



# TREPSEA

## INTERNATIONAL CONFERENCE

# 2021

trepsea.org

Organized By :



University  
Of  
Lampung



Research  
Institute For  
Humanity  
And Nature



The  
Bandung  
Institute of  
Technology



University  
Of  
Gorontalo

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Future Earth



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Ikatan Ahli  
Geologi  
Indonesia



Perhimpunan  
Ekonomi Pertanian  
Indonesia (PERHEPI)

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## **About TREPSEA International Conferences**

### **Our Purpose**

The purpose of International Conference of the Transdisciplinary Research on Environmental Problems in Southeast Asia (TREPSEA) is to conduct integrative research of interactions between natural environment and human-social systems to solve the environmental problems in Southeast Asia. Its scope thus includes topics of geoscience, environmental science, engineering, medicine, economy, culture, education, and administration, etc.

Transdisciplinary Research is defined as research efforts conducted by researchers from different disciplines and non-academic stakeholders and integrate and move beyond discipline-specific approaches to address a wicked problem in society. Related stakeholders include sponsoring institutions, governments, development organizations, business and industries, civil society (inhabitant, NGO's etc.), and the media.

We are expanding the area to environmental problems and current contributions to have more growth for international conference on the matter of environmental problems. We believe that you are definitely interested for joining it.

### **Our Vision**

To become a unique and leading international conference on transdisciplinary research studies in varieties of environmental problems of Asia's countries especially ASEAN countries.

### **Our Mission**

To share, discuss and exchange knowledge, experience and outcome of transdisciplinary research on environmental problems with various stakeholders.

### **Website URL**

For more information about TREPSEA events, please visit [www.trepsea.org](http://www.trepsea.org).

### **TREPSEA Committee**

TREPSEA Committee is composed with the following committees: General Committee, Scientific Committee, and Local Committee. Prof. Masayuki Sakakibara is a chairperson of General Committee. Host university's rector or vice-rector or president can be selected as Vice Chairperson of General Committee of the relevant TREPSEA International Conference.

### **Past and Present TREPSEA Conferences**

TREPSEA Conferences were held every two years since 2014. Past TREPSEA International Conferences are TREPSEA 2014, TREPSEA 2016, TREPSEA 2018, and upcoming TREPSEA 2021.

*Note\* TREPSEA 2020 was postponed due to the ongoing crisis of COVID pandemic and it will be held as TREPSEA 2021.*

### **TREPSEA 2014**

Our very first, the 1<sup>st</sup> TREPSEA 2014 International Conference was held on September 4-5, 2014 at Swiss Belinn Hotel, Makassar, Indonesia. 50 abstracts had been received for both oral and poster presentations. It was organized by Hasanuddin University as a host along with Ehime University of Japan, Institute of Technology Bandung (ITB), and State University of Gorontalo (UNG). The conference was supported by Nexco West (West Nippon Expressway Company), Jriss (Japan Research Institute for Social Systems Co., Ltd.) and OMRON (Omron Social Solutions Co., Ltd.)



TREPSEA 2014 Conference at Swiss Belinn Hotel, Makassar, Indonesia.

## **TREPSEA 2016**

The 2<sup>nd</sup> TREPSEA 2016 was held on September 20-22, 2016 at Papandayan Hotel, Bandung, West Java, Indonesia, which was organized by Ehime University of Japan, Institute of Technology Bandung (ITB), and State University of Gorontalo (UNG). The conference was sponsored by Pemerintah Kota Bandung, MedcoEnergi, and LAPI ITB.



TREPSEA2016



TREPSEA 2016

## TREPSEA 2018

The 3<sup>rd</sup> TREPSEA 2018 was held on August 11-12, 2018 at Hotel TC Damhil, State University of Gorontalo, Gorontalo, Sulawesi, Indonesia. Over 200 participants: scientists, researchers, students, and stakeholders from Indonesia, Japan, South Africa, Myanmar, and Vietnam attended TREPSEA 2018 Conference. One hundred and twenty seventh (127) abstracts for both oral and poster presentations was presented at TREPSEA 2018.



TREPSEA 2018 at Hotel TC Damhil





TREPSEA 2018 at Hotel TC Damhil



TREPSEA 2018 at Hotel TC Damhil



TREPSEA 2018 at Hotel TC Damhil

### TREPSEA 2018's Featured Topics

The TREPSEA conferences featured oral and poster presentations and workshop, and participants present, share and discuss their experience on the following 4 main topics:

1	Disaster Mitigation:	<ul style="list-style-type: none"> <li>○ Volcanic Eruption</li> <li>○ Flood</li> <li>○ Earthquake</li> <li>○ Tsunami</li> <li>○ Landslide</li> <li>○ Groundwater</li> </ul>
2	Sustainable Development and Environmental Preservation:	<ul style="list-style-type: none"> <li>○ Heavy Metal Problem</li> <li>○ Conversion of Waste to Energy</li> <li>○ Renewable Energy</li> </ul>
3	Measure and Improvement to Urban Environmental Problem:	<ul style="list-style-type: none"> <li>○ Urban Management and Community Development</li> <li>○ Urban Transportation Planning</li> <li>○ Traffic Control and Surveillance System</li> <li>○ Garbage Problem</li> <li>○ Waste Water Problem</li> </ul>
4	Food and Human Security:	<ul style="list-style-type: none"> <li>○ Food</li> <li>○ Security problems</li> </ul>

## TREPSEA 2021

The theme of 4th International Conference of TREPSEA will address important themes of “Managing Ecological Risks and Natural Disasters in Southeast Asia: Challenges for Food Security, Public Health, and Economic Welfare”. The conference will serve as an arena for stimulating academic exercise and policy dialogues on trans-disciplinary dimensions of environmental problems in Southeast Asia, primarily on the themes of managing ecological risk, disaster mitigation, environmental conservation, food and nutritional security, social and economic welfare, and other related issues in sustainable development in general. The 4th International Conference of TREPSEA will be held as an online conference on September 16-18 of 2021.

### Objectives

The objectives of the 4th International Conference of TREPSEA will address important themes of “Managing Ecological Risks and Natural Disasters in Southeast Asia: Challenges for Food Security, Public Health, and Economic Welfare” are as follows:

1. to stimulate academic exercise and policy dialogues on academic exercise and policy dialogues on trans-disciplinary dimensions of environmental problems in Southeast Asia;
2. to encourage trans-disciplinary research dimensions on of environmental problems, primarily on the themes of managing ecological risk, disaster mitigation, environmental conservation, food and nutritional security, and
3. to update some research progress and new knowledge on managing ecological risk, disaster mitigation, environmental conservation, food and nutritional security, and other related issues in sustainable development in general.

### Topics of TREPSEA 2021

***“Managing Ecological Risks and Natural Disasters in Southeast Asia: Challenges for Food Security, Public Health, and Economic Welfare”*** as the main theme of the conference and sub-themes are as follows:

1. Environmental Issues and Public Health
2. Ecological Risks and Food Security
3. Disaster Risks Reduction (DRR) and Disaster Management (DM)
4. Sustainable Agriculture and Equitable Development
5. Resources Management and Global Value Chain
6. Legal Issues and Business Ethics in Resource Management
7. Heavy Metal Problems and Renewable Energy
8. Urban Management and Community Development
9. Sustainable Development Goals (SDGs)

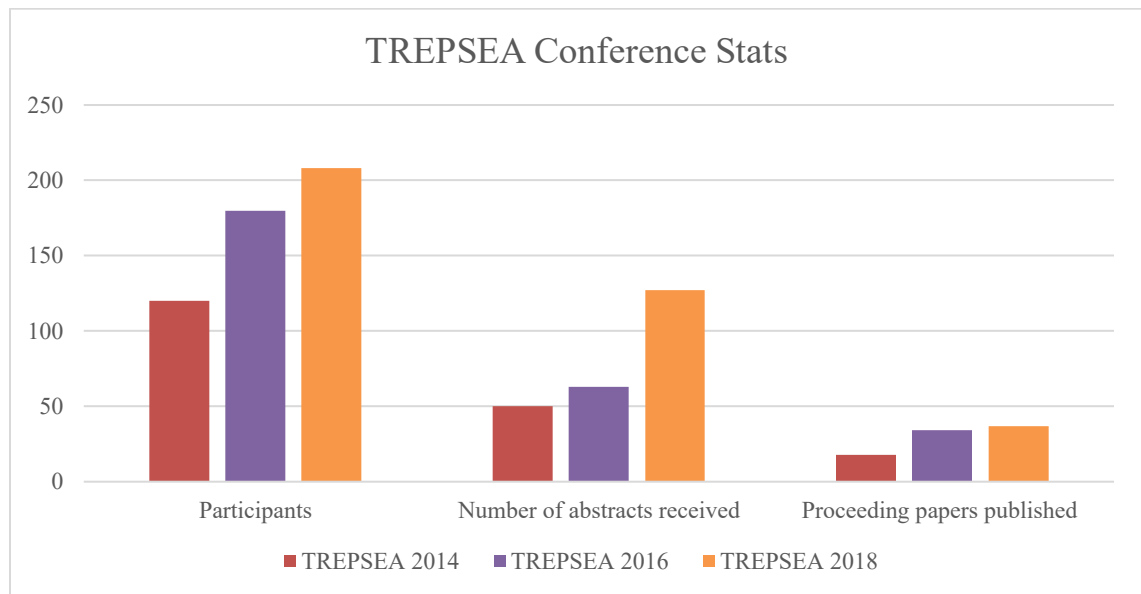
### Progress Data

TREPSEA is in progress because of the increasing numbers of the participants, abstracts and proceeding papers for the past years.

TREPSEA Conference Stats

Year	Participants	Number of abstracts received	Proceeding papers published
TREPSEA 2014	120	50	18
TREPSEA 2016	180	63	34
TREPSEA 2018	208	127	37





TREPSEA Conference Stats

### TREPSEA 2021 Programs and Schedules

Day 1 - 16 September 2021					
start	end	Program (Zoom1)	start	end	Program (Zoom2)
9:00	9:20	Opening Ceremony (*ONLY at Zoom 1)			
9:30	11:00	Keynotes (*ONLY at Zoom 1) by Professor Bambang S Brodjonegoro, Dr. Alue Dohong and Professor Hein Mallee			
11:10	12:10	Plenary Session 1: Heavy Metal Problem and Environment Issue & Public Health (*ONLY at Zoom 1) (Dr. Nurfitri Abdul Gafur, Dr. Sri Manovita Pateda and Professor Masayuki Sakakibara)			
12:10	13:00	Lunch Break			
13:00	14:50	Session 1: Environmental Issues and Public Health - QA for Environmental Issues and Public Health	13:00	14:40	Session 7: Heavy Metal Problems and Renewable Energy - QA for Heavy Metal Problems and Renewable Energy
			14:40	15:00	Break
14:50	15:10	Break	15:00	15:25	Session 5: Resources Management and Global Value Chain - QA for Resources Management and Global Value Chain
15:10	16:05	Session 1: Environmental Issues and Public Health - QA for Environmental Issues and Public Health	15:25	15:40	Break
			15:40	15:50	Session 6: Legal Issues and Business Ethics in Resource Management - QA for Legal Issues and Business Ethics in Resource Management
Day 2 - 17 September 2021					
start	end	Program (Zoom1)	start	end	Program (Zoom2)
8:30	10:00	Plenary Session 2: Ecological Risks and Food Security and Sustainable Agriculture and Equitable Development (*ONLY at Zoom 1) (Professor Ryohei Kada, Professor Katsuya Tanaka and Professor Bustanul Arifin)***TBC			
10:15	11:05	Session 2: Ecological Risks and Food Security - QA for Ecological Risk & Food Security	10:15	11:35	Session 4: Sustainable Agriculture and Equitable Development - QA for Sustainable Agriculture and Equitable Development
11:05	11:20	Break			
11:20	11:40	Session 8: Urban and Community Development - QA for Urban Management and Community Development	11:35	13:30	Lunch Break
11:40	13:30	Lunch Break			
13:30	13:45	Session 8: Urban and Community Development - QA for Urban Management and Community Development	13:30	13:55	Session 4: Sustainable Agriculture and Equitable Development - QA for Sustainable Agriculture and Equitable Development
13:45	14:30	Break	13:55	14:30	Break
14:30	16:00	Poster Session via Spatial Chat			
Day 3 - 18 September 2021					
start	end	Program (Zoom1)	start	end	Program (Zoom2)
8:30	10:00	Plenary Session 3: Disaster Risks Reduction and Disaster Management and Sustainable Development Goals (SDGs) (*ONLY at Zoom 1) Professor Atsushi Yoshimoto, Dr. Irwan Meilano, Professor Rudy and Dr. Yayu Indriati Arifin			
10:15	11:15	Session3: Disaster Risks Reduction and Disaster Management - QA for Disaster Risks Reduction and Disaster Management	10:15	11:55	Session 9: Sustainable Development Goals (SDGs) - QA for Sustainable Development Goals
11:15	13:00	Lunch Break	11:55	13:00	Lunch Break
13:00	14:30	Workshop 1 Transdisciplinary Approach to Reducing the ASGM related Problems Organized by RIHN	13:00	14:30	Workshop 2 Sustainability Certification of Agricultural System Organized by UNIRA
14:40	15:30	Discussion (*ONLY at Zoom 1)			
15:30	16:00	Closing ceremony (*ONLY at Zoom 1)			

## Day 1<sup>st</sup> ( 16 September 2021)

start	end	Program (Zoom1)		start	end	Program (Zoom2)	
9:00	9:20	Opening Ceremony (*ONLY Zoom 1)					
9:30	11:00	Keynote talk (Professor Bambang S Brodjonegoro, Dr. Siti Nurbaya Bakar, Professor Hein Mallee) (*ONLY Zoom 1)					
11:10	12:10	Plenary session 1 Heavy Metal Problem and Environment Issue & Public Health (Dr. Nurfitri Abdul Gafur, dr. Sri Manovita Pateda, M.Kes, and Professor Masayuki Sakakibara) (*ONLY Zoom 1)					
12:10	13:00	Lunch Break					
Session 1 Environmental Issues and Public Health Chairperson: Dr. Yusriani, Universitas Muslim Indonesia				Session 7 Heavy Metal Problems and Renewable Energy Chairperson: Dr. Ina Winarni , Forest product Research and Development Center			
13:00	13:30	O-3	The Effect of Housewife Assistance on Dengue Haemorrhagic Fever Management in the Work Area of the Pampang Community Health Center Makassar City  Ilham Syam, Nurlili and Nurul Sekolah Tinggi Ilmu Kesehatan Makassar	13:00	13:30	O-102	Heavy Metal Contamination of River Sediment at ASGM Area in Gorontalo Province, Indonesia  Basir <sup>1</sup> , Masayuki Sakakibara <sup>2</sup> , Sri Manovita Pateda <sup>3</sup> and Koichiro Sera <sup>4</sup> <sup>1</sup> STIK Tamalatea Makassar, <sup>2</sup> Research Institute for Humanity and Nature, <sup>3</sup> Gorontalo State University, <sup>4</sup> Iwate Medical University
		O-4	Effects of Mentoring Housewives Assistance on Ability toSort Waste in Sub-District of Panakukkang Makassar  Nurleli, Sri Syatriani and Sri Fauziah Sekolah Tinggi Ilmu Kesehatan Makassar			O-109	Atmospheric Mercury Contamination on the Tree Bark Due to the Artisanal Small Scale Gold Mining (ASGM) Activity in the Bunut Seberang Village, Pesawaran District, Lampung Province Indonesia  Azhary Taufiq <sup>1</sup> , Melya Riniarti <sup>1</sup> , Hendra Prasetya <sup>1</sup> , Slamet Budi Yuwono <sup>1</sup> , Endang Linirin <sup>1</sup> and Masayuki Sakakibara <sup>2,3</sup> <sup>1</sup> University of Lampung, <sup>2</sup> Research Institute for Humanity and Nature, <sup>3</sup> Ehime University
		O-5	Hazard Risk Identification from Used Masks  Meithyra Melviana Simatupang <sup>1</sup> , Erna Veronika <sup>2</sup> <sup>1</sup> Universitas Respati Indonesia, <sup>2</sup> Universitas Esa Unggul			O-108	Analysis of Atmospheric Mercury Concentrations in Tree Bark of Multi Purpose Tree Species (MPTS) in Bunut Seberang Village, Lampung Province, Indonesia  Tedy Rendra <sup>1</sup> , Melya Riniarti <sup>1</sup> , Slamet Budi Yuwono <sup>1</sup> , Hendra Prasetya <sup>1</sup> , Endang Linirian Widiastuti <sup>1</sup> and Masayuki Sakakibara <sup>2,3</sup> <sup>1</sup> University of Lampung, <sup>2</sup> Research Institute for Humanity and Nature, <sup>3</sup> Ehime University
		O-6	Implementation of Health Protocols to Reduce COVID-19 Spread: Study at Terminal Transit in Tana Toraja District, South Sulawesi  Sri Syatriani and Ilham Panggula Sekolah Tinggi Ilmu Kesehatan Makassar			O-103	A preliminary study on mercury contamination in plants from small-scale artisanal gold mining area in Mandalay Region, Myanmar  Xiaoxu Kuang <sup>1</sup> , Win Thiri Kyaw <sup>1</sup> , Pyae Sone Soe <sup>2</sup> , Hnin Ei Khin <sup>3</sup> , Nan Myat Pyae Zaw <sup>4</sup> , Aye Myat Thandar <sup>4</sup> and Masayuki Sakakibara <sup>1,5</sup> <sup>1</sup> Research Institute for Humanity and Nature, <sup>2</sup> Prefectural University of Kumamoto, <sup>3</sup> Environmental Conservation Department (Mandalay Region), <sup>4</sup> Environmental Conservation Department (Head Office), <sup>5</sup> Ehime University
		O-9	Evaluation of the Remote Health Survey Mode Conducted for the Artisanal and Small-scale Gold Mining (ASGM) Community in Mandalay Region, Myanmar During COVID-19 Pandemic  Win Thiri Kyaw <sup>1</sup> , Yee Mon Myint <sup>2</sup> , Xiaoxu Kuang <sup>1</sup> and Masayuki Sakakibara <sup>1,3</sup> <sup>1</sup> Research Institute for Humanity and Nature, <sup>2</sup> Magway General Hospital, <sup>3</sup> Ehime University			O-106	A Complex Land Use Matrix, the Case of Ponce-Enriquez in Ecuador: ASGM, Agricultural Plantations and Local Forest remnants  José Luis Rivera, Ximena Diaz, Carolina Bernal, Carolina Ramos and Jeny Ruales Escuela Politécnica Nacional
		O-16	Knowledge and Attitude of Pregnant Women Towards COVID-19 Prevention in Makassar City, Indonesia  Andi Sani Silwanah <sup>1</sup> , Muhammad Sahlan Zamaa <sup>1</sup> , Hasriani I and Rezky Aulia Yusuf <sup>2</sup> <sup>1</sup> Sekolah Tinggi Ilmu Kesehatan Makassar, <sup>2</sup> Universitas Muslim Indonesia			O-105	Purification of selenium-containing leachate in wastewater tanks at a tunnel construction site  Kenji OKAZAKI <sup>1</sup> , Akihiko OBINATA <sup>1</sup> , Toshiyuki KURAHASHI <sup>1</sup> and Masayuki SAKAKIBARA <sup>2,3</sup> <sup>1</sup> Civil Engineering Research Institute, <sup>2</sup> Research Institute for Humanity and Nature, <sup>3</sup> Ehima University

start	end	Program (Zoom1)		start	end	Program (Zoom2)	
Session 1_Environmental Issues and Public Health Chairperson: Dr. Win Thiri Kyaw, Research Institute for Humanity and Nature				Session 7_Heavy Metal Problems and Renewable Energy Chairperson: Dr. José Luis Rivera, Escuela Politecnica Nacional			
13:40	14:10	O-13	Characteristics of Moringa Leaf Powder as Fortification and Consumer Acceptance  Yossi Handayani <sup>1</sup> , <b>Syarifah Aminah</b> <sup>2</sup> , Muflihani Yanis <sup>1</sup> and Waryat <sup>3</sup> <sup>1</sup> Jakarta Assesment Institute of Agriculture Technology, <sup>2</sup> Indonesian Center for Food Crops Research and Development, <sup>3</sup> Indonesian Center for Horticulture Research and Development	13:40	14:10	O-112	Distribution of Heavy Metals on Water and Sediments of Ratai Bay of Pesawaran Regency-Lampung, Indonesia  Endang Linirin Widiastuti, <b>Ellen Larasati</b> , Warsono, Gregorius Nugroho Susanto and Abdullah Aman Damai University of Lampung
		O-28	The determinant factor of stunting in children under five in Bandar Lampung City  <b>Yaktiworo Indriani</b> , Samsu Udayana Nurdin and Rodiani University of Lampung			O-113	Distribution of Heavy Metals on Biota of Ratai Bay of Pesawaran Regency-Lampung, Indonesia  Endang Linirin Widiastuti, <b>Retno Fitriarningsih</b> , Warsono, Supono and Indra Gumay Febryano University of Lampung
		O-35	Sources of Knowledge for Pregnant Women About How to Prevent Maternal Mortality Based on Group and Mass Communication Levels  <b>Yusriani</b> Universitas Muslim Indonesia			O-114	Heavy Metals Concentration in Green Macroalgae <i>Spirogyra</i> sp. of Way Ratai River Pesawaran Regency Lampung  Endang Linirin, <b>Fatimah Alhafizoh</b> , Tugiyono and Gregorius Nugroho Susanto University of Lampung
		O-130	Assessment of Factors Affecting the Incidence of Malaria in the Middle Wasile Area, East Halmahera Regency, North Maluku Province  <b>Adi Hermawan</b> and Sahdan Mustari Institut Teknologi dan Kesehatan Tri Tunas Nasional			O-115	Plankton Diversity and its Heavy Metal Content on Ratai Bay of Pesawaran District-Lmapung Indonesia  Endang Linirin Widiastuti, <b>Anisa Danyatul Afifa</b> , Tugiyono and Suratman University of Lampung
		O-131	Survey of Knowledge and Practice related Health Risks of Mercury Exposure among Gold Craft Workers in Rappocini Area, Makassar City  <b>Nanang Rahmadani</b> and Muhammad Syafri Institut Teknologi dan Kesehatan Tri Tunas Nasional			O-116	Heavy Metals Determination on Nekton of Way Ratai River of Pesawaran Regency  <b>Rizka Ayu Assyifa</b> , Enisantaria br Manik, Endang Linirin Widiastuti, Nuning Nurcahyani , Tugiyono and Wawan A. Setiawan University of Lampung
		O-132	Factors Related to Knowledge Level of Mother for Providing Complementary Food to Breastfeeding in Central Mamuju District, South Sulawesi  <b>Asmiana Saputri Ilyas</b> and Sitti Herliyanti Rambu Institut Teknologi dan Kesehatan Tri Tunas Nasional			O-118	Management of Lead (Pb) Waste Post Closing of Used Battery Smelter  <b>Ridwan Fauzi</b> , Rita, and Siti Masitoh Ministry of Environment and Forestry
Session 1_Environmental Issues and Public Health Chairperson: Dr. Yaktiworo Indriani, University of Lampung				Session 7_Heavy Metal Problems and Renewable Energy Chairperson: Dr. Xiaoxu Kuang, Research Institute for Humanity and Nature			
14:20	14:50	O-2	Central Java Regional Geochemistry: Influence of Environmental Geology and Mineral Occurrences  <b>Purnama Sendjaja</b> , Ari Kusniadi and Verry Eddy Setiawan Ministry of Energy and Mineral Resources Republic of Indonesia	14:20	14:40	O-107	Bioethanol Production from Seaweed Waste as Biomass Resources  <b>Ina Winarni</b> <sup>1</sup> , Uju 2, Joko Santoso <sup>2</sup> and Tri Wibowo <sup>3</sup> <sup>1</sup> Forest Product Research and Development Center, <sup>2</sup> Bogor Agriculture University, <sup>3</sup> Ministry of Finance
		O-10	Metals in green mussels: is there any effect on their reproduction? A preliminary study of Muara Angke, Jakarta Bay  <b>Wulan Koagouw</b> <sup>1,2</sup> , Ni Luh Putu Rischha Phadmacanty <sup>1</sup> , Mochamad Riza Iskandar <sup>1</sup> , Dwi Hindarti1 and Zainal Arifin <sup>3</sup> <sup>1</sup> Indonesian Institute of Sciences, <sup>2</sup> University of Brighton			O-110	Rooftop Solar PV program for Tourism Villages in Bali  <b>Deddy Kurniawan Halim</b> <sup>1</sup> and A.A. Nyoman Sri Wahyuni <sup>2</sup> <sup>1</sup> Politeknik Internasional Bali, <sup>2</sup> Sekolah Tinggi Ilmu Sosial dan Ilmu Politik Margarana
		O-17	A Simple Colorimetric Detection of Ceftriaxone and Its Removal Using Zeolite Synthesized from Low-Cost Materials  <b>Vicky Prajaputra</b> , Zaenal Abidin, Sri Budiarti and Dyah Tjahyandari Suryaningtyas IPB University			O-111	Effects of Adhesive Content on the Bioenergetic Properties of Charcoal Briquette from Sengon ( <i>Falcataria moluccana</i> ) Wood  <b>Siti Mutiara Ridjayanti</b> <sup>1</sup> , Wahyu Hidayat <sup>1</sup> , Rahmi Adi Bazenet <sup>1</sup> , Irwan Sukri Banuwa <sup>1</sup> , Melya Riniarti <sup>1</sup> , Hendra Praselia <sup>1</sup> , Ainin Niswati <sup>1</sup> , Udin Hasanudin <sup>1</sup> , Jiho Yoo <sup>2</sup> , Sango Kim <sup>2</sup> and Sihyun Lee <sup>2</sup> <sup>1</sup> University of Lampung, <sup>2</sup> Korean Institute of Energy Research,
		O-19	Adaption Strategy of Fisherman to Climate Change : A Case Study from Limau Sub-District, Tanggamus Regency  <b>Abdul Mutolib</b> <sup>1</sup> , Ali Rahmat <sup>2</sup> , Indah Listiana <sup>3</sup> , Helvi Yanfika <sup>3</sup> , Diana Widyastuti <sup>3</sup> , and Maya Riantini <sup>3</sup> <sup>1</sup> Siliwangi University, <sup>2</sup> The Indonesian Institute of Sciences, <sup>3</sup> University of Lampung			O-117	Sugar Production of Autoclave-pretreated Oil Palm Empty Fruit Bunches ( <i>Elaeis Guineensis</i> Jacq.) by Different Acids  <b>Fahriya Puspita Sari</b> <sup>1</sup> , Fitria <sup>1,2</sup> , Sita Heris Anita <sup>1</sup> , Maulida Oktaviani <sup>1</sup> and Widya Fatriasari <sup>1</sup> <sup>1</sup> Research Center for Biomaterials LIPI, <sup>2</sup> Washington State University
		O-34	Study of Potential Pollution of Teaching Laboratory Chemical Waste in IPB University And Its Alternative Management Solutions  <b>Della Kharisma</b> <sup>1</sup> , Zaenal Abidin <sup>1</sup> , Cecep Kusmana <sup>1</sup> , Herry Suhardiyanto <sup>1</sup> , Najwa Azzahra Siradj <sup>2</sup> <sup>1</sup> IPB University, <sup>2</sup> Bogor Vocational School of Chemical Analyst			14:40	15:00
	O-152	Removal of Residual Antibiotics from Hospital Waste Water with Activated Carbon from Palm Kernel Meal (PKM)  <b>Achmad Gus Fahmi</b> , Zaenal Abidin , Cecep Kusmana and Erliza Noor IPB university					
14:50	15:10	Break					

start	end	Program (Zoom1)		start	end	Program (Zoom2)	
Session 1_Environmental Issues and Public Health Chairperson: Dr. Hiroki KASAMATSU, Ehime University				Session 5_Resources Management and Global Value ChainChairperson: Dr. Melya Riniarti, University of Lampung			
15:10	15:35	O-14	The Effect of Land Cover Forest on Fluctuations in Availability of Water in the Batutegi Dam, Lampung, Indonesia  Emi Artika, Slamet Budi Yuwono, Irwan Sukri Banuwa, Agus Setiawan Universitas Lampung	15:00	15:25	O-93	The Diversity of Plant Species in the Proboscis Monkey's Habitat as a Species Reference for Habitat Rehabilitation  Tri Atmoko Ministry of Environment and Forestry
		O-15	A Sociocultural Analysis of Word <i>Ladies</i> in ASGM Area of Suwawa Timur  Yeni Mariyani Junus <sup>1</sup> , Muziatun <sup>1</sup> , Yayu Pongoliu <sup>1</sup> , Hiroki Kasamatsu <sup>2</sup> , Motoko Shimagami <sup>2</sup> <sup>1</sup> Gorontalo State University, <sup>2</sup> Ehime University			O-95	Conditions for Successful Local Collective Action in Mangrove Forest Management: Some Evidences from Eastern Coastal Area of South Sulawesi, Indonesia  Sri Suharti <sup>1</sup> , Dudung Darusman <sup>2</sup> , Bramasto Nugroho <sup>2</sup> and Leti Sundawati <sup>2</sup> <sup>1</sup> Forest Research and Development Centre, <sup>2</sup> Bogor Agricultural University
		O-18	An Analysis of <i>Natural Phenomenon Superstition</i> in ASGM area of Suwawa Timur  Mohamad Ariyanto Adjulaini <sup>1</sup> , Muziatun <sup>1</sup> ,Yayu Pongoliu <sup>1</sup> , Hiroki Kasamatsu <sup>2</sup> and Motoko Shimagami <sup>2</sup> <sup>1</sup> Gorontalo State University, <sup>2</sup> Ehime University			O-97	The Potential of Kabuyutan Sacred Natural Site toward a Sustainable Landscape Management in Indonesia  Mohammad Zaini Dahlan <sup>1</sup> , Katsue Fukamachi <sup>2</sup> and Shozo Shibata <sup>2</sup> <sup>1</sup> Institut Teknologi Bandung, <sup>2</sup> Kyoto University
		O-30	Attitudes and Skills of Women Farmer Groups in Waste Management in the Coastal Areas of Srengsem Village, Bandar Lampung City  Yuli Safitri, Kordiyana K. Rangga, Indah Listiana and Rinaldi Bursan University of Lampung			O-94	Economic Significance and Challenges in Community-based Sericulture Cultivation  Retno Agustarini, Sri Suharti, Lincih Andadari, Asmanah Widarti and Dhany Yuniati Ministry of Environment and Forestry
		O-32	Effectiveness of Using of Brown Algae Alginate to Immobilize the Indigenous Bioremediation Bacteria for Reduce Waste Water from Shrimp Culture  Agus Setyawan, Supono, Arlin Wijayanti and Ussy Tri Anti University of Lampung			O-92	Measurement of the Risk of COVID-19 Exposure to Nurses Working in the COVID-19 Isolation Room  Rahma Yulis and Anggraeni Kae Sekolah Tinggi Ilmu Kesehatan Makassar
Session 1_Environmental Issues and Public Health Chairperson: Dr. Abdul Mutolib, Siliwangi University				15:25	15:40	Break	
15:45	16:05	O-20	Current Situation, Problems, and a New Program of the Long-Term Stay Type ASGM in East Suwawa, Gorontalo, Indonesia  Hiroki KASAMATSU <sup>1</sup> , Motoko SHIMAGAMI <sup>1</sup> , Sri Manovita PATEDA <sup>2</sup> , Zuhriana K. YUSUF <sup>2</sup> , Wirda Y. DULAHU <sup>2</sup> , Mohammad Rivai NAKOE <sup>2</sup> , Yayu PONGOLIU <sup>2</sup> , MUZIATUN <sup>2</sup> , Nurfitri Abdul GAFUR <sup>3</sup> and Xiaoxu KUANG <sup>4</sup> <sup>1</sup> Ehime University, <sup>2</sup> Gorontalo State University, <sup>3</sup> Bone Bolango Regency, <sup>4</sup> Research Institute for Humanity and Nature, Japan	Session 6_ Legal Issues and Business Ethics in Resource Management Chairperson: Dr. Hendra Prasetya, University of Lampung			
		O-22	The Estimated Total Area of Forest Fire in Siak Regency, Riau Province during the Early Period of COVID-19 Outbreak  Muhammad Hidayatul Mustofa, Lailan Syaufina and Nining Puspaningsih IPB University	15:40	15:50	O-99	Level Of Gender Equality In Salted Fish Agro-Industrial Production At Tulang Bawang District  Helvi Yanfika <sup>1</sup> , Rudy <sup>1</sup> , Indah Listiana <sup>1</sup> , R.A. Diana Widyastuti <sup>1</sup> , Maya Riantini <sup>1</sup> and Abdul Mutolib <sup>2</sup> <sup>1</sup> University of Lampung, <sup>2</sup> University of Siliwangi
		O-23	Bird's Species Response to The Ex-Coal Mining Reclamation Stages  Tri Atmoko, Ardiyanto Wahyu Nugroho, and Mukhlisi Ministry of Environment and Forestry			O-100	Mangrove Forest: Analysis of Regulatory Impact (Studies in the Coastal Zone of the City of Bandar Lampung)  Novita Tresiana <sup>1</sup> , Noverman Duadji <sup>1</sup> , Indra Gumay Febryano <sup>1</sup> , Maurent Kartika Maharani <sup>1</sup> and Ali Rahmat <sup>2</sup> <sup>1</sup> University of Lampung, <sup>2</sup> Indonesian Institute of Sciences
		O-31	Time-series Assessment of Artisanal and Small-Scale Gold Mining Sites and Change in Miners' Activities: a Case of Gorontalo, Indonesia  Satomi Kimijima <sup>1</sup> , Masayuki Sakakibara <sup>1,2</sup> , Masahiko Nagai <sup>3</sup> <sup>1</sup> Research Institute for Humanity and Nature, <sup>2</sup> Ehime University, <sup>3</sup> Yamaguchi University				



## Day 2<sup>nd</sup> (17 September 2021)

start	end	Program (Zoom1)		start	end	Program (Zoom2)	
8:30	10:00	Plenary session 2 Ecological Risks and Food Security and Sustainable Agriculture and Equitable Development (Professor Ryohei Kada, Professor Krista Jacobsen, Professor Katsuya Tanaka, and Professor Bustanul Arifin) (*ONLY Zoom 1)					
Session 2_Ecological Risks and Food Security Chairperson: Dr. Yulia Rahma Fitriana, University of Lampung				Session 4_Sustainable Agriculture and Equitable Development Chairperson: Dr. Zainal Abidin, University of Lampung			
10:15	10:35	O-39	Basic Hydrogeochemical Characterization in Four Microwatershed in the Mining Districts: Bella Rica, San Gerardo, Nambija and Chinapintza, South of Ecuador  Samantha Ruiz, Carolina Bernal, Ximena Díaz and José Luis Rivera Escuela Politécnica Nacional	10:15	10:35	O-79	Contesting Power and Agricultural Expansion in Gunung Halimun Salak National Park (GHSNP) Corridor, West Java, Indonesia  Sulastris Sardjo 1, 2, Arya Hadi Dharmawan 1, Dudung Darusman 1 and Ekawati Sri Wahyuni 1 1 IPB University, 2 University of Indonesia
		O-40	Influence of Farmer Decision Making Choosing Rice Varieties and Climate Change to Rice Productivity Levels in Central Lampung Regency  Kordiyana L. Rangga 1, Helvi Yanfika 1, Ragil Ayu Mangesti 1,Tubagus Hasanuddin 1, Rinaldi Bursan 1 and Ali Rahmat 2 1 University of Lampung, 2 Indonesian Institute of Sciences			O-86	Women's Contribution in Supporting Coffee Sustainability: Case Study in Tana Toraja and Enrekang Districts, South Sulawesi  Diany Faila Sophia Hartatriti, Fitria Yuliasmara and Novie Pranata Erdiansyah Indonesian Coffee and Cocoa Research Institute
		O-47	Ecological Risks and Food Security: Community-based Programs in Forest Restoration & Food Security in the Bukit Nanti Martapura Forest Area (UPTD KPH WIL VI Bukit Nanti-Martapura)  Noverman Duadji and Novita Tresiana University of Lampung			O-76	Residents' consciousness of traditional rice cultivation - Case Study of Tana Toraja Regency, Indonesia  Kaho Furutani and Hiroki Kasamatsu Ehime University
		O-50	Income and Welfare of Cassava Farmers in the Era of COVID- 19 in Lampung Province, Indonesia  Wan Abbas Zakaria, Teguh Endaryanto, Lidya Sari Mas Indah and Dedy Hermawan University of Lampung			O-80	Economic Feasibility and Factors Influencing the Sustainability of Hybrid Rice Production  I Putu Wardana 1, Bhakti Prihatmojo 1, Dedi Nugraha 1 and S.A.N. Aryawati 2 1 Indonesian Center for Food Crops Research and Development, 2 Bali Assessment Institute for Agricultural Technology
Session 2_Ecological Risks and Food Security Chairperson: Dr. Hendra Prasetya, University of Lampung				Session 4_Sustainable Agriculture and Equitable Development Chairperson: Mr. Bangun Adi Wijaya, University of Lampung			
10:45	11:05	O-38	Study of Rhodamine B Dyes Content in Snacks of Karuwisi Traditional Market Makassar, South Sulawesi, Indonesia  Andi Tilka Muftiah Ridja, Andi Yulia Kasma and Aminullah Sekolah Tinggi Ilmu Kesehatan Makassar	10:45	11:15	O-69	Meranti Biochar Effect on Growth of Falcataria Moluccana Seedlings  Melya Riniarti 1, Hendra Prasetya 1, Wahyu Hidayat 1, Ainin Niswati 1, Udin Hasanudin 1 Irwan Sukri Banuwa 1, Aulia Asmara Loka 1, Jiho Yoo 2, Sangdo Kim 2 and Sihyun Lee 2 1 University of Lampung, 2 Korean Institute of Energy Research
		O-44	Authentication of Pure and Adulterated Sumbawa Monofloral Honey using Ultraviolet-Visible Spectroscopy  Diding Suhandy 1, Kusumiyati 2, Sapto Kuncoro 1, Winda Rahmawati 1 and Meinelwita Yulia 1 University of Lampung, 2 Padjadjaran University, 3 Lampung State Polytechnic			O-73	Monstera adansonii Plant Propagation Acceleration Using Bud Breaker and Rootmore  Hayane Adeline Warganegara and Sri Ramadiana University of Lampung
		O-45	UV Spectroscopy for Discrimination of Two Arabica Coffee Cultivars in West Java Indonesia: A Feasibility Study  Meinelwita Yulia 1, Kurnia Rimadhanti Ningtyas 1, Siti Suharyatun 2, Winda Rahmawati 2 and Diding Suhandy 2 1 Lampung State Polytechnic, 2 University of Lampung			O-85	Accelerated Growth of Kappaphycus alvarezii with Using Sargassum aquifolium Extract  Nunik Cokrowati 1, Yenny Risjani 2, Muhamad Firdaus 2 and Sri Andayani 2 1 University of Mataram, 2 University of Brawijaya
		O-46	Nutritional Quality of Faloak (Sterculia quadrifida R.Br.) Plant Parts  Siswadi Siswadi 1, Grace Serepina Saragih 2 and Heny Rianawati 3 1 Banjarbaru Environment and Forestry Research and Development Institute, 2 Research and Development Center for Environmental Quality and Laboratory, 3 Kupang Environment and Forestry Research Development Institute			O-77	Application of Biochar from Oil Palm Empty Fruit Bunches to Enhance the Soil Fertility and Growth of Falcataria Moluccana Plantation  Novendra Muhammad Raffly 1, Melya Riniarti 1, Hendra Prasetya 1, Wahyu Hidayat 1, Ainin Niswati 2, Udin Hasanudin 1, Irwan Sukri Banuwa 1, Jiho Yoo 2, Sangdo Kim 2 and Sihyun Lee 2 1 University of Lampung, 2 Korean Institute of Energy Research
11:05	11:20	Break				O-67	Physico-chemical and Chemical Characterization of Lignin Isolated from Black Liquor of Pulp Industry by-product  Nissa Nurfajrin Solihat 1, Eko Budi Santoso 2, Maya Ismayati 1, Muhammad Adly Rahandi Lubis 1, Fahriya Puspita Sari 1, Faizatul Falah 1, Widya Fatriasari 1 and Wasrin Syafii 2 1 Indonesian Institute of Sciences, 2 Institut Pertanian Bogor
						O-78	Studies on the Crude Nutrient and Mineral Composition of Cassava Tuber Peels for Animal Feedstuff  Khalil Andalas University

start	end	Program (Zoom1)		start	end	Program (Zoom2)	
Session 8. Urban and Community Development Chairperson:Dr. Ali Rahmat, Indonesian Institute of Sciences				Session 4. Sustainable Agriculture and Equitable Development Chairperson: Dr. Melya Riniarti, University of Lampung			
11:20	11:40	O-120	Reformulation of Socially Resilient Village  Nyi R. Irmayani, B. Mujiyadi, Habibullah, Nurhayu, Rudy G. Erwinsyah and Arif Aeni Ministry of Social Affairs Republic of Indonesia	11:25	11:35	O-82	Effect of Meranti-based Biochar on the Growth of Sengon (Facataria moluccana)  Bangun Adi Wijaya <sup>1</sup> , Melya Riniarti <sup>1</sup> , Hendra Prasetya <sup>1</sup> , Wahyu Hidayat <sup>1</sup> , Ainin Niswati <sup>1</sup> , Udin Hasanudin <sup>1</sup> , Irwan Sukri Banuwa <sup>1</sup> , Jiho Yoo <sup>2</sup> , Sangdo Kim <sup>2</sup> and Sihyun Lee <sup>2</sup> <sup>1</sup> University of Lampung, <sup>2</sup> Korean Institute of Energy Research
		O-121	Relationship on Forest Health with the Welfare Level of the Community Around the Mangrove Forest  Irlan Rahmat Maulana <sup>1</sup> , Rahmat Safe'i <sup>1</sup> , Indra Gumay Febryano <sup>1</sup> , Hari Kaskoyo <sup>1</sup> and Ali Rahmat <sup>2</sup> <sup>1</sup> University of Lampung, <sup>2</sup> Indonesian Institute of Sciences			O-71	Characteristic of Growth and Development of Red Chili (Capsicum ANNUM L.) by Biofertilizer and Alkali Supplement Fertilizer Application  R.A.D Widyastuti <sup>1</sup> , Kus Hendarto <sup>1</sup> , Fitri Yelli <sup>1</sup> , Indah Listiana <sup>1</sup> , Helvi Yanfika <sup>1</sup> , Maya Riantini <sup>1</sup> , Ali Rahmat <sup>2</sup> and Abdul Mutolib <sup>3</sup> <sup>1</sup> University of Lampung, <sup>2</sup> Indonesian Institute of Science, <sup>3</sup> University of Siliwangi
		O-124	Creating Community Awareness Inaction on Environmental Problems: Implementation and Outcomes of Cinematic Education  Andi Muhammad Nur Fitrah Syamsul <sup>1</sup> , Mohamad Jahja <sup>1</sup> , Lanto Ningrayati Amali <sup>1</sup> , Fachruddin Oliingo <sup>1</sup> , Hasanuddin Fatsah <sup>1</sup> , Ishak Isa <sup>1</sup> , Hiroki Kasamatsu <sup>2</sup> and Satomi Kimijima <sup>3</sup> <sup>1</sup> State University of Gorontalo, <sup>2</sup> Ehime University, <sup>3</sup> Research Institute for Humanity and Nature	11:35	13:30	Lunch Break	
		O-126	Spatial Structure and Community Perception of Pejaten Village on Policy Determining Rural Industry Area in Tabanan District, Bali  Nyoman Utari Vipriyanti, Sang Putu Kaler Surata, I Putu Sujana, Emy Handayani and Dewa Ayu Puspawati Universitas Mahasaraswati Denpasar				
				Session 4. Sustainable Agriculture and Equitable Development Chairperson: Ms. Diany Faila Sophia Hartatri, Indonesian Coffee and Cocoa Research Institute			
11:40	13:30	Lunch Break		13:30	13:55	O-89	Analysis of Food Expenditures of Rice Farmers in Flooding Prone Region in South Lampung District, Lampung Province  Zainal Abidin, Dewangga Nikmatullah, Adia Nugraha and Yuliana Saleh University of Lampung
Session 8. Urban and Community Development Chairperson: Dr. Abdul Mutolib, Siliwangi University						O-83	Farmers' Perception to Climate-Smart Agriculture (CSA) and Coffee Farming Productivity (Case Study on Coffee Farming Families in Tanggamus District, Lampung Province)  Tubagus Hasanuddin and Intan Diani Fardinatri University of Lampung
13:30	13:45	O-119	Changes in Land Use using the NDVI (Normalized Difference Vegetation Index) Method in Kedamaian Sub district, Bandar Lampung City as Urban City  Ali Rahmat <sup>1</sup> , Azan Noer Ramadhan <sup>2</sup> , Winih Sekarintyas Ramadhani <sup>2</sup> , Indah Listiana <sup>2</sup> , Muhammad Nurtanto <sup>3</sup> and Rinaldi Bursan <sup>2</sup> <sup>1</sup> Indonesian Institute of Science, <sup>2</sup> University of Lampung, <sup>3</sup> Sultan Ageng Tirtayasa University			O-91	The Culture of Farmers-Breeders Mitigation Facing Drought in Lampung, Indonesia  Slameto, Jekvy Hendra, Meidaliyantisah and Rely Hevrizen Lampung Assesment Institute Agricultural Technology
		O-128	The Impact of Transplants Machine on Acceleration of Innovations Adoption in Rice Cultivation  F Y Adriyani <sup>1</sup> and K K Rangga <sup>2</sup> <sup>1</sup> The Assessment Institute of Agricultural Technology, <sup>2</sup> University of Lampung			O-68	Behavior of Farmers in Adaptation to Climate Change on Productivity of Pepper (Pipper nigrum L.) in East Lampung Regency  Indah Listiana <sup>1</sup> , Helvi Yanfika <sup>1</sup> , Rinaldi Bursan <sup>1</sup> , Habibullah Jimad <sup>1</sup> , Maya Riantini <sup>1</sup> , R.A.D Widyastuti <sup>1</sup> , Abdul Mutolib <sup>2</sup> and Reno Wikandaru <sup>3</sup> <sup>1</sup> University of Lampung, <sup>2</sup> University of Siliwangi, <sup>3</sup> University of Gadjah Mada
O-123	Farmers Perceptions of Paddy Rice Cultivation Technology in Jakarta City  Chery Soraya Ammatillah <sup>1</sup> , Susi Sutardi <sup>1</sup> , Syarifah Aminah <sup>2</sup> and Dan Nurmawati <sup>1</sup> <sup>1</sup> Jakarta Assessment Institute for Agricultural Technology, <sup>2</sup> Indonesian Center for Food Crops Research and Development	O-74	Placement Precision of Organic Fertilizer Based on Soil Conservation in Taro Cultivation  Andi Masnang, Asmanur Jannah, Dyah Budibruri, Wibaningwati and Febi Nurilmala Nusa Bangsa University				
13:45	14:30	Break		13:55	14:30	Break	
14:30	16:00	Poster session via Spetial Chat (*ONLY Zoom 1)					

Poster session via Spatial Chat				
14:30	16:00	P-1	Service Quality and Patient Interest in Choosing Class 2 Inpatient Care	Herlinawati <sup>1</sup> , Muslimin <sup>1</sup> , Heni Fa'riatul Aeni <sup>1</sup> and Lisandi <sup>1</sup> Sekolah Tinggi Ilmu Kesehatan Cirebon
		P-2	A Comparative Study of the Neurological Symptoms of the Suwawa Artisanal and Small- Scale Gold Mining (ASGM) Community	Diaz Regina Shafira <sup>1</sup> , Zuhriana K. Yusuf <sup>1</sup> , Sri Manovita Pateda <sup>1</sup> , Wirda Y. Dulahu <sup>1</sup> , Mohammad Rivai Nakoe <sup>1</sup> and Nurfitri A. Gafur <sup>2</sup> <sup>1</sup> State University of Gorontalo, <sup>2</sup> Bone Bolango regency
		P-3	The Impact of COVID-19 Pandemic in ASGM Community	Widya Puspa Molou <sup>1</sup> , Wirda Y Dulahu <sup>1</sup> , Sri Manovita Pateda <sup>1</sup> , Zuhriana K Yusuf <sup>1</sup> , Mohamad Rivai Nakoe <sup>1</sup> and Nurfitri Gafur <sup>2</sup> <sup>1</sup> State University of Gorontalo, <sup>2</sup> Bone Bolango regency
		P-4	Tobacco Consumption Behaviour in Artisanal and Small-scale Gold Mining (ASGM) Community	Putri Dian Puspita <sup>1</sup> , Moh. Rivai Nakoe <sup>1</sup> , Zuhriana K. Yusuf <sup>1</sup> , Sri Manovita Pateda <sup>1</sup> , Wirda Y. Dulahu <sup>1</sup> , Nurfitri A. Gafur <sup>2</sup> <sup>1</sup> State University of Gorontalo, <sup>2</sup> Bone Bolango regency
		P-7	Mapping of Mangrove Ecosystem Conditions in Coastal Waters of Bintan Island using SPOT 4 and SPOT 7 Satellite Imagery	Money Carattri Kusuma Werdani <sup>1</sup> , Rudi Siap Bintoro <sup>1</sup> and Anang Dwi Purwanto <sup>2</sup> <sup>1</sup> Hang Tuah University, <sup>2</sup> Remote Sensing Applications Center, LAPAN
		P-10	Consumer Skepticism toward Green Purchase Intention in Bandar Lampung	Rinaldi Bursan <sup>1</sup> , Driya Wiryawan <sup>1</sup> , Habibullah Jimad <sup>1</sup> , Indah Listiana <sup>1</sup> , Maya Riantini <sup>1</sup> , Helvi Yanfika <sup>1</sup> , RAD Widyastuti <sup>1</sup> , Abdul Mutolib <sup>2</sup> and Dina Arini Adipathy <sup>3</sup> <sup>1</sup> University of Lampung, <sup>2</sup> University of Siliwangi, <sup>3</sup> Magister Management University of Lampung
		P-14	The Relationship Between Income and Inhabitant Consumption Patterns in Suwawa Timur ASGM Area During the Pandemic of Covid-19	Achmad Renaldi Saputra Illy <sup>1</sup> , Yayu Pongoliu <sup>1</sup> , Junus Buhari Hafid <sup>1</sup> , Muziatun <sup>1</sup> , Hiroki Kasamatsu <sup>2</sup> , Motoko Shimagami <sup>2</sup> <sup>1</sup> State University of Gorontalo, <sup>2</sup> Ehime University
		P-15	Family Financial Condition During The COVID-19 Pandemic in Suwawa Timur ASGM	Junus Buhari Hafid <sup>1</sup> , Yayu Pongoliu <sup>1</sup> , Achmad Renaldi Saputra Illy <sup>1</sup> , Muziatun <sup>1</sup> , Hiroki Kasamatsu <sup>2</sup> , Motoko Shimagami <sup>2</sup> <sup>1</sup> State University of Gorontalo, <sup>2</sup> Ehime University

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start	end	Program (Zoom1)		start	end	Program (Zoom2)		
8:30	10:00	Plenary session 3 Disaster Risks Reduction and Disaster Management and Sustainable Development Goals (SDGs) (Professor Atsushi Yoshimoto, Dr. Irwan Meilano, Professor. Rudy and Dr. Yuyu Indriati Arifin) (*ONLY Zoom 1)						
Session3_Disaster Risks Reduction and Disaster Management Chair Person: Ms. Putri Nilam Sari, Andalas University				Session 9_Sustainable Development Goals (SDGs) Chairperson: Dr. Mohamad Jahja, Gorontalo State University				
10:15	10:50	O-52	Geological, Geohydrological Mapping And Disaster Analysis in Baturturu Hamlet, Mertelu Village, Gunungkidul District, D.I. Yogyakarta  Fajriani <sup>1</sup> , Nurfadillah Jusman <sup>1</sup> , Umrah <sup>1</sup> , <b>Ayusari Wahyuni</b> <sup>1</sup> , Ihsan <sup>1</sup> , Muh Said <sup>1</sup> and M Arif Rahmna Bole <sup>2</sup> <sup>1</sup> UIN Alauddin Makassar, <sup>2</sup> Gadjah Mada University,	10:15	10:35	O-145	Development of Geo-tourism Site in Bunikasih-Pangalengan: Environmental Conservation from ASGM Activities  <b>Idham Andri Kurniawan</b> <sup>1</sup> , Mirzam Abdurrachman <sup>1</sup> , Masayuki Sakakibara <sup>2</sup> , Irwan Meilano <sup>1</sup> , Nurcahyo Indro Basuki <sup>1</sup> , Andri Slamet Subandrio <sup>1</sup> , Very Susanto <sup>1</sup> , Adzkia Noerma Arifa <sup>1</sup> and Muhammad Saung Penggalih <sup>1</sup> <sup>1</sup> Bandung Institute of Technology, <sup>2</sup> Research Institute for Humanity and Nature	
		O-53	Earthquake Hazard Analysis Based on Seismicity Data  <b>Wa Ode Emiria Srikandi</b> , Intan Noviantari Manyoe, Yasin Septian and Dela Pusfika Sari Napu Universitas Negeri Gorontalo			O-146	The Structure of Sustainable Eco-tourism with the Case Study of Geodiversity Story in the Oze National Park, Central Japan  <b>Hisanari Sugawara</b> Gunma Museum of Natural History	
		O-54	Assessment of Student Knowledge Concerning COVID-19 Transmission: A Case Study in a Health Institute  <b>Esse Puji Pawenrusi</b> , Nurleli and Rika Pratiwi Sekolah Tinggi Ilmu Kesehatan Makassar			O-148	Visitors Experience on Sumatran Butterfly Ecotourism in Sustainable Environmental Awareness  <b>Gita Paramita Djausal</b> <sup>1</sup> , Lilih Muflihah <sup>1</sup> , Linda Rosalia <sup>2</sup> and M. Hanif Khairy V <sup>1</sup> <sup>1</sup> University of Lampung, <sup>2</sup> Yayasan Sahabat Alam	
		O-55	Business Models on Peatlands to Prevent Land and Forest Fires  <b>Dhany Yuniati</b> <sup>1</sup> , Husnul Khotimah <sup>1</sup> , Yunita Lisnawati <sup>1</sup> and Habibi Mainas <sup>2</sup> <sup>1</sup> Ministry of Environment and Forestry, <sup>2</sup> Indonesian Conservation Community Warsi			O-151	Assessment of Geosite for Geotourism Development in Gorontalo Outer Ring Road Area  <b>Naafi' Syahna Firdhaus Biya</b> , Intan Noviantari Manyoe, Moh. Afandi Polontalo, Fikri Boften, Mardiana Baharta, Alifi Naftalia and Fauzul Chaidir Usman Universitas Negeri Gorontalo	
		O-56	Synergy between Disaster Preparedness Area Program with Local Institutions for Community Disaster Preparedness  Suradi, Setyo Sumarno, Sugiyanto, Togiaratua Nainggolan, Ruaida Murni, <b>Rudy G. Erwinsyah</b> and Lis Andriyani Ministry of Social Affairs the Republic of Indonesia			Session 9_Sustainable Development Goals (SDGs) Chairperson: Dr. Hisanari Sugawara, Gunma Museum of Natural History		
	O-57	The Role of Crystal Fraction to Relative Magma Viscosity: An Approach to Understand the Explosive Caldera-Forming Volcanism of Raung Volcano  <b>Firman Sauqi Nur Sabila</b> <sup>1</sup> , Mirzam Abdurrachman <sup>2</sup> and Idham Andri Kurniawan <sup>2</sup> <sup>1</sup> Universitas Jember, <sup>2</sup> Institut Teknologi Bandung	10:45	11:05	O-136	Vulnerability of Fishermen Household Poverty the Impact of Climate Varibility in the Tanggamus District, Lampung Province, Indonesia  <b>Maya Riantini</b> <sup>1</sup> , Indah Listiana <sup>1</sup> , Helvi Yanfika <sup>1</sup> , RAD Widyastuti <sup>1</sup> , Abdul Mutolib <sup>2</sup> , Ali Rahmat <sup>3</sup> and Rinaldi Bursan <sup>1</sup> <sup>1</sup> Lampung University, <sup>2</sup> Siliwangi University, <sup>3</sup> Indonesian Institute of Science		
	O-58	Reducing the Risk Disaster of COVID-19 in Indonesia with Social Cash Assistance  <b>Badrun Susantyo</b> , Habibulah, Nyi Irmayani, Togiaratua Nainggolan, Sugiyanto, Rudy G. Erwinsyah, Aulia Rahman, Johan Arifin and Bilal As'Adhanayadi Ministry of Social Affairs The Republic of Indonesia			O-137	Social Entrepreneurship Program to Improve the Economic Welfare of Poor Families in Indonesia  <b>Hari Harjanto Setiawan</b> , Badrun Susantyo, Agus Budi Purwanto, Muhammad Belanawane Sulubere, Delfirman, Yanuar Farida Wismayanti, Alit Kurniasari, Husmiati Yusuf, Aulia Rahman, Ita Konita, Mery Ganti and Widiarto Ministry of Social Affairs the Republic of Indonesia		
					O-144	The Resource Management and Subjective Well-Being of Indonesian Families in the Midst of COVID-19 Pandemic  <b>Megawati Simanjuntak</b> and Istiqlaliyah Muflikhati Department of Family and Consumer Sciences, Faculty of Human Ecology		
Session3_Disaster Risks Reduction and Disaster Management Chairperson: Mr. Firman Sauqi Nur Sabila, Institut Teknologi Bandung								
11:00	11:10	O-59	Landuse Changes, Climate Change and Flood Episodes in Way Bulok Watershed Lampung Province  <b>Slamet Budi Yuwono</b> , Irwan Sukri Banuwa and Nano Suryono University of Lampung				O-135	Accounting Correlated Random Parameters in Best-worst Scaling: Case of Preferences of Job Opportunities in Artisanal Small Gold Mining (ASGM) Community in Indonesia  <b>Satoru Komatsu</b> <sup>1</sup> , Yuyu Isyana D. Pongoliu <sup>2</sup> , Katsuya Tanaka <sup>3</sup> , Masayuki Sakakibara <sup>4,5</sup> and Taro Ohdoko <sup>6</sup> <sup>1</sup> Nagasaki University, <sup>2</sup> Gorontalo State University, <sup>3</sup> Shiga University, <sup>4</sup> Research Institute for Humanity and Nature, <sup>5</sup> Ehime University, <sup>6</sup> Dokkyo University
		O-62	Community Preparedness Against the Threat of Abrasion and Tidal Floods in Padang City  <b>Putri Nilam Sari</b> , Yulina Wahyuningrum Purba and Azyyati Ridha Alfian Andalas University					

(Day3) 18th September, 2021

start	end	Program (Zoom1)		start	end	Program (Zoom2)	
Session3 Disaster Risks Reduction and Disaster Management Chairperson: Mr. Firman Sauqi Nur Sabila, Institut Teknologi Bandung				Session 9 Sustainable Development Goals (SDGs) Chairperson: Dr. Yuyu Indriati Arifin, Gorontalo State University			
11:10	11:15	O-65	Hazard assessment of tephra fallout for October 2013 eruption of Tangkuban Perahu in Lembang subdistrict, West Java, Indonesia  I Gusti Eddy Sucipta, Idham Andri Kurniawan, <b>Mirzam Abdurrahman</b> , Asep Saepuloh, Muhammad Rais Abdillah, Very Susanto and Adzkia Noerma Arifa Bandung Institute of Technology	11:15	11:30	O-134	Household Demand for Animal Food in Urban and Rural of Bengkulu, Indonesia  <b>Nikmatul Khoiriyah</b> <sup>1</sup> , Ana Arifatus Sa'diyah <sup>2</sup> and Esther Kembauw <sup>3</sup> <sup>1</sup> University of Islam Malang, <sup>2</sup> University of Tribhuwana Tunggadewi, <sup>3</sup> University of Pattimura
11:15	13:00					O-140	Limboto Lake Case and Cultural Diversity  <b>Magdalena Baga</b> , Yuyu Indriati Arifin and Nonny Basalama Universitas Negeri Gorontalo
						O-143	Model of Potential Fishing Ground in Regional Fisheries Management of Indonesia (WPP-RI) 716 to Support the Achievement of SDGs  <b>Anang Dwi Purwanto</b> <sup>1</sup> , Argo Galih Suhada <sup>1</sup> and Diyah Permatasari <sup>2</sup> <sup>1</sup> Remote Sensing Applications Center, LAPAN, <sup>2</sup> Diponegoro University
				Session 9 Sustainable Development Goals (SDGs) Chairperson: Dr. Idham Andri Kurniawan, Bandung Institute of Technology			
				11:40	11:55	O-147	A Novel Palm-fiber Net Industry as New Hope of Alleviating Poverty in Gorontalo Province  <b>Mohamad Jahja</b> <sup>1</sup> , Nurfitri Abdul Gafur <sup>1,2</sup> , Hugeng Lamansa <sup>2</sup> , Masayuki Sakakibara <sup>3,4</sup> and Tsutomu Yamagiuchi <sup>5</sup> <sup>1</sup> State University of Gorontalo, <sup>2</sup> Bone-bolango Regency, <sup>3</sup> Ehime University, <sup>4</sup> Research Institute for Humanity and Nature, <sup>5</sup> ESPEC MIC Corp.
O-133	The Effect of Acclimatization Chamber and Growth Hormone on the Survival of Endangered <i>Hopea Gregaria</i> Tree Species  Faisal Danu Tuheteru <sup>1</sup> , Asrianti Arif <sup>1</sup> , Husna I, Albasri <sup>1</sup> , Sri Andriyani <sup>1</sup> and <b>Diana Prameswari</b> <sup>2</sup> <sup>1</sup> University of Halu Oleo, <sup>2</sup> Forest Research and Development Center						
O-149	The Response of Medang Seedling ( <i>Litsea firma</i> Hook) to Various Doses of Biofertilizer  Diana Prameswari, <b>Dona Octavia</b> and Linciah Andadari Forest Research and Development Center						
		Lunch Break		11:55	13:00	Lunch Break	
13:00	14:30	Workshop 1  Transdisciplinary Approach to Reducing the ASGM related Problems  Organized by RIHN		13:00	14:30	Workshop 2  Sustainability Certification of Agricultural System  Organized by UNIRA	
14:40	15:30	Discussion (*ONLY Zoom 1)					
15:30	16:00	Closing ceremony (*ONLY Zoom 1)					





**Ministry of Education and Culture**

**University of Lampung**

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## **Rector Speech**

at the Opening Ceremony of  
**the 4th International Conference of TREPSEA 2021**  
on September 16 of 2021

Assalamu'alaikum Warahmatullahi Wabarakatuh

A very good morning to all of you. Alhamdulillah. Praise to God the Almighty

Your Excellency Dr. Alue Dohong, Vice Minister of Environment and Forestry

Your Excellency Professor Dr. Bambang P.S. Brodjonegoro of the University of Indonesia, Former Minister of Research and Technology and Higher Education.

Your Excellency Professor Hein Mallee, Deputy Director General of Research Institute for Humanity and Nature (RIHN), Kyoto-Japan

Keynote Speakers, Invited Speakers, All Presenters, Ladies and Gentlemen, the participants of the Fourth International Conference of Transdisciplinary Research on Environmental Problems in Southeast Asia (TREPSEA). Welcome to Lampung. Welcome to the University of Lampung (UNILA).

We are happy and very honoured to host you all in the current Fourth International Conference of TREPSEA, from September 16 to 18 of 2021, together with the Research Institute for Humanity and Nature (RIHN) in Kyoto, Bandung Institute of Technology (ITB), and the State University of Gorontalo (UNG). In July of 2019, we UNILA signed a Memorandum of Understanding (MoU) with RIHN in Kyoto to promote academic exchanges and international cooperation between the two institutes. The purpose of the cooperation is to establish long-term scientific and technical cooperative relationships, including mutually academic collaborative research and the exchange of information, techniques, and publications. Under this MoU, UNILA and RIHN have agreed develop collaboration on:

- Development, implementation, and promotion of cooperative research projects in fields of common interest
- Exchange of researchers, including visits of research staff and other experts with a special mission and training for long or short periods
- Exchange of scientific information and materials including research papers, publications, methodology and other collaborative documents
- Organization of joint research projects, joint conferences, workshops, symposia, seminars and training programs
- Other forms of scientific cooperation

The University of Lampung (UNILA) has 8 faculties, namely: Faculty of Agriculture, Faculty of Economics and Business, Faculty of Engineering, Faculty of Law, Faculty of Mathematics and Natural Sciences, Faculty of Medical, Faculty of Social and Political Sciences, and Faculty of Teacher Training and Education. We are hosting about 35 thousand students, from diploma level, undergraduate, and graduate programs. In 2021, UNILA has 73 full professors, hundreds of associate professors and assistant professors. The University of Lampung is highly committed to continuing Tri Dharma, the three pillars of higher education for the sake of the development of the university as well as the nation. As stipulated in the long-term development plan (LDP) in the period of 2005 – 2025, the university has established the vision, namely: “By the year 2025, the University of Lampung will have been among the top ten universities in Indonesia.”

UNILA is located in the City of Bandar Lampung, a city of over one million population, a fast growing and vibrant city in the Southern Tip of Sumatra, which is also a Capital of the Province of Lampung. The population of Lampung is over 9 million people with the growth rate of 1,65 percent per year, far higher than the 0.98 percent population growth of the country Indonesia. During the Covid-19 Pandemic, the economic growth rate of Lampung in 2020 was negative 1.67 percent, a bit better than the national economic growth rate of negative 2.02 percent. In 2021, the economic recovery of Lampung has shown significant progress, where the economic growth rate in Quarter 2 of 2021 is positive 5.03 percent (year on year) from Quarter 2 of 2020. We all should continue to work together to contribute to the economic recovery of the province, and of the nation.

Ladies and Gentlemen,

The main theme of the Fourth International Conference of TREPSEA this year is “Managing Ecological Risks and Natural Disasters in Southeast Asia: Challenges for Food Security, Public Health, and Economic Welfare”. This TREPSEA conference should serve as an arena for stimulating academic exercise and policy dialogues on trans-disciplinary dimensions of environmental problems in Southeast Asia. I have heard from the Chairman of Organizing Committee of TREPSEA Conference, Dr. Slamet Budi Yuwono of UNILA, that the Conference is currently attended by about 200 participants from at least 5 countries. We would like to convey our sincerest thanks and appreciations to three important keynote speakers, Dr. Alue Dohong, Vice Minister of Environment and Forestry, Professor Bambang P.S. Brodjonegoro of the University of Indonesia, and Professor Hein Mallee of RIHN-Kyoto. Our sincerest appreciations also go to all invited speakers and contributed speakers and to all of you, the participants from different parts of the world. Initially, we plan to host this conference off-line, so that we could take you all to visit our field research station in East Lampung and Central Lampung, our field laboratory in promoting sustainable development in many different places in this Province. Unfortunately, the Covid-19 Pandemic has prevented us all to meet you in person. However, although this Fourth TREPSEA Conference is organized online by Zoom platforms, we really hope that the objectives of the Conference will be achieved. We believe that we could stimulate academic exercise and policy dialogues on trans-disciplinary dimensions of environmental problems in Southeast Asia, encourage trans-disciplinary research dimensions on of environmental problems, and other related issues on sustainable development in general.

Ladies and Gentlemen,

By the name of Allah, the God Almighty, I hereby officially open the Fourth International Conference of TREPSEA. We wish you all have a fruitful and productive conference in the next three days. Thank you very much for your kind attention.

Wassalamu’alaikum Warahmatullahi Wabarakatuh.

Bandar Lampung, September 16 of 2021

Rector of the University of Lampung

Professor Karomani

# **BOOK OF ABSTRACTS**

# **KEYNOTE & PLANARY SESSIONS**

## **The Roles of University and Research Agency in Managing Ecological Risks and Natural Disasters**

***Bambang P. S. Brodjonegoro***

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### **Abstract**

This paper examines the roles of university and research institutions in managing ecological risks and natural disasters. Recent studies and policy documents show that the majority ecological risks and of natural disasters in Indonesia is hydrometeorological such as floods, landslides, earthquakes, and tsunami. Based on the Ministry of Finance data, economic losses due to disasters reached an average of IDR 22.8 trillion (US\$ 1.6 billion) per year, and caused a death toll 1,183 people in the last 10 years. Climate change also poses major threat to food security, reducing crop yields by 5-10 percent, causing additional of 12 million people at risk of hunger in Southeast Asia. Moreover, one third of all food produced is either lost or wasted, amounted to 115-184 kg/capita/year, where the potential economic losses was IDR 213-551 trillion per year or approximately 4-5 percent of the Indonesia's gross domestic product (GDP). The food loss and waste (FLW) also contributed to the global warming by generating 1,703 million ton of CO<sub>2</sub>-eq or equivalent to 7.29 percent of total greenhouse gas (GHG) emission of Indonesia over the past 20 years.

University and research agency play important roles in providing in the following: First, research and innovation, where technological innovation is crucial in addressing societal problem and in resolving trade-offs between production and the ecosystem; Second, teaching and advocacy, such as direct community engagement to educate local communities, and bridging the research and policy gap, to provide policy makers with robust and high-quality researches. Therefore, green economy is a must, rather than an option. Green economy is our future, so that without green economy we could survive in a good way. We should start implementing the green economy as early as possible.

Keynotes: Climate change, hydrometeorological disaster, green economy

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# **Policy on Environmental Conservation and Sustainable Forestry Management for the Future**

**Alue Dohong**

Vice Minister of Environment and Forestry of The Republic of Indonesia,  
Gedung Manggala Wanabakti, Senayan, Jakarta-Indonesia

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**Abstract:** This paper explains the policy on environmental conservation and sustainable forestry management for the future. Covid-19 Pandemic, however, also taught us to adapt to the new and even the harshest condition. Thus, we all need to cautiously advancing our development while addressing environmental challenges in a balanced and holistic manner, including building a resilient and inclusive post-pandemic world through green recovery plan. The Government of Indonesia has implemented some aspects on environmental conservation and sustainable forest management. As a home for more than 490.000 species in 19 different types of ecosystem with 74 vegetation types, Indonesia, well known as one of the mega biodiversity country, supports environmental conservation especially to preserve the biodiversity of the country. Indonesia promotes 3 pillars of the Biodiversity Convention; (1) conservation, (2) sustainable utilization, (3) equitable access and sharing on genetic resources.

The Government of Indonesia has been encouraging initiatives taken by producers to improve end-of-life management, and innovation in designing plastic better and more circular. Indonesia has issued regulation emphasizing the obligation of producers to reduce waste originating from products, product packaging, and the containers they produce by implementing the 3R (reduce, reuse, recycle) and circular economy principles in their business practices. Indonesia is continuously strengthening its transformational reforms to achieve the responsible economic growth, as an integral part of sustainable development agenda. We have developed and issued a “Sustainable Finance Roadmap Phase II for 2021 – 2025: The Future of Finance” as a foundation for the Indonesia’s Financial Services Sector and serve as a reference for the line Ministries/Institutions in developing innovative financing initiatives. An ecosystem has been developed in the Roadmap encompasses 7 (seven) key components: (1) policy; (2) funding/investment products; (3) market infrastructure; (4) coordination among ministries/institutions; (5) non-government support; (6) human resources; and (7) awareness. This ecosystem is hoped to create transparent regulations, build synergies, and improve financial industry’ s capability.

**Keywords:** Biodiversity Convention, Sustainable Finance Roadmap

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## **Transdisciplinarity, Research Institute for Humanity & Nature, Future Earth**

**Hein Mallee**

Research Institute for Humanity & Nature, Japan.

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**Abstract:** Transdisciplinarity can be defined as real-world problem-solving involving both researchers and actors in society. It can take various concrete approaches, but one element always involved is the bridging of different kinds of knowledge, as researchers, policy-makers, citizens, indigenous peoples, etc. hold different kinds of knowledge that are all needed in addressing the grand challenges of the 21st century. This presentation briefly introduces a few main aspects of transdisciplinarity and then introduces the experience of the Research Institute for Humanity and Nature (RIHN, Kyoto, Japan) as well as a global initiative called Future Earth, of which RIHN hosts the Regional Center for Asia. RIHN aims to provide a safe space for experimentation with transdisciplinary research whereas Future Earth links researchers and other actors in large networks.

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## **The Character of symptoms related to heavy metals contamination in Gorontalo Province, Indonesia**

**Sri Manovita Pateda<sup>1</sup>, Masayuki Sakakibara<sup>2,3</sup>**

<sup>1</sup> Medical Faculty, State University of Gorontalo, Indonesia.

<sup>2</sup> Research Institute for Humanity and Nature, Kyoto, Japan

<sup>3</sup> Faculty of Collaborative and Regional Innovative, Ehime University, Japan

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**Abstract:** Pollution is still the number one environmental problem in the world, strengthened by the planet itself which is unstable, but continually material cycle moving naturally, and human (anthropogenic) redistribution in the elements are superimposed on these continuous naturals, and humans are placed in the high-risk exposure. But the diversity of the human biomedical system raises variation of the disease symptoms related to heavy metals, and even be overlapped with the general physiological disorders. //The purpose of this study is to explain the variability of symptoms related to heavy metals contamination in human body.//This study examined lung function using a portable spirometer, as well as general health and neurological examinations. Heavy metals concentration in hair sample analyzed by ICP-MS in RIHN, Kyoto, Japan. As the results, lead concentration in scalp hair related to lung function with smoking status as a comparison, shows that smoking is not a determinant factor in the occurrence of pulmonary disorders associated with heavy metal contamination. On the other hand, chronic exposure to copper shows the obvious sign of Kayser Fleischer ring. This is the physiological character of human age. One of the metabolic factors that influence tremor symptoms is nutritional status. Malnutrition tends to lead to deficiency of essential body elements and tremor symptoms are easy. The conclusion that can be drawn from this study is that the diversity and uniqueness of the human body systems have been studied and need to be studied more deeply.

**Keywords:** pollution, anthropogenic, heavy metal, spirometer, copper.

## Arsenic, mercury, and lead absorption by *Pteris vittata* in the Bone River area, Gorontalo Province, Indonesia

Nurfitri Abdul Gafur<sup>1</sup>, Masayuki Sakakibara<sup>2,3</sup>, Satoru Komatsu<sup>4</sup>, Sakae Sano<sup>5</sup>  
and Koichiro Sera<sup>6</sup>

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**Abstract:** In terms of geography position, Bone Bolango has boundaries as follows: north-Northern Bolaang Mongondow regency; south-Tomini Gulf; west-Gorontalo Capital city; and east-Southern Bolaang Mongondow regency. There are two areas of artisanal small-scale gold mining (ASGM) in the region where previously reported as a source of heavy metals such as Arsenic (As), lead (Pb), and mercury (Hg). These metals and metalloid has a significant impact, which is harmful both to humans and the environment. This study reports an investigation of heavy metal and metalloid absorption by *Pteris vittata* in the As–Pb–Hg-polluted Bone River area, Gorontalo Province, Indonesia. *Pteris vittata* and soil samples were collected along the Bone River area, from upstream, ASGM area, to downstream. This study shows *Pteris vittata* has a higher-density distribution in the upstream of the River and ASGM area compare to downstream. Maximum concentrations of As, Hg, and Pb recorded in soil samples were 401, 36, and 159 mg kg<sup>-1</sup>, respectively, with maximum concentrations in *P. vittata* of 17,700, 5.2, and 39 mg kg<sup>-1</sup>, respectively. As a hyperaccumulation plant of As, *P. vittata* also absorbs Hg and Pb, and so may be useful as a bioindicator in assessing environmental pollution by heavy metals and metalloids.

**Keywords:** Absorption; Arsenic; Mercury; Lead; *Pteris vittata*

## **Transformation of Values and Behavior Towards Solving Environmental Issues Using Transdisciplinary Approach**

**Masayuki SAKAKIBARA<sup>1,2</sup>, Hiroki KASAMATSU<sup>2</sup> and Yuichi MATSUMOTO<sup>3</sup>**

<sup>1</sup> Research Institute for Humanity and Nature, Kyoto, Japan

<sup>2</sup> Faculty of collaborative regional innovation, Ehime University, Japan

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**Abstract:** People around the world have pursued material and economic affluence after World War II. As a result, the economy has developed not only in developed countries but also in developing countries, and many people have become able to lead convenient and comfortable lives. The purpose of this study is to clarify the importance of transdisciplinary research utilizing “transformative boundary objects (TBO)” and “transdisciplinary community of practice (TDCOP)” theoretically and practically to collaborate with various stakeholders with serious interests and solve the environmental problems. It is important for both to identify the TBO that are indispensable for the people of the region from the nature, culture, history, and traditional industry, etc. of the region. It is effective in encouraging people who are not interested in the problem to participate in transformational learning and to raise their interest in the problem. In order to solve environmental problems, it is important for inhabitants and researchers to work together to transform mutual values and behavior, and engage in learning and practice in the TDCOP. The result of practical research carried out in Gorontalo Province, Indonesia, shows that the usage of TBOs and the formation and fostering of TDCOPs in collaboration with key stakeholders are effective methods for solving the environmental pollution problem by artisanal and small-scale gold mining against the background of poverty.

**Keywords:** Environmental problems; Transdisciplinary approach; Transformative boundary objects (TBO); Transdisciplinary community of practice (TDCOP); Transformation of values and behavior; Gorontalo Province; Indonesia



## **Integrating Green Infrastructure System in Indonesian Agriculture**

**Ryohei Kada**

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**Abstract:** Asia is facing serious environmental degradation, mainly caused by rapid forest losses and land use changes. As a result, flooding, water quality degradation and other negative impacts to the livelihood of rural population have resulted, including biodiversity losses and declining ecosystem services.

Green Infrastructure (GI), defined as maintaining agricultural production, can provide sustainable ecosystem services to local people and regional economy. GI could also be adopted for disaster risk management to protect and/or reduce natural disaster risks of flooding, soil erosion or drought. If well-managed, GI can provide good nutrient cycles, biodiversity with healthy ecological balance; providing sustainable fishery, aquaculture, forestry and agricultural resources (and biomass energy outputs).

We have conducted an empirical research on this subject in Sekampung Watershed, Indonesia, with the participation of local people and communities. The following 3 points have been examined in this collaborative research:

- (1) What are the major roles and significance of green infrastructure, especially with respect to disaster risk reduction management?
- (2) Whether environmental conservation and productivity enhancement (sustainable rural development) are compatible? and
- (3) How community-oriented and watershed-based approaches (Trans-disciplinary Approach) are effective in this case?

## **Ecological Risks and Food Security**

**Bustanul Arifin**

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**Abstract:** This article examines the nature of ecological risks and their consequences on food security, covering the impact of climate change on global gross domestic products (GDP) by 2050, the roles of Indonesian agriculture as a temporary cushion during the economic crisis brought about by Covid-19 pandemic and the food system approach to food security. The exposition of ecological risks was developed based on the extreme weather events and natural disaster data collected from the emergency events database and daily cumulative confirmed Covid-19 cases from Our World Data. The food security performance is presented at the global level and supported by the domestic status of food security and vulnerability atlas.

The findings show that Indonesia ranks 65 out of 113 countries, a significant decline from the 60th ranks in the previous year. Regions in Eastern Indonesia have serious episodes of food security and vulnerability, because of low level of consumption to food availability ratio, high percentage of poverty and low population to health workers ratio. The extreme drought of 2019 had severe impacts on rice production, causing a significant decline and production capacity, hence sustainability issues. The policy recommendations include improving productivity and efficiency, through crop breeding, climate change adaptation and mitigation, capacity building in R&D, policy reforms in food security, to be integrated with rural development and employment creation. Transdisciplinary approach is really needed as the ecological risks and food security cover the biophysical, socioeconomic, health dimensions of global environmental change. The future of food security in Indonesia, for its part, must rely on more scientific and evidence-based policy formulation and implementation at the national, provincial, and local level.

## **Wildlife Corridor and Forest Resource Management Through Mathematical Programming toward SDGs**

**Atsushi Yoshimoto**

Institute of Statistical Mathematics, Tokyo, Japan.

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**Abstract:** Spatial requirements to preserve or set aside natural reserve from management activities are one of the major concerns for forest managers as well as natural reserve practitioners. Mathematical programming plays an important role in solving this conflict efficiently and has been extensively utilized for forest resource management. The current environmental concerns are placed on the creation of contiguous forest stands for the protection of wildlife habitat protection through the management scheduling. In this presentation, I construct a new exact optimization model to seek optimal corridor connection in a spatially constrained forest resource management over space and time. The proposed model incorporates the concept of the maximum flow problem to deal with spatial connection for corridor reserve network. Two forest harvest scheduling models are utilized as a base for forest resource management. I demonstrate several scenarios on the size of hypothetical forest maps to investigate how the proposed models perform.

## **Securing Customary Rights for Sustainable Development: From Constitutional Rights to Legislation Making**

**Rudy**

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**Abstract:** Disaster study and sustainable development is an interdisciplinary field in which more active involvement of legal studies is required. While lawyers have contributed to legal instrument design in such areas as an administrative organization on emergency rescue and disaster relief, many legal issues in the disaster-related issues have been left almost untouched.

At the same time, the revival of local wisdom and adat tradition has been a recent key area in the international endeavors of law and institution building in Asia, in which Indonesia's and many Asian countries' legal development is significantly involved. Within the context, the revival of local wisdom since long ago has been linked to the community resilience as part of the customary community live hood, thus shall be considered as an essential element for disaster management and sustainable development policy and law-making.

However, while local wisdom may be fruitful for these issues, a naive assumption of legal pluralism to naturally survive and integrate into the post-modern context can no more be defended. Unless intentionally resorting to legal measures to assert such informal norms against the intrusion of global standards. It is perhaps the responsibility of this paper to re-identify the need for local wisdom in the form of customary rights integration into the legal instrument. Within context, the limit of legal positivism within the context of legal instrumentalism is discussed.

**Keywords:** Disaster, Sustainable Development, Customary Rights, Legal Instrument.

## **Geodiversity Assessment of Oluhuta Geosite as Geological Heritage Potential in Gorontalo Province**

**Yayu Indriati Arifin<sup>1</sup>, Intan Noviantari Manyoe<sup>1</sup>, Febriyanto Masulili<sup>1</sup> and Dewi Darmayanti Tolodo<sup>1</sup>**

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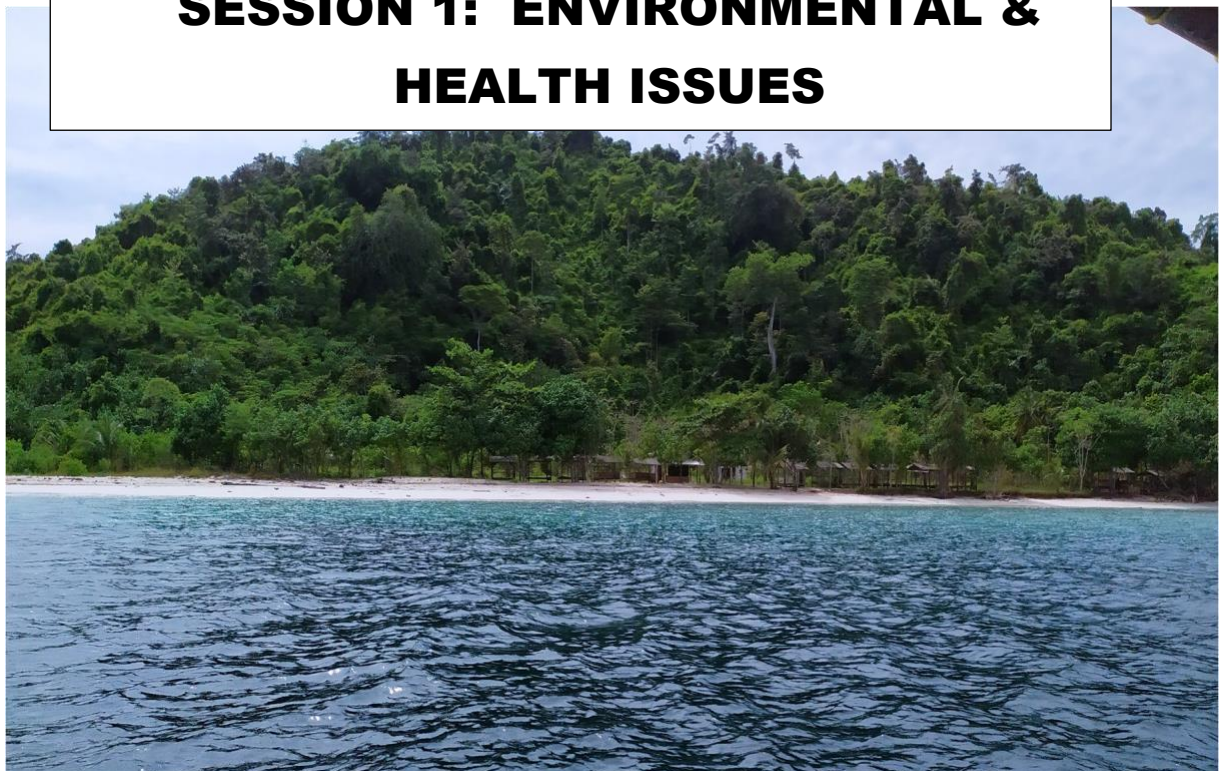
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**Abstract:** Indonesia is a country that has geological diversity. This geological diversity is the formation of the tectonic processes at work in this area. Gorontalo Province has potential geotourism locations including those which are known as public tourism locations, such as waterfalls, lakes, beaches, valleys, canyons, hot springs and others. This study aims to provide an assessment of the geological diversity in the Oluhuta area as a potential geosite area. The method used in this research is geological survey and interviews with local people. The assessment of each geosite is carried out using the Regulation of the Minister of Energy and Mineral Resources of the Republic of Indonesia Number 1 of 2020. Based on the geological surveys, Oluhuta area has geological diversity, namely the presence of igneous rock outcrops that have a columnar joint structure and setting joint. In addition, there is a Coral Terrace which has geological diversity such as limestone caves and various types of hard fossils. Based on the interviews in Oluhuta Village there is a historical site, namely the discovery of prehistoric human skeletons that were around 2000 years ago. Assessment average for Oluhuta is 3.10 that's mean Oluhuta has high score as geosite potential to be developing. Based on the results of the assessment, the recommended utilization are for education, research and tourism.

**Keywords:** Geopark; Geosite; Assessment; Oluhuta; Gorontalo



## **SESSION 1: ENVIRONMENTAL & HEALTH ISSUES**



## **The Effect of Housewife Assistance on Dengue Hemorrhagic Fever Management in the Work Area of the Pampang Community Health Center Makassar City**

**Ilham Syam<sup>1</sup>, Nurleli<sup>1</sup> and Nurul**

<sup>1</sup> Sekolah Tinggi Ilmu Kesehatan Makassar, Indonesia

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**Abstract:** Dengue hemorrhagic fever is a disease caused by the dengue virus through the bite of the *Aedes aegypti* mosquito. In Indonesia in 2016 there were 201,885 dengue cases with 1,585 deaths. In the last three years, there were 16 cases of DHF sufferers in RW 02 Panaikang Village and RT A was in the first place with a total of 6. The purpose of this study was to determine the effect of housewife assistance on DHF prevention in the Pampang Community Health Center, Makassar City. This type of research is descriptive research, the population in this study is a housewife in RT A RW 02 with total sampling. The results of the research before assistance showed that there were 11 houses in the experimental group (50.00%), 11 houses (50.00%). The control group had 9 larvae (40.9%), 13 larvae (59.1%) did not. After assisting the house, the experimental group larvae were 2 houses (9.1%) did not have 20 larvae (90.9%). Control group Having 9 larvae (40.9%) does not have 13 houses (59.1%),  $Z = -3,000$  p value of  $0.003 < 0.05$ , the hypothesis is accepted. Based on the research results, it can be concluded that there is an effect of assistance on Dengue Hemorrhagic Fever Management in the Work Area of the Pampang Community Health Center, Makassar City. The suggestion that the researchers recommend requires regular outreach and monitoring from the local government so that the public knows the PSN (3M Plus) program and its benefits.

**Keywords:** PSN 3M Plus; Larva; Housewife Assistance

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## **Effects of Mentoring Housewives Assistance on Ability to Sort Waste in Sub-District of Panakkukang Makassar**

**Nurleli<sup>1</sup>, Sri Syatriani<sup>1</sup> and Sri Fauziah<sup>1</sup>**

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**Abstract:** Waste sorting is separating one type of garbage from another type. Minimum sorting into two types, namely organic and inorganic waste. In 2016, the number of garbage in Makassar reached to 4,183.41 m<sup>3</sup>/day, while the one handled was 3,962.63 m<sup>3</sup>/day. The number of landfill in Panakkukang Subdistrict is 403.13 m<sup>3</sup>. In RW 002 RT 001 Sinrijala, Panakkukang Sub-District, Makassar, there were 53 families with 48 housewives, who had never sorted out waste. This study aimed to recognize the effects of mentoring housewives on the ability to sort waste. This was quasi-experimental research with non-randomized control group pretest posttest design. The number of sample was 48 respondents in RT 001 RW 002 Sinrijala, selected by saturated sampling. The results before mentoring revealed that those who sorted waste in experimental group was 1 respondent (4.2%), while those who did not sort out garbage were 23 (95.8%). In control group, housewives who sorted out garbage were 2 (8.3%), while those who did not were 22 (91.7%). After being mentored, 10 respondents (41.7%) sorted waste, but 14 (58.3%) did not in experimental group. In the control group, 2 respondents (8.3%) sorted out garbage, while 22 (91.7%) did not. Statistical test obtained  $Z = -3.000$  p value of  $0.003 < 0.05$  that the hypothesis was accepted. It concluded that there was an influence of assistance on waste sorting. It is encouraged to provide regular counseling and monitoring from local government, so that people know the benefits of sorting waste.

**Keywords:** Sorting waste; Organic; Inorganic; Housewife mentoring

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## **Hazard Risk Identification from Used Masks**

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**Abstract:** COVID-19 has brought many changes of lifestyle to people around the world. The obligation to use masks as the efforts made to prevent the transmission of COVID-19 is such an example is an example. This policy led to the increase of masks using in the general population. In fact, some particular procedures must be applied of masks usage and used masks handling thus prevent negative impacts. Many of these guidelines not generally known. This study was carried out to determine the handling of used masks at the beginning of pandemic. The research data were obtained from 152 random respondents who voluntarily filled out online questionnaires. Participants came from a number of areas in Jabodetabek that implemented Large-Scale Social Restrictions (PSBB) and required to wearing masks. Most of the respondents kept masks that had been used before to reused them without washed them first. Disposal of used masks, both medical masks and cloth masks, was also showed poor sanitation for some participants. The waste generation from used surgical masks by whole community at the start of the pandemic is also quite alarming. Education on handling of used masks is important to be widely publicized to prevent potential hazards that can be caused, such as the transmission of respiratory infections and environmental contamination risk.

**Keywords:** COVID-19; used masks; masks disposal; masks waste; environmental contamination

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# **Implementation of Health Protocols to Reduce COVID-19 Spread: Study at Terminal Transit in Tana Toraja District, South Sulawesi**

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**Abstract:** Coronavirus Disease 2019 (COVID-19) is a disease caused by SARS-CoV-2 which can cause respiratory problems and pneumonia. The number of COVID-19 sufferers in the world reached 103,377,424 cases and South Sulawesi recorded 48,910 cases in January 2021. The study aimed to assess the level of compliance with wearing masks, maintaining distance, and washing hands in the transit terminal area in Tana Toraja Regency. The research design used an observational method with a descriptive design. Data collection was carried out on December 8 - 12 2020. The study population was all visitors in the transit terminal area of Tana Toraja Regency as many as 450 people. Samples were 100 visitors at the transit terminal of Tana Toraja Regency. The sample was selected by accidental sampling technique. The data collection instrument was carried out by the method of observation and interviews using the observation sheet and questionnaire. The results showed that the proportion of respondents who obeyed using masks, kept their distance and washed their hands was quite high compared to those who were not compliant (82%, 71%, and 74%, respectively). The government must implement strict and consistent health protocols in the transit terminal area to break the chain of transmission of COVID-19 in Toraja Regency.

**Keywords:** COVID-19; Health protocol; Transit terminal; Toraja

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## Evaluation of the Remote Health Survey Mode Conducted for the Artisanal and Small-scale Gold Mining (ASGM) Community in Mandalay Region, Myanmar During COVID-19 Pandemic

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**Abstract:** Artisanal and small-scale gold mining (ASGM) activity poses the environmental and human health impacts to the mining community which requires the health surveys on ASGM related health outcomes. However, the face-to-face health surveys in ASGM areas during COVID-19 pandemic raises the questions on ethical issue and safety of both interviewers and interviewees, thereby the remote health surveys are considered. On the other hand, the evaluation of the effectiveness of the remote health surveys is required. In our study, we have been evaluating the effectiveness of the live video health interview of the health survey which is conducted using a SNS application in ASGM community in Chaung Gyi Village, Thabeikkyin Township, Mandalay Region, Myanmar during COVID-19 pandemic. The ongoing study is planning to include about 100 respondents of the study area. The respondents undertook the interview questions and followed the instruction of the medical examinations by medical doctors during the live video health interview and their hair samples were collected to analyze the contents of mercury and other heavy metals. The interview questions consisted of the detailed health questionnaires on the present and past medical histories, symptoms of the mercury intoxication, and household survey questionnaires regarding their occupations, educational backgrounds, and socio-economic status of the respondents. The medical examination included the evaluation of general well-being and signs of the mercury intoxication. We found that the live video health interview mode is effective for assessing the health status of the ASGM community. In conclusion, it is recommended to conduct onsite annual health check of the ASGM communities once per year and follow up with regular remote health surveys such as using live video health interview mode for both assessment of the health status and long-term health monitoring of the ASGM communities.

**Keywords:** Remote health survey; Live video health interview; ASGM; Health questionnaire; COVID-19 pandemic, Mandalay Region

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## **Knowledge and Attitude of Pregnant Women Towards COVID-19 Prevention in Makassar City, Indonesia**

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**Abstract:** Coronavirus disease 2019 (COVID-19) is an airway disease caused by the new corona virus. The transmission of COVID-19 from human to human occurs through droplets, contact and contaminated objects, so it is believed that pregnant women have a higher risk of serious illness. The purpose of this study is to describe the knowledge and attitudes of pregnant women towards the prevention of COVID-19 in Makassar City, South Sulawesi Indonesia. The research method used was a descriptive observational research. The subjects of this study were pregnant women in the work area of the Antang Community Health Center, by using the purposive sampling technique. Research instruments in the form of questionnaires and interviews. The results showed that from 73 respondents, there were 65 mothers with sufficient knowledge (89.0%), eight mothers with less knowledge (11.0%), and 71 mothers who had a preventive attitude towards COVID-19 (97.3%), and two mothers (2.7%) did not take COVID-19 prevention attitudes. The conclusions and suggestions from this study are that the knowledge and attitudes of pregnant women towards the prevention of COVID-19 are categorized as fulfilling. It is hoped that health workers will further increase outreach efforts related to the prevention of COVID-19 in pregnant women.

**Keywords:** Knowledge; Attitude; COVID-19 prevention; Pregnant

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## Characteristics of Moringa Leaf Powder as Fortification and Consumer Acceptance

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**Abstract:** *Moringa Oleifera* are not only rich in nutrients, but also have functional properties with efficacies and benefits for human health. Moringa leaf powder as an intermediate product can be used as fortification to enrich nutrition in food products with a concentration that is acceptable to consumers. This study aims to determine the physical and chemical characteristics of Moringa leaf powder and the level of consumer acceptance of the Moringa leaf powder fortification product. The research experiments included the process of making Moringa leaf powder until the preeminent temperature and drying time were obtained, and the use of Moringa leaf powder as fortification in food products. Fortification of ice cream used 4 (four) treatments of the concentration of Moringa leaf powder, 0.5%, 1%, 1.5% and 2%. The results showed that the yield of Moringa leaf powder was 25%, with a 7.80% of water content at a temperature of 47° – 50 °C for 5 hours. Proximate content of ash level 9.32%, 29.6% protein, 6.98% fat, 39.4% carbohydrates, 6.91% crude fiber, 1.86% potassium, 2.21% calcium, 91.2 mg / kg iron,  $\beta$ -carotene 271 mg / kg, vitamin C 498%. The level of consumer acceptance of fortified ice cream with moringa leaf powder shows the same acceptance of color, aroma, texture, except taste. The preferred ice cream formula for consumers is the concentration of 0.5% - 1% moringa powder.

Keywords: Moringa leaf powder; Fortification; Organoleptic test; Consumer acceptance; Moringa ice cream

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## **The Determinant Factor of Stunting in Children Under Five in Bandar Lampung City**

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**Abstract:** Lampung is one of eight provinces in Indonesia that has experienced an increase for three consecutive years in the prevalence of stunting in under five years children, which in 2017 reached 31.6%. In 2018, this figure may drop slightly to 27.5%, but this is still quite high. Some cities and districts have a much higher figure, including Bandar Lampung as the provincial capital, which reaches 33.4%. This study aims to determine the determinants of stunting in children under five in Bandar Lampung, by a survey method that takes a sample of 124 children under five who are registered in posyandu in three topographic regions. The three regions are lowland, urban and highland areas. The research data was collected in September-October 2019, including anthropometric data and nutritional intake of children under five as well as the socio-economic characteristics of their families. The results showed that the prevalence of stunting was 43.5%, much higher than the provincial average. The data analysis showed that stunting was not only caused by a lack of nutritional intake, but significantly stunting was also influenced by the mother's educational and social status, namely the mother's occupation before marriage and the mother's employment status during pregnancy.

**Keywords:** Highland; Lowland; Prevalence; Stunting; Under five years children; Urban

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## **Sources of Knowledge for Pregnant Women about How to Prevent Maternal Mortality Based on Group and Mass Communication Levels**

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**Abstract:** Maternal Mortality Rate was an important indicator in showing the number of mothers who die because of pregnancy disorders or their treatment during pregnancy, childbirth and during the puerperium regardless of the length of gestation per 100,000 live births. In 2017, the maternal mortality rate in Southeast Sulawesi was 75 people per year. Meanwhile, in North Kolaka Regency there were 209 per 100,000 live births. The aim of study was to determine the source of knowledge for pregnant women on how to prevent maternal mortality based on the level of group and mass communication. This type of research is an observational study with a descriptive approach. The population was 140 people, the sample size was 103 people who were obtained using the Slovin formula. Sampling used simple random sampling technique. Data collection was by using a questionnaire that was filled in directly by pregnant women. The results showed that of the 103 pregnant women at the Lasusua Health Center who had less knowledge, 10 respondents (9.7%) had sufficient knowledge, while those who had sufficient knowledge were 93 respondents (90.3%). Pregnant women get information through the level of group communication with a good category (10%), comes from the recitation group (4.9%), farmer/sewing/housewives group or the like (2.9%), pregnant women class group (1.9%), and the artisan group (1.0%). Pregnant women get information through the level of mass communication with a good category, only 17.5%, which comes from TV, radio, newspapers/magazines/tabloids, brochures/banners/posters/flyers, WhatsApp, Facebook, Twitter, Instagram, telegram, Youtube and its kind. The conclusion shows that the source of knowledge of pregnant women on how to prevent maternal mortality is still lacking based on the level of group and mass communication. It is necessary to make efforts to provide communication, education, and information through group and mass communication approaches.

**Keywords:** Source of knowledge; Communication level; Group; Mass

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## **Assessment of Factors Affecting the Incidence of Malaria in the Middle Wasile Area, East Halmahera Regency, North Maluku Province**

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**Abstract:** Malaria is the primary cause of death for children and pregnant women in many developing countries. Malaria cases are still quite high in Indonesia, especially in Maluku province. The three main factors that contribute to malaria in humans are host, agent and environment. This study aims to identify and analyze the factors that influence the increase in malaria cases in the Middle Wasile area, East Halmahera Regency, North Maluku Province. The study design used a descriptive cross-sectional study. This study involved 32 patients of malaria as respondents who were selected based on medical records and determined used purposive sampling technique. The assessment results show that the age level of the patient is dominated by the 26- 35-year-old group, the gender is female, the occupation is farm labour, the income level is Rp. 1,400,000 - Rp. 2,000,000 in proportions (47.1%, 64.7%, and 64.7%, 47.1%, respectively). Meanwhile, the environmental assessment results show that the biological environment has more influence on the incidence of malaria when compared to the physical and social environment (53.1%, 37.5% and 28.1%, respectively). The government must build an integrated and consistent system by involving individuals, families and communities in environmental management.

**Keywords:** Assessment of factors; Malaria; Maluku

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## **Survey of Knowledge and Practice related Health Risks of Mercury Exposure among Gold Craft Workers in Rappocini Area, Makassar City**

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**Abstract:** Mercury (Hg) is a silvery chemical element that is liquid at room temperature. Hg is a dangerous heavy metal because it leads to acute intoxication in humans, such as damage to the brain, lungs, central nervous system and kidneys. Goldsmiths pose the risk of exposure to Hg through direct skin contact or inhalation of mercury vapour during the amalgam burning process. The study aims to assess the level of workers' knowledge regarding the risk of exposure to Hg and investigate the practice of preventing health risks from exposure to Hg in household-level gold-crafting activities. The study used a descriptive observational approach. The population of the study was 110 gold craftsmen in the Rapokkaling area. The number of samples was 52 people who were determined by purposive sampling technique. The data collection instruments included a structured questionnaire, camera, recorder and field note. The results of data analysis showed that the proportion of respondents with a sufficient level of knowledge was greater than that of a low level of knowledge (65.4% and 34.6%, respectively). The results of the observation showed that 100% of gold craft workers had unsafe work practices. A sufficient level of knowledge about the risks of exposure to Hg does not guarantee the discipline of implementing safe work practices including using personal protective equipment.

**Keywords:** Knowledge; practice; health risk; mercury exposure; gold craft worker

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## **Central Java Regional Geochemistry: Influence of Environmental Geology and Mineral Occurrences**

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**Abstract:** Stream sediments geochemical surveys were undertaken in the Central Java Indonesia between 2012 and 2013, as a part of geochemical mapping project of Java and Kalimantan Islands by the Centre for Geological Survey, Geological Agency, Ministry of Energy and Mineral Resources with support from universities. A total of 1583 stream sediment samples were collected from Central Java, resulting in an average sampling density one sample for about 25 km<sup>2</sup>. The stream sediments samples were dry sieved and the fraction passing -80 mesh was analyzed. A powder pellet was used prior to analysis by X-Ray Fluoresces (XRF) for 30 elements. Geochemical maps at a scale of 1:100,000 were created using statistical kriging methods processed by the Oasis Montaj software. These maps as unpublished report to accompany 20 published geological maps in Central Java. Based on the overlay between geological and geochemical maps, there are several elemental anomalies in several places, for example: The ultramafic formation from Kebumen showing distinctive anomaly Cr, Co, and Mg. Meanwhile the potassic igneous rocks from the Muria Mountain have Ce, La and Zr anomalies. Elemental anomalies related to mineral resources and mining areas such as As, Cu and Pb are found in Trenggalek, Pacitan, and Kebumen; While the elements Ba, Fe and Mn are scattered along the southern coast of Central Java. Anthropogenic elements (Cl, Ce and As) spread along the north coast of Central Java probably because of pollution by industrial, farming and urban city. Heavy metals (Cr, Cu and Zn) pollution that have been identified by previous researchers in the Bengawan Solo river flow between Wonogiri and Sragen can be seen on this geochemical map.

**Keywords:** Geochemical Map; Stream Sediments; Central Java; Environmental Geology; Mineral Resources

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## Metals in Green Mussels: Is There Any Effect on Their Reproduction? A Preliminary Study of Muara Angke, Jakarta Bay

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**Abstract:** Water pollution and its impacts on ecosystems in Jakarta Bay have been extensively studied over the years. Muara Angke is known anecdotally as one of the most heavily polluted parts of Jakarta Bay. In the context of the ongoing debate regarding contamination in the area, we present here the concentration of metals in green mussels *Perna viridis*, one of the most popular edible commodities in Jakarta bay. Histological examination of their gonads was also performed to demonstrate the direct effects of possible contamination on reproduction in this organism. Among those metals quantified by emission spectroscopy using inductively coupled plasma (ICP), only arsenic (As) exceed the limit set by the National Agency of Drug and Food Control Republic of Indonesia. However, the histological observation of gonad tissue after being stained with hematoxylin and eosin revealed some pathologies, including atresia. Interestingly, these adverse effects are more prominent in female mussels. Ecologically, direct impacts on the tissue of *P. viridis* will provide vital information needed to predict the health of the species in Muara Angke and the sustainability of the population. The levels of metals detected and pathologies recorded in *P. viridis* in the context of the environment and public health are discussed. As green mussels are a popular food in the area, the information is also of public interest.

**Keywords:** Jakarta Bay; Green mussels; Heavy metals; Histopathology; Reproduction; Muara Angke

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## **A Simple Colorimetric Detection of Ceftriaxone and Its Removal Using Zeolite Synthesized from Low-Cost Materials**

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**Abstract:** One of the most widely used antibiotics in Indonesian hospitals is ceftriaxone (rocephin), a third-generation cephalosporin with an excellent performance against many gram-negative bacteria. Due to incomplete metabolism in human body (patients), the residue can be continuously released from hospital wastewater into the environment and also promotes the growth of resistant bacteria. In this study, a simple colorimetric detection of ceftriaxone from aqueous solution using a visible spectrophotometer and its removal by zeolites were investigated. Zeolites was synthesized from three different materials (volcanic soil, pumice, and fly ash) as precursors via hydrothermal route. The result showed that ceftriaxone formed a red colored complex with iron(II) under acidic condition which was stable less than 15 hours at room temperature. The maximum wavelength found at 470 nm was used to determine ceftriaxone concentrations. Although the adsorption of ceftriaxone on zeolites was relatively low, the adsorption can be increased at acidic pH. Overall, this study revealed that the removal of ceftriaxone on zeolites can be determined colorimetrically using a visible spectrophotometer.

**Keywords:** Adsorption; Ceftriaxone; Hospital wastewater; Spectrophotometer; Zeolite

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## **Adaption Strategy of Fisherman to Climate Change : A Case Study from Limau Sub-District, Tanggamus Regency**

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**Abstract:** Climate change is a natural phenomenon that occurs all over the world. Climate change has a negative impact on many sectors such as the fisheries sector. One of the communities that is vulnerable to the impact of climate change is the fishing community in coastal areas. Fishermen depend on the availability of fish in the sea, waves, weather and other aspects related to climate and nature. This study aims to identify the fishermen's efforts and adaptation strategy to climate change. Data collection was carried out from July to August 2020 in Limau Sub-District, Tanggamus Regency with total respondent reached 80 fishing households. Respondents were determined through the approach of simple random sampling. The data collected consisted of both qualitative and quantitative data. Data collection was performed through the method of survey, Focus Group Discussion (FGD), and interview with key informants. Data were analyzed by the qualitative descriptive approach. The results of the study shows that fishermen in Limau Sub-district have made some adaptations to climate change in coastal areas through income diversification, diversification of fishing gear, migration and social network development among fishermen.

**Keywords:** Adaptation strategy; Climate change; Fsherman; Income; Migration

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## **Study of Potential Pollution of Teaching Laboratory Chemical Waste in IPB University and Its Alternative Management Solutions**

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**Abstract:** Chemical laboratory waste has the potential to pollute the environment because it is generated continuously every year. This study aims to determine and identify the characteristics of the chemical laboratory waste of the Teaching Laboratory of IPB University, its potential for environmental pollution. This study is important to provide solutions in handling waste that may have an impact on the surrounding environment. The method used is descriptive analytic with a qualitative approach. The identification of the chemical laboratory waste shows the following types: solid waste and liquid waste (acid-base, organic waste, inorganic waste, and heavy metal). The results showed that the total liquid waste for one year is about 1000 liters with the concentration of soluble Fe at 1114 mg/kg, ammonia at 562 mg/kg, and phosphate at 1159 mg/kg. The results showed that the levels of teaching lab waste exceeded the permissible quality standards according to Regulation of The Minister of Environment of The Republic of Indonesia Number 5 the Year 2014 and had the potential to pollute the environment. Although phosphate is unregulated in the quality standard parameters of laboratory wastewater, excessive phosphate disposal will have an impact on the environment, namely eutrophication. All the waste was categorized based on the waste management hierarchy to reduce the potential for hazardous chemical waste in the laboratory.

**Keywords:** Waste management; Toxic; Pollution; Laboratory wastewater

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## **Removal of Residual Antibiotics from Hospital Waste Water with Activated Carbon from Palm Kernel Meal (PKM)**

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**Abstract:** Antibiotics are well-known as one of the effective drugs to cure infectious diseases in Indonesian society, such as ceftriaxone. The use of ceftriaxone reached 4.10 DDD/hbd during 2012 for the treatment of typhoid fever in one hospital. This allows the release of ceftriaxone antibiotic residues into the environment. This study aims to utilize activated carbon from palm kernel meal (PKM) as an antibiotic residue absorbent. PKM waste was pyrolyzed at 750 °C for 3 hours as a physical activation. The infrared spectroscopy (IR) spectrum of the activated carbon of PKM waste shows that active functional groups are still present on the surface with calculating estimated surface area of 751 m<sup>2</sup>/g. The activated carbon from PKM waste was successful in absorbing antibiotic residues of 46.39 mg/g absorbent. This shows the potential of palm kernel meal activated carbon as an absorbent of the antibiotic residue of ceftriaxone.

**Keywords:** Absorption; Ceftriaxone; Hospital wastewater

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## **The Effect of Land Cover Forest on Fluctuations in Availability of Water in the Batutege Dam, Lampung, Indonesia**

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**Abstract:** Sekampung Hulu watershed has an important role in Lampung, as a catchment area for the Batutege dam. The Batutege Dam is a multi-purpose dam with its main function as a supplier of irrigation water so it is very dependent on water availability (inflow). The ability of the Batutege Dam to meet water needs in the dry season and prevent flooding in the rainy season is an indicator to determine the hydrological condition of the Sekampung Hulu watershed. This study analyzes the effect of forest cover on the inflow fluctuation of the Batutege Dam. To determine the relationship between forest cover and conditions of inflow fluctuations, a regression analysis was carried out between forest land cover and fluctuations in the inflow of the Batutege Dam. Results of the study showed that the inflow fluctuation from 2005-2012 is in the very high category, 2013-2014 is in a low category, 2015-2016 is in the medium category and 2017-2020 in the category of extremely high Condition of land cover of forest Sekampung Hulu watershed in 2005-2012 amounted to 15.67%, 2013-2016 has increased to 22.27% and 2018-2020 experienced a decrease in the forest area to 15.73%. The lowest fluctuation in inflow in 2014 was 28.99 with a forest area of 9,060.37 hectares, the highest fluctuation in 2010 was 578.26 with a forest area of 6643.65 hectares. Analysis of the relationship between landcover of the forest to fluctuations in inflow showed a relationship that is apparent between the extensive forests against value fluctuations of inflow with a p-value of 0.071. These results indicate that the condition of the forest will affect the stability of water availability. Therefore, efforts to improve forests and land through reforestation and rehabilitation activities are very important to prevent hydrological and environmental damage.

**Keywords:** Sekampung Hulu Watershed; Forest; Inflow; water balance; fluctuation

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## A Sociocultural Analysis of Word *Ladies* in ASGM Area of Suwawa Timur

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**Abstract:** With the existence of sex workers in the ASGM area in Suwawa Timur after women are allowed to come over to the mining sites, different interpretation of the society toward them needs to be analyzed. The concept of word *ladies* that refers to sex worker in the ASGM area needs to be explored. Women's perspective toward *ladies* is considered negative and it is because they are rivals to each other. Men, on the contrary, have a positive impression toward them, since they are the service users. In order to observe this, the purpose of this study was to examine the interpretation of the community members toward the presence of such *ladies* from gender perspective. Using a mix method through sociocultural approach with survey, questionnaire, and interview toward the inhabitants around the ASGM area has been conducted to reveal such issue. This study was conducted in nine villages around the ASGM area of Suwawa Timur District, Bone Bolango Regency, Gorontalo Province, Indonesia. The result has shown a unique trend in which contradicts with the previous theories. The finding exposed the fact that the existence of *ladies* in the ASGM area of Suwawa Timur was more acceptable to women than men. It is because the women view *ladies* as a job. It is constructed by social and cultural interaction happened in ASGM area. It can be seen that there has been a change in the viewpoint of *ladies* or sex workers in the ASGM area in terms of gender as the result of the sociocultural development of the community.

**Keywords:** ASGM; Gender; Gorontalo; Ladies; Sex worker

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## **An Analysis of *Natural Phenomenon Superstition* in ASGM area of Suwawa Timur**

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**Abstract:** Superstition has been destroyed by science, although it exists in the society including the ASGM area in Indonesia. It is just a handful research about superstition in the ASGM area, especially related to the *natural phenomenon*. Superstitions that refer to *natural phenomenon* usually use a supernatural thing. Its impact toward the point of view of the society from the perspective of sociocultural in ASGM areas needs to be investigated. Therefore, it is necessary to do the investigation regarding such thing for the context of Indonesia. Using a mixed method by applying interview, survey, and questionnaire toward inhabitants and miners around the ASGM area, some miners stated that there were some impacts of the superstitions that exist. This means that the existence of *natural phenomenon superstition* in the ASGM area is still strong. This study was conducted in nine villages around ASGM area of Suwawa Timur District, Bone Bolango Regency, Gorontalo Province, Indonesia. However, this result has been contradicted with the previous statement, in which science has destroyed superstitions. This finding leads to the idea that there is a big change of viewpoint of *natural phenomenon superstitions* in the ASGM area of Suwawa Timur especially from perspective of the miners.

**Keywords:** *Superstition; Natural Phenomenon; ASGM; Miners*

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## **Attitudes and Skills of Women Farmer Groups in Waste Management in the Coastal Areas of Srengsem Village, Bandar Lampung City**

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**Abstract:** In the era of technological advances today, the problem of waste is still a matter of concern for the public. Awareness in reducing and handling waste has begun to be driven from its own sources, namely through knowledge, attitudes, and skills in community waste management, especially for coastal communities who are often affected by the accumulation of garbage carried by ocean currents and rivers. The purpose of this study was to determine the level of knowledge of coastal communities in waste management, to determine the level of attitudes of coastal communities in waste management, and to determine the level of skills of coastal communities in waste management. This research was conducted in Srengsem Village, Panjang District, Bandar Lampung. Data collection in this study was conducted in November 2020. Respondents were 40 female farmers who participated in KWT Kenanga. This study used a survey method with a quantitative descriptive approach. The results from this research are the level of knowledge and attitudes of coastal communities in waste management which were classified as high but not yet supported by concrete actions or skills, meaning that the community had made waste reduction and handling such as simply processing waste into planting media and accommodating waste in one container so that it would not be scattered. However, they have not fully implemented the Reduce, Reuse, and Recycle management.

**Keywords:** Attitudes; Skills; Waste management

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## Effectiveness of Using of Brown Algae Alginate to Immobilize the Indigenouse Bioremediation Bacteria for Reduce Waste Water from Shrimp Culture

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**Abstract:** Shrimp culture contributes significantly to Indonesian gross national product and also contributes to supply of wastewater that seriously causes in coastal ecosystem. *Bacillus coagulans* T1.2, the indigenous bacteria from shrimp ponds in East Lampung, revealed to reduce total ammonia nitrogen (TAN). The purpose of this study was to know the effectivity of immobilization bacterial by natrium alginate from marine brown algae to reduce wastewater from shrimp culture. The brown algae, *Sargassum* and *Padina*, were collected from Pesisir Barat and Ketapang beach, Lampung. Alginate was extracted from both *Sargassum* and *Padina* by alkali method. The bacterial immobilized beads were made by mixed *Bacillus coagulans* suspension with alginate (1:2 v/v) and created beads by 1,5 ml syringe without a needle. In the in vitro study, the immobilized bacteria were sunk in artificial wastewater (2 beads ml<sup>-1</sup>) and incubated for 14 days. The control group was performed by the same bacteria without immobilization. After incubation, the TAN was measured by UV-spectrophotometer and the viability of bacteria was evaluated. The results showed that using *Sargassum* alginate as the matrix of immobilization increase in bacterial activity to reduce TAN in artificial wastewater. However, there was no different result on bacterial viability after treatment in immobilization by both *Sargassum* and *Padina* alginate although it was higher than control group. This study suggests that using *Sargassum* alginate is potent as immobilization matrix to increase the bacterial activity and viability in wastewater reducing from shrimp ponds.

**Keywords:** *Bacillus coagulans*; Immobilized bacteria; *Padina*; *Sargassum*; Shrimp ponds

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## Current Situation, Problems, and a New Program of the Long- Term Stay Type ASGM in East Suwawa, Gorontalo, Indonesia

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**Abstract:** There are 7 artisanal and small-scale gold mining (ASGM) sites in Gorontalo Province. There are 2 mining sites, namely Motomboto and Mohutango, in East Suwawa District (*Kecamatan*), Bone Bolango Regency (*Kabupaten*). Both are far from villages. We explored the current situation and problems of long-term stay type ASGM. According to the interviews conducted in 2020, the number of miners at Motomboto is 1,083 persons/month. They stay at the mining site for a minimum of one week to three months, because it takes around 2 hours from the nearest village by off-road motorcycle. In the mining site, there are simple lodgings, eating places, coffee shops, and karaoke bars. In 2020, 55.2% of the miners are from outside of Bone Bolango Regency. Owners of mining tunnels manage employment, arrange materials and meals, and provide transportation expenses for miners. Then, the owners deduct these expenses and the owner's portion from income, and they pay the rest of the money to miners. Several mining companies started their business in the 1970s in East Suwawa. ASGMs by inhabitants have started since 1991 in the area where the mining companies stopped their operation. Tunnel owners of ASGM established "The United Suwawa Miners Forum" and they request the government to recognize their customary rights to the mining areas. As widely known, mercury pollution from the ASGM brings about health hazards. Besides these environmental and health problems, village heads of the mining area claim the importance to solve socio-economic problems, including prostitution and child education in the mining sites. Based on these findings and dialogues with the district head and village heads of this area, researchers in collaboration with local inhabitants initiated a new program called "health resilient villages (*kampung tangguh kesehatan*)". The researchers will start action research from 2021 using a "transdisciplinary community of practice (TDCOP)" approach.

**Keywords:** Long-term stay type ASGM; Mine activity; Health resilient villages; TDCOP approach

## **The Estimated Total Area of Forest Fire in Siak Regency, Riau Province during the Early Period of COVID-19 Outbreak**

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**Abstract:** Forest fires in Indonesia can be caused by natural and human factors, but human factors are the most prominent. In 2020, the COVID-19 outbreak resulted in the enactment of social distancing policies. As a result, several activities related to forest and land fire control have also been disrupted. The aim of this research is to estimate the total area and locations of forest fires in Siak Regency, Riau Province from March to October 2020. This period was chosen because it includes the fire season in Riau and also coincides with the timing of the COVID-19 outbreak in Indonesia. Estimations of the area and distribution of forest fires were carried out based on satellite images through Normalized Burn Ratio (NBR) analysis and also visual observations. In this research, we use Sentinel-2 images which obtained through Google Earth Engine. The determination of the satellite image period has been directly matched and confirmed with the official data from Manggala Agni of Siak. Furthermore, the NBR values were utilized to estimate the burned area and emissions due to forest fire. We found the total area of fires based on the NBR results was 302.79 ha. On the other hand, the fire area based on visual analysis was 459.71 ha. The results showed that the the total area of fires based on NBR interpretation method was 65,86% compared to the total area from visual method. In both approaches, forest fires locations matches and their locations were mostly concentrated in Siak Regency's western region. In both approaches, the locations of forest fires have similar coordinates. The locations are mostly concentrated in the western area of Siak Regency. Specifically, Mengkapan Village and Lalang Village in Sungai Apit District.

**Keywords:** Forest fire; Siak Regency; Geographic Information System; Burnt area; Normalized Burn Ratio

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## Bird's Species Response to the Ex-Coal Mining Reclamation Stages

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**Abstract:** Birds play an essential role in the life cycle. This study aimed to measure the bird's diversity in a coal mining reclamation area in PT. Kideco Jaya Agung (KJA), East Kalimantan, Indonesia. Bird observation is performed by two methods, direct observation and using mist nets. Direct observations were carried out in the morning and afternoon. The second method was done by installing mist nets at some point in the three age levels reclamation (one year, four years, and eight years). Morphometric measurement was done to birds captured by the mist nest: beak length, head length, head width, total length, tail length, limb length, wing length, and weight. The results showed 25 species of birds belong to 16 families, 20 species of this as an under-canopy bird. Birds species were dominated by Blue-throated bee-eater (*Meriops viridis* Linnaeus), Yellow-vented bulbul (*Pycnonotus goiavier* Scopoli), Asian-glossy starling (*Aplonis panayensis* Scopoli), and Javan myna (*Acridotheres javanicus* Cabanis). The number of species, family, and birds' diversity in the reclamation four years was height than 1 and 8 years. However, the number of individual birds in the reclamation eight years age was the highest. Differences in habitat conditions with three-stage reclamation plant cause low similarity index types, only 20% until 40%. Javan myna, Yellow-vented bulbul was found at all sites. The height percentage of species early found in reclamation area is Asian-glossy starling (38.9%) and Yellow-vented bulbul (33.3%). There are differences in the morphometry of birds that occupy habitats with different reclamation ages.

**Keywords:** Morphometry; Mining reclamation; Diversity; Similarity index; Dominancy

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## **Time-series Assessment of Artisanal and Small-Scale Gold Mining Sites and Change in Miners' Activities: a Case of Gorontalo, Indonesia**

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**Abstract:** Rapid price increase of the global gold market may affect artisanal and small-scale gold mining (ASGM) activities, especially in developing countries. The Minamata Convention on Mercury has been activated since 2017; however, the effects of the convention on the ASGM sector have not been evaluated well due to the closedness of the ASGM sector. This study assesses the development of ASGM and the changes in miners' activities in Gorontalo, Indonesia during 1995–2020, using satellite imagery. Normalized Difference Vegetation Index (NDVI) was utilized to detect build-up areas in the mining sites in time-series by Google Earth Engine. The results show that the build-up area increased by approximately 2,000 times during the period 1995–2020. Furthermore, rapid development was found from 2012. Hence, landcover change provides a critical indicator quantitatively assessing and monitoring the closed ASGM sector and their transformation at the regional level.

**Keywords:** Artisanal and small-scale gold mining (ASGM); Indonesia; landcover change; NDVI; remote sensing

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## **SESSION 2: ECOLOGICAL RISKS AND FOOD SECURITY**

## **Basic Hydrogeochemical Characterization in Four Microwatershed in the Mining Districts: Bella Rica, San Gerardo, Nambija and Chinapintza, South of Ecuador**

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**Abstract:** The study presents hydrogeochemical descriptions in superficial waters, in four micro watershed that are between the provinces: Guayas, Azuay, El Oro and Zamora Chinchipe, to the south of Ecuador, in the mining districts; Ponce Enríquez (Bella Rica, San Gerardo), Nambija and Chinapintza. The main objective of this research was to analyze the space distribution of these parameters, as well as to analyze the relation that they present with the mineralization in each mining district and to determine the quality of the water. The data was obtained by performing water sampling in downstream and upstream rivers; these physicochemical parameters were measured in the field and laboratory. Considering which the hydrogeochemical characteristics of drainages evolve based on physicochemical characteristics like mineralization, when being these micro watershed in these zones, are feasible to think that the hydrogeochemical of natural drainages will be characterized by the type of mineralizations. In case of Bella Rica and San Gerardo, the presence of polysulfides contain: gold, silver, copper, zinc, lead, arsenic, bismuth, tellurium, cadmium and antimony; in Nambija, the native gold appears generally free and in almost all cases are related with the alteration of skarn; in Chinapintza the mineralization of gold is in refractory state, and mineralization associated to sulfides like galena and sphalerite. The obtained results showed that: potassium with 13.2 mg / l in San Gerardo; Sodium with 228,30 mg / l, ph 5,8 in Bella Rica; Iron with 18.46 mg / l, ph 3,3 in Chinapintza; and Manganese with 1.33 mg / l in Nambija, exceed the permissible limits for human consumption and irrigation water. The parameters allowed to relate water sources and geology of the area, finding formations which have high mineral contents.

**Key words:** Mining district; Parameters physicochemical; Mineralization; Micro watershed; Major elements; Quality of the water

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## **Influence of Farmer Decision Making Choosing Rice Varieties and Climate Change to Rice Productivity Levels in Central Lampung Regency**

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**Abstract:** This research aims to determine the influence of decision making on farmers choosing rice varieties and climate change on rice productivity levels. The data analysis method used in this study is descriptive and quantitative analysis. This research was conducted in Bangun Rejo Subdistrict, Central Lampung Regency. The number of respondents in this study was as many as 73 samples. The data used are primary and secondary data. The data analysis in this study was conducted with multiple linear regression tests. The results showed that the decision-making process of choosing rice varieties by farmers is done by considering several things, namely the suitability of varieties to the needs of farmers, the suitability of varieties with the experience of farmers, the level of complexity in the application of varieties, as well as the relative advantages of varieties. Decision making farmers choose rice varieties positively affect rice productivity. The more appropriate farmers choose rice varieties that suit the needs, conditions of the land, type and intensity of pest attacks in the area, which will support the acquisition of high productivity. In addition, it is known that climate change affects rice productivity by 76.40 percent.

**Keywords:** Decisions; Productivity; Varieties; Change, Climate

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## **Ecological Risks and Food Security: Community-based Programs in Forest Restoration & Food Security in the Bukit Nanti Martapura Forest Area (UPTD KPH WIL VI Bukit Nanti-Martapura)**

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**Abstract:** Forests store biodiversity. Forest preservation is a reflection of the ecology of terrestrial life, particularly on reducing ecological risks and increasing food security. Although the Government has implemented many forest conservation programs, forest damage in the Province of South Sumatra until 2021 is recorded to be 733,755.99 ha — from year to year there is an increase of about 2%. Phenomena of flooding, drought and conflicts between humans and animals often occur, and also threaten food security due to crop failure. This study aims to identify the actors, patterns and motives of forest destruction and program designs that are relevant to repairing forest damage and increasing food security of the local communities around the forest area in Bukit Nanti Martapura (UPTD KPH WIL VI Bukit Nanti-Martapura). The research method used qualitative methods, namely by directly involving the community around the forest area and Lembaga Jejak Bumi Indonesia (the Indonesian Earth Footprint Institute) who were concerned with. The research finds:

First, forest destruction is mostly caused by political rent (village officials and UPTD officials) in collaboration with immigrant communities and a small proportion of people living around forest areas as operators of forest destruction. Second, the motives of local elites are political and economic; while the motive of society is economic. Third, a community-based forest reforestation and intercropping program called the Forestry Based Community which is run by Lembaga Jejak Bumi Indonesia (the Indonesian Earth Footprint Institute) as a program design that can be used as an option to reduce ecological risks and increase food security.

**Keywords:** Ecological Risks; Forest Destruction; Food Security; Community Based Programs

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## **Income and Welfare of Cassava Farmers in the Era of COVID- 19 in Lampung Province, Indonesia**

**Wan Abbas Zakaria <sup>1</sup>, Teguh Endaryanto <sup>1</sup>, Lidya Sari Mas Indah <sup>1</sup> and Dedy Hermawan <sup>1</sup>**

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**Abstract:** Indonesia has experienced the COVID-19 pandemic since March 2020, and until now it continues to spread to all regions including Lampung Province. This outbreak has an impact on the economic activities of the community, including the income and welfare of cassava farmers. This study aims to analyze the level of income and household welfare of cassava farmers during the COVID-19 Pandemic Era in Lampung Province. The research used a survey method, which was carried out in Central Lampung Regency and East Lampung Regency as the center of cassava production in Lampung Province. Respondents of 120 people including 60 people for each district were selected by simple random sampling method in July 2020. Data analysis used the quantitative descriptive method. The level of household welfare of cassava farmers was analyzed based on the BPS, Sajogyo and subjective methods. The results showed that during the COVID-19 Era farmers experienced the difficulties in accessing capital, production facilities and product markets. Cassava farming income dominates household income. Only 31.67 percent of the batik farmers in Central Lampung and five percent in East Lampung are classified as having a decent and prosperous life, the rest are almost poor. Food expenditure is still dominant and expenditure on personal hygiene is a fairly large type of non-food expenditure.

**Keywords:** Income; Farmers; Cassava; Welfare

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## **Study of Rhodamine B Dyes Content in Snacks of Karuwisi Traditional Market Makassar, South Sulawesi, Indonesia**

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**Abstract:** Snack is food that is purchased in a ready-to-consume form and is widely preferred because of its relatively cheap price, easy to obtain, attractive and varied appearance. Rhodamine B dye is one of the coloring substances prohibited for food and is declared as hazardous substance according to Regulation of Health Minister Indonesia No. 722/Menkes/Per/IX/1988 regarding dyes that are declared dangerous and prohibited in Indonesia as well as in the Decree of the Directorate General of POM No. 239/Menkes/Per/V/1985 regarding certain dyestuffs declared as hazardous materials. This study aimed to recognize the levels of Rhodamine B dye in snacks traded. This was descriptive survey research with laboratory examination by analyzing Rhodamine B dye on snacks by the results of UV-Vis spectrophotometric method. Population in this study were all snacks marketed in Karuwisi Traditional Market, while the sample was nine snacks consisting of chili sauce, layer cake, red chocolate cream, red curly crackers, cassava chips, red jelly, red popcorn, cassava crackers, and macaroni crackers because the nine samples were physically identical to Rhodamine B coloring agent, namely the use of a striking red or pink color. The sampling technique was total sampling. The results revealed that of the nine samples, only one sample was positive for Rhodamine B, namely cassava cracker containing 7.960 µg/g. It concluded that red cassava cracker was a wholesale snack at Karuwisi Traditional Market which is positive for Rhodamine B.

**Keywords:** Dye; Red; Rhodamine B; Snacks; Traditional market

## **Authentication of Pure and Adulterated Sumbawa Monofloral Honey using Ultraviolet-Visible Spectroscopy**

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**Abstract:** Sumbawa monofloral honey is one of the most expensive honey in Indonesia. In this present study, ultraviolet-visible (UV-vis) spectroscopy was utilized to discriminate between authentic pure Sumbawa monofloral honey and its adulterated one. The adulterated honey samples were created by intentionally mixing pure authentic Sumbawa monofloral honey with high-fructose corn syrup (HFCS) at a level of 10% (w/w). A total of 50 samples of pure and adulterated samples were prepared. The UV-vis spectral data of each sample were obtained by using a UV-vis spectrometer in the range of 190-1100 nm. The result of PCA (principal component analysis) using the first two PCs with the CEV (cumulative explained variance) of 93% shows that the pure and adulterated honey samples could be separated. All pure samples lied in the negative of PC1 ( $PC1 < 0$ ) and all adulterated samples were in the positive of PC1 ( $PC1 > 0$ ). As conclusion, this result suggested us the possible application of UV-vis spectroscopy for authentication of honey adulterated with HFCS in a simple and low-cost method.

**Keywords:** Authentication; HFCS; PCA; Sumbawa monofloral honey; UV-vis spectroscopy



## UV Spectroscopy for Discrimination of Two Arabica Coffee Cultivars in West Java Indonesia: A Feasibility Study

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**Abstract:** Arabica coffee variety is one of the key parameters that highly influences the cup quality of arabica coffee. The objective of this current research is to evaluate the possible application of UV spectroscopy for discrimination of arabica coffee with different in cultivar. Green beans from two arabica coffee cultivars (*Coffea arabica*) of Typica and Sigarar Utang were collected from the same origin in Papandayan mountain West Java, Indonesia. The samples were subjected to the same postharvest treatments (wet cherry processing method). All samples were roasted in medium roasting with 200°C for 16 minutes using a portable roasting machine. A total of 50 samples of Typica and Sigarar Utang were provided by weighing 1 gram of coffee powder (mesh 40) for each sample. The extraction of coffee samples was performed based on previously reported work. The UV spectral data of aqueous coffee samples were acquired by using a benchtop of UV-vis spectrometer in the range of 190-1100 nm. The first two PCs (principal components) with 96% of CEV (cumulative explained variance) could be used to separate between the Typica and Sigarar Utang samples. The Typica samples were situated in the left of PC1 ( $PC1 < 0$ ) and Sigarar Utang samples were on the right of PC1 ( $PC1 > 0$ ). In the future, it is promising to apply UV-vis spectroscopy for simple and reliable discrimination of arabica coffee cultivar.

**Keywords:** Discrimination; PCA; Sigarar Utang; Typica; UV-vis spectroscopy

## Nutritional Quality of Faloak (*Sterculia quadrifida* R.Br.) Plant Parts

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**Abstract:** In 2013 and 2018, East Nusa Tenggara Province had the highest malnutrition cases in Indonesia. The provision of local food containing high nutrition and naturally available is an alternative to overcome this problem. Faloak (*Sterculia quadrifida*) is a medicinal plant whose stem bark is used as a hepatitis medicine in East Nusa Tenggara (NTT) province. Its seed and root were not widely consumed. Meanwhile, *S. quadrifida* root and seeds are known as bush food by Aborigines in Australia. This study aimed to determine proximate parameters (moisture, ash, fat, protein, fiber, and carbohydrate), zinc, and flavonoid content of Faloak seed and root. Materials for analysis were gathered from naturally grown Faloak trees in residential yards and gardens in Kupang city. Seeds were collected from mature fruits and tubers which were harvested from 8-month-old seedlings planted in polybags. The tubers were washed and then thinly sliced. The seeds and tubers were dried in the oven for 24 hours at a temperature of 55 °C. Proximate analysis was carried out by the gravimetry method. Flavonoid and zinc contents were determined by the spectrophotometry method. Laboratory analysis was carried out at Research Laboratory and Integrated Testing (LPPT), Gadjah Mada University. Faloak seed contains flavonoid, zinc, moisture content, fiber, ash content, fat content, total protein content, and carbohydrates higher than root, namely 1.15%; 96.04 ppm; 10.09%; 16.43%; 3.35%; 20.61%; 16.54%; and 49.41%, respectively. Faloak's seed protein was as high as cashew nut (*Anacardium occidentale*). Faloak's seed also has a taste similar to nuts and it is high in nutrition. Therefore, it is recommended as local alternative food.

**Keywords:** Alternative Food; Faloak; Root; Seed; Timorese



## **SESSION 3: DISASTER RISK REDUCTION**



## **Geological, Geohydrological Mapping And Disaster Analysis in Baturturu Hamlet, Mertelu Village, Gunungkidul District, D.I. Yogyakarta**

**Fajriani<sup>1</sup>, Nurfadillah Jusman<sup>1</sup>, Umrah<sup>1</sup>, Ayusari Wahyuni<sup>1\*</sup>, Ihsan<sup>1</sup>, Muh Said<sup>1</sup> and M Arif Rahmna Bole<sup>2</sup>**

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**Abstract:** The purpose of this determination is to identify and map the geological structure of the study area, which consists of geomorphology, lithology, stratigraphy and geological structures that can better describe the geological history of the research area. Geological mapping should provide information about geological potential, both about positive potentials such as mineralization, aquifers as well as negative potentials in the form of natural disasters. The grid method consisting of 136 points with a distance of 25 m between points was used to collect data on the site. The morphology of the research area from the dominant observation results is Barada in the range of 30°- 45° and above with Palawija vegetation, so the research area is very prone to landslides and landslides have also occurred at several observation points. The research location does not have aquifer potential.

**Keywords:** Aquifer; geomorfology; geological; lithology; disaster

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## **Earthquake Hazard Analysis Based on Seismicity Data**

**Wa Ode Emiria Srikandi<sup>1</sup>, Intan Noviantari Manyoe<sup>1</sup> Yasin Septian<sup>1</sup> and**

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**Abstract:** Gorontalo is an area with complex tectonic conditions due to subduction activity along the northern and eastern parts of the North Sulawesi Arm, so that this area is included in an earthquake-prone area. The purpose of this study was to analyze earthquakes that occurred in Wonosari District, Boalemo Regency based on depth and magnitude data. This study uses earthquake data obtained from the USGS. Earthquake data are mapped to produce seismic maps and seismic zonation maps. The results showed that the Wonosari area had a shallow earthquake depth value and a small to medium magnitude value. Wonosari has a high level of seismicity as evidenced by the seismicity parameter value and a shallow earthquake occurs which can cause significant damage, especially inland areas.

**Keywords:** Earthquakes; Seismicity; Geological Structure; Zonation, Gorontalo

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## **Assessment of Student Knowledge Concerning COVID-19 Transmission: A Case Study in a Health Institute**

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**Abstract:** Positive cases of COVID-19 in the world as of September 2020 reached 20,388,408 people which were accumulated from positive patients being treated, positive patients recovering, and positive patients dying. The total number of positive COVID-19 patients in Indonesia reached 130,718, including patients who recovered and died (85,798 and 5,908 people, respectively). Until now, COVID-19 cases will continue to increase because the pandemic has not ended. The purpose of this study is to assess student knowledge about the transmission of COVID-19 at health colleges in Makassar City. This research uses a descriptive approach. The population in this study were students who were active in nursing and public health department at a health institute. Sample characteristics are limited to students who have participated in the study in the 2016-2019 academic year. The sample size of 170 people was determined using the purposive sampling technique. The results showed that the students' knowledge of symptoms, methods of prevention, virus transmission, and nutrition to prevent COVID-19 were generally insufficient category (64.1%, 100%, 85.9% and 85.9%, respectively). Students should maintain a level of knowledge about COVID-19 and under certain conditions must update information related to the application of balanced nutrition during a pandemic.

**Keywords:** Assessment of Knowledge; COVID-19 transmission; Health institute

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## Business Models on Peatlands to Prevent Land and Forest Fires

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**Abstract:** Peatlands nowadays, most of it has been degraded due to land and forest fires. The Indonesian government through The Peatland Restoration Agency has attempted to carry out peat restoration through three pillars. Revitalization as one of the restoration pillars beside rewetting and replanting, seeks to improve the community livelihoods. The objectives of this study are to identify business models that have developed in the community and to analyze the mechanisms that occur in those business models in preventing forest and land fires. The research was conducted at the Peat Hydrological Unit (PHU/KHG) of Mendahara-Batanghari, Jambi Province. In-depth interviews were conducted with respondents who were obtained by purposive sampling method. Data and information then were analyzed descriptively qualitatively. Based on the field research we found that the business models which can prevent forest and land fires, are the rice field and horticulture business model, areca cultivation and utilization, *liberica* coffee agroforestry, pineapple cultivation, honey/beekeeping, *jelutung* agroforestry, ecotourism and carbon trading. We find the conclusion that these business models have similar characteristics in preventing forest and land fires, namely land use adjusting the peat depth zoning with native peat species, non-timber forest products, and agroforestry patterns; intensive land management; utilization of biomass so that it does not become fuel during the dry season; maintaining peatlands in humid conditions through water management; and maintaining forest cover.

**Keywords:** Business model; Livelihood; Peatlands; Forest fires, land fire

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## **Synergy between Disaster Preparedness Area Program with Local Institutions for Community Disaster Preparedness**

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**Abstract:** The Government of Indonesia through Ministry of Social Affairs launched the Disaster Preparedness Area Program in 2019 to build community preparedness for natural disasters. This program is a forum for early community-based disaster management synergy with an integrated approach that involves various stakeholders in areas with high risk of natural disasters. Meanwhile social reality exposes that historically, people living in areas prone to natural disasters have had their own local institutions and knowledge on dealing with natural disasters. Several research results indicated there is a gap between the government programs and the social realities occurring in society. The targeted communities are not a blank canvas that can be filled with anything, because they already have their own dynamics and uniqueness before the presence of government programs. Accordingly, this research will identify the consequences of the Disaster Preparedness Area Program on existing local institutions in the community before this program was launched. That very problem is answered through qualitative approach with data collected from literature studies, field observations, in-depth interviews, and FGDs. Social mapping and life history are mainly used to explore actor networks, history, experience-near, and community everyday practice related to disasters. Furthermore, the collected texts and narratives are analyzed by categorization and then comparing the existence and actions of local institutions before and after the Disaster Preparedness Area Program. The results show that there are consequences due to the presence of the program on the social reality of local institutions, especially in the reconfiguration of social networks in the community. These consequences are inevitable because there are intersections between programs, institutions, local knowledge, and the interests of various actors in natural disaster preparedness.

**Keywords:** Synergy; Disaster Preparedness Area; Local institutions; Social networks; Natural disasters

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## **The Role of Crystal Fraction to Relative Magma Viscosity: An Approach to Understand the Explosive Caldera-Forming Volcanism of Raung Volcano**

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**Abstract:** Explosive volcanism is one of the deadliest volcanic hazards. The characteristics of the magma chamber that cause explosive eruptions need to be studied more deeply to obtain complete knowledge and minimize the volcanic hazard risk. Raung Volcano in East Java is an example of volcano that has a history of explosive eruptions that marked by a 2 km wide caldera. The last magma condition before the caldera-forming eruption can be understood from the characteristics of the pre-caldera eruption lava. Petrographic analysis was carried out on selected 4 basaltic lava samples to determine the composition and proportion of minerals. Then, an analysis of the viscosity of the magma was carried out in relative terms using the shape and size configuration of the crystals. The comparison between the percentage of crystals and the relative viscosity value shows a positive correlation which indicates that there is an effect of the number of crystals on the viscosity of the magma. The increase in the viscosity of magma that occurred in the pre-caldera lava eruption of Raung Volcano indicates a fairly intensive crystallization. This is supported by petrographic data which shows a porphyritic texture with a phenocryst of more than 40%. Plagioclase crystals become quite dominant crystals (> 30%). Based on this, it can be interpreted that the crystallization process occurred intensively in the shallow magma pocket of Raung Volcano at the end of the pre-caldera period or before the eruption of the caldera formation.

**Keywords:** Crystal; Magma; Viscosity; Raung; Eruption

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## **Reducing the Risk Disaster of COVID-19 in Indonesia with Social Cash Assistance**

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**Abstract:** COVID-19 has a global disaster. Many countries are forced to allocating funds to reducing the risk of this disaster, including Indonesia. The Government Republic of Indonesia, through the Ministry of Social Affairs, has been launched a Social Cash Assistance Program for 10 million families are affected by COVID-19. This study aims to identify how families are affected by COVID-19 and ake advantage of this social cash assistance. The study was conducted on the beneficiaries of social assistance, in cash transfer of Rp. 600,000, per month, for 3 months. This study involved 2290 beneficiaries as respondents spread on 12 provinces. Sampling was done by proportional stratified random sampling. The findings show that 1). 99 percent of social cash assistance is used for basic needs, especially for food, 2). social cash assistance could be used for basic needs around for 2-3 weeks. 3). the information of social cash assistance receipts was obtained through local community leaders. The recommendations are 1). need further social assistance to strengthen vulnerable groups of the poor, 2). to strengthen the community aspirations on structuring process the List of Social Assistance Beneficiaries (Data Terpadu Kesejahteraan Sosial), and 3). To increase the sustainable family income, giving cash stimulant of assistance for business start-ups is very needed.

**Keywords:** Global disaster; Social cash assistance; Vulnerable groups; Community leaders; Community aspirations

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## **Landuse Changes, Climate Change and Flood Episodes in Way Bulok Watershed Lampung Province**

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**Abstract:** Changes in land use in a watershed greatly affect its hydrological characteristics, but it is also influenced by climate change, especially rainfall parameters. Increasing the intensity and duration of rainfall as well as changes in land cover from forest to non-forest will increase the direct flow rate which in turn will result in flooding in the downstream. The research aims to identify land use changes, identify rainfall characteristics and flood events. The research was conducted in February-June 2020, in the Way Bulok watershed, Lampung Province. Data analysis used the approach coefficient run-off and discharge fluctuation. The results showed that during the 2011-2019 period, there were 18 floods in the Sekampung watershed, with 7 occurrences floods of the Bulok watershed being dominant. The cause of flooding is not only caused by changes in land cover, but also by changes in intensity and the amount of rain in the Bulok watershed. The strategy to control flooding is to apply soil and water conservation technology and increase the land area with permanent vegetation.

**Keywords:** Climate changes; Landuse changes; floods episodes

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## **Community Preparedness Against the Threat of Abrasion and Tidal Floods in Padang City**

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**Abstract:** The tidal wave in Padang City resulted in 674 houses potentially erode by abrasion over the next five years, so it is essential to improve community preparedness. This study aims to analyze the preparedness of coastal communities for the threat of abrasion and tidal flooding. This study used a cross-sectional study design, conducted from January to July 2020. The population was the people of Pasie Nan Tigo Village, with a sample of 74 respondents. The results showed that more than half of the respondents were less prepared to face abrasion and tidal flooding (64.9%), low knowledge (41.9%), low policies and guidelines (77.0%), low emergency response plans (33.8%), low disaster warning system (43.2%), and low resource mobilization (44.6%). The statistical test results showed a relationship between knowledge, emergency response plans, disaster warning systems-resource mobilization, and preparedness. Meanwhile, there was no relationship between policies, guidelines, and preparedness. Because the level of preparedness of coastal communities in the face of abrasion and tidal flooding is still unprepared, society and government need to improve disaster readiness by increasing knowledge in seminars, training, and providing sufficient facilities.

**Keywords:** Abrasion; Tidal wave; Flood; Preparedness

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## **Hazard assessment of tephra fallout for October 2013 eruption of Tangkuban Perahu in Lembang subdistrict, West Java, Indonesia**

**I Gusti Eddy Sucipta<sup>1</sup>, Idham Andri Kurniawan<sup>1</sup>, Mirzam Abdurrachman<sup>1</sup>, Asep Saepuloh<sup>1</sup>,  
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**Abstract:** Tangkuban Perahu (TP) is one of the active volcanoes near Bandung City, West Java Province, which is surrounded by many tourist sites and agribusiness lands. One of the historical eruptions occurred in October 2013, that was covered in the Lembang subdistrict area. The aims of this study are to determine the hazard assessments of tephra fallout in several sites in Lembang subdistrict, especially in tourist and main agribusiness sites. Study literature, geology observation, and modeling of tephra using TEPHRA 2 were combined to reconstruct the October 2013 eruption. The result of tephra fallout modeling shows October 2013 eruption covered south side of TP with east to west pattern, that is covered to Lembang subdistrict and Cimahi city. The new several scenarios hazard curve and probability maps of tephra fallout from TP are presented to discuss the probability of future hazard.

**Keywords:** Tangkuban Perahu; Lembang; Tephra; Probability; TEPHRA2

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A blue-tinted photograph of a group of farmers working in a field. The farmers are wearing traditional conical hats and are bent over, tending to the crops. The field is filled with green plants. The image is framed by dark blue geometric shapes in the corners. A white rectangular box with a black border is centered over the image, containing the text "SESSION 4: SUSTAINABLE".

## **SESSION 4: SUSTAINABLE**

## **Contesting Power and Agricultural Expansion in Gunung Halimun Salak National Park (GHSNP) Corridor, West Java, Indonesia**

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**Abstract:** This study examines how various actors are contesting for power to gain access to the corridor of the Gunung Halimun Salak National Park (GHSNP). Both quantitative and qualitative approaches were applied in collecting data in Cipeuteuy Village, Kabandungan District, Sukabumi, West Java. Qualitative data were collected through in-depth interviews with key informants from the local government, the GHSNP Office, community leaders and farmer groups. Meanwhile, quantitative data were obtained through household surveys to describe their involvement in agricultural expansion in GHSNP. Preliminary findings of this study show that farmers have been excluded from conservation policies hence they use certain ‘illegal’ mechanisms to gain access to GHSNP. Within power and capital relations, poor farmers are the most neglected group so that they have to fight for their livelihoods. As a conclusion, this study suggests that conservation policies must take into account the livelihoods of local people, particularly of the neglected-poor farmers.

**Keywords:** Gunung Halimun Salak National Park (GHSNP); agricultural expansion; conservation policy, livelihood, access.

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## **Women's Contribution in Supporting Coffee Sustainability: Case Study in Tana Toraja and Enrekang Districts, South Sulawesi**

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**Abstract:** Indonesia is the fourth biggest coffee-producing country that majority produced by smallholder farmers across Indonesia. Toraja and Kalosi coffee are well known as the best Indonesian specialty coffee. Therefore, the demand for these coffees, both in domestic and export markets tend to high. There are various factors influence on productivity. In Tana Toraja and Enrekang districts, the majority of coffee farmers not only grow coffee as a source of household income. Farmers are also growing other crops, such as horticulture and other annual crops, such as cocoa, and cloves. This has led farmers could not focus on coffee; thus, coffee farmers shared their activity with their wives. The objective of the research was to understand the women's contribution in supporting coffee production in Tana Toraja and Enrekang districts. Survey for the smallholder coffee farmers was conducted in 2020. There were 20 household farmers that randomly chosen has been interviewed in each Tana Toraja and Enrekang district. The survey results showed that the decision making in determining the type of coffee planting materials and other agricultural activities was dominated by men. The average women contribution on coffee plantation in Tana Toraja was slightly higher than that of in Enrekang, accounted for 30.97% and 23.85%, respectively. In Tana Toraja, the highest contribution of women was in land preparation activity, namely 55.45%, meanwhile, in Enrekang district, the highest women contribution was in chuppon pruning (light pruning) activity, i.e., 52.30%. This indicates that the role of women in coffee plantation in Tana Toraja and Enrekang is relatively low as women tend not to have technical skills in coffee cultivation. Therefore, empowering women in coffee plantation, such as by providing technical training on coffee cultivation, could be implemented for increasing coffee productivity.

**Keywords:** Tana Toraja; Enrekang; Women; Empowering; Contribution; Coffee; Sustainability

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## **Residents' consciousness of traditional rice cultivation - Case Study of Tana Toraja Regency, Indonesia**

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### **Abstract:**

Due to the progress of the economic growth, the unique cultures and traditions of the region are being lost such as traditional rice. Before and after the world warII, the traditional rice is decreasing because of expanding the cultivation of high-yielding varieties in Indonesia. However, there are farmers who continue to produce traditional rice without financial support in Tana Toraja Regency, Indonesia. The purpose of this study is to understand why these farmers continue to produce traditional rice. The research method is to conduct deep interview with 24 rice farmers in Saluallo village. From the interview, the following main results were obtained: (1) ancestral rice is one of the motivation for cultivation for them,

(2) it is used for large funerals, and (3) it has a health benefit such as increased immunity. Moreover, It was found that the areas where traditional events remain are highly conscious of traditional rice cultivation. The loyalty of the Toraja-specific religion "Arktodro" also could have influenced the growing consciousness of traditional rice farmers.

**Keywords:** Indonesia; Tana Toraja Regency; traditional rice; Arktodro

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## Economic Feasibility and Factors Influencing the Sustainability of Hybrid Rice Production

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**Abstract:** Domestic rice demand of Indonesia continuously increased and it cannot be fully met with the domestic consumption. The government has to import premium and specialty rice ranged from 200-500 thousand tons annually. Hybrid rice has an opportunity to fulfil the need for premium rice. However, the economic feasibility and competitiveness of hybrid rice toward rice import need to be addressed. The objectives of this study were to analyze the economic feasibility of hybrid rice development particularly the financial feasibility and factors (internal and external) influencing hybrid rice production. The district of Tabanan was chosen as study sites based on the good performance of hybrid rice demonstration farm. The return to cost ratio (R/C) was used to evaluate the hybrid rice farming feasibility while Cobb Douglas production function was used to analyze the factors affecting hybrid rice production. The results showed that the income of hybrid rice farmers was higher than that of inbred under similar farm sizes. The income of hybrid rice farmer was Rp 26.1 million/ha/season, while the income of inbred rice farmer averaged Rp 21.7 million/ha/season. The higher income was contributed by higher yield, while the cost of both hybrid and inbred rice farming was similar (averaged of Rp 12.5 million/ha/season). Hybrid rice farming was economically feasible since its R/C ratio above cash and total costs were 2.91 and 2.01, while the R/C ratio of inbred rice were 2.53 and 1.89. This figure indicated that hybrid rice farming was more profitable compared to inbred rice farming. Factors affecting the hybrid rice production were farm size, seed, organic and urea fertilizers, and labor for crop care.

**Keywords:** Hybrid rice; Economic feasibility

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## Meranti Biochar Effect on Growth of *Falcataria Moluccana* Seedlings

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**Abstract:** The purpose of this study was to determine the effect of biochar application on growing media on the growth of *Falcataria moluccana* seedlings. Biochar was produced by a slow pyrolysis at a temperature of 600 °C. The basic ingredient of biochar was meranti wood waste (*Shorea* sp.). The study was arranged in a completely randomized design with three treatments and 15 replications. The treatments were 100% topsoil (control), 5% biochar and 10% biochar addition to the planting media. The parameters observed were height increment, diameter increment, biomass, and some soil parameter (pH, N,P, K, CEC, and C-organic). The results showed that the addition of biochar indicated a very significant difference compared to the control for all growth and soil parameters. However, the two dosages showed no significant different effect. This study concluded that the addition of 5% biochar meranti in the planting media provide enough to increasing the growth of *F. moluccana*.

**Keywords:** Biochar; *Falcataria moluccana*,; *Shorea*; Soil amendment

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## ***Monstera adansonii* Plant Propagation Acceleration Using Bud Breaker and Rootmore**

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**Abstract:** *Monstera Adansonii* or swiss cheese plant is one type of plant that belongs to the Araceae family. The enthusiasm for this plant is now increasing since the COVID-19 Pandemic. The high price of *monstera* is also influenced by the slow pace of this plant to form proportional roots and shoots when cultivated by Water Propagation. There have not been many scientific papers that have thoroughly examined the propagation of the *M.adansonii* plant. The success of the Water Propagation technique so far in providing a source of new seedlings is still low and is strongly influenced by the source of the cuttings. This study aims to obtain information about the acceleration of plant propagation of *M. Adansonii* using Bud Breaker and Rootmore. The difference in the source of propagation using a Bud Breaker is that the tendrils do not need to be cut so that the plant is not damaged, while in Water Propagation and Rootmore the propagation material must be cut first. The information obtained from this research is also expected to contribute to determining the acceleration of propagation of *M. adansonii* plants, especially if it is carried out on a small or large scale. The results of this study indicate that the use of Bud Breaker can be an alternative propagation acceleration of *M. Adansonii* without damaging the mother plant first. Meanwhile, the cuttings smeared with Rootmore had a faster root growth rate of 2 weeks than using the Water Propagation technique.

**Keywords:** *Monstera adansonii*; Propagation; Bud Breaker; Rootmore; Cutting

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## Accelerated Growth of *Kappaphycus alvarezii* with Using *Sargassum aquifolium* Extract

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**Abstract:** Cultivation of *Kappaphycus alvarezii* seaweed has been carried out in the province of West Nusa Tenggara, but its production has decreased in the last three years due to its slow growth. In 2014, seaweed production was 1,882,875.50 tons and in 2017 it was 1,037,000 tons. Efforts are needed to increase growth by providing growth triggers from marine natural ingredients, namely *Sargassum aquifolium*. These brown algae can be found in the waters of Ekas Bay, East Lombok, West Nusa Tenggara, the numbers are abundant and untapped. The purpose of this study was to analyze the growth of *Kappaphycus alvarezii* given *Sargassum Aquifolium* extract. This research was conducted in the waters of Ekas Bay, Ekas Buana Village, Jerowaru District, East Lombok Regency, West Nusa Tenggara Province. The method used is experimental. The experimental design used was a completely randomized design with different treatments of *Kappaphycus alvarezii* immersion time using *Sargassum aquifolium* extract. The results showed that the growth of *Kappaphycus alvarezii* given *Sargassum aquifolium* extract increased and was significantly different between treatments.

**Keywords:** Macroalgae; Brown algae; Phytohormones; Extracts; Growth

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## Application of Biochar from Oil Palm Empty Fruit Bunches to Enhance the Soil Fertility and Growth of *Falcataria Moluccana* Plantation

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**Abstract:** Oil Palm Empty Fruit Bunches (OPEFB) wastes were abundant and became problems. The biochar application would solve the problems due to the great role of biochar as soil amendment. The aim of this study was to investigate the application of OPEFB biochar to enhance the soil fertility and growth of *Falcataria moluccana*. Biochar was produced by a slow pyrolysis at temperature of 400 °C and 600 °C. Biochar was applied to the six-month *F. moluccana* trees in the plantation with 3 dosage (0 ton/ha, 5 ton/ha and 10 ton/ha). Growth parameters such as height and diameter increment was observed once a month during six months, while the P-shoot content, soil pH, cation exchange capacity (CEC), C-organic, and P-soil content were taken once at the end of the experiments. The result showed that the growth of *F. moluccana* was increased by application of OPEFB biochar and significantly different from the control. The application 5 ton/ha of 400°C OPEFB biochar indicated the best result of the growth parameters. Otherwise, the interaction of pyrolysis temperature and biochar dosage of soil properties affected to the C-organic and P-soil content. Meanwhile, there is no significance different between the temperature and biochar dosage to the soil pH and CEC.

**Keywords:** Biochar; *Falcataria moluccana*; Oil palm; OPEFB; Soil amendment

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## **Physico-chemical and Chemical Characterization of Lignin Isolated from Black Liquor of Pulp Industry by-product**

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**Abstract:** Lignin consists of a high amount of phenolic compound which potential to utilize as sustainable material such as bio-energy, building block, or totally in various applications. Lignin can be isolated directly from biomass or black liquor of pulp industry by-product. In Indonesia, approximately 4.7 million tons per year of lignin were obtained from the pulp industry. Therefore, the potency of lignin from black liquor is intriguing to researchers to find a suitable method for lignin isolation. Besides, chemical characterization of lignin is also an important step to evaluate isolation technique and decide next utilization of lignin. In this work, we demonstrated the isolation of lignin from black liquor by one and two-step dilute acid precipitation and its Physico-chemical characterization by UV-Vis, FTIR, TGA, DSC, and py-GCMS. Lignin was successfully isolated with a total solid rendement of 35% for one step and 15% for two-step isolation with acid-insoluble lignin content ~77%. The functional group of lignin was identified by UTR-FTIR where lignin standard was also analyzed as reference. The result showed that unique bands correspond to Guaiacyl ring (G), Syringil rings (S), dan aromatic C-H in G>S respectively at 1265, 1204, dan 1109 cm<sup>-1</sup> were observed. However, the peak intensity of S rings in this study was higher than lignin reference and vice versa for a peak intensity of G. This result was also in correlation with the py-GCMS result. The pyrogram showed that syringol content of lignin in this study was higher than lignin reference with S/G ratio of 0.03, 1.27, and 1.16 for lignin reference, lignin one- step isolation, and two-step isolation. It may be due to the difference in source biomass. The thermal degradation rate by TGA presented all the lignin samples have similar thermal stability until about 260 °C. This result revealed that this method was a success to isolate lignin with high purity.

**Keywords:** Black liquor; FTIR; Lignin; TGA; Py-GCMS

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## Studies on the Crude Nutrient and Mineral Composition of Cassava Tuber Peels for Animal Feedstuff

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**Abstract:** Payakumbuh region, which covers Payakumbuh city and Limapuluh Kota district, is an important tourist destination in West Sumatra. They produce various types of snack food made from cassava tubers. The research aimed to study the meal yield rate, crude nutrient, fiber fraction, and mineral composition of cassava peels as by-products of cassava farm and snack food industries for animal feedstuff. Twenty cassava farms and ten snack food industries visited, and the owners interviewed out data on the type of cassava used, products, and handling of cassava peel. Cassava peel's quantity produced potentially used for animal feedstuff was measured. Samples of fresh peels from three different varieties and tuber sizes were collected, weighed, dried, and ground in meal form to find out data on the meal yield rates and analyze for dry matter (DM) content, crude nutrient, fiber fraction, and mineral composition. Results found three types of cassava used to produce snack foods, i.e., black, bread, and sticky cassava. The percentage of fresh peel and meal yield rates ranged from 16.4-16.7% and 21.9-26.9%, respectively. DM and crude protein content varied between 23.8 to 27.0% and 9.3 to 11.2%, respectively. Bead cassava peels showed the highest DM, ash, and acid detergent fiber (ADF) content. Cassava peel contained many high and satisfactory sources of K, Mg, P, Na, Mn, and Zn.

**Keywords:** Cassava peel; Mineral composition; Fiber fraction; Crude nutrient

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## Effect of Meranti-based Biochar on the Growth of Sengon (*Facataria moluccana*)

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**Abstract:** *Falcataria moluccana* is widely cultivated in Indonesia. To optimize *F. moluccana* cultivation, a good plant growing media condition is needed. Biochar was an agent that could improve the quality of soil, especially wood-based biochar because contains higher C compare to other materials. The aim of this study was to find out the effect of meranti biochar to the growth of *F. moluccana*. In this study, biochar made from wood waste of meranti (*Shorea* spp.) using pyrolysis system, with temperature of 400 °C and 600 °C. Dosage applied were 0 ton/ha, 5 ton/ha and 10 ton/ha. The experimental design was split plot with main plot was the temperature and split by dosages. The study took for 6 months. Parameters observed was heigh increment, diameter increment, P-shoot content and some soil properties (pH, Cation Exchange Capacity (CEC), C-organic and P-total). The results showed that the height and diameter of *F. moluccana* was increasing compared to control treatment. The application of meranti biochar 5 ton/ha at temperature 600°C had the highest diameter and height increment compared to other treatment, and also for C-organic value. While for P-soil total, the application of meranti biochar at temperature of 400°C gain the best value for both dosages applied compare to another treatments. Meanwhile, there is no significant effect yet for pH and CEC.

**Keywords:** Biochar; *Falcataria moluccana*; *Shorea*; Pyrolysis; Wood waste

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## Characteristic of Growth and Development of Red Chili (*Capsicum annum* L.) by Biofertilizer and Alkali Supplement Fertilizer Application

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**Abstract:** Chili is one of the horticultural commodities that has an essential economic value in Indonesia, but the amount of national production has not been able to meet the community's high demand for the level of consumption of chilies. Increasing the production of red chili plants requires proper cultivation technology, one of them is fertilization. This study aims to describe the effect of biofertilizer and alkali supplement fertilizer on growth and characteristics of chili. This research was conducted at Laboratorium Lapangan Terpadu, University of Lampung from August 2019 to February 2020. Data were collected by observing the growth and development of curly red chilies in periodic times. The observations were made on the response of plant height, number of flower, number of fruit, fruit length, and fruit weight per plant. The results showed that the higher application of biofertilizer and the alkali supplement fertilizer will increased the result of growth and development of chili. 20 ml/l concentration of biofertilizer with 4 times of applications and alkali supplement fertilizers 2 times/week are the most effective application in increasing result on all variables.

**Keywords:** Red Chili; Alkali Supplement Fertilizer; Biofertilizer

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## **Analysis of Food Expenditures of Rice Farmers in Flooding Prone Region in South Lampung District, Lampung Province**

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**Abstract:** Flooding frequently happened in South Lampung District between January and February which caused loss of production significantly to rice farmers. This study aims at analyzing model of food expenditures of paddy farmers using survey method. The study involved 120 farmers who were randomly selected from flooding prone area and was carried out in July-September 2020. Data were analyzed using regression model where dependent variable is food expenditures, and independent variables include rice production, corn production, loss of production due to flooding, family income, number of owning livestock, price of rice, price of cassava, and number of family member. Before regression analysis was run, the study did standard test for ordinary least-squares (OLS) such as multicollinearity, heteroscedasticity, and autocorrelation tests. The data passed all the required tests. The study suggests that factors affecting food expenditures include rice production, corn production, family income, price of cassava, loss of production due to flooding, and price of rice. The model is not as strong as it was expected as  $R^2$  is 0.543 suggesting that there is still about 45% of other factors that were not included in the model. The t-test suggests that rice production, family income, and price of cassava have a highly significant influence in affecting the farmers' food expenditure in South Lampung District.

**Keywords:** Food; Expenditures; Regression analysis

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## Farmers' Perception to Climate-Smart Agriculture (CSA) and Coffee Farming Productivity (Case Study on Coffee Farming Families in Tanggamus District, Lampung Province)

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**Abstract:** Climate-Smart Agriculture (CSA) is one innovation in agriculture to tackle challenges caused by climate change. The application of CSA in coffee farming in Indonesia is low. The research aims to know perception of coffee farmers to Climate-Smart Agriculture (CSA) technology and its effect to coffee productivity. This research was conducted in the Community of Social Forestry under the management of the Batu Tegi Forest Management Unit (FMU) in Tanggamus District, Lampung Province. The research methodology is quantitative method. Data collection used interview techniques and field observations from September to November 2020. The numbers of respondent are 77 coffee farmers, purposively selected from 200 coffee farmers. Data were analyzed by using *Parametric Statistical analysis; Anova Single Factor*. The results of this research indicate that farmers' perception to CSA technology are significantly correlated ( $p < 0.05$ ) with the number of days invested on coffee farms and coffee farms' productivity. Perceptions of farmers to CSA technology have affected the practices in coffee farming like fertilizers application, pruning of coffee branches, and controlling pests and diseases. The farmers who perceived that CSA technology contributes to coffee productivity have allocated 33% more time in their farms and have higher 16% coffee productivity and therefore increased the application sustainable agriculture.

**Keywords:** Climate Smart Agriculture (CSA); farmers, perception, productivity, Coffee farming

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## **The Culture of Farmers-Breeders Mitigation Facing Drought in Lampung, Indonesia**

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**Abstract:** In Lampung, climate change is a consequence of natural degradation and impacts agriculture in the form of drought and floods. This study aims to analyze the mitigation of ranchers in facing drought due to climate change. The research was conducted in the districts of Central Lampung and East Lampung in 2017. The location selection was determined (purposive) with the consideration that the area is a center for rice and livestock production. The research method was a survey of farmer breeders by taking random samples in 60 respondents. The results showed that climate change tends to have a negative impact on the sustainability of farming. Mitigation of drought has been carried out for years in the farmer and farmer community in Lampung. Efforts to mitigate farmers in dealing with drought in Lampung were by providing feed reserves through planting forage plants and optimizing the use of agricultural waste as feed. Mitigation efforts for rice farmers in dealing with drought include providing alternative irrigation sources and constructing drainage channels and collecting water harvesters in the rainy season.

**Keywords:** Mitigation; Drought; Farmers; Breeders

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## **Behavior of Farmers in Adaptation to Climate Change on Productivity of Pepper (*Pipper nigrum* L.) in East Lampung Regency**

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**Abstract:** This study aims to determine the behavior of farmers in adapting to climate change on pepper productivity in East Lampung Regency. This research was conducted in Sukadana Baru Village, Marga Tiga Subdistrict, East Lampung Regency, in the period March to April 2020. The research method used was a survey and with purposive sampling method. The population in this study were 433 pepper farmers who were members of the pepper farmer groups in Sukadana Baru Village. The number of samples in this study was 108 people. The data analysis method used in this research is descriptive. The impact of climate change on pepper plants that occurs is changes in temperature, changes in rainfall, changes in production and changes in pepper productivity. The temperature changes that occur in the research area are indicated by the percentage of respondents at 51.85. Meanwhile, 30.56 percent of respondents said there was no change in temperature that occurred in the study area. Rainfall that occurred experienced a change with the percentage of respondents of 75.00 percent, while the rest considered it unchanged with a percentage of 7.41 percent and 17.59 percent said they did not know. The majority of farmers said that production had decreased by a percentage of 75.93 percent. the farmer answered that he did not know with a percentage of 63.89 percent, because most of the farmers rarely calculated the amount of productivity. As many as 20.37 percent of respondents answered that there was a change in productivity that occurred as a result of climate change as it is today. Land productivity decreases, if there is increased productivity, it will provide intensive input on managed agricultural land.

**Keywords:** Behavior; Adaptation; Climate change; Pepper

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## **Placement Precision of Organic Fertilizer Based on Soil Conservation in Taro Cultivation**

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**Abstract:** One of the things that are important to consider when fertilizing is how to place the fertilizer so that plants can consume nutrients efficiently. The research objective was to assess the precision of soil conservation based fertilizer placement so that fertilizers could increase production of taro effectively. This study applied four treatments, which were without fertilizer, placing manure in the planting hole, placing manure in the biopore and placing manure on the borders. The three treatments were given 2 kg of goat manure. The treatment was repeated three times. Harvesting is carried out in 8 months. The results showed that the placement of manure with borders showed the highest yield of wet tubers of 21.4 Mg ha<sup>-1</sup>, was not so different from the treatment of manure in biopores 18.3 Mg ha<sup>-1</sup> and was different significantly in the placement of fertilizer in the planting hole of 15.9 Mg ha<sup>-1</sup> while the production of taro without manure is only 11.57 Mg ha<sup>-1</sup>.

**Keywords:** Organic fertilizers; Production, Soil conservation, Taro

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## **SESSION 5: RESOURCE MANAGEMENT AND GLOBAL VALUE CHAIN**



## The Diversity of Plant Species in the Proboscis Monkey's Habitat as a Species Reference for Restoration

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**Abstract:** Proboscis monkeys (*Nasalis larvatus*) are protected primates that are endemic to Borneo. Most of the habitat is outside the protected area, so the potential for destruction is high. One of the efforts to improve its habitat is habitat rehabilitation. This study aims to determine the appropriate plant species for rehabilitation. The research was conducted at five locations outside protected areas in East Kalimantan: the Berau Delta, Mahakam Delta, Suwi River, Ohong River, and Kuala Samboja River. Vegetation analysis with line-plot sampling method with a total sample area of 6.9 ha. Two locations inside protected areas (Kutai National Park and Sungai Wain Protected Forest) based on secondary data. Habitat clustering and Venn diagram analysis were carried out to determine the habitat type and native species adapted to various habitats. The results showed that the proboscis monkey habitat included two main types, namely mangrove and riparian. A total of 159 species of 48 families were found in the proboscis monkey habitat, 41 of which were potential feed. The dominant species in mangroves were *Rhizophora mucronata* (IV = 154.87), *Avicennia alba* (IV = 66.8%), *Rhizophora apiculata* (IV

= 41.4%), *Sonneratia alba* (IV = 27.8%), while in riparian were *Sonneratia caseolaris* (IV = 78.03 %), *Vitex pinnata* (IV = 56.23%), *Elaeocarpus stipularis* (IV = 34.84%), and *Cerbera manghas* (IV = 13.08%). Species that are a source of food and have good adaptation are *Sonneratia caseolaris*, *S. alba* (mangrove), *Heritiera littoralis*, *Vitex pinnata*, *Dillenia excelsa*, *Garcinia parvifolia*, *Ilex cymosa*, and *Gluta renghas* (riverine), so they are recommended for this type of habitat restoration proboscis monkey.

**Keywords:** Habitat cluster; Proboscis monkey; Rehabilitation; Vegetation analysis; Venn diagram

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## **Economic Significance and Challenges in Community-based Sericulture Cultivation**

**Retno Agustarini, Sri Suharti, Lincah Andadari, Asmanah Widarti and Dhany Yuniati**

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**Abstract:** Development of new technology together with its proper dissemination play a vital role for the success of community-based sericulture development. Sericulture, an age old tradition has become a prospective and potential occupations that generate higher incomes at frequent intervals for the community who cultivate sericulture. However, there are still some hitches in its development especially in improved practices by the farmers who are the main actors and the end users and is coming in the way of the spread and development of Sericulture. The research aimed to study its economic significance and some hindrances in community-based sericulture and strategy for its development in Indonesia. The research was done in a sericulture centers in Boalemo, Gorontalo in 2016. Interview of respondents using structured questionnaire and focus group discussion method were applied to collect the necessary information from farm households. Collected data and information were analyzed using quantitative and qualitative data analysis. The results showed that main hitches in the development of community-based sericulture development are continuous supply of high quality seeds and feed; limited skill and experience of farmers that cannot bring the required adoption level of technology to generate higher income; and marketing facilitation from related stakeholders. To resolve the problem, a cluster of community-based sericulture by using partnership model should be widely established. Furthermore, there is a need for an active engagement of the Government, supporting agencies and entrepreneur communities for its success and sustainability.

**Keywords:** Economic; Challenges; Community; Prospect; Sericulture Economic Significance and Challenges in Community-based Sericulture Cultivation

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## **Conditions for Successful Local Collective Action in Mangrove Forest Management: Some Evidences from Eastern Coastal Area of South Sulawesi, Indonesia**

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**Abstract:** Resource management characterized by common pool resources (CPR's) requires collective action for its sustainable management. CPR's with "rivalry" and "non-excludable" features face overexploitation problems because unlike the nature of pure public goods, the use of CPR's by one user will reduce the chances of other users taking advantage of it. This study aims to analyze the most appropriate local institutions and tenure arrangements for sustainable mangrove management in Eastern coastal area of South Sulawesi, Indonesia. Data and information were collected through in-depth interviews involving key informants selected by using snow-ball method and continued by Focus Group Discussion. Design principles for sustainable management of common pool resources of Ostrom has been used in this study as an analytical framework which illustrate the structure of rules established and imposed by the local CPR's institutions. The findings show that collective action in sustainable mangrove management can be achieved through accepted rules and agreements that are participatory formulated. The agreed norms and rules have enacted as a benchmark for collective action in maintaining mangrove and to enforce sanctions for violators. The success of the community in sustainable mangrove resources management is mainly supported by the existence of several prerequisites that facilitate collective action. It is necessary to strengthen regulations both at the local and higher level through socialization to the community along with the development of incentive and disincentives system.

**Keywords:** Community; CPR's; Local institution; Mangrove management; Sustainability

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## The Potential of *Kabuyutan* Sacred Natural Site towards a Sustainable Landscape Management in Indonesia

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**Abstract:** Sacred natural sites have been recognized by International Union for Conservation of Nature (IUCN) as a landscape heritage that contains biological and cultural diversity due to conserved over generations and sacred by indigenous people. This study identified the characteristics and their ecological significance of *kabuyutan*, a sacred natural site perceived by Sundanese people in West Java Province, Indonesia. The observation participant method was used to gain a close and intimate relationship between Sundanese people and their natural as well as cultural environment, particularly *kabuyutan*. We identified 33 *kabuyutan* and found a typical structure compared to the surrounding landscape which dominantly covered by a dense vegetation and marked by sacred trees, springs, ancestor's graves, or stones. *Kabuyutan* were perceived to have a vital role in conserving land and water which is proven by their specific land variables and proposed a watershed-based management concept. This concept proposed a sustainable landscape management that focusses on how to ensure the continuity of the hydrological system from upstream to downstream. However, we found that changes in buffer zone of *kabuyutan* into agricultural or residential area due to the land ownership status, have potentially affected their existence. We suggested that empowering custodian and transferring information about the important role of sacred natural sites are necessary in landscape management strategy to prevent the negative impact of landscape dynamic as well as to ensure its sustainability.

**Keywords:** *kabuyutan*; sacred natural site; landscape management; watershed

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## **Measurement of the Risk of COVID-19 Exposure to Nurses Working in the COVID-19 Isolation Room**

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**Abstract:** The COVID-19 pandemic has increased the risks and dangers for nurses in the workplace, especially infection hotspots. The Indonesian National Nurses Association (PPNI) identified the number of deaths due to COVID-19 infection in the work space of 149 people from January to December 2020. The aim of this study is to measure the risk of exposure to COVID-19, to nurses caring for COVID-19 patients in isolation rooms. The research design used a cross sectional design with an observational approach. The sample in this study were 50 nurses who worked in the COVID -19 isolation room at Wahidin Sudirohusodo Hospital, who were determined by the total sampling method. The results showed that the risk based on the work environment was very high based on the lower risk of work accidents (100% and 16%, respectively). When providing nursing care, 8 respondents (16%) were exposed to body fluid/ secretions from the patient's respiratory tract, 2 respondents (4%) were doused with body fluids / patient's respiratory secretions on the mucous membranes of the eyes and 6 respondents (12%) were doused with body fluids/the patient's respiratory secretions in the mouth / nose lining membrane. The conclusion in this study is that nurses who work in the COVID-19 isolation room are at very risk of being exposed to COVID-19.

**Keywords:** Nursing; COVID-19; Risk Assessment

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## **SESSION 6: LEGAL ISSUES AND BUSINESS ETHICS IN RESOURCE MANAGEMENT**

## **Level of Gender Equality in Salted Fish Agro-Industrial Production at Tulang Bawang**

**Helvi Yanfika<sup>1</sup>, Rudy<sup>1</sup>, Indah Listiana<sup>1</sup>, R.A. Diana Widyastuti<sup>1</sup>, Maya Riantini<sup>1</sup> and Abdul Mutolib<sup>2</sup>**

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**Abstract:** This study aims to find out how the level of gender equality in the production of salted fish agro- industry in Tulang Bawang Regency. The data analysis method used in this study is descriptive with quantitative approach. This research was conducted in East Menggala Subdistrict and Menggala Subdistrict of Tulang Bawang Regency. The number of respondents in this study was 39 samples. The data used is primary and secondary data. The results of this study showed that the activities carried out by the saltfish processing community in Tulang Bawang Regency both in reproductive, productive and social activities show that women dominate in playing a leading role in their daily lives. The existence of gender in terms of access and control of farmers to resources and benefits shows the dominant role of women to be the first reference in the life of salted fish processing society. Thus, women with this role in salted fish processing can already be productive in helping support the family economy, the average receipt per producer in one month amounted to Rp. 10,891,025.64 and the average total cost per producer in one month amounted to Rp.8,757,081.00 so that the average profit per producer in one month was Rp. 2,143,944.64. The profit obtained by each producer varies due to the difference in total revenue received and the total cost incurred by each producer, and the main obstacles experienced by fishermen is the weather that is difficult to predict so as to decrease the productivity of salted fish processing.

**Keywords:** Role; Access; Control; Goaling

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## **Mangrove Forest: Analysis of Regulatory Impact (Studies in the Coastal Zone of the City of Bandar Lampung)**

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**Abstract:** Kota Karang Mangrove is one of the mangrove forests located in urban areas and the existence of mangrove forests is very limited in Indonesia. Mangrove forests have economic, physical, and ecological potential. The government has made several policy designs to protect and develop the potential of mangrove forests. The research objective was to assess the quality of the mangrove forest policy in Karang City. The research method uses regulatory impact analysis with the stages of problem analysis, regulatory mapping, and stakeholder analysis. The research findings indicated that at the problem analysis stage, mangrove forests were not yet a major issue; location of limited authority, implementation and implementer constraints. Regulatory mapping has been included in several policies, both national and local, and the clarity of the implementer. On stakeholder analysis, there is a mistake in determining the main and supporting stakeholders. The results of the regulatory impact analysis provide empirical data to make appropriate regulations, increase the capacity of policymakers, increase transparency, public accountability and reduce implementation costs for the government.

**Keywords:** Regulatory impact analysis; Policy quality; Policy design; Environment

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## **SESSION 7: HEAVY METAL PROBLEMS AND RENEWABLE ENERGY**

## **Heavy Metal Contamination of River Sediment at ASGM Area in Gorontalo Province, Indonesia**

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**Abstract:** The contamination of heavy metal has been a tremendous crucial issue around the world derived from Artisanal and Small-Scale Gold Mining (ASGM), found in the watershed and sediments. This study aimed to clarify the heavy metal pollution of sediments in the river basin nearby the ASGM sites in Gorontalo Province, Indonesia. Sediment samples were collected both in the experimental area consisted of 9 samples of clay and 27 samples of sand respectively and three samples were collected in the control area. Those samples were then analyzed by applying Particle-Induced X-ray Emission (PIXE) in the Cyclotron Research Center, Iwate Medical University, Japan. The results showed that the concentrations of Hg, Pb, As, and Zn ranged from 0 to 334 µg/g, 5.5 to 5.5 to 1,930 µg/g, 0 to 18,900 µg/g, and 0 to 4,923.2 µg/g, exceeded the limits recommended by the US Protect Agency (1991), and the Indonesian Government Regulation Number 38, 2011. Furthermore, river sediments taken from along the river mining sites are contaminated by Hg, Pb, As, and Zn.

**Keywords:** Heavy metal contamination; River sediments; ASGM; Gorontalo; PIXE

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## **Atmospheric Mercury Contamination on the Tree Bark Due to the Artisanal Small Scale Gold Mining (ASGM) Activity in the Bunut Seberang Village, Pesawaran District, Lampung Province Indonesia**

**Azhary Taufiq<sup>1</sup>, Melya Riniarti<sup>1</sup>, Hendra Prasetya<sup>1</sup>, Slamet Budi Yuwono<sup>1</sup>, Endang Linirin Widiastuti<sup>1</sup> and Masayuki Sakakibara<sup>2,3</sup>**

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**Abstract:** Mercury is known as heavy metals toxic that used in various industrial and mining supply. The extensive use of mercury as amalgamation process caused heavily problems of mercury contamination around the ASGM area. The evaporated mercury from amalgamation process could damage people's health through inhaling, causing complex health problem such brain damage and death. The aim of this study was to know the distribution of evaporated mercury contamination using tree barks as bioindicator by measuring the mercury concentrations and toxicity levels. The method that used to measure the mercury distribution in tree bark was using Atomic Absorption Spectrometer (AAS). The results showed that the total mercury (THg) of *Magnolia champaca*, *Swietenia mahagoni* and *Anthocephalus cadamba* were 56.5, 45.8 and 34.8 µg, respectively. The sampling method used was stratified sampling around the ASGM area and found with a total of 11 trees (one *Magnolia champaca*, three *Anthocephalus cadamba* and seven *Swietenia mahagoni*). *Magnolia champaca*, *Swietenia mahagoni* and *Anthocephalus cadamba* showed high concentrations of THg in the tree bark, which were found at the elevation level of 0-114 m and 114-231 m. This results indicated that the tree barks could be used as bioindicator of atmospheric mercury contaminations. The mercury found in these tree barks indicating that the mercury was spread across around the ASGM area, either the closest to the ASGM or furthest from the ASGM has a high level of mercury toxicity. This shown that the atmospheric condition was in danger because of high atmospheric mercury toxicity.

**Keywords:** ASGM; Distriburion pattern; Mercury; Mining; Tree bark

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## **Analysis of Atmospheric Mercury Concentrations in Tree Bark of Multi Purpose Tree Species (MPTS) in Bunut Seberang Village, Lampung Province, Indonesia**

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**Abstract:** MPTS plants cultivated by the community were suspected contaminated by mercury used in gold refining. Bark can be used as a bioindicator for mercury pollution in the atmosphere. The research objective was to determine the concentration of mercury contamination in MPTS plants and types of plants that have the potential as atmospheric mercury bioindicators. This study used a pathway method for sampling with an area of 387.03 ha and used Atomic Absorption Spectrophotometry (AAS) to analyze the mercury concentration in tree bark. The results showed that *Tamarindus indica*, *Persea americana*, and *Annona muricata* were accumulated the high mercury concentrations compared to the other types of MPTS plants. The *Tamarindus indica*, *Persea americana*, and *Annona muricata* were accumulate 74.4, 58.7 and 44.2 µg total mercury (THg), respectively. It is known that the bark of MPTS trees at low altitude contains more mercury in terms of the location of the tree. This is influenced by various factors such as skin characteristics, height, and natural conditions. This shows that the activity of refining gold using mercury has polluted the environment of Bunut Seberang Village and some plants are able to accumulate mercury in the atmosphere.

**Keywords:** Evaporation; Mercury; MPTS; Refining gold; Tree bark

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## **A Preliminary Study on Mercury Contamination in Plants from Small-scale Artisanal Gold Mining Area in Mandalay Region, Myanmar**

**Xiaoxu Kuang<sup>1</sup>, Win Thiri Kyaw<sup>1</sup>, Pyae Sone Soe<sup>2</sup>, Hnin Ei Khin<sup>3</sup>, Nan Myat Pyae Zaw<sup>4</sup>, AyeMyat Thandar<sup>5</sup> and Masayuki Sakakibara<sup>1,6</sup>**

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**Abstract:** Mercury-dependent artisanal and small-scale gold mining (ASGM) contributes to the largest artificial source of mercury pollution. Thabeikkyin Township, a small-scale gold mining township of Pyin Oo Lwin District in the Mandalay Region, operates mineral crushing, mineral processing, refining and other mining activities in the villages around Thabeikkyin Township. Miners in this area mainly use mercury for gold recovery through heating amalgam with open flame at home, in the gold shop, on the street or riverbank. Mercury is released into the atmosphere, then transported and deposited in the surrounding environment, result in mercury pollution of air, water, soil, etc. These mercury are considered to eventually accumulate in bodies of miners and the nearby residents through respiration and food chain. A preliminary study on mercury contamination to the environment from ASGM in Thabeikkyin Township, Mandalay Region, Myanmar was conducted to assess mercury atmospheric pollution issue. Mercury concentrations in plants were investigated. Mercury was detected in the tree bark, tree leaves and grass from 5 places. Higher mercury concentrations were observed in tree bark and tree leaves which near the refining sites with the values of 6.51, 4.17, 0.67 and 0.43 ug/g, respectively, than that in distance from grass with the value of 0.33 ug/g. Although the data obtained in this study was not sufficient, the results indicated that the atmospheric environment of Thabeikkyin Township may be contaminated with mercury originated from ASGM and have a high possibility lead to a negative impact on the health of surrounding residents.

**Keywords:** Artisanal and small-scale gold mining (ASGM); Mercury atmospheric pollution; Plant; Myanmar

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## **A Complex Land Use Matrix, the Case of Ponce-Enríquez in Ecuador: ASGM, Agricultural Plantations and Local Forest remnants**

**José Luis Rivera-Parra<sup>1</sup>, Ximena Diaz<sup>1</sup>, Carolina Bernal<sup>1</sup>, Carolina Ramos<sup>1</sup> and Jeny Ruales<sup>1</sup>**

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**Abstract:** Ponce-Enríquez is a locality in south-western Ecuador with a long history of artisanal and small gold mining (ASGM). The ASGM areas are found closer to the highlands and headwaters that irrigate the lowlands, where there are extensive banana and cocoa plantations. At the ecological level, Ponce-Enríquez is found embedded in the Tumbes dry forest biodiversity hotspot. In this complex matrix of different land uses, we were interested in analyzing the distribution of heavy metal contamination, likely related to ASGM activities. Specifically, we analyzed the spatial distribution of heavy metal presence in different environmental partitions: water, sediments, soil, crops, wild fish, wild plants and the local human population. We sampled the different environmental partitions following the major hydric systems from the highlands to the lowlands during the dry (July-August) and wet (January-February) seasons in 2019. The concentrations of As, Pb, Cd, Cr, Cu and Ni were determined using an ICP-MS analysis. These elements were chosen due to previous evidence of hazardous effects on humans. Our results suggest a widespread distribution of these elements across the different environmental partitions. The concentration pattern followed a gradient, with higher values closer to the ASGM areas. Moreover, we found evidence of elevated concentrations of these elements in native wild plants and wild fish. Cocoa beans grown closer to ASGM areas showed an increased level of Cd, concordant with a high level of the element in the nearby water and soil. We did not find evidence of anomalous levels of these elements in banana plants. Furthermore, there is evidence of atypical high levels of Pb, Ni and Cu across the study area. Our study suggests a widespread heavy metal contamination in the Ponce-Enríquez area, the spatial distribution and specific anomalies suggest a direct relationship with ASGM activities.

**Keywords:** Banana; Cocoa; Contaminant movement; Heavy metal contamination

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## Purification of Selenium-containing Leachate in Wastewater Tanks at a Tunnel Construction Site

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**Abstract:** Some civil engineering work, such as tunnel construction and earth cutting, requires excavation of soil and rocks that may contain heavy metals (e.g., arsenic, lead and selenium). When excavated soil and rocks need to be temporarily stored, they are often exposed to rainfall and other weather conditions, potentially producing leachate containing heavy metals in concentrations exceeding environmental and/or effluent standards. Phytoremediation is a technique of removing environmental pollutants using plants such as *Eleocharis acicularis*. The use of phytoremediation to remove heavy metals from contaminated leachate has attracted a great deal of interest in recent years. We have been attempting to establish a method of removing heavy metals from leachate derived from civil engineering work using natural bio resources with the ability to absorb heavy metals, such as *E. acicularis*. We therefore carried out experiments in which 8.4 m<sup>2</sup> mat-shaped *E. acicularis* were allowed to float on the surface of leachate stored in each wastewater tank placed at a tunnel construction site. 21 weeks after the introduction of *E. acicularis*, we measured the amounts of heavy metals absorbed by *E. acicularis* and the concentrations of heavy metals in the treated leachate. Our experimental results indicate that *E. acicularis* in a wastewater tank are capable of absorbing 0.0005 mg/L of selenium per day. In addition, we estimated the cost of this phytoremediation treatment based on the conditions under which this experiment was conducted. As a result, implementation of this method was found to be 55 % cheaper than conventional leachate treatment methods.

**Keywords:** Civil engineering; Leachate; Selenium; *Eleocharis acicularis*; Phytoremediation

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## Distribution of Heavy Metals on Water and Sediments of Ratai Bay of Pesawaran Regency – Lampung, Indonesia

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**Abstract:** Ratai Bay is part of Lampung Bay with water areas that are used for various activities, such as tourism, cultivation, fishing, core shipping and marine reserves. Into these, waters flow from several streams containing various wastes originating from the industry and urban potentially as toxic and dangerous chemicals such as heavy metals. This study aims to determine the concentration of metals Cd, Ag, Co, Pb, Cu, Ni, Cr, Zn, Fe and Mn in Ratai Bay. Water and sediment samples were taken at 8 stations, that is 4 stations on the river (stations A, B, C, D), 1 station at the estuary (station E) and 3 stations on the coast (station F, G, H). Concentration weight on water and sediment were analyzed using *Inducible Coupled Plasma Optical Emission Spectrophotometry* (ICP-OES). The results showed that Ag, Co and Mn metals in the water at all stations are below quality standards. The highest Cd and Cu concentrations in water were 0.02 mg / L (stations B and C) and 0.02 mg / L (station B and F). While for sediment metal Co, Cr, Cu, Pb and Zn at all stations is below the quality standard. Concentrations of Fe and Mn the highest on the sediment of 20,053.29 mg / kg (station G) and 600.64 mg / kg (station G).

**Keywords:** Heavy metal; Sediment; Ratai Bay; ICP-OES

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## **Distribution of Heavy Metals on Biota of Ratai Bay of Pesawaran Regency– Lampung, Indonesia**

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**Abstract:** Marine coastal of the shelter last for a river that empties and carries waste, both from industry and the home of stairs so that there is the potential of the accumulation of heavy metal. Ratai Bay either of regions with the various activities of society such as housing, transportation, ports, mining, and recreation have waste heavy metal potential. This study aims to determine the concentrations of Ag, Cd, Cr, Co, Cu, Fe, Mn, Ni, Pb and Zn metals in the biota of Ratai Bay. Biota sampling was carried out at four stations on the coast of Ratai Bay. Heavy metal concentrations in biota were analyzed using Inducible Coupled Plasma Optical Emission Spectrophotometry (ICP-OES). The types of biota that are obtained in Ratay Bay are fish, crabs and blood clams. From the research, it was found that the concentrations of Ag, Cr, Cu, Fe, Mn, Ni, Pb and Zn in biota showed values above the quality standard, while for Cd and Co were still below the quality standard. Where the highest Ag concentration was found in crab at station 4 of 48.39 mg/kg, Cr 415.86 mg/kg, Fe 3.339,86 mg/kg, Mn 26.39 mg/kg, and Ni 14.88 mg/kg. The highest concentration of Cu was 82.89 mg/kg and Zn 148.80 mg/kg in fish at station 2. The highest Pb concentration was at station 3 in blood clams at 2.45 mg/kg.

**Keywords:** Heavy metal; biota; Ratai Bay; ICP-OES

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## Heavy Metals Concentration in Green Macroalgae *Spirogyra* sp. of Way Ratai River, Pesawaran Regency, Lampung

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**Abstract:** The Way Ratai River of Pesawaran Regency in Lampung is one of the rivers which flows through Ratai Bay. Several points the Way Ratai riverbanks, there are small scale gold mining activities. The disposal of gold mining waste in the Way Ratai river, which empties into Ratai Bay will affect the heavy metal content around the waters. Certain metals in high concentrations will be extremely dangerous if found in the environment including the organisms in them, one of which is green algae. Therefore, further information is needed regarding the content of heavy metals in waters, especially those contained in the green macroalgae *Spirogyra* sp. Sampling was carried out at 4 observation stations around the Way Ratai River, this research was conducted in November 2020 – February 2021. Analysis of water metal content and *Spirogyra* sp. was done using the ICP-OES instrument (variant 715-ES). Heavy metal content in green macroalgae *Spirogyra* sp. namely Ag, Cd, Cr, Cu, Fe, Mn, Ni, Pb, Zn were above the quality standard threshold that had been set at all stations. Meanwhile, heavy metal Co content could not be detected. In river water, the heavy metal content of Ag at station A, Cd, Cu, Fe at station B-D, Mn and Zn at station D had passed the predetermined water quality standards (based on Indonesian Government Regulations such as PP RI No 82/2001, and ANZECC & ARMCANS 2000 regarding the Guidelines for the Quality of Freshwater and Marine Water), while Ag at station B-D and Pb at all station could not be detected. Based on the results of calculating bioconcentration factor (BCF) of heavy metals in *Spirogyra* sp, accumulation of heavy metals was in very high category with the highest BCF value of 162588.57 found for heavy metal Mn.

**Keywords:** Way Ratai River, *Spirogyra* sp., Heavy Metal

## **Plankton Diversity and its Heavy Metal Content on Ratai Bay of Pesawaran District-Lampung Indonesia**

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**Abstract:** The Way Ratai river runs through the Ratai Bay of Pesawaran Regency of Lampung Province, from which there are several small scale gold mining activities on the river side. The tailings waste resulting from mining activities affects the heavy metal content of the water because the tailings disposal goes directly to the water. Therefore, further information is needed regarding the content of heavy metals in the waters, especially those contained in plankton. Also, this study aims to determine the diversity of plankton species found in the waters of Ratai Bay. Eight (8) sampling sites were pointed along the river reaching to the coast. The study was conducted from November 2020 - February 2021. Heavy metal content of the water and plankton were determined by using ICP-OES (variant 715-ES). The results indicated that there were 14 classes and 77 types of plankton. Metal content in Fe, Mn, Zn, Cd, Ni, Ag, and Pb in plankton were all in above quality standard based on Decree of Environment Ministry (KEPMEN LH No 51/2004, PERMEN LH No. 5/2014, PP RI No 82/2001, and ANZECC/ARMCANZ 2000). Meanwhile, the heavy metal content of Cd, Cu, Fe, Mn, and Zn on the river had passed the predetermined water quality standards, while Ag and Pb metals had not been detected. The metal content of Cd, Co, Cr, Cu, Fe, Pb, Ag, and Zn in seawater had passed heavy metal quality standards for seawater. The highest BCF value (12.96) was found for Fe at station G while the lowest BCF value (0.13) was found for Ag at stations G and H.

**Keywords:** Ratai Bay, Way Ratai River, Plankton, Heavy metal

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## Heavy Metals Determination on Nekton of Way Ratai River of Pesawaran Regency

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**Abstract:** Way Ratai river is the area with various community activities, such as mining, recreation and residential areas that have the potential to dispose of waste including toxic and dangerous chemicals such as heavy metals. This study aims to determine the concentrations of Cd, Ag, Co, Pb, Cu, Cr, Zn, Fe and Mn metals in the waters of Way Ratai, Lampung. Sampling golden snail (*Pomacea canaliculata* L.), yuyu crab (*Parathelapsa convexa*), nila fish (*Oreochromis niloticus*), and cenang fish (*Gambusia affinis*) and sediment were carried out at three stations (stations A, B, C) on the Way Ratai river. Concentrations of heavy metals in golden snails (*Pomacea canaliculata* L.), yuyu crab (*Parathelapsa convexa*), nila fish (*Oreochromis niloticus*), and cenang fish (*Gambusia affinis*) were analyzed using Inducible Coupled Plasma Optical Emission Spectrophotometry (ICP-OES-ThermoFishers Scientific). The results showed that the metals Co, Cr, Cu, Pb and Zn in the sediments were below than the national quality standard. While for Ag, Cd, Fe and Mn in the sediment were above the quality standard with the highest Fe concentration was 26629.43 mg/kg detected in station B and Mn concentration was 1158.12 mg/kg in station C. Heavy metal concentrations in biota that reach the threshold was Fe. The Fe concentration found in crabs (at station A) was 766.52 mg/kg while the highest concentration of Fe found in fish (at station A) was 1240.81 mg/kg, and the highest concentration of Fe (at station B) found in golden snails was 1231.10 mg/kg. The highest bioconcentration factor (BCF) in crab found in Zn metal (at station B) was 4.080, while in fish was 7.679 in Cu metal (at station B), gold snail in Cu metal (at station C) was 8,738, and snail eggs in Fe metal (at station C) was 7,837.

**Keywords:** Heavy metals, Sediments, Biota, Ratai Bay, ICP-OES

## **Management of Lead (Pb) Waste Post Closing of Used Battery Smelter**

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**Abstract:** Lead (Pb) heavy metal contamination increases along with the community-managed waste processing of used lead batteries. People living in the vicinity of the lead smelter are at risk of exposure to lead which can have an impact on health. This study aims to identify the level of lead in the environment around post-closure used battery melting. The research used a quantitative descriptive method approach. Data collection was carried out by interview and sampling test. The test sample was taken purposively at two smelting locations, namely Cinangka and Parung Panjang in Bogor Regency, Indonesia. The results showed that there was still lead exposure in the soil and in the plants around the smelting site. The high lead levels that have been found require measurable remediation action. This is to minimize the risks that can affect the humans who are active around the used battery smelting site. In addition to having a negative impact in the form of lead exposure, lead smelting also provides economic benefits for workers in a smelter. Involving workers in collecting or sorting used batteries is an alternative after closing the smelting site. Meanwhile, smelting activities are only carried out by authorized smelters.

**Keywords:** Lead (Pb); Heavy metal; Smelter; Used batteries; Remediation

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## Bioethanol Production from Seaweed Waste as Biomass Resources

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**Abstract:** This paper describes about the potential application of renewable energy sources from biomass (seaweed waste) to replace fossil fuels combustion which produced CO<sub>2</sub> emission and heavy metal pollution. Utilization of energy for fuel increase continuously, unfortunately it is not in line with the processing raw material for energy production. Therefore, energy availability in Indonesia is decreasing significantly. On the other hand, the use of gasoline as fossil fuel creates serious environmental pollution problems, especially heavy metal pollution. Bioethanol is one of a promising biofuel candidates to substitute or replace liquid fossil fuel such as gasoline. Seaweed waste biomass from the agar industry is a potential biomass feedstock for producing sustainable bioethanol production because its availability and also using the feedstock can increase the product value and reduce the pollutant risk. The objective of the research is to utilize the solid waste from agar production industry which can pollute the environment. The enzymatic method was carried out for glucose production with the addition 1% of surfactant Tween 20 during the saccharification process of three (3) kinds of substrate concentration (20, 25, 30% dw); 10 FPU/g substrate for the cellulase concentration. On the other hand, the fermentation process for ethanol production used *Saccharomyces cerevisiae* as yeast. The result showed that the highest reducing sugar value (122.4 mg/mL) and 2.7% for the ethanol content were from 30% dw treatment of substrate concentration. Therefore, the waste from agar industry is a potential raw material to be used as biofuel and could reduce the heavy metal problems.

**Keywords:** Renewable energy; Seaweed waste; Substrate; Reducing sugar; Bioethanol

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## **Rooftop Solar PV program for Tourism Villages in Bali**

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**Abstract:** Electrical energy for the island of Bali, majorly supplied by power plants in Java island that is fossil fuel. With petroleum and coal reserves expected to run out by 2025, The Government of Bali has issued the Governor Ordinance No. 45/2019 concerning Clean Energy in encouraging Balinese people to use roof top Solar Photovoltaic for future electricity. Bali province has 8 regencies (Badung, Tabanan, Bangli, Karangasem, Klungkung, Jembrana, Buleleng, Gianyar) and 1 municipality (Denpasar). As Bali is backboned by the tourism industry and it is now drastically declining due to the COVID-19 pandemic which caused hundreds of hotels and its most supporting industries to close, the Government of Bali has changed the tourism orientation from urban tourism to rural tourism. This paper proposes Solar PV rooftop power plant program in the tourism villages that are representing all the 9 local governments respectively: 1) Sudaji, 2) Catur, 3) Tenganan, 4) Kerta, 5) Blimbingsari, 6) Paksewali, 7) Bongan, 8) Bongkasa, and (9) Sanur Kauh. Recent studies have shown that there is significant potential to produce renewable energy in Bali. In 2019 a joint study by CORE (Center of Community Based Renewable Energy) of Udayana University and Greenpeace, created a Road Map of Solar Power Plants throughout the island. This highlights the huge potential for rooftop-based solar energy generation across the island to be generated by 2025. The existence of Rooftop Solar PV is in line with Sustainable Development Goals of Bali Province. The study elaborates the biggest obstacle in implementing the program which is cultural barrier since Solar PV is still new and tradition and religion could hinder the people in the tourism village to utilize it as most of Balinese are Hindus. Behaviour modification strategy must be explored to make the program can be successfully done.

**Keywords:** Rooftop solar PV; Tourism village; Cultural barriers; Behaviour modification

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## Effects of Adhesive Content on the Bioenergetic Properties of Charcoal Briquettes from Sengon (*Falcataria moluccana*) Wood

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**Keywords:** Sengon (*Falcataria moluccana*); Charcoal briquettes; Tapioca starch; Pyrolysis; Adhesive content

**Abstract:** Sengon (*Falcataria moluccana*) is a fast-growing tree species widely planted in community forests in Indonesia. Timber harvesting of sengon wood and its wood processing operations generate a significant amount of wastes. Wood wastes from sengon have a high potential to be used as solid fuel, and the quality can be further improved by converting them into charcoal briquettes. This study aimed to determine the effects of adhesive content on the bioenergetic properties of charcoal briquette from sengon wood wastes. The charcoal briquettes were produced by mixing charcoal powders with tapioca starch as an adhesive with a concentration of 5%, 10%, and 15%. Biomass briquette from sengon wood particles (without pyrolysis) was also produced for comparison (control). The bioenergetic properties of the charcoal briquette were evaluated. The results showed that charcoal briquettes were more hydrophobic than biomass briquettes (control), indicating lower moisture adsorption in the charcoal briquettes with lower adhesive content. The results of proximate analysis of charcoal briquettes showed volatile matter of 22.13–29.83%, ash content of 19.47–21.64% and fixed carbon of 42.78–49.42%. Higher adhesive content increased the volatile matter and moisture content of the charcoal briquettes and decreased the ash content. The charcoal briquettes have a calorific value of 22.50–23.80 MJ/kg, which is remarkably higher than the control. Higher adhesive content tended to decrease the calorific value of the charcoal briquettes.



## Sugar Production of Autoclave-pretreated Oil Palm Empty Fruit Bunches (*Elaeis guineensis* Jacq.) by Different Acids

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**Abstract:** Indonesia is the biggest oil palm producer in the world, followed by Malaysia. They totally supply nearly 90% of the global market with predicted combined production of about 60 million tonnes this year, Indonesia with 37.8 million tonnes. One of the residues of this industry is oil palm empty fruit bunches (OPEFB) which can be utilized as bioethanol feedstock due to its high holocellulose content of about 60%. As with other lignocellulosic biomass, OPEFB has to be pretreated before subsequent enzymatic hydrolysis to break or loosen the linkage of cellulose, hemicellulose, and lignin creating a large industry in food and agricultural products and chemicals. Therefore, this study investigated the influence of the three different acids (oxalic, maleic, and sulfuric acids), 3 concentrations (1% w/v, 3% v/v, 5% v/v), and 3 heating durations (15, 30, 45 min) in an autoclave (121.1 °C) on the pretreatment of OPEFB and to evaluate sugar production after enzymatic hydrolysis of pretreated OPEFB. The results show that maleic acid gave the highest sugar yield at 3% concentration for 45 min heating duration at 20.94 g per 100 g raw biomass while 17.58 g and 15.40 g sugar per 100 g raw biomass were obtained from oxalic acid (3%, 45 min) and sulfuric acid (1%, 15 min) pretreated OPEFB, respectively. This study shows the promising result of using maleic acid for lignocellulosic pretreatment compared to oxalic and sulfuric acids.

**Keywords:** Bioethanol; Enzymatic hydrolysis; OPEFB; Pretreatment; Sugar analysis

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## **SESSION 8: URBAN MANAGEMENT AND COMMUNITY DEVELOPMENT**

## **Reformulation of Socially Resilient Village**

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**Abstract** Village capacity development is a major focus in the era of President Jokowi. There have been many policies, strategies and community empowerment programs aimed at realizing a prosperous village. One of the programs at the Ministry of Social Affairs is the model of empowering social institutions as an effort to increase social resilience in the community is measured by four indicators: (1) community's ability to protect its vulnerable and problem-affected citizens; (2) community participation in social organizations; (3) community's ability to prevent and manage social conflicts and violence; (4) community's ability to maintain local wisdom, manage natural and social resources. However, the model experiences obstacles, such as; high dependency on government assistance, its ceremonial nature, obscurity in institutions and human resources to actuate, discordance with current conditions and unsustainable. Therefore, research is needed to reformulate socially resilient village. This research uses qualitative research methods, through literature studies, in-depth interviews, FGDs, and field observations. The results show that socially resilient villages are being redeveloped by the Extension Center for Social Affairs through the role of community social extension agents as agents of change, implementing and providing Communication, Information and Education services along with social guidance to individuals, families and communities as well as institutional strengthening and local social participation. The socially resilient village is able to attract other Ministries/Institutions (Ministry of Research and Technology; and the Ministry of Village, Development of Disadvantaged Regions and Transmigration) to collaborate in its implementation.

**Keywords:** Social resilience; Village; Community development; Indicators

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## **Relationship on Forest Health with the Welfare Level of the Community Around the Mangrove Forest**

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**Abstract:** Mangrove forests must have a health condition to maintain forest functions and ensure the community's welfare. The purpose of this study was to obtain the value of mangrove forest health status in Margasari Village and to determine the relationship between mangrove forest health indicators and the level of community welfare. Research methods to determine the value of forest health status using Forest Health Monitoring (FHM). SPSS 20 statistical spearman rank correlation test was used to determine the relationship between mangrove forest health and community welfare indicators. The results showed that the average value of mangrove forest health status in Margasari Village was 5.40 (medium category). Indicators of the level of community welfare related to the health level of mangrove forests are health and nutrition, education, and indicators of housing and environment. Forest managers and the community need accurate data and information regarding the health condition of the forest and its relationship to the level of welfare of the community around the mangrove forest to facilitate appropriate management and utilization decisions in managing forests while still supporting the principles of sustainability. Based on the results of the relationship between forest health and community welfare, shows that good mangrove forest conditions have an impact on the welfare of the surrounding communities, particularly in terms of health and nutrition, housing and community levels, and education.

**Keywords:** Forest Health Monitoring (FHM); Forest health; Community welfare

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## **Creating Community Awareness Inaction on Environmental Problems: Implementation and Outcomes of Cinematic Education**

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**Abstract:** The Limboto Lake is one of the icons of the Gorontalo Province, which unfortunately lacks attention from the community. Apart from the problem of silting and accumulating water hyacinth which is a natural thing, there is a problem of garbage that actually comes from the surrounding village community. It may causes of the point of view of people living around the lake and the government towards the lake environment is very low. Transformative Boundary Object (TBO) in the form of problems and the potential for Limboto Lake is proposed to be able to change community values. The problems and potentials of Limboto Lake are complex matters that are difficult to address, especially to the people around Limboto Lake who are village people. Providing understanding to the community to be able to change their views is usually done through socialization. However, because of the lack of time efficiency, money efficiency, and cannot be done continuously, socialization will not be an effective action. Therefore, the TBO approach using cinematic films is proposed because it can cover the above shortcomings. The making and screening of cinematic educational films was carried out as part of the TBO approach. In addition, a questionnaire was distributed to the audience to be able to measure changes in community values after the screening. From the results of the questionnaire obtained, there is an increase in people's understanding of Limboto Lake. This increased understanding directly affects people's feelings and makes plans for contributions to Limboto Lake.

**Keywords:** Limboto lake; Transformative boundary object (TBO); Environmental problems; Cinematic education; Gorontalo

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## Spatial Structure and Community Perception of Pejaten Village on Policy Determining Rural Industry Area in Tabanan District, Bali

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**Abstract:** Tabanan Regency is well known as Bali's rice granary. However, one of the villages located in an agricultural area, Pejaten Village, is famous as its tile industry. The Tabanan Regency Government has designated Pejaten Village as a rural industrial area. The successful implementation of these policies needs to be supported by preparing human and natural resources that have adequate competence and creative power. This study aims to analyze (1) community knowledge and attitude about rural industrial area; (2) the spatial structure of industrial village based on the Hindu's concept of balance called *Tri Hita Karana*. The method of determining respondents was done by stratified random sampling. The strata are carried out based on the scale of the tile industry. Methods of data analysis using: (1) likert scale for analyzing attitude and perception and (2) GIS analysis for knowing the spatial structure of common space. The results showed that (1) the community had quite positive attitudes and moderate perception categories regarding the policy of determining rural industrial area of Pejaten Village and

(2) the spatial structure of common space had adapted from a rural space structure to an urban spatial structure. This changes affected the management of land use, environmental and social resources owned by the community. Based on the results of this study, it is necessary to conduct a more intensive approach to increase moderate perception of the community.

**Keywords:** Community Perception; Land Use Competition; Rural Industry; Spatial Transformatio

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## **Changes in Land Use using the NDVI (Normalized Difference Vegetation Index) Method in Kedamaian Sub district, Bandar Lampung City as Urban City**

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**Abstract:** Land use change occurs naturally, but in urban areas land use change usually occurs more rapidly than in rural areas. Therefore, it is necessary to analyze land use changes using spatial data to determine land use changes that occurred in urban areas such as Bandar Lampung in 2000 and 2020. This study uses Landsat 7 and 8 imagery processed by the NVDI (Normalized Difference Vegetation Index) analysis method with an arithmetic formula to determine the vegetation index  $NDVI = (NIR - RED) / (NIR + RED)$ . After obtaining the land cover map from the results of the NDVI analysis, a ground check was carried out at 30 location points to determine thereal condition of the field and to calibration the data from NDVI analysis and real condition. In this study, it wasfound that the results of land use from 2000 to 2020 experienced changes, namely in open land / settlements increased by 74% or 217 ha, shrubland decreased by 27% or 32 ha, low vegetation land decreased by 4.8% or 7 ha, and vegetation land is decreasing by 72.5% or 100 ha. Based on the results of ground checks, changes in land use are caused by the construction of settlements, housing and industrial estates due to an increase in population and urban growth.

**Keywords:** Land Use Change; Landsat; NDVI; Urban City; Bandar Lampung

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## **The Impact of Transplants Machine on Acceleration of Innovations Adoption in Rice Cultivation**

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**Abstract:** The use of machinery in agriculture is mainly to solve the problem with the scarcity of labor. In fact, this innovation is not automatically accepted by farmers, especially in areas with a large labor force. This study aims to determine the impact of transplant machines on rice cultivation. This study was conducted as a literature study and based on the author's experience from 2014 to 2020 as an extension worker in rice cultivation assessment in Lampung province. The result shows that the use of rice transplant machines has a particularly positive impact on increasing the application of innovation such as improved nursery techniques, use of young seedlings, and use of legowo planting systems. In addition, the use of transplant machines also causes changes in society and has a negative impact such as the emergence of competition between farmworkers and transplant machines service providers.

**Keywords:** Technology; Transplanter; Paddy; Legowo; Adoption

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## **Farmers Perceptions of Paddy Rice Cultivation Technology in Jakarta City**

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**Abstract:** The introduction of rice cultivation technology from the Indonesian Agency for Agricultural Research and Development has been carried out to several rice farmers in DKI Jakarta. The introduction was carried out to optimize rice productivity amidst limitations of urban agricultural resources. Farmers in urban areas have different characteristics, easy information access and easy farming location access, expected to be able to influence farmers' perceptions and make it easier for farmers to apply introduced technology. Therefore, this research aims to determine the characteristics of rice farmers in Jakarta and to find out farmers' perceptions of introduced paddy rice cultivation technology. To determine the characteristics of paddy rice farmers in Jakarta, a qualitative descriptive analysis was carried out, while to measure farmers' perceptions, a perception analysis was carried out. The results show that although the majority of paddy farmers in Jakarta are not owners of cultivated rice fields, and have limited land in various aspects, the resulting production is quite optimal. This is due to good accessibility, which includes access to information, location access and infrastructure access. Good market access also has an impact on the ease with which farmers can sell their products and get good selling prices. The results of the analysis also show that the majority of farmers respondent have good / positive perceptions of introduced paddy rice cultivation technology. This shows that the introduced technology can be accepted and has opportunity to be adopted by rice farmers.

**Keywords:** Perception; Farmers; Urban agriculture

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## **SESSION 9: SUSTAINABLE DEVELOPMENT GOALS**

## **Development of Geo-tourism Site in Bunikasih-Pangalengan: Environmental Conservation from ASGM Activities**

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**Abstract:** Bunikasih village is located south of Bandung city, the capital of West Java province, which has Artisanal Small Gold Mining activities (ASGM). In addition, this village which is included in the Pangalengan district, has many tourist attractions that have geological and cultural values. This study aims to develop the potential for geo-tourism around Bunikasih village and more widely in Pangalengan district. The method was using a review study, field observation and geomorphological study. The candidate unique geosites in Bunikasihvillage are Cibaliung river and Congeang waterfall that have lava flow and hydrothermal alteration, besides Panglengan district itself which is a former ancient volcano. The results of this activity provide added value for geological education from several geosite and put it in the form of information that can be found on geosites information or tourism pamphlets. This geo-tourism activity is expected to replace the livelihoods of ASGM activities and environmental conservation in Bunikasih village and its surroundings.

**Keywords:** Geotourism; ASGM; Environmental conservation; Bunikasih.

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## **The Structure of Sustainable Eco-tourism with the Case Study of Geodiversity Story in the Oze National Park, Central Japan**

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**Abstract:** “Oze” consists of the high moor, peatland, and lake surrounded by 2000’s-meter mountains. Oze is a national park, a national special natural monument, and also assessed as a Ramsar site. There are two visitor centers at the wetland area and the lakeshore operated by the Oze Preservation Foundation. Oze has its history of preservation since it has designated as a national park in 1934. At present, trespassing over the boardwalks or is highly prohibited, and hence the original nature is well protected. There are 220 official Oze eco-tour guides who guide students for their nature education programs. Alpine plants and other great nature attract a variety of people including inbound tourists. Oze is an effective site for SDGs study especially of the goals 4, 13, and 15. The most contents of Oze eco-tourism presented by guides are related to biodiversity, and the broader perspective including geodiversity is welcomed. It would be difficult to have a guiding story about geodiversity because there are only a few observation points to know geodiversity from boardwalks. This study practices to have a geodiversity story about a boulder called “Kawagoiwa” rock. The 4 meters by 5 meters Kawagoiwa rock sits next to the top of cape-shaped hill called Teragasaki, and some guides tell that Kawagoiwa was ejected by Mt. Keizuruyama about 3.6 km away by its volcanic eruption without an academic reference. This study performed the petrological documentation of Kawagoiwa for the first time, and the rock is composed of orthopyroxene-clinopyroxene andesite. Kawagoiwa is compared with the rock obtained from Mt. Keizuruyama and Teragasaki to discuss its origin. This study also performed the stakeholder analysis in terms of eco-tourism in Oze, and the result highlighted the essential communication between researcher and guides. The structural background related to the Oze eco-tourism and the effective way to promote the sustainable eco-tourism is discussed.

**Keywords:** Eco-tourism; SDGs; Oze; National park; Natural monument; Ramsar site; Geodiversity

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## **Visitors Experience on Sumatran Butterfly Ecotourism in Sustainable Environmental Awareness**

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**Abstract:** Sustainable development can be accounted by contributing to environmental sustainability. The objective of this study was stressing on sustainable environmental awareness in butterfly conservation. Data were collected from 100 visitor respondents visiting Gita Persada Butterfly Park, an ecotourism based on Sumatran butterfly conservation in Bandar Lampung City - Lampung Province, Indonesia. There were 16 questions given to respondent, consisting of respondent's background and knowledge on butterfly conservation. The responses showed that visitors had ecological knowledge about butterfly life. From 15 items on tourist activities and 14 items on knowledge of butterfly's life cycle indicated that visitors had specific interest on having experiences in butterfly ecotourism. Transfer knowledge on conserving butterfly to visitors gave possibility on participatory of people to support and conserve the butterfly ecosystem. Furthermore, it gave contribution on achieving sustainable development goals.

**Keywords:** ecotourism; butterfly conservation; environmental awareness

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## Assessment of Geosite for Geotourism Development in Gorontalo Outer Ring Road Area

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**Abstract:** Gorontalo is one of the provinces in Sulawesi that have a complex background. Gorontalo Outer Ring Road (GORR) area located in Gorontalo District is one of the examples of an area that have a complex geological condition. This study was conducted to study the geosite potential in GORR area, Gorontalo. This study uses lithology analysis and petrography analysis. Geosite assessment is done using the Kubaliková Parameters. Lithology analysis is used to determine the type of lithology in the outcrop. Petrography analysis is used to observe the presence of microstructures on every layer of the outcrop. The outcrop itself consists of 3 layers of lithology, namely Calcilutite, Carbonate Tuff and Calcarenite. The result of petrography analysis shows the microfossils of *Lepidocyclina Sumatrensi* which is dated back to Plio-Pleistocene. The structure of the study area itself is very unique because both the structure and the petrography analysis give different outcomes which leads to different results. According to The Kubaliková Parameters, the study area has potential for geotourism development.

**Keywords:** Lithology; Structural geology; Calcarenite; Carbonate tuff; Calcirudite

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## **Vulnerability of Fishermen Household Poverty the Impact of Climate Variability in the Tanggamus District, Lampung Province, Indonesia**

**Maya Riantini<sup>1</sup>, Indah Listiana<sup>1</sup>, Helvi Yanfika<sup>1</sup>, RAD Widyastuti<sup>1</sup>, Abdul Mutolib<sup>2</sup>, Ali Rahmat<sup>3</sup> and  
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**Abstract:** Seasonal and annual climate variability in Indonesia is influenced by the rainy season. So that it can affect the climate in Indonesia through the movement of the sun's culmination point which causes Indonesia to experience rainy and dry seasons. One of the impacts of climate variability, such as rainfall or sea conditions with high waves or strong winds, is a threat to fishermen in fishing activities at sea. Natural phenomena that do not necessarily impact fishermen from being able to do their jobs as fishermen. The existence of climate variability has an impact on the vulnerability of fishermen households to fishermen's life, this is because fishermen households are very dependent on fishery products. This research was conducted in Kota Agung Subdistrict, Tanggamus Regency, Lampung Province. This study involved 100 respondents consisting of 70 traditional fishermen and 30 modern fishermen. The purpose of this study was to analyze the vulnerability of fisherman households due to climate variability in Tanggamus Regency, Lampung Province. The analysis method used in this research is multiple linear regression analysis of the Livelihood Vulnerability Index LVI. The results of the LVI analysis show that traditional fishermen are in the most vulnerable category with an LVI value of 0.477, while modern fishermen with an LVI value of 0.378. The LVI value of traditional fishermen, which is close to 0.5, indicates that traditional fishermen are very vulnerable compared to modern fishermen. Climate variability causes the vulnerability of traditional fishermen due to disturbing fishermen's livelihoods and encourages fishermen to change their orientation towards fishermen's livelihoods.

**Keywords:** Vulnerability; Fishermen; Poverty; Household; Climate

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## **Social Entrepreneurship Program to Improve the Economic Welfare of Poor Families in Indonesia**

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**Abstract:** In 2020 the Indonesian Ministry of Social Affairs will carry out the Social Entrepreneurship Program with the aim of improving the economic welfare of 1000 poor people as beneficiaries. Social entrepreneurship is a combination of business and social that contributes to the Sustainable Development Goals (SDGs), namely achieving zero poverty by 2030. This study aims to evaluate the implementation of social entrepreneurship programs with indicators of input, process, output and outcome. The method used in this research is descriptive quantitative equipped with in-depth interviews and focus group discussions. Taking samples with a confidence level of 99% and an alpha value of 0.05, the total sample size is 509 respondents spread across 5 cities, namely DKI Jakarta, West Bandung, Majalengka, Semarang, and Bantul. The results of this study indicate that the input indicators covering business capital incentives, business assistance incubation, and social assistance have been implemented well. In the process indicator consisting of business incubation and entrepreneurship guidance, it still needs to be improved and the need to add social guidance. Output indicators consisting of financial inclusion, asset management, sustainable livelihoods, and capital and social networks were mostly affected by the Covid 19 pandemic. The outcome indicators show that there is an increase in results after joining the social entrepreneurship program, but the income is still higher than before the pandemic. The conclusion of this study is that social entrepreneurship programs can increase the income of the poor.

**Keywords:** Social entrepreneurship; Poverty; Sustainable Development; family income; Economic welfare

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## **The Resource Management and Subjective Well-Being of Indonesian Families in the Midst of COVID-19 Pandemic**

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**Abstract:** Economic pressures due to pandemic coronavirus diseases 2019 (COVID-19) require families to make various adjustments to maintain their welfare. This study examined economic coping strategies and the subjective well-being of families amid the COVID-19 pandemic. A total of 1125 families participated in this study through an online survey. Descriptive analysis is used to produce the distribution of data. In addition, inference analysis was applied to test whether there are significant differences in coping strategies and subjective well-being based on education level, employment status, economic status and income changes during the COVID-19 pandemic. The study shows that the average per capita income decreased during the pandemic. During the pandemic, the family experienced a decrease in income, which encouraged the family to adopt various economic coping strategies. The coping strategy adopted by the family is primarily by saving expenses followed by the use of savings and increased income. The most efficient savings strategy was by reducing snacks. In contrast, the strategy to increase income is mostly done by utilizing hobbies or skills to sell the results of subjective well-being. The family is relatively prosperous in terms of physical, social and psychological, but not prosperous in economic terms. Low satisfaction with savings and income conditions contributes significantly to low economic satisfaction. Most families were forced to take savings to overcome family financial problems caused by the pandemic. Differences in subjective well-being can be seen from differences in economic status, education levels, and changes in income. Based on demographic characteristics, families that are not poor, fixed income, and highly educated tend to employ low coping strategies and high subjective well-being.

**Keywords:** Coping strategies; COVID-19; Economic pressure; Subjective well-being

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## **Accounting Correlated Random Parameters in Best-worst Scaling: Case of Preferences of Job Opportunities in Artisanal Small Gold Mining (ASGM) Community in Indonesia**

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**Abstract:** This paper investigates latent demands regarding new job opportunities in Gorontalo province, Indonesia, where limited job opportunities hinder sustainable improvements in rural livelihoods. The research focused on rural villages where small-scale gold mining (ASGM) activities are prevalent in the economy. In ASGM community, alternative job opportunities that generate cash income are of particularly importance to reduce dependency on mining sectors which thereby contribute to reduce mercury emissions to the atmosphere. Assuming hypothetical scenarios that local governments establish food processing industries, the research examines workers' preferences that influence on their decision to take job opportunities. Based on the findings of the previous survey in 2017, seven attributes are set as hypothetical factors. A questionnaire survey designed as a best worst scaling (BWS) was applied to households to elicit preferences. Under BWS, each respondent is asked to choose "best" and "worst" factors among four ones. Each respondent repeats answers at seven times. Main household survey had conducted in 2019 in Bone Bolango Regency, Gorontalo province of Indonesia. Estimation results from random parameter logit model reveal that on average, villagers prefer creating job opportunity for society, frequency of payments, better local environmental quality, occupation-related health risk, obtaining new skills on their job choice. Since those factors are significant in SD parameters, there is a significant preference heterogeneity. Factors that discuss reputation of the company, and whether friends are working in the same company are considered as relatively less important ones. Furthermore, the paper employed random parameter logit model with correlated normally distributed coefficients. The likelihood-ratio test statistics indicate that null of uncorrelated coefficients is rejected. The covariance matrix of the random parameters are estimated. The present study is beneficial for policymakers when considering the provision of job opportunities in rural areas to reduce dependency for mining and simultaneously improve rural livelihoods.

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**Keywords:** Preference; Job Opportunities; Best Worst Scaling; Artisanal Small Gold Mining; Indonesia

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## **Household Demand for Animal Food in Urban and Rural of Bengkulu, Indonesia**

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**Abstract:** The price of animal source of protein food has increased in the last five years. A price increase will reduce demand. This study aimed to analyze the impact of price and income on demand for five animal food groups in Bengkulu's urban and rural areas. The demand system approach uses the Quadratic Almost Ideal Demand System model. The research data used data from the National Socio-Economic Survey (Susenas) in March 2016, totaling 3000 households. The results showed that the demand elasticity of urban was greater than that of rural areas. In urban households, beef and fresh fish's demand elasticity was 5,747% and 3,010%, while in rural areas, it was 3,829% and 2,345%. Beef and fresh fish are more elastic in urban households than in rural areas. In urban and rural areas, the four animal food groups of chicken, beef, fresh fish, and powdered milk are almost substitution, except in rural areas where fresh fish and milk powdered are complementary. Meanwhile, in urban areas, fresh fish with powdered milk and powdered milk with beef are complementary. The price policy is more effective than the income policy, both in urban and rural areas in Bengkulu.

**Keywords:** Food demand system; Animal source of protein; Beef; Bengkulu Indonesia

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## **Limboto Lake Case and Cultural Diversity**

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**Abstract:** The purpose of this study is to analyze how nature can bring up cultural contestation mirroring cultural diversity, namely how old values and Islamic values provided effects to preserve the nature around Limboto Lake. Furthermore, the natural disaster also changes the lakeside culture becoming mainland culture. In the case of Limboto Lake, the relation between the landscape and the culture become crucial. The idea that nature and culture are not related is the crucial discussion of cultural experts, because natural landscapes shape how humans carry out activities. Moreover, humans are not just doing physical activity in a place, but also humans think, arrange their social lives base on the conditions where they live in. This statement shows that humans' geographical setting has social and cultural dimensions, not only an empty place. The tools used by humans gave impacts to the physical and cultural setting. Thus, we can state that cultures will adapt to its environmental form. On the other hand, the environment is also formed by the feature of cultures. This research uses ethnography method, some concepts of culture such as circuit of culture, and cultural landscape. Ethnography is a field research that observes culture as the way it is. The result shows that there are distinctive phenomena, namely social and cultural transition. The society around the lake is still in transition of thought between old and Islamic culture in handling Limboto Lake; and also due to the condition of the lake, the society developed mainland culture beside lakeside culture. Considering to these conditions, it can be concluded that there are certain periods of time that must be overcome by all parties either government and the society around the lake.

**Keywords:** Limboto lake; Culture; landscape, diversity

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## **Model of Potential Fishing Ground in Regional Fisheries Management of Indonesia (WPP-RI) 716 to Support the Achievement of SDGs**

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**Abstract:** The Sustainable Development Goals (SDGs) program has 17 big goals, two of which are related to food security (SDGs 02) and management of coastal and marine resources (SDGs 14). The fisheries sector, especially in Indonesia, has good potential in supporting these two SDGs goals. However, in fishing activities, many fishermen still use traditional methods and only based on their fishing experience. This study aims to create a potential fishing ground model in Regional Fisheries Management of Indonesia (WPP-RI) 716 using remote sensing satellite imagery data. The data used is sea surface temperature data extracted from the Suomi National Polar-orbiting Partnership (SNPP), the Visible Infrared Imaging Radiometer Suite (VIIRS) image level 2 for the daily period in a period of 2 years, namely the period of 2018-2019. The method used in calculating sea surface temperature is statistical regression with the Non-Linear Multi Channel SST (NLSST) approach, while the determination of fishing grounds uses the Single Image Edge Detection (SIED) method. All fishing ground points that have been generated were analyzed for their density using point counting techniques in a polygon. The results showed that the most information on fishing ground was produced in 2018 during the second transitional monsoon (September, October and November) as much 354 points, while the least information was generated during the first transitional monsoon (March, April and May) as much 12 points. In 2019, the most information on fishing ground produced during the second transitional monsoon was 1835 points, while the least information generated in SE monsoon (June, July and August) was 312 points. In 2018 and 2019, information on fishing areas was mostly found during the second transitional monsoon. The information generated is expected to increase fishermen's catch so that it can increase the level of welfare of coastal communities and support the achievement of SDGs goals.

**Keywords:** Fishing ground; Sea surface temperature; WPP-RI 716; SDGs goals

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## **A Novel Palm-fiber Net Industry as New Hope of Alleviating Poverty in Gorontalo Province**

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**Abstract:** Arenga pinnata fibers have many advantages in terms of mechanical strength when compared to other palm fibers. The fibers have been widely used such as ropes, roofs, broom and part of water filtering devices. Now it is being replaced by plastics-based ropes, broom and net and zinc-based roofs. Now the huge amount of fibers is just left to be naturally composting on their parent trees. Whereas the owners and the rope makers living under poverty line incomes. The use of erosion control blanket based on palm fibers such as coconut fibers is well known in Japan, Europe, US and Australia. Through transdisciplinary approach we do the practice of making new industry of making palm-fiber net in Bone Bolango and Boalemo regencies of Gorontalo Province. Several meetings with three communities (Bunuo village (BV), Managgu village (MV) and Tulabolo barat village (TV)) of practice have been done with various results, where the two communities (BV and MV) showing a lesser commitment on the project. While the TV community has a strong commitment on the project, which may be caused by existing community producing the rope.

**Keywords:** Palm-fiber net; Erosion; Small industry; Poverty ; Gorontalo

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## The Effect of Acclimatization Chamber and Growth Hormone on the Survival of Endangered *Hopea* *Gregaria* Tree Species

**Faisal Danu Tuheteru<sup>1</sup>, Asrianti Arif <sup>1</sup>, Husna<sup>1</sup>, Albasri<sup>1</sup>, Sri Andriyani<sup>1</sup> and Diana Prameswari<sup>2</sup>**

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**Abstract:** *Hopea gregaria* Slooten tree species locally named Pooti, of Dipterocarpaceae family, belongs to an endemic tree species in Sulawesi Tenggara, Indonesia. At present, due to various causes such as unsustainable forest exploitation management and forest fire, this species is categorized as endangered forest tree species in Indonesia. Therefore it is urgently needed to sustain this tree species. The purpose of this study was to determine the effect of acclimatization box and growth hormone treatment on the survival of endangered Pooti (*H. gregaria*) wilding tree species. This research was conducted at the green house of the Indonesian Mycorrhizal Association (AMI) Southeast Sulawesi branch, for as long as three months. There are many wildings of *H. gregaria* at Nipa- Nipa National Park . Those wildings have the potency to be developed as plant procurement through natural wilding collection. This study used a factorial Completely Randomized Design (CRD) with three replications and five plant units. The first factor was the use of acclimatization box and the second factor was Rootone-F treatment, with a concentration of 0 ppm, 50 ppm 100 ppm and 150 ppm. Based on data processing and analyses the research results showed that the acclimatization box and Rootone-F interaction had no effect on all variables. However the acclimatization box can increase the survival and percentage of shoots, height of wildings, number of leaves and leaf length. Natural wildings depend on providing transparent cover/acclimatization box at the beginning of growth; Rootone-F increases the height of wildings.

**Keywords:** *Hopea gregaria*, Southeast Sulawesi, Acclimatization chamber, Natural wildings, Growth hormone

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## The Response of Medang Seedling (*Litsea firma* Hook) to Various Doses of Biofertilizer

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**Abstract:** The need for wood is increasing, but currently the forest area tends to decrease due to forest fires, illegal logging and exploitation of natural forests. To anticipate the decline in log production from natural forests, a forest planting program is needed, especially in unproductive land, grasslands and shrubs. One of the recommended species for development of plantation forest is medang (*Litsea firma*). Distribution area of medang in Indonesia is quite wide covering Sumatra, Java, Kalimantan, Sulawesi, Maluku, Nusa Tenggara and Papua. The purpose of this study was to determine the effect of biofertilizer dosage on medang growth (*Litsea firma*). The research was carried out in the Silvicultural nursery of the Forest Research and Development Center in Bogor. The treatment method used a completely randomized design consisting of one factor by three replications. The dosage for bionature as treatment factor consists of control (without fertilizer), 25 mL of bionature, 50 mL of bionature and 100 mL of bionature. The growth parameters measured were height, diameter, shoot ratio and seed quality index. The results showed that the dose of bionature that produced the best growth of medang seedling was 50 mL for height and diameter.

**Keywords:** Seedling growth; *Litsea firma*; Biofertilizer dosage; Bionature; Plantation forest

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**ABSTRACT OF  
POSTER SESSION**

## **Service Quality and Patient Interest in Choosing Class 2 In Patient Care**

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**Abstract:** The decrease in the number of patients hospitalized in class II for three consecutive years was not in line with the increase in hospitalization rate at the hospital. This indicated a decrease in interest in choosing class II inpatient care. Decreased interest was due to dissatisfaction for the services provided which was possible to be less quality. This study aims to determine relationship between service quality and patient interest in choosing class II inpatient care at the hospital. This was an analytical survey study with a cross-sectional design. The population was all patients hospitalized in class II at the General Hospital of the Muhammadiyah University of Cirebon in 2019 as many as 1,970 people and the samples were taken using the accidental sampling method as many as 95 people. Data were collected using a questionnaire. Hypothesis test used the continuity correction test. The results showed that there was a significant relationship between the dimensions of tangible ( $p = 0.031$ ), reliability ( $p = 0.036$ ), responsiveness ( $p = 0.013$ ), assurance ( $p = 0.002$ ), and empathy ( $p = 0.047$ ) with the patient interest in choosing class II inpatient care. Service quality is one of the factors that may create interest of the users in reusing the previous service facilities. Hospitals are expected to improve service quality (tangibles, reliability, responsiveness, assurance and empathy) by providing technical training to the officers to increase their capability in providing services.

**Keywords:** Quality; Interest in Choosing Inpatient Care

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## **A Comparative Study of the Neurological Symptoms of the Suwawa Artisanal and Small-Scale Gold Mining (ASGM) Community**

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**Abstract:** Artisanal and small-scale gold mining activities (ASGM) can cause mercury poisoning due to various gold processing processes, one of which is burning amalgam. Mercury poisoning as a result of the amalgamation process causes health problems that lead to several different diagnoses and then lead to a differential diagnosis. This study aims to provide an overview of the differential diagnosis of diseases caused by mercury poisoning in the community. The data collection technique is done by taking anamnesis, observation, and physical examination. The location of data collection was carried out in the ASGM area of East Suwawa District. The data were analyzed by using descriptive methods. The results showed that from 102 patients who had nervous or mental disorders were 3%, 3% malaria, 23.8% gasoline and kerosene contact history, 17.8% insecticide and pesticide contact history, 12.9% alcohol consumption, leprosy. 2%, history of whitening cosmetics 17.8%, hepatitis or liver disorders 2%, tuberculosis 10.9%, severe infection 25%. From this study, it can be concluded that the differential diagnosis with the largest percentage of mercury poisoning found in the ASGM East Suwawa area is a severe infection by 25%, contact history of gasoline and kerosene 23.8%, and contact history of insecticides and pesticides 17.8%.

**Keywords:** Mercury; Intoxication; Differential diagnosis; ASGM; Neurological symptoms

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## **The Impact of COVID-19 Pandemic in ASGM Community**

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**Abstract:** The COVID-19 pandemic to date still has an impact on many communities, even people around the mining area, especially East Suwawa in Gorontalo Province, feel the same way. Even though the existence of the COVID-19 virus has entered the New Normal Life era implemented by the government, the effects of this pandemic are still being felt by the public. This study aims to describe the effects of the COVID-19 pandemic on communities in the eastern Suwawa mining area. The method used is quantitative with a survey approach. The number of samples was 274 respondents with purposive sampling, which was conducted face-to-face with due observance of the health protocols that were also implemented by the government. Based on the results of research on 274 respondents, it was found that 67.2% did not feel happy even though this pandemic had entered the New Normal Life era. It was also found that 66.8% of respondents were visiting when visiting public places, 35.4% easily felt emotional for no apparent reason, 62.8% still read the news that could make you anxious. This affects the average behavior of the respondents so that 60.2% of respondents are diligent in their hands, 43.8% take a shower after arriving at home, 58.4% change clothes worn by people, 29.6% still rarely leave the house, 82.1% still sunbathe frequently, 59.5% frequent exercise and 68.2% consume vegetables and fruit for nutritional fulfillment. It can be argued that the COVID-19 pandemic affected the psychological conditions and behavior of people in the New Normal era in mining area communities.

**Keywords:** COVID-19; Psychological; ASGM; Mining; Gorontalo

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## **Tobacco Consumption Behaviour in Artisanal and Small-scale Gold Mining (ASGM) Community**

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**Abstract:** Now days, smoking behavior in Indonesia increases the tobacco consumption rate by 33.8%. The community in the Artisanal and Small-scale Gold Mining (ASGM) area of East Suwawa District is also inseparable from this smoking behavior. The purpose of this study was to see a description of smoking behavior in the Artisanal and Small-scale Gold Mining (ASGM) area, East Suwawa District, Bone Bolango Regency, Gorontalo Province. The research method used is descriptive. Based on the results of research on 274 households in the ASGM area of East Suwawa District, it was shown that 192 (70.07%) head of household smokers were dominant with smoking frequency >10 cigarettes per day. While the period of time they smoking is >5 years. Cough, chest pain, shortness of breath, and headaches are the complaints felt by respondents when consuming cigarettes. This shows that the high rate of smoking behavior in Artisanal and Small-scale Gold Mining (ASGM) area in East Suwawa District effect on health, so it needs to be treated as soon as possible.

**Keywords:** Tobacco Consumption; Smoking Frequency; Smoking Duration; ASGM Community; Mining

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## **Mapping of Mangrove Ecosystem Conditions in Coastal Waters of Bintan Island using SPOT 4 and SPOT 7 Satellite Imagery**

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**Abstract:** Bintan Island is one of the islands in Indonesia that has a high potential for mangrove ecosystem, especially in North Bintan and East Bintan Sub-districts. Along with the increasing needs and activities of coastal communities which ultimately have an impact in the existence of the mangrove ecosystem. The purpose of this study is to analyze the extent and density of mangrove vegetation in Coastal Waters of Bintan Island based on remote sensing satellite imagery data. The data used include SPOT 4 image acquisition on September 12, 2012 and SPOT 7 acquisition on April 5, 2019. The method of separating mangrove and non-mangrove objects used supervised classification, while calculation of mangrove density used vegetation index algorithm of NDVI, GNDVI and OSAVI, then it will be analyzed by correlating with field measurement data. Mangrove density classes are divided into five classes, namely very rare, rare, moderate, meeting, very dense. The results showed that there was a decrease of mangrove distribution area by 70 ha, where mangrove forest area in 2011 was 287 ha, while in 2019 it was 217 ha. Many mangrove forest lands have been converted into buildings and settlements. The correlation results with field data from the NDVI, GNDVI, and OSAVI methods that have the largest correlation (R) are NDVI. The correlation value of 0.412 is in the strong enough category. The results of calculation of mangrove density using NDVI showed that there was a decrease in very dense and dense classes of 86.65 ha and 32.59 ha, respectively. The results of the accuracy tests using the method confusion matrix obtained an overall accuracy of 84.6%, while the accuracy-test with the kappa method obtained an accuracy of 85.7%. The results of observations in the mangrove field at the research location were dominated by three species, namely *Rhizophora apiculate*, *Rhizophora mucronata* and *Rhizophora stylosa*.

**Keywords:** Mangrove; NDVI; SPOT-7; Confusion matrix; Bintan island

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## **Consumer Skepticism toward Green Purchase Intention in Bandar Lampung**

**Rinaldi Bursan<sup>1</sup>, Driya Wiryawan<sup>1</sup>, Habibullah Jimad<sup>1</sup>, Indah Listiana<sup>1</sup>, Maya Riantini<sup>1</sup>, Helvi Yanfika<sup>1</sup>, RAD Widyastuti<sup>1</sup>, Abdul Mutolib<sup>2</sup> and Dina Arini Adipathy<sup>3</sup>**

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**Abstract:** The image of environmentally friendly products is often seen as bad, consumer doubt that environmentally friendly products are really made with environmentally friendly raw materials. This attitude is known as consumer skepticism (doubt) towards products with an environmentally friendly label. Consumer skepticism occurs because product advertisements contain confusing information as well as consumer insecurity about the raw material for products that the company claims are environmentally friendly. This study uses a theoretical approach to consumer behavior control and attitude, perceived value and environmental consciousness associated with consumer intentions to buy green products in Bandar Lampung. The study was conducted on April until June 2020. The sample in this research were consumers who had been buying green product. The research sample was calculated using the Lemeshow method, with a margin of error of 5%, the minimum number of samples was 236 samples. The analysis tool used is regression model. The conclusion that is expected from this study is the effect of less consumer doubt on the intention to buy environmentally friendly products. Meanwhile, the influence of consumer value perceptions and environmental awareness will increase on the purchase intention of green products. The implication of this research is that companies must pay attention to communication about green products that are produced so as to reduce consumer doubt. Another impact if consumers consume green products will lead to environmentally friendly perceptions and attitudes.

**Keywords:** Consumer skepticism; Value perceptions; Environmental awareness; Green purchase intention

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## **The Relationship Between Income and Inhabitant Consumption Patterns in Suwawa Timur ASGM Area During the Pandemic of Covid-19**

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**Abstract:** Healthy and nutritious food is a necessity for everyone, so the body's health can be maintained, but to consume healthy and nutritious food, you have to spend more. During this pandemic, many people have their work disrupted, which affects the income they receive. This study aims to determine whether income has a relationship with the consumption pattern of the inhabitant living in the mining area of Suwawa Timur. This research is a quantitative study, with primary data obtained from distributing questionnaires to 274 respondents. The results obtained are that the income of the residents there varies from Rp200,000 to Rp9,500,000 per month. For the consumption pattern, it was found that as many as 71.4% of people consume fish every day, 26% every week and 2.6% never consume it, for consumption of chicken, duck and eggs 9.5% of people consume it every day, 41% every week, 44% every month, and 5.5% never consume it, while for the consumption of vegetables and fruit 66% of the people consume it every day, 21% every week, 6% every month, and 7% never consume it. Computerized Statistical analysis used the Spearman test show that the result is 0.15 with a significance level of 0.014, which means that income has a significant relationship with consumption patterns, but the relationship is very small.

**Keywords:** Income; Consumption pattern; Inhabitant; ASGM, Pandemi

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## **Family Financial Condition During The COVID-19 Pandemic in Suwawa Timur ASGM**

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**Abstract:** The COVID-19 pandemic has become a challenge for the world community. This challenge also has an impact on people's income. This study is to determine the financial condition of the family during the COVID-19 Pandemic. The research was conducted in Suwawa Timur Subdistrict, Bone Bolango Regency, Gorontalo Province using descriptive observational methods. The results of this study show that families in Suwawa Timur have their financial condition disturbed by the COVID-19 pandemic by 70.8%. Based on research on 274 respondents in 9 villages, Pangi Village is the village that has the most disturbing family financial conditions by the COVID-19 pandemic with an average of 87.5%, then Tilangobula Village 87.0%, Tinemba Village 79.4%, Desa Panggulo 73.5%, Tulabolo Timur Village 68.2%, Dumbaya Bulan

Village 68.2%, Tulabolo Barat Village 65.8%, Tulabolo Village 61.9%, and Poduwoma Village 57.1%. The COVID-19 pandemic has various impacts, including on the family financial sector. The financial part in question is the income and expenses for family needs.

**Keywords:** COVID-19; Finance; Income; Family; ASGM

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