying solely on post content without direct environmental observation. The analysis focuses on message themes, communication strategies, narrative framing, and audience engagement. Findings show that content combining visual documentation with narratives of direct community impact generates the highest engagement, particularly on marine pollution and abrasion. Government narratives vary from informative, policy-oriented framing to more participatory approaches inviting public involvement, though they tend to emphasize achievement over urgency, suggesting a need for stronger crisis framing. Strategic Instagram use by local governments thus functions not merely as passive information dissemination but as a catalyst shaping how coastal environmental issues are understood and prioritized by the public.</p> |
| <b>KEYWORDS</b>    | <i>Content Analysis; Coastal Environmental Issues; Government Communication; Instagram; Social Movement Theory</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>AUTHORS</b>     | Rizki Halim                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>AFFILIATION</b> | Universitas Diponegoro                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

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| <b>TITLE</b>       | <b>Digital Twins for Supply Chain Resilience: A Bibliometric and Thematic Analysis of Research Trends, Knowledge Structure, and Future Research Directions</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>ABSTRACT</b>    | Digital twin technology is increasingly used to enhance supply chain resilience through monitoring, simulation, disruption analysis, and decision support. This study analyzes research trends, knowledge structure, and future directions in digital twins for supply chain resilience based on 368 Scopus-indexed publications from 2018 to 2025. Bibliometrix/Biblioshiny and VOSviewer were used to analyze publication trends, collaboration patterns, keyword relationships, thematic mapping, co-citation, and bibliographic coupling. The results show a significant increase in publications since 2023 and strong connections among supply chain resilience, disruption, ripple effects, digital twins, artificial intelligence, predictive analytics, Industry 4.0, and sustainability. Research has increasingly shifted from reactive resilience toward simulation-enabled, predictive, and adaptive approaches. The analysis also highlights opportunities for applying digital twins to food and fisheries supply chains, particularly in island and archipelagic regions and data-scarce environments. |
| <b>KEYWORDS</b>    | <i>digital twin; supply chain resilience; bibliometric analysis; science mapping; predictive resilience; adaptive resilience</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>AUTHORS</b>     | Wilma Latuny                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>AFFILIATION</b> | Universitas Pattimura                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

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| <b>TITLE</b>       | <b>Estimating Risk Mitigation Costs in the Tuna Loin Agro-Industrial Supply Chain Using Monte Carlo Simulation</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>ABSTRACT</b>    | The tuna loin agro-industrial supply chain faces high uncertainty due to product perishability, dependence on raw material supply, export quality requirements, and operational and logistical risks. This study estimates risk mitigation costs in the tuna loin agro-industrial supply chain in Maluku Province using Monte Carlo simulation. The study employs a descriptive quantitative approach involving supply chain mapping, identification of risk events and risk agents, mitigation strategy identification, risk event cost (REC), preventive action cost (PAC), Monte Carlo simulation, and benefit-cost ratio (BCR) analysis. The results identify nine priority mitigation strategies with minimum and maximum total PAC of IDR 8,977,637,888 and IDR 11,194,857,888, respectively. Based on 544 simulation iterations, the estimated risk mitigation cost at a 95% probability level is IDR 10,547,000,000. The BCR value of 1.59 indicates that each IDR 1 spent on mitigation has the potential to avoid IDR 1.59 in losses. These results provide information to support risk mitigation cost estimation and budget planning in the tuna loin supply chain. |
| <b>KEYWORDS</b>    | <i>Tuna Loin; Supply Chain Risk Mitigation; Monte Carlo Simulation</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>AUTHORS</b>     | Wilma Latuny                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>AFFILIATION</b> | Universitas Pattimura                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

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| <b>TITLE</b>       | <b>Integrating Lake Tempe Socio-Ecological Issues into Biology Learning to Strengthen Senior High School Students' Sustainability Literacy and Environmental Decision-Making</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>ABSTRACT</b>    | <p>problems experienced by students in their local environments. This study investigates the effects of integrating Lake Tempe socio-ecological issues into biology learning on senior high school students' sustainability literacy and environmental decision-making. A quasi-experimental pretest–posttest non-equivalent control group design involved 240 students from three senior high schools in South Sulawesi, Indonesia, comprising 115 students in the experimental group and 125 in the control group. The experimental group received biology instruction incorporating authentic Lake Tempe issues, including aquatic ecosystem degradation, pollution, macrophyte proliferation, biodiversity decline, fisheries practices, and community adaptation. The control group received regular instruction covering comparable curricular content. Sustainability literacy was assessed through ecological knowledge, systems thinking, and solution-oriented reasoning, while environmental decision-making was evaluated through evidence use, multiple-perspective consideration, consequence evaluation, and action justification. Data were analysed using analysis of covariance by controlling for pretest scores and school differences, accompanied by effect-size estimation. The study examines whether place-responsive biology learning can strengthen students' sustainability understanding and capacity to formulate evidence-informed environmental decisions, thereby supporting their participation in sustainable natural resource governance.</p> |
| <b>KEYWORDS</b>    | <i>biology education; environmental decision-making; Lake Tempe; socio-ecological issues; sustainability literacy</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>AUTHORS</b>     | Muhammad Nasir; Sumarni                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>AFFILIATION</b> | Universitas Puangrimaggalatung                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

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| <b>TITLE</b>       | <b>From Environmental Guilt to Routine Reproduction: Why Circular Intentions Do Not Displace Disposable Convenience</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>ABSTRACT</b>    | <p>Circular-economy research often explains consumer participation through an attitude–behaviour gap. This paper develops a processual account of circular consumption inertia by examining how consumers accommodate conflicts between environmental values and disposable convenience. Drawing on interviews concerning single-use large-format water containers in Indonesia, the study shows that disposable consumption is embedded in retail availability, hygiene expectations, mobility, household storage, and waste-removal arrangements, whereas circular systems require additional consumption work. When purchases generate guilt, consumers undertake three forms of moral repair: discursive repair frames consumption as necessary or exceptional; material repair extends container use through repurposing; and delegative repair transfers responsibility to landlords, waste workers, collectors, or recycling channels. Although these practices may deliver material benefits, they can also produce emotional closure without changing subsequent purchasing. Guilt consequently becomes incorporated into the disposable routine rather than necessarily disrupting it. Negative cases indicate that guilt is more likely to generate routine rupture when consumers can access a repeatable refill system. The paper contributes by reframing the attitude–behaviour gap as value–routine accommodation, distinguishing material circulation from routine transformation, and conceptualising convenience as an infrastructural achievement. Circular participation becomes durable when infrastructures reduce consumption work and convert moral concern into a credible, low-friction alternative.</p> |
| <b>KEYWORDS</b>    | <i>circular economy; circular consumption; behavioural inertia; consumption work; environmental guilt; moral repair</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>AUTHORS</b>     | Nurist Ulfa                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>AFFILIATION</b> | Universitas Diponegoro                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

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| <b>TITLE</b>       | <b>THE EFFECTIVENESS OF THE IMPLEMENTATION OF CSR FUNDS&amp; THEIR IMPACT ON THE SUSTAINABILITY OF BUSINESSES IN VILLAGES SUPPORTED BY UNPATTY</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>ABSTRACT</b>    | <p>This study aims to analyze the effectiveness of Corporate Social Responsibility (CSR) funding implementation and its impact on the sustainability of community-based businesses in the villages under the guidance of Pattimura University, with Ouw Village serving as the research site. The study employs a quantitative approach using descriptive and inferential analysis methods. The sample was selected through purposive sampling of business operators and groups benefiting from PT Astra International's CSR program. Data were collected through questionnaires, interviews, observations, and program documentation. The results indicate that the implementation of the Astra Prosperous Village Program (DSA) in Ouw achieved a CSR Effectiveness Index of 93 out of 100, falling into the "highly effective" category. The program generated impacts including increased community income, expanded beneficiary reach, enhanced production capacity, and increased employment. The CSR approach has also evolved from a model of aid toward empowerment through production assistance, product quality improvement, provision of equipment, and market development. Nevertheless, the program's sustainability still requires strengthening in the areas of long-term impact monitoring, business group institutional capacity, and digital marketing.</p> |
| <b>KEYWORDS</b>    | <i>Corporate Social Responsibility, effectiveness, business sustainability, community empowerment, Ouw Village</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>AUTHORS</b>     | stenly ferdinandus                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>AFFILIATION</b> | Universitas Pattimura                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

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| <b>TITLE</b>       | <b>Sustainable Supply Chain Practices and MSME Performance: Their Contribution to Regional Economic Self-Reliance</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>ABSTRACT</b>    | <p>Micro, Small, and Medium Enterprises (MSMEs) play a vital role in strengthening local economic development and creating jobs, particularly in developing regions. However, MSMEs often face challenges related to supply chain efficiency, access to raw materials, production sustainability, market access, and resource constraints. Sustainable supply chain practices offer MSMEs the opportunity to improve operational performance while contributing to broader regional economic development. This study aims to examine the role of sustainable supply chain practices in enhancing MSME performance and their contribution to regional economic self-reliance, particularly in Pamekasan Regency, Indonesia. This study employs a systematic literature review to identify, examine, evaluate, and interpret a phenomenon. The research process is based on five steps: selection, review, and quality assessment of the literature reviewed. The results indicate that MSME performance can be measured by productivity, product quality, market access, and competitiveness, while regional economic self-reliance is reflected in the utilization of local resources, increased income, job creation, local value added, and reduced dependence on external economic resources. The findings of this study are also expected to enhance local economic resilience within a sustainable supply chain.</p> |
| <b>KEYWORDS</b>    | <i>Keywords: Competitiveness, SMEs, Sustainable Supply Chain Practices, Regional Economic Self-Reliance.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>AUTHORS</b>     | Yufita Listiana; Bondan Satriawan                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>AFFILIATION</b> | Universitas Trunojoyo Madura                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

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| <b>TITLE</b>       | <b>BEYOND BROMO AND SEMERU: A NETNOGRAPHIC STUDY OF NGADAS VILLAGE AS A CULTURAL LANDSCAPE</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>ABSTRACT</b>    | <p>Ngadas Village, located in East Java, is home to the Tengger community and forms an integral part of the cultural landscape of Bromo Tengger Semeru National Park (TNBTS). Increasing tourism creates opportunities for local development while raising concerns about cultural and environmental sustainability. However, tourism evaluation in TNBTS tends to emphasise natural attractions, particularly volcanic landscapes, while the cultural and social dimensions of Ngadas Village remain underexplored. This study examines visitors' positive and negative sentiments toward Ngadas Village using a netnographic approach to analyse tourism-related expressions and experiences shared in digital spaces. The findings indicate that positive sentiments predominate, reflecting visitors' appreciation of the village's attractions, cultural characteristics, and tourism experiences. Nevertheless, negative sentiments also emerge, highlighting aspects of destination management that require further attention. These findings demonstrate that visitor-generated digital content can provide valuable insights into tourism experiences and reveal management issues that may not be captured through conventional evaluation. The study broadens the understanding of TNBTS tourism by positioning Ngadas Village as an integral component of the Tengger cultural landscape. Integrating digital sentiment analysis into tourism management can support responsive, inclusive, and sustainable destination management while strengthening the links between environmental conservation, cultural sustainability, and visitor experience.</p> |
| <b>KEYWORDS</b>    | <i>environmental science, negative sentiment, resource governance, tourism, volcanoscape.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>AUTHORS</b>     | Rizki Alfian; Soemarno; Gatot Ciptadi; Bambang Hendroyono                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
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| <b>TITLE</b>       | <b>Local Wisdom as a Foundation for Sustainable Batik: Linking Cultural Heritage, Competitiveness of Batik MSMEs and Environmental Sustainability Indonesia</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>ABSTRACT</b>    | <p>Batik represents an important component of Indonesia's creative economy, contributing not only to local economic development but also to the preservation of cultural heritage. However, the development of batik micro, small, and medium enterprises (MSMEs) faces challenges related to market competitiveness, resource efficiency, production waste, and environmental sustainability. In this context, local wisdom can serve as an important foundation for integrating cultural heritage with sustainable business practices. This study aims to examine the role of local wisdom in strengthening the competitiveness of batik MSMEs while supporting environmental sustainability in Pamekasan, Indonesia. The study focuses on how traditional knowledge, cultural values, local skills, traditional motifs, and community-based practices can be integrated into production and business processes. This research used a systematic literature review to identify, study, evaluate, and interpret a phenomenon. Practically, the findings may provide insights for policymakers and local stakeholders in designing policies that simultaneously preserve batik cultural heritage, strengthen MSME competitiveness, promote environmentally responsible production, and support sustainable regional economic development.</p> |
| <b>KEYWORDS</b>    | <i>local wisdom; batik MSMEs; cultural heritage; competitiveness; environmental sustainability</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
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## 2nd ICESAS 2026

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### **Conference Day**

Wednesday, 28 October 2026 | The Natsepa Hotel & Resort, Ambon | Hybrid  
Conference | WIT (UTC+09:00)

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