Conference on Sustainability Science 2018

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Conference on Sustainability Science 2018

ECOLOGY AND SUSTAINABILITY SCIENCE

from Theory to Practice

Jointly organized by Universitas Padjadjaran
and The Greening of Industry Network (GIN)
October 9-11, Savoy Homann Bidakara Hotel
Bandung-West Java, Indonesia

ABSTRACT BOOK

FOREWORD
Rector of Universitas Padjadjaran

Interconnectedness is one of the keywords to understand sustainability. This is particularly true in the context of achieving sustainable human and nature relation. Interconnectedness is not only about interrelation of different systems (natural and social systems), but more than that it is also about interdependency. This is what ecology all about. Without recognizing the meaning of interconnectedness, the discussion on sustainability will end up nowhere. In fact, ecological sustainability is the foundation of much of sustainability thought and science.

To discuss sustainability issues, it is imperative to use the science of ecology as the platform. Despite ecology as the backbone of sustainability science is still developing and forming new theories and concepts that are important to advancing sustainability science, its practicality should be emphasized since sustainability science as an emerging science needs theories integrated with practices. Sustainability science needs this integration because it is a use-driven and solution-base science.

On the basis of the rationales mentioned above, the theme of the 3rd Conference on Sustainability Science is '**Ecology and Sustainability Science: from Theory to Practice'**. Through this theme, ecology will be discussed from different perspectives in relation to the practices of sustainability science. Scholars, government officials, non-governmental organizations, medias and general public will be expected to take part in the conference. These parties will share scientific and experiential knowledge on various issues related to:

1. Ecology, industry and supply chains
2. Ecology, business and policy
3. Ecology, resilience and environmental hazards/vulnerability
4. Ecology, rural and urban development
5. Ecology, conservation, ecosystem services
6. Ecology, governance and policy
7. Inclusive education for ecology and sustainability sciences
8. Social and technologic innovations in ecology and sustainability science
9. Ecology, bio-economy and circular economy

It is not too exaggerating to expect that the 3rd Sustainability Science Conference held on October 9-10 2018 at Universitas Padjadjaran is part of the pathway in achieving sustainable human and nature relation. Moreover, the conference is expected to provide opportunity to build common and better understanding among different parties about sustainability science in theories and practices.

Rector of Universitas Padjadjaran

FOREWORD
Greening for Industries

In October of 2016, the Organisation for Economic Co-operation and Development (OECD), presented a report on Green Growth in Bandung, Indonesia. It was a recognition that this bustling conglomerate city, like most cities in emerging economies throughout the world, is in dire need of a green growth strategy. The report urges a relationship between a number of systems that can support this complex environment's sustainability. These interrelationships are at the crux of Sustainability Science, the theme of this conference, located in Bandung.

Bandung is at the center of some of the world's most ecologically sensitive and biodiverse regions. It is appropriate that we have a conference on these issues here to, at a minimum, raise awareness of the issues in a region where the concerns are easily observable.

The Greening of Industry Network (GIN) is in its third decade of bringing together some of the world's leading thinkers from academia, industry, government, and civil society. GIN began when Kurt Fischer and Johan Schot met to discuss the idea of creating a knowledge platform (GIN) to enable the interaction among stakeholders who had questions about how the industry could become greener and sustainable.

This event is the first time we are holding a GIN sponsored conference in a region that spans Oceania and Southeast Asia. It is well known that this region of the world has come under various environmental and social pressures. These pressures include island nations directly impacted by climate change, biodiversity

concerns, increased urbanization, and poverty, to name some of the biggest concerns.

But, this region, as in every region of the world, has the knowledge and skills to be able to address these complex, “wicked problem”, issues. This conference on Sustainability Science brings people from many regions to discuss and address these complex systemic concerns.

We expect a dialogue and hopefully some action from various disciplines and vocations. Sustainability science requires a transdisciplinary focus. Where use-driven science meets social systems, and eventual implementation of solutions.

We will not have all the solutions; but through our linkage to past and future investigations from GIN and other sources, a broader picture is expected to emerge.

It is our pleasure to be sponsors of this Sustainability Science Conference and supporting events. We wish to thank Universitas Padjadjaran in hosting this important event. We also wish to commemorate Dies Natalis 60th of Universitas Padjadjaran. There are many people to thank for making this conference a reality with dozens of individuals necessary to make up the Advisory, Steering, Organizing, and Scientific Committees.

We look forward to a stimulating and energetic conference.

Greening of Industry Network (GIN) Coordinators

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CONFERENCE PROGRAM

1st day: Ocotber 9th, 2018

Time	Activity
08.15 – 09.15	Registration
09.15 - 10.00	Opening 1. Indonesia Raya 2. Opening/Welcome remark: Rector of Universitas Padjadjaran 3. Prayer for Conference
10.00 - 10.30	Coffee Break
10.30 - 11.30	Keynote Speaker Prof. Diego Vazquez-Burst (Professor at University of Portsmouth, UK and Visiting Professor at Federal University of Santa Catarina, Brazil) Moderator: Chay Asdak, Ph.D
11.30 - 11.45	Awarding Session
11.45 - 12.45	Lunch and pray
12.45 - 14.00	Invited Speaker 1 & 2 Ir. Wiratno, M. Sc (Ministry of Environment & Forestry, Republic of Indonesia) Prof. Dr. Michiel A. Heldeweg LL.M (University of Twente, The Netherland) Moderator: Sunardi, Ph.D
14.00 - 14.15	Awarding Session
14.15 - 15.30	Invited Speaker 3 & 4 Prof. Hans Bressers (University of Twente, The Netherland) Prof. Makoto Yokohari (University of Tokyo, Japan) Moderator: Dr. Budiawati Supangkat Iskandar
15.30 - 15.45	Awarding Session
15.45 - 16.00	Coffee Break

16.00 - 17.00	Poster Session
18.30 – 21.00	Gala Dinner

2nd day: October 10th, 2018

Time	Activity
07.30 – 08.00	Registration
08.00 – 08.15	Introduction of the Conference
08.15 – 09.15	Keynote Speaker 2 Prof. Dr. Joseph Sarkis (Foisle School of Business Worcester Polytechnic Institute, USA) Moderator: Chay Asdak, Ph.D.
09.15 – 09.30	Awarding Session
09.30 – 09.45	Coffee break
09.45 – 11.00	Invited Speaker 5 & 6 Prof. Dr. Yunita T Winarto (Universitas Indonesia) Roy Huijsman Ph.D (ISS Erasmus Rotterdam, The Netherland) Moderator: Ronnie Susman Natawidjaja, Ph.D
11.00 – 11.15	Awarding Session
11.30 – 12.30	Parallel Presentation Session 1
12.30 - 13.30	Lunch and pray
13.30 – 15.30	Parallel Presentation Session 2
15.30 – 15.45	Coffee break
16.00	Closing

PARALLEL SESSION SCHEDULE

2nd day: October 10th, 2018

Session 1

From	To	Room 1	Code
11.30	11.45	Integrated Water Resources Conservation Management for a Water Security	**A1**
		Chay Asdak	
11.46	12.00	Characteristics of Pigment Extract from Green Seaweed (*Ulva Lactuca* L) Encapsulated by Electrospun Poly (Vinyl Alcohol) Nanofibers	**A2**
		Windu Merdekawati, Sukarti Moeljopawiro, Kuwat Triyana, Tri Joko Raharjo, AB Susanto	
12.01	12.15	Unravelling Stakeholders' Perceptions for Sustainable Tourism: The Case of Water Scarcity in Bali	**A3**
		Desi Adhariani	
12.16	12.30	Cytotoxicity and Genotoxicity of Cikamal and Cirengganis Rivers at Pananjung Pangandaran Nature Reserve Using Biomarker *Allium cepa*	**A4**
		Annisa, Mirda Sylvia, Cindy Hervina, Nining Ratningsih	

From	To	Room 2	Code
11.30	11.45	Transitioning towards a Socially Inclusive Circular Economy on Brazil: Critical Assessment of Ecological and Social Impacts of Solid Waste Policies.	**B1**
		Ana Carolina Gonçalves Caetano, Lucila M. de Souza	

From	To	Room 2	Code
		Campos, Mônica M. M. Luna	
11.46	12.00	Subcontracting Environmental Design and Its Impact on Environmental Compliance Diego Vazquez-Brust, Miguel Pérez-Valls, José Céspedes-Lorente and Eva Carmona-Moreno	**B2**
12.01	12.15	State of the Art: Conceptualizing Circular Economy at the City Level Nurdiana. J, Franco-Garcia. M, Heldeweg. M	**B3**
12.16	12.30	Environmental & Economic Valuation of Raw Water Resource of East Flood Canal DKI Jakarta R. Suwarti, S.S. Moersidik, TEB. Soesilo	**B4**

From	To	Room 3	Code
11.30	11.45	Sustainable Finance Implementation: A Case Study of an Indonesian State-Owned Bank Naufal Daffaveda Adam, Desi Adhariani	**C1**
11.46	12.00	A Governance of Climate Change Mitigation in Transport Sector and Selected Co-Benefits in Indonesia: The Case of Bandung City Helmi Gunawan, Hans Bressers, Erri N. Megantara, Tb. Benito A. Kurnani, Thomas Hoppe, Nthabiseng Mohlakoana, Parikesit	**C2**

From	To	Room 3	Code
12.01	12.15	Analysis of Changes in Water Quality for Supporting Fish Productivity of Floating Net Cage/ KJA (Keramba Jaring Apung) in Cirata Reservoir	**C3**
		Fitri Awaliyah; Wawan Gunawan; Muhammad Tasrif	
12.16	12.30	Coorporate Sustainability and Governance: An Analysis of the Literature	**C4**
		Roberta Souza, Mary Melo, Rodrigo Yaryd, Diego Vazquez-Brust and Eva Carmona Moreno	

From	To	Room 4	Code
11.30	11.45	Government Sovereignty Over Natural Gas Price Settlement and Allocations in the Republic of Indonesia's Territory	**D1**
		Zainal Muttaqin, Adrian E. Rompis, Amelia Cahyadini, Rafika Fajriati Nastiti, Irvan Duwana, Muhammad Agus Salim	
11.46	12.00	Reclamation of Jakarta Bay: Between Environmental Aspect, Social and Policy	**D2**
		Yulinda Adharani, Nadia Astriani, Yusuf S Zamil	
12.01	12.15	Environmental Injustice in the 'Black Hole': An Overview of Coal Mining Reclamation Failure in East Kalimantan	**D3**
		M. Muhdar, Laurens Bakker, Rikardo Simarmata	
12.16	12.30	Working Women, Parity, and Modern Contraception Methods	**D4**
		Dona Dewi Putri, Dwini	

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From	To	Room 5	Code
11.30	11.45	A Joint Bayesian Network and Analytic Hierarchy Process for Sustainable Supplier Evaluation and Selection	**E1**
		Nadine Kafa, Anicia Jaegler, Joseph Sarkis	
11.46	12.00	Identifying Sustainability Metrics at Real Applications of the Supply Chain Network Design Problem: A Systematic Literature Review	**E2**
		Carlos A. Moreno-Camacho, Jairo R. Montoya-Torres, Anicia Jaegler and Natacha Gondran	
12.01	12.15	Dynamics of Traditional Agroforestry System Management in West Java: Alternatives to Bamboo Garden Conversion	**I1**
		Budhi Gunawan, Dwi Rustam Kendarto, Budi Irawan	
12.16	12.30	Women's Adaptation Strategy in *Bubulak* Management in Cisukadana Village, Kadugede District, Kuningan Regency - West Java	**I2**
		Dede Tresna Wiyanti, Hardian Eko Nurseto, Mutia Latifah	

Session 2

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13.30	13.45	Potential of East Flood Canal as Provider of Drinking Water Environmental Service for DKI Jakarta W S Pradafitri, S S Moersidik	**A5**
13.46	14.00	Biological Carrying Capacity of Reeps Species (Rare, Endangered, Endemic, Protected Species) Habitat in Non-Conservation Areas in Cisokan, Bandung-Cianjur Regency, West Java Indri Wulandari, Randi Hendrawan, Teguh Husodo, dan Erri Noviar Megantara	**A6**
14.01	14.15	Economic Valuation of Komodo Dragon (*Varanus Komodoensis*, Ouwens 1912) and Its Contribution to Tourism Locally-Generated Revenue of West Manggarai Regency Ahmada D. Nurilma; Achmad Sjarmidi; Yooce Yustiana	**A7**
14.16	14.30	The Disease Control of Bacterial Leaf Blight on Paddy by Using Biological Agent of *Paenibacillus polymyxa* Mace Sopialena	**A8**
14.31	14.45	The Influence of Community Behaviour on Water Quality in Sekanak River South Sumatra Herda Sabriyah Dara Kospa and Rahmadi	**A9**
14.46	15.00	Endemic Species: Morphometric Differences Between Male and Female of Black-winged Myna (*Acridotheres melanopterus*)	**A10**

From	To	Room 1	Code
		Renaldi Ednin Vernia, Nurul Winarni and Anom Bowolaksono	
15.01	15.15	Identification of Pollution Load of Livestock Sector in Cisangkuy Watershed	**A11**
		Meinar Nadiasari Putri Ismayani, Iwan Juwana	
15.16	15.30	An Eviromentally Friendly Fisheries Resource Use Pattern in Pangandaran Based on Its Bioecoregional Conditions (A Case Study in Pangandaran, West Java Province)	**A12**
		Atikah Nurhayati, Agus Heri Purnomo	
15.31	15.45	Performance Evaluation of Recycle Unit on The Parameters of Chemical Wastewater (Case Study of Recycling Wastewater Heavy Equipment Industry in Jakarta	**A13**
		Aristya Wahyu Murdiana, Herdis Herdiansyah	
15.46	16.00	Phytoremediation Using Pistia stratiotes L. to Reduce Hexavalent Chromium from Nickel Ore Mining Wastewater	**A14**
		Erikha Maurizka Mayzarah, Setyo Sarwanto Moersidik, Lana Saria	
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		Nurul Hidayati	
16.16	16.30	Modelling of Multihazzard Potential Based on Satelite Imagery for Environmental Monitoring in Jatinangor, West Java, Indonesia	**A16**
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		Susanti Withaningsih**,** Parikesit, Johan Iskandar	

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		Lies Sulistyowati, Handoko, Trisna Insan Noor, Adi Nugraha	
13.46	14.00	Organic Rice Farming for Sustainable Development in The Nurani Sejahtera Farmers Group	**B6**
		Tuti Karyani, Ery Supriyadi, Hepi Hapsari	
14.01	14.15	The Knowledgement Of Green Marketing and Consumer Decisions in Buying Organic Product with Fuzzy Analysis	**B7**
		Yosini Deliana, Irlan Adiyatma Rum	
14.16	14.30	Eco-label as Policy Instruments to Promote Green Purchasing Behavior and a Response to Climate Change	**B8**
		Herdis Herdiansyah, Aloysius Suratin, Retty D. Handayani	
14.31	14.45	Eco Innovation and Cost of Equity: Current Practices in Indonesian Companies	**C5**
		Grazecelda Latupeirissa, Desi Adhariani	
14.46	15.00	Political Ecology of Household Solid Waste Management in Cimahi City, West Java Province, Indonesia: Social Aspects	**C6**

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		Vina Septi Suherman, Oekan S. Abdoellah, Denny Kurniadie, Yuli Astuti Hidayati	
15.01	15.15	Go Urban or Stay Rural: Determinants of Young Farmers Staying in or Leaving Agriculutural Field (A Case Study in Cisondari, West Java, Indonesia)	**C7**
		Iwan Setiawan, Adi Nugraha, Siska Rasiska	
15.16	15.30	Heading Towards Sustainable Cocoa Agribusiness System (A Case Study in North Luwu, South Sulawesi, Indonesia)	**C8**
		Adi Nugraha, Mahra Arari Heryanto, Eliana Wulandari, Pandi Pardian	
15.31	15.45	The Ecological Strategy of Fish Processing Industry to Reduce Pollution through Waste Minimization Approach	**C9**
		Setia Devi Kurniasih, Tri Edhi Budhi Soesilo, Roekmijati W. Soemantojo	

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13.46	14.00	The Sustainability of an Environmental Policy: A Review of Indonesia Peat Restoration Program	**D6**
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16.01	16.15	Analysis of Ecological Management of Floating Net Cages Aquaculture in Cirata Reservoir	**F8**
		Atikah Nurhayati, Isni Nurruhwati, Titin Herawati, Ayi Yustiati	
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		Nurrohman Wijaya	
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From	To	Room 5	Code
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KEYNOTE AND INVITED SPEAKERS PROFILE

Diego Vazquez-Brust has 25 years' experience in sustainable development research and policy in developing countries. He is Professor in Global Business Sustainability at Portsmouth University (UK) and visiting professor at Federal University of Santa Catarina (Brazil). Before joining Portsmouth, he was director of Royal Holloway University of London's Centre for Research into Sustainability (CRIS) and research manager in the ESRC Center for Business Relationships Accountability and Society (BRASS) at Cardiff University. Previously he worked as auditor for the Inter-American Development Bank and for the Argentinean Government as director of externally funded programs for floods alleviation, industrial pollution control and waste minimization. He has co-authored 5 books on sustainability related topics, including "Green Growth: Transitions to a Sustainable Economy' (2010), Collaboration for Sustainability and Innovation: A role for Sustainability driven by the Global South? A Cross-border, Multi-stakeholder Perspective (2014) and Globalization and Sustainable Development (2016). He has 100+ papers, book chapters and reports published, many in leading journals in international business, operations management, environmental management and corporate social responsibility as well as in UN institutes. He worked with international and interdisciplinary disciplinary teams on numerous industry- funded and government funded research and consulting projects. He lead a world-class impact case study on social vulnerability and environmental deterioration. He is one of the coordinator of the Greening of Industry Network (GIN) since 2010, co-editor in Chief of Springer's Book Series on Greening of Industry Network Studies (GINS), and member of the Argentinean Academy of Environmental sciences. During the

last decade he has studied sustainability in Latin-America and sub-Saharan Africa

Joseph Sarkis is Professor of Management within Worcester Polytechnic Institute's Foisie Business School. He earned his Ph.D. from the University of Buffalo. His research covers topics in operations, supply chain management, sustainability, and technology management. He has over 400 publications in a wide variety of outlets. He has been recognized as a Highly Cited Researcher by Clarivate Analytics (Web of Science); which noted him as one of the world's "most influential scientific minds". He is the editor of IEEE Engineering Management Review. He serves on the editorial boards of some of the most influential journals in environmental, supply chain, and operations management. His work has been cited over 35,000 times and has an h-index of 89 on Google Scholar. He will has just finished solo editing a Handbook on Sustainable Supply Chain Management published by Edward Elgar publishers.

Michiel A. Heldeweg (1957) is full professor of Law, Governance &Technology at the University of Twente (UT), within the department of Governance & Technology for Sustainability/ CSTM. He completed his LL.M. and MA (public administration & Law) at Groningen University (in 1985 and 1987 respectively) and his PhD (on Law and technical expertise in environmental decision-making) at the University of Maastricht (1993) Heldeweg is a member of the Netherlands Institute of Governance, an associate senior member of the Ius Commune Research School, and a partner to the Netherlands Institute for Law and Governance.

In his research, Heldeweg focuses on the (methodology of) legal design of smart & resilient rules & regimes fostering technological and governance innovation, such as through experimental regulation, institutional change and smart mixes of public and private legal regulatory governance (e.g. certification and PPPs). His research relates especially to legal governance and co-evolution of law, governance and technology as regards the energy transition, such as through smart infrastructures, community energy initiatives, and as regards the responsible development and use of robotics, such as drones. Presently Heldeweg is supervising 11 PhDs.

Aside from his work at the UT, Heldeweg is honorary judge at the District Court of Overijssel (Administrative bench), chairman of the University of Twente Committee on Scientific Integrity, and the Exam Appeals Board. Since 2011 he is also a visiting professor & lecturer at the Faculty of Law at the University of Aruba. For more information see: https://people.utwente.nl/m.a.heldeweg

Wiratno graduated from Faculty of Forestry, Gajah Mada University (1988) and Master of Science from ITC, the Netherland, in the field of integrated surveys and natural resource development, especially in rural development, regional planning, and project planning and implementation (1993). Wiratno had been an instructor at the Forestry Training Center in Manokwari (1989-1990), Head of the Special Region of Yogyakarta/DIY Natural Resources Conservation Unit/KSDA (1999-2000). He worked as a policy analyst at Conservation International (CI-IP) in 2001-2004 for national level, Papua and Siberut. In 2005-2007 he became the Head of the Gunung Leuser National Park Office. Subsequently, he became the Head of Sub Directorate of Management and Development, Directorate of Area Conservation at the Directorate General of Forest Protection and Nature Conservation/PHKA (2008-2011). He was the Head of the NTT Province Natural Resources Conservation Unit/KSDA Center (2012-2014), Director of Social Forestry Preparation at the Directorate General of Social Forestry and Environmental Partnership (2014-2017). On June 16, 2017, Wiratno was appointed Director General of Natural Resources Conservation and Ecosystems to date. Wiratno has written more than 8 books and various writings both on print and online media.

Hans Th. A. Bressers (1953) is professor of Policy Studies and Environmental Policy at the University of Twente in the Netherlands and founder of the CSTM, currently the Department of Governance and Technology for Sustainability, one of the departments of the Faculty of Behavioral, Management and Social sciences. Previously he has been, inter alia, vice-chairman of the official permanent Evaluation Committee of the Environmental Management Act, which advised the Minister regularly on the efficacy of Dutch environmental policy. He was also the chairman of the Advisory Committee to the Dutch Minister for the Environment for the implementation of environmental policy by local government and has been chairman of SWOME, the Dutch social science association for environmental and energy research. Until recently he also was an independent scientific member of the Commission on Sustainable development of the Dutch Social-Economic Council (SER) and a member of the national Advisory Committee on Water, that was chaired by the Prince of Orange until April 2013 when he became king. His dissertation on the effectiveness of Dutch water quality management (1983) won the annual award for best Dutch Public Administration book and was later chosen by a Dutch practitioners' journal as one of the ten best international public administration books of the 20th century. In over three hundred articles, chapters, and books and a similar number of reports, conference papers and presentations (both in Dutch and in English) he published on policy -evaluation, - instruments and - implementation, mostly applied on environmental and sustainability oriented policies. He has been researcher and project leader of numerous externally funded projects, including several projects funded by EU research frameworks, Dutch national science foundation, national priority research programmes, Dutch ministries, etc. As a PhD advisor, he has led 50 researchers to their graduation until 2018. At the university level, Hans Bressers is the Chair of the Twente Water Centre, that bundles the over 150 water management researchers of all technical, natural science and policy oriented faculties of the University of Twente.

Makoto Yokohari is Professor and the Steering Committee Chair of the Graduate Program in Sustainability Science, The University of Tokyo. He received Bachelor of Agriculture (1984), Master of Agriculture (1986), and PhD (2002) from The University of Tokyo. Landscape and urban planning, urban ecology, ecological landscape design are the cores of his academic interests. Yokohari's professional career includes Research fellow at the National Institute of Agro-Environmental Sciences (1986 to 1998), Visiting Scholar at University of Guelph, Canada (1992 to 1993), Associate Professor at University of Tsukuba (1998 to 2004), Professor at University of Tsukuba (2004 to 2006) and Visiting Scholar at University of Copenhagen (2015). Yokohari has been invited to teach at universities including University of Kyoto, Japan, Waseda University, Japan, Tongji University, China, China Agriculture University, China, University of Adelaide, Australia, Bogor Agricultural University, Indonesia, Chulalongkorn University, Thailand, University of Massachusetts, USA, University of Guelph, Canada, University of British Columbia, Canada, Swedish Agricultural University, Sweden, University of Copenhagen, Denmark, University of Bari, Italy, and Technical Institute of Wien, Austria. His professional career as a technical advisor includes National Capital Region Planning Committee, EXPO2005 Planning Committee, 2020 Tokyo Olympic Games Planning Committee, and Agriculture, Forestry and Fisheries Planning Committee of Tokyo. His academic publications include over 120 reviewed papers and 20 book articles.

M.A. Yunita Triwardani Winarto is professor in anthropology at the Department of Anthropology, Faculty of Social and Political Sciences, Universitas Indonesia. She was the first appointed Academy Professor Indonesia in Social Sciences and Humanities under the auspices of the Royal Netherlands Academy of Arts and Sciences (KNAW) and the Indonesian Academy of Sciences (AIPI) (2006—2011). She is now a member of the Cultural Commission of the Indonesian Academy of Sciences (AIPI) from 2013—present times. She received her bachelor from Padjadjaran University (1972), her first degree (1980) and second degree in anthropology (1984) from Universitas Indonesia; Master of Science in environmental technology from the Centre of Environmental Technology, Imperial College of Science, Technology, and Medicine (UK) with the option in Ecological Management (1985); and Ph.D. degree in anthropology from the Department of Anthropology, the Research School of Asia and the Pacific, the Australian National University (1997). She is now developing her research in the domain of Public Anthropology. She has been developing interdisciplinary and trans-disciplinary collaboration with scientists from other disciplines, e.g. entomology, agrometeorology, environmental education, sociology, and law. Her teaching in both undergraduate and graduate programmes in anthropology covers her expertise in research methodology, theories in anthropology, human ecology/ecological anthropology, ethnography of Indonesia, and ethnography of Southeast Asia. She is the author of more than five books. She publishes various articles in the national and international refereed journal and chapters in edited books published by foreign editors. The most recent work on the Science Field Shops—written with co-authors from agrometeorology, anthropology, and sociology—was published online by the Global Alliance for Climate Smart Agriculture (GACSA, Rome, 2018).

Roy Bernardus Cornelis Huijsmans is Associate Professor Childhood & Youth Studies, Institute of Social Studies (ISS) of Erasmus University Rotterdam. He has a background in education and development studies and obtained a PhD in 2010 from Durham University (UK) in human geography, MA in Development Studies from Institute of Social Studies, the Netherlands, and B.Ed. in Primary Education, Katholieke Pabo Zwolle, the Netherlands. His PhD research focused on discourses and the lived experiences of migration and mobility involving rural Lao children and youth as related to processes of rural transformation and shaped by the reconfiguration of constructs of childhood and youth. A Dutch national, Roy has worked in the field of development in Malawi, Nepal, Suriname and Lao PDR. He is currently based in the Netherlands and holds a senior lecturer position in Children & Youth Studies at the International Institute of Social Studies (ISS), a university institute of Erasmus University Rotterdam that focuses on international development. Currently Roy involved in two major international, comparative research projects. They both focus on young people's orientation to the future and their pathways into social adulthood (one ESRC-DFID funded, one Canadian Insight Grant funded project). Next to this he is conducting research into young people's engagement with mobile telephony in rural post-socialist Southeast Asia, shedding light on the intersection between being young and the post-socialist condition. Throughout, his research is characterised by an ethnographic orientation, which informs his writing, methodological choices, research ethics, approach to theory building and conceptualisation, as well as his teaching. Roy has published several peer reviewed articles and book chapters, mostly in development studies, human geography and childhood & youth studies areas.

ABSTRACTS

KEYNOTE AND INVITED SPEAKERS

CRITICAL GREEN GROWTH: A PATHWAY TO WORLD UN SDGs

Diego Vazquez-Burst
(Royal Holloway University of London, United Kingdom)

ABSTRACT

Political will at the national and multilateral scale is coalescing around the global discourse of UN Sustainable Development Goals, but transformational pathways to achieve such goals are unclear or ambiguous. The narratives and practices of Green Growth and Circular Economy could provide a viable pathway but have already been challenges by many stakeholders as a reformulation of business as usual discourse. This keynote article argues that this critique is grounded in a false conflation of distinct interpretations of the concept. In place of homogenising all associated narratives, we argue for the consolidation of an aspirational Critical Green Growth perspective, socially inclusive and conducive to structural transformation. Examples from Brazil and South Africa, and a review of Circular Economy benefits will be used to steer discussion and highlight the potential and challenges ahead.

THE ROLE OF CONSERVATION AREA IN THE SUSTAINABLE MANAGEMENT OF FOREST

Wiratno

(Director General of Natural Resource and Ecosystem Conservation, Ministry of Environment and Forestry, Republic of Indonesia)

ABSTRACT

In the past period, the term of sustainability in the context of forest was emphasized to ecological reasoning and just focused on protection and conservation forest. At the same time, the fact showed that the production forest was spearheading conventional economic growth, as though it has no sustainability role. This unappropriated supposition arises due to the extreme classification of forest area based on the function of production, protection and conservation – production forest just for timber based economic activity, protection forest for human life support system emphasized to hydrological function and conservation forest for biodiversity conservation. Each forest function was perceived has single function and that is a misunderstanding occurred so far. There was one fundamental issue across the function of the forest, lack of social aspect in the forest resource management system has caused ineffective forest management. The 27,2 million hectares of conservation area in Indonesia are also not spared from social and cultural issues, about 2 million hectares of conservation forest was indicated as degraded forest and deforested area due to encroachment driven by unharmonised relationship between conservation area management system with

the local values including social, cultural and economic aspect.

At recent, experts from academic, government and non-governments were agreed that each forest unit has multiple function both ecological, economic and social which can not be separated each other, even the integration of them is a key of sustainability. This supposition is apparently supported by on the ground evidences. Success story of forest management reached due to the recognition and involvement of local entities such as community-based tourism at Tangkahan in Leuser National Park and Kalibiru at Kulonprogo Community Forest. The other pattern of sustainable forest management can found at Customary People of Kajang in South Sulawesi and Tebing Siring Community Forest, community based restoration as occurred at South Kalimantan has beeb proven to covert grassland into agroforestry with rubber trees, supported by local university, rubber company, and DG of Social Forestry and Partnership, etc. The success is usually appeared on small scale, driven by local champion, presence of companion partner and good leadership of the formal forest manager mainly in social awareness, network and partnership building.

The lesson from the field was recognized and institutionalized by the government trough social forestry regulation framework including community forestry, village forest, and community plantation forest which can be applied in production and protection forest, and conservation partnership in conservation forest. Social forestry as a new expectation to achieve sustainable management of forest by integrating three aspects on sustainability principle concept – ecology, economic, and social. After this regulation established then the major

works in the next is assists community in developing their capacity in management planning and action, introducing appropriate technology and increasing added value of resources management.

Keywords: *sustainability, ecology, conservation forest, social forestry*

LEGAL GOVERNANCE OF THE CIRCULAR ECONOMY

Heldeweg, Michiel A.
(Chair in Law, Governance & Technology, Department of Governance and Technology for Sustainability (CSTM), University of Twente (UT), the Netherlands)

ABSTRACT

The transition towards a circular economy is one of the key sustainability challenges of this era. It is reflected particularly in Sustainable Development Goal (SDG) no. 12 (Responsible consumption and production), but also in other SDGs, such as no. 11 (Sustainable cities and Communities). Because responsible consumption and production patterns do, unfortunately, not always come about spontaneously and voluntarily, we need to consider the institutional settings that are conducive to promote such patterns. If necessary legal commands and prohibitions could be helpful, but we need to look more broadly at the ways law can support the necessary mode(s) of governance towards establishing and securing such settings. In this presentation some examples of environmental legislation and principles will be discussed to see what they can bring to the desired transition, particularly in terms of fostering (radical) circular innovations. Beyond operational rules, the presentation will look at the underlying legal governance structures that shape economic relations that are key to how a transition from linear to circular socio-technical and business-innovation ecosystems can be made.

MICRO-ENTERPRISE ENTREPRENEURSHIP AND GENDER: THE STREET FOOD SECTOR IN AFRICA

Hans Bressers
(University of Twente, The Netherland)

ABSTRACT

Much of the employment, especially in developing countries takes the form of micro-enterprises. When official jobs are too few or not available for large parts of the population, micro-enterprises often form an indispensable livelihood. Some sectors are especially important for women. In sub-Saharan Africa one of them is the street food sector. The workers in the street are often also the owners, a large majority is female. The sector is actually growing, partly in symbiosis with the growing number of office workers in the formal part of the economy, who need quick meals during their busy days. Supported by DFID, the British development agency, a study under 750 street food enterprises was done, equally divided among Senegal, Rwanda and South Africa, on the impact of gender and energy access and use on entrepreneurship. By this focus the study related to almost half of the SDGs (sustainable development goals). The speech will address topics like why this sector is attractive for women, to what degree the safety of the workers is an issue and what role electric lighting plays, and what effect working in and often owning a street food enterprise has on empowerment issues. Furthermore, the role of modern energy services is dealt with, and whether this is different for women and men. In literature it is often stated that micro-enterprises are just “survivalist” and do not have any growth ambitious. It is claimed that this is

even more true with female owners. But is it true? We asked the owners themselves and come to very different conclusions! As a consequence, it makes sense to think about ways to support the workers in the sector in their ambitions, thereby helping the many women that have these enterprises as their source of livelihood. As often street food enterprises are regarded by municipal governments in “cleaning the streets” terms rather than as a viable sector that is worth to be developed, this requires the cooperation of various branches of the municipal governments and not in the last place cooperation with representatives of the representatives of the street food sector themselves.

THE VALUE OF GREY
-Planning Resilient Future of Asian Cities-

Makoto Yokohari
(Graduate School of Engineering, The University of Tokyo)

ABSTRACT

Dichotomy is probably one of easiest approaches to understand and plan complicated issues. When we face with complicacy, we usually try to understand the issue by locating it in a very simple dichotomous structure; yes or no, black or white, and this or that. Such a dichotomous concept has been applied to urban planning. Cities in medieval Europe, often surrounded by a wall and moat, had a clear boundary between its dense urban fabric with almost no green and surrounding wide-open rural landscapes filled with various types of green. Rooted in such a legacy, one of key concepts of modern urban planning, which was initiated in Western Europe at the dawn of the 20th Century, was to clearly separate urban fabrics from surrounding rural areas ensuring efficiencies both in urban developments in the city and agricultural productions in rural areas. Today, cities in the world are following the same planning system based on the dichotomous land use concept.

Contrary, what can commonly be found in the fringe of Japanese and Asian cities is small-scaled mixture of urban and rural land uses, which can be called a “grey” landscape. From the perspective that prefers dichotomous solutions, “grey” is often regarded as a symbol of an ambiguity and/or disorder. However, while a dichotomous approach provides a simple and clear but

rather static, even stubborn, solutions, “grey” as a blend of black and white may allow various darkness of the color. If the planning concept is based on a “grey” approach the result may become flexible to a given condition, which leads to adaptable solutions that may successfully provide “resilience” to cities. By having growing concern on natural disasters as a result of the global climate change, cities in the world are now seeking for a new planning concept which may provide resilient solutions to face with catastrophe which may hit them in the near future. “Grey” approach may be regarded as one of practical answers to such a demand.

SOCIAL AND TECHNOLOGICAL TRANSFORMATIONS: A SUPPLY CHAIN SUSTAINABILITY PERSPECTIVE

Joseph Sarkis
(Foisle School of Business Worcester Polytechnic Institute, USA)

ABSTRACT

A variety of social and technological transformations are occurring. In some areas of the world, greater global coordination is occurring, for example in China and its one belt and one road initiative. In other areas of the world, there is greater nationalism and closure of borders such as in the United States and the United Kingdom. Evolving interest in the United Nations' Sustainable Development Goals (SDGs) is also occurring. Broad based technological developments such as Industry 4.0, blockchain technology, and additive manufacturing are evolving in parallel. A future look is presented. What do these broad-based transformations mean to sustainable supply chains? This presentation is meant to provoke discussion and thought, and maybe some action.

THE ROLE OF SOCIAL SCIENCE IN AN INTER- AND TRANS-DISCIPLINARY COLLABORATION FOR ECOLOGICAL SUSTAINABILITY

Yunita T. Winarto
(Department of Anthropology, Faculty of Social & Political Sciences, Universitas Indonesia)

ABSTRACT

Various development projects in the past decades have significantly altered the ecological nature of resources in diverse range of ecosystems, including agricultural ecosystems. From the early 1970s until recently, the Green Revolution paradigm in food crop intensification programmes in Indonesia and other countries in the world have led to the increased vulnerability of farming ecosystems and the threats to farmers' prosperity. The recent unprecedented consequences of climate change complicate that vulnerable condition. To face those threats to ecological sustainability and farmers' welfare, it is now crucial to address the problems from an interdisciplinary approach between diverse disciplinary backgrounds, as well as trans-disciplinary collaboration with the subjects. The paper examines the role of social science in developing an inter- and trans-disciplinary collaboration in assisting farmers to cope better to the consequences of climate change. The case of an interdisciplinary approach between agrometeorologists and anthropologists while developing the trans-disciplinary collaboration with farmers in Indonesia will be highlighted to understand the learning mechanism between various parties and the lessons-learned gained from such a collaborative work.

Keywords: *the role of social science, ecosystems' vulnerability, ecological sustainability, climate change, inter- and trans-disciplinary collaboration*

EVERYDAY GENERATIONED ENCOUNTERS WITH 'SUSTAINABILITY': EDUCATION, RURAL LIVELIHOODS AND SUSTAINABLE FUTURES FOR RURAL YOUTH

Roy Huijsmans
(International Institute of Social Studies (ISS) of Erasmus University Rotterdam)

ABSTRACT

In this presentation I approach the question of sustainability science from the perspective of the everyday and through the lens of generation. I do so by zooming in on the space of the school and by reflecting on how ideas about sustainability are manifested in (primary) school curricula, how these relate to rural lives and futures, and why attending to these everyday encounters with sustainability matters.

Education is recognised as key to realising sustainable development. Education has linkages with all pillars of sustainable development (economic, environmental and social). UNESCO has recognised 'education as a critical tool for moving societies to sustainability', which led to the UN Decade of Education for Sustainable Development (ESD), 2005-14. The idea is that through the generationally structured system of the school, children and youth are schooled into a sustainability aware future generation of 'lay experts'.

Drawing on research findings from two ongoing projects about schooling, aspirations and rural futures I suggest that the various dimensions of sustainability are indeed represented in primary school textbooks, yet the relation between these dimensions appears unaddressed. As a

result, schooled representations of sustainability stand in stark contrast with the lived reality and future chances of rural youth. Rather than empowering rural children to realise sustainable rural futures as UNESCO's Education for Sustainable Development discourse propagates the actually existing practices of education for sustainable development thus leads to the production of confused lay experts, or worse to an alienation of young people from the practice of smallholder farming that has been recognised as potentially socially, environmentally and economically sustainable.

I conclude by affirming the empowering potential of schooling for realising sustainable futures. This is especially pertinent in rural areas and needs to be done with awareness of how the key pillars of sustainability intersect in shaping rural lives. Yet, realising this potential I suggest is often frustrated by the various other functions education systems are set out to meet.

ORAL PRESENTATION

Theme:
Ecology, Conservation, Ecosystem Services

A1

INTEGRATED WATER RESOURCES CONSERVATION MANAGEMENT FOR A WATER SECURITY

Chay Asdak [1*]

[1] Postgraduate Program on Environmental Studies and Faculty of Agricultural Technology, Universitas Padjadjaran, Bandung
*Corresponding author: casdak@yahoo.com

ABSTRACT

Most of the Indonesia's watersheds are in a critical condition. This results in food security being threatened due to the insufficient water availability for agriculture. For this reason, Indonesia's National Development Planning Agency (Bappenas) wants to develop a national policy on Integrated Water Conservation Management (IWCM). This paper has been prepared based on focused group discussions with relevant interests at the national and five regional levels to provide the rationale and suggested content for such a national policy. At the landscape level, the formulation of national policy on IWCM was based on integrated watershed management analysis as water resources within a specific watershed are integrated into other resources within an ecosystem. This policy research recommends: a) integrating the IWCM into the regional development programs, b) encouraging local agreements on water resource conservation, c) formulating attractive economic incentives in implementing IWCM programs, and e) institutional arrangement on IWCM.

Keywords: *IWCM; food security; green and blue water; watershed; institutional arrangement*

A2

CHARACTERISTICS OF PIGMENT EXTRACT FROM GREEN SEAWEED (*Ulva lactuca* L) ENCAPSULATED BY ELECTROSPUN POLY (VINYL ALCOHOL) NANOFIBERS

Windu Merdekawati[1], Sukarti Moeljopawiro[1], Kuwat Triyana[2], Tri Joko Raharjo[3], AB Susanto[4]

[1]Department of Biological Science, Faculty of Biology, Universitas Gadjah Mada, Jl. Teknika Selatan Sekip Utara, Yogyakarta 55281, Indonesia
[2]Department of Physic, Faculty of Mathematics and Sciences, Universitas Gadjah Mada, Jl. Teknika Selatan Sekip Utara, Yogyakarta 55281, Indonesia
[3]Department of Chemistry, Faculty of Mathematics and Sciences, Universitas Gadjah Mada, Jl. Teknika Selatan Sekip Utara, Yogyakarta 55281, Indonesia
[4]Department of Marine Science, Faculty of Fisheries and Marine Science, Universitas Diponegoro, Jl. Prof. Soedharto, Tembalang, Semarang 50275, Indonesia
*Corresponding author: winz.merdekawati18@gmail.com

ABSTRACT

Electrospinning is a process used to produce ultrafine fibers with diameters in the nanometer range. Nanofiber mats have high potentials for biomedical uses, due to their high surface area, porosity and ease of drug incorporation into the fibers. They can be used as carriers for drug delivery and can enhance drug release and skin permeability. The objectives of this research were to prepare nanofiber mats, to incorporate pigment extract of green seaweed (*Ulva lactuca*) (PEU), and to

determine the antioxidant activity. Poly (vinyl alcohol) (PVA) was selected as the polymer matrix. Extract in the range of concentration of 750 ppm, 1000 ppm and 1250 ppm with 1 ml of volume, were incorporated with 10% PVA by blending and dipping methods. The morphology and diameter of nanofiber mats were analyzed using a scanning electron microscope (SEM). The characterization of functional group of nanofiber mats were detected by Fourier Transform Infra Red (FTIR) spectrophotometry. Nanofiber with seaweed formulation is potential for many applications. Exploration of seaweed with nanotechnology will opening the new perspective of utility of this potential marine resources especially in Indonesia. It is also can be a solution for increasing prosperity with sustainability principle.

Keywords: *pigment, electrospun fiber, green seaweed (Ulva lactuca L), sustainability*

A3

UNRAVELLING STAKEHOLDERS' PERCEPTIONS FOR SUSTAINABLE TOURISM: THE CASE OF WATER SCARCITY IN BALI

Desi Adhariani[1*]

[1]Department of Accounting, Faculty of Economics and Business, Universitas Indonesia
*Corresponding author: desi.adhariani@ui.ac.id

ABSTRACT

The impact of tourism on environment has been warned by environmentalists and has become subject of academic studies. This research analyses stakeholder perceptions on water scarcity in Bali amid the glitter of Bali tourism. Survey and interviews have been conducted to several stakeholder groups, including government, local residents, tourists (foreign and domestic), hotel industry and non-government organizations. 400 respondents participate in the survey, followed by a series of interviews with several key people representing various stakeholder groups. The results show that majority of respondents are not aware of the water scarcity problem but support the notion of sustainable tourism. Respondents also have one voice regarding the importance of water savings and water conservation activities in Bali. This research has implications on the importance of water scarcity awareness, water conservation campaign, as well as sustainable tourism.

Keywords: *water scarcity, sustainable tourism, stakeholder analysis*

A4

CYTOTOXICITY AND GENOTOXICITY OF CIKAMAL AND CIRENGGANIS RIVERS AT PANANJUNG PANGANDARAN NATURE RESERVE USING BIOMARKER *Allium cepa*

Annisa[1*], Mirda Sylvia[1], Cindy Hervina[1], Nining Ratningsih[1]

[1)]Department of Biology, Faculty of Mathematics and Natural Sciences, Universitas Padjadjaran. Jl. Raya Bandung Sumedang Km. 21 Jatinangor West Java 45363, Indonesia. Tel/Fax. +62-22-7796412. *Corresponding author: annisa.annisa4@gmail.com

ABSTRACT

River becomes the most highly threatened ecosystem compared to other aquatic environments. Contamination of the aquatic environment that come from anthropogenic activities, may cause the reduction of water quality and harm living creatures which is inhabiting within. Population growth contributes in increasing water contamination since it is directly proportional to clean water demands. This research aimed to compare cytotoxicity and genotoxicity of Cikamal and Cirengganis rivers located at Pananjung Pangandaran Nature Reserve based on mitotic index and type of chromosomal aberration using *Allium cepa* as biomarker. Both rivers are known to play important role as water resources for local inhabitants around the nature reserve. Methods used in this experiment were Completely Randomized Design and observation. Mitotic index was analyzed using analysis of cvariance (ANOVA) followed by Duncan's test. Types of

chromosome aberrations were observed descriptively. The results showed that mitotic index was declined throughout upstreams to downstreams on both river upstreams (Cikamal 62.4%; Cirengganis 62.1%), midstreams (Cikamal 47.8%; Cirengganis 54,6%), and downstreams (Cikamal 38.8%; Cirengganis 34.1%). Number of chromosome aberration types which were successfully observed were 27 types on Cikamal and 10 types of Rengganis. Overall, Cikamal river has higher cytotoxicity and genotoxicity level compared to Cirengganis.

Keywords: *rivers, cytotoxicity, Allium cepa, genotoxicity, chromosome*

A5

POTENTIAL OF EAST FLOOD CANAL AS PROVIDER OF DRINKING WATER ENVIRONMENTAL SERVICE FOR DKI JAKARTA

W S Pradafitri[1a], S S Moersidik[1b]

[1] School of Environmental Science, University of Indonesia, 4 Salemba Street, Indonesia
Corresponding authors: [a] wednespradafitri@gmail.com; [b] ssarwanto@eng.ui.ac.id

ABSTRACT

The increasing population and water pollution in DKI Jakarta by domestic waste causes the need for raw water supply is not met. The problem can be solved by utilizing one of the existing surface water in DKI Jakarta that is East Flood Canal (BKT). The purpose of this research is to analyze the quality, quantity, and continuity of East Canal Flood as water source of DKI Jakarta. Water quality test method is based on Indonesian National Standard (SNI) with raw water key parameters according to water class 1 and 2 Government Regulation No. 82 of 2001. Calculation reliable discharge of Q80 (probability 80%) is accumulation of capacity of Cipinang River and the supply from *sudetan* Ciliwung River. The results showed that there were seven parameters that exceeded the water quality standard 1 and 2 PP 82 year 2001, ie BOD (4,40-4,60 mg/L), COD (75,06-89,23 mg/L), phosphate (0,50-0,74 mg/L), nitrite (0,24-0,30 mg/L), ammonia (0,51-1,15 mg/L), total coliform (9200-54000 MPN/100 mL), and fecal coli (9500-35000 MPN/100 mL). The quantity and continuity of water in upstream BKT is

available at minimum discharge is 1.49 m^3/sec and the maximum discharge is 4.69 m^3/sec when Cipinang River critical condition in August-September and the water volume in the Ciliwung River is excessive. The conclusion of this reasearch there is potency of water that can be utilized but must pay attention to upstream water quality of BKT as environmental service provider enriched with domestic waste processing effort.

Keywords: *domestic waste, East Flood Canal, water quality, water quantity, water continuity*

A6

BIOLOGICAL CARRYING CAPACITY OF REEPS SPECIES (RARE, ENDANGERED, ENDEMIC, PROTECTED SPECIES) HABITAT IN NON-CONSERVATION AREAS IN CISOKAN, BANDUNG-CIANJUR REGENCY, WEST JAVA

Indri Wulandari[1,2,3], Randi Hendrawan[3♥], Teguh Husodo[2,3], dan Erri Noviar Megantara[2,3]

[1]Doctoral of Environmental Science, School of Graduate, Universitas Padjadjaran. Jl. Dipatiukur No. 35, Bandung 40132, West Java, Indonesia. Tel +62-22-2504970
[2]Department of Biology, Faculty of Mathematics and Natural Sciences, Universitas Padjadjaran. Jl. Raya Bandung-Sumedang KM 21, Jatinangor, Sumedang 45363, West Java, Indonesia. Tel. +62-22-7796412 ext. 104, Fax. +62-22-7794545.
[3]Center Environment and Sustainable Science, Universitas Padjadjaran. Jl. Sekeloa Selatan I, Bandung 40132, West Java, Indonesia. Tel-Fax +62-22-7796412
*Corresponding author: randi.hendrawan2@gmail.com

ABSTRACT

Research on the biological carrying capacity of reeps (rare, endangered, endemic and protected species) habitat in non-conservation areas in Cisokan, Bandung-Cianjur regency, West Java, has been conducted from October to November 2017. The method used in this research was with Quantitative and Qualitative methods. Qualitative methodologies has been done to provide an overview of the habitat's carrying capacity for survival of reeps species in the study sites, while quantitative methods have been done to explain vegetation conditions around habitat research sites. Based on the

results of research in 2017, there were 4 species classified as REEPS in the study locations, namely Sunda Porcupine, leopard, Javan gibbon and mouse-deer. Vegetation and habitat data retrieval was done by direct observation using inventory method and Mueller-dumbois profile diagram, 1974). Data collection using profile diagram method has done to give description of the habitat condition of reeps animal in research location. This study found 3 types of habitats where the discovery of reeps species, namely natural forests, production forests, and riparian forests. The results showed that these species were found more in habitats with less vegetative vegetation conditions, but were composed by complete plant strata from tree start, pole, sapling, seedling and ground cover. Most of the habitats for the presence of reeps animals in the study sites have habitat conditions that support the carrying capacity of the species of animals in it in terms of feed and refugee from predators. However, for primate species requiring specific habitat-carrying capacity compared to other species, there was a continuous canopy that forms a corridor connecting one habitat type and another habitat type. In the result of vegetation analysis, there was several habitat types that have similarity from the aspect of vegetation composition. Calculations using the plant species equality index (ISs) indicated that in riparian forest and natural forest sites have a fairly high index of similarity at 89.9%. The production and riparian forest habitat types have a value of similarity of plant species at 75% and the similarity index value of plant species in natural forest and production forest habitat types is 90.78% which is the highest in the observation location.

Keywords**:** Carrying capacity, REEPS Species, Habitat, Non-Conservation Area

A7

ECONOMIC VALUATION OF KOMODO DRAGON (*Varanus komodoensis*, OUWENS 1912) AND ITS CONTRIBUTION TO TOURISM LOCALLY-GENERATED REVENUE OF WEST MANGGARAI REGENCY

Ahmada D. Nurilma[1]; Achmad Sjarmidi[1]; Yooce Yustiana[1]

[1]School of Life Science and Technology, Institut Teknologi Bandung
*Corresponding author: nurilma.ad@gmail.com

ABSTRACT

The komodo dragon (*Varanus komodoensis*) is one of the largest reptiles in the world. Komodo dragons (*Varanus komodoensis*) are listed in the Appendix I Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and categorized as "vulnerable" by the International Union for the Conservation of Nature and Natural Resources (IUCN) due to the limited demographic demarcation and distribution. In achieving sustainable resource utilization, knowledge of the value of natural resources as a whole is required, both tangible and intangible values. Komodo dragons have intangible value in the form of existence value. Therefore, the value of komodo dragon is necessary to know, because it shows the potential of these resources and to be considered in making appropriate management/policy planning for the sustainability of Komodo National Park ecotourism, as well as the instruments to preserve the species of *Varanus komodoensis*. The purpose of this study is to

estimate the economic value of *Varanus komodoensis*, which is the main attraction of Komodo National Park ecotourism, as an instrument of conservation. Estimation of *Varanus komodoensis* value was obtained by using Individual Travel Cost Method (TCM). The result of this research is the value of Komodo National Park is Rp 5.995.232.147.515,00. If that value divided by the average population of komodo dragons during 2012 to 2016 that is 2.841 individuals, then the value of each individual komodo dragon per year is Rp 2.110.254.188,00 and its contribution to West Manggarai Regency is 92% in locally-generated revenue of tourism.

Keywords: *Economic valuation, Locally-generated revenue, Travel Cost Method (TCM), Varanus komodoensis*

A8

THE DISEASE CONTROL OF BACTERIAL LEAF BLIGHT ON PADDY BY USING BIOLOGICAL AGENT OF *Paenibacillus polymyxa* MACE

Sopialena[1*]

[1]Faculty of Agriculture, Mulawarman university
*Corresponding author: sopialena88@gmail.com

ABSTRACT

Xanthomonas oryzae pv may cause Bacterial Leaf Blight Disease. *Oryzae* (*Xoo*) becomes a significant rice disease in Indonesia and other rice-producing countries in Asia. The use of pesticides in the form of antibacterial chemicals is known to disrupt human health and the environment by leaving residues. As a solution to control the disease is the use of biological agents that are safe for human health and the environment.This study aims to control the disease of Bacterial Leaf Blight by using Biological Agents Paenibacilus polymyxa Mace on Several Varieties of Rice Field Crops (Cibogo, Mekongga, and Ciherang). A split-plot design with 3 (three) replications applies in the research. The biological agent *Paenibacilus Polymyxa* Mace (P) as the Main Plot that consist of 4 levels, they were: P0 = Control/without treatment, P1 = 2.5 mL/L water, P2 = 5 mL/L water, P3 = 7.5 mL/L water. As the Sub Plot was the Variety (V) that consist of 3 levels, they were: V1 = Cibogo Variety, V2= Mekongga Variety, V3 = Ciherang Variety.The results showed that the use of the biological agent *Paenibacilus polymyxa* Mace controlled the disease of Bacterial Leaf Blight. The Cibogo variety (V1) is a very susceptible variety, while the most resistant

varieties are the Mekongga variety (V2). The best concentration of *Paenibacilus polymyxa* Mace agent is 7.5 mL/L water (P3).

A9

THE INFLUENCE OF COMMUNITY BEHAVIOUR ON WATER QUALITY IN SEKANAK RIVER, SOUTH SUMATRA

Herda Sabriyah Dara Kospa[1*] and Rahmadi[1]

[1]Department of Urban and Regional Planning
University of Indo Global Mandiri, P.O. Box 30129
Palembang
*Corresponding author: darakospa@uigm.ac.id

ABSTRACT

This study was carried out to analyze the effect of community behavior towards water quality degradation in the Sekanak River. Both qualitative and quantitative research methods were used in this study. This quantitative research data was gathered through conducting a questioner survey of 100 selected households living along the riverbank. It was also used to measure the water quality status using Pollution Index (PI) Method. The descriptive qualitative component included analyzing and elaborating the actual data of community behavior toward water quality assessment using triangulation data source. The questionnaire results of the research revealed that the household's knowledge and attitude on disposal management, sanitation and hygiene at the river bank were in high level. They are generally knowledgeable, having positive attitude and also practiced good personal hygiene, but twenty percent was still throw the garbage to the river. Furthermore, a total of seven sampling station has been identified along the river. The result showed that water quality status from the upstream to the downstream had slightly polluted. It also revealed that COD, BOD, NH_3-N

and Phosphate have exceeded the allowable threshold levels. This may attributed to the anthropogenic activities such as washing and throwing garbage which can be indicated from changing in the levels of COD and phosphate. However, water pollution inevitably occurs due to the unavailability of communal wastewater treatment plant, poor waste management and lack of public stimulus such as incentive and punishment to protect the river. Beside technical aspect, resolve complex socio-ecological issues are important components of a long-term environmental strategy. It is recommended that education, legislation and incentivization are necessary to spur and improve community awareness and potential as “river guards”.

Keywords: *water quality, water resource, community behavior, Sekanak River, pollution index*

A10

ENDEMIC SPECIES: MORPHOMETRIC DIFFERENCES BETWEEN MALE AND FEMALE OF BLACK-WINGED MYNA (*Acridotheres melanopterus*)

Renaldi Ednin Vernia[1], Nurul Winarni[2] and Anom Bowolaksono[1*]

[1] Biology Department, Universitas Indonesia, Depok, West Java, Indonesia
[2] Research Center for Climate Change, Universitas Indonesia, Depok, West Java, Indonesia
*Coresponding author: alaksono@sci.ui.ac.id

ABSTRACT

Black-winged myna (*Acridotheres* melanopterus) is an endemic species from Indonesia. The bird can only be found at Java and Bali Island at the moment. The population is keep decreasing due to the animal trading activity, both legally or illegally. The conservation effort is had been conducted to save them from extinction, by protecting them under the law and breeding them to increase the population. The bird is morphologically monomorphic; there is no differences between male and female based on the morphological characteristic. It can be a problem for the breeders to identify the sex when they have to pair the bird. A mistake in the pairing process can lead it into unnecessary fight among the bird and wound the birds in the end. The research is aiming to identifying the differences between male and female black-winged myna based on the morphometric characteristic, there are weight, length, wide,

circumference, and the spread of the wings. The data is being processed using principal component analysis (PCA) on the SPSS 20 program. The sample are 71 black-winged myna with minimum two years of age from the breeding facilities at Java and Bali island. The research was conducted from the July until August 2018. Based on the research, the morphometric characteristic that differ the male and female bird the most is the wingspan and the weight. Overall, the morphometric characteristics of the female myna are smaller than the male myna. The result is essential for the breeders to minimize the risk of pairing the same sex bird. It is important to make sure that the breeding centre is effectively breeding the bird to help the decreasing population in the wild.

Keywords: *Black-winged myna, Endemic, Monomorphic, Morphometric*

A11

IDENTIFICATION OF POLLUTION LOAD OF LIVESTOCK SECTOR IN CISANGKUY WATERSHED

Meinar Nadiasari Putri Ismayani[1*], Iwan Juwana[1]

[1] Jurusan Teknik Lingkungan, Fakultas Teknik Sipil dan Perencanaan, ITENAS, Bandung
*Corresponding author: meinarnadiasari@gmail.com

ABSTRACT

Cisangkuy watershed is part of the upstream of Citarum River which is located in Bandung district. Land uses surrounding Cisangkuy River can potentially pollute the river, one of them is livestock sector. The purpose of this study is to identify the pollutant loads from various livestock species in Cisangkuy watershed, which based on the calculation of pollution load methods. The livestock pollution load is done through the available livestock emissions factor, which was developed bye the Environmental Center of Water Resource Research and Development. After the calculation, it was found that pollutant loads generated from all livestock in the Cisangkuy watershed in 2016 is 2.678,68 Kg/day for BOD, 6.381,08 Kg/day for COD, 9,95 Kg/day for Total-N, and 1,87 Kg/day for Total-P. The types of livestock that contribute to increase Cisangkuy watershed pollution of livestock sector came from various cattle for all parameters. Result of this study will then be used as an input in the water quality modelling, using QUAL2K software. Once this done, alternative strategies to prevent further river pollution will be delivered.

Keywords: *Cisangkuy Watershed, Livestock Sector, Pollution Load*

A12

AN EVIROMENTALLY FRIENDLY FISHERIES RESOURCE USE PATTERN IN PANGANDARAN BASED ON ITS BIOECOREGIONAL CONDITIONS

(A Case Study in Pangandaran, West Java Province)

Atikah Nurhayati [1*], Agus Heri Purnomo [2]

[1]Faculty of Fisheries and Marine Science, Padjadjaran University
[2]Agency for Marine and Fisheries Research and Development
*Corresponding author: nurhayati_atikah@yahoo.com; atikah.nurhayati.unpad.ac.id

ABSTRACT

Coastal development in the District of Pangandaran can be carried out through optimization of the fisheries resources potential and is expected to bring about prosperity to the local communities. The potential can be associated with the premise of unique favorable bioecoregional condition, where fisheries industry may grow side by side with the marine tourism. This research aims to determine an environmentally friendly fisheries use pattern for Pangandaran, considering the bioecoregional condition and factors influencing the economic value that can be generated through fisheries exploitation. The research follows a case study methodological framework supported by data collected through a cluster random sampling technique. Primary data were collected through interviews with respondents which included 20 fishermen and 15 traders; secondary data in the meantime were gathered from documented information available at relevant institutions. The primary analytical tools are quantitative descriptive and multiple

linear regression. Based on the research, it can be concluded that considering the bioecoregional condition, fisheries development can be done by focusing on a number of economic species including *Colossoma macropomum*, *Metapenaeus monoceros*, *Trichiurus lepturus*, *Scomberomorini*, *Katsuwonus pelamis*, *Thunnus Albacares*. In line with this, important factors that should be taken care of; these are fishing season, type of fishing vessels, environmentally friendly fishing gears, on-board fish handling, and fish price.

Keywords: *bioecoregional, eviromentally friendly, fisheries, resources, use pattern*

A13

PERFORMANCE EVALUATION OF RECYCLE UNIT ON THE PARAMETERS OF CHEMICAL WASTEWATER (CASE STUDY OF RECYCLING WASTEWATER HEAVY EQUIPMENT INDUSTRY IN JAKARTA)

Aristya Wahyu Murdiana and Herdis Herdiansyah[1*]

[1]School of Environmental Science, Universitas Indonesia, Salemba Campus, Building C, 5th & 6th floor, Jl. Salemba Raya No. 4, Jakarta 10430, Indonesia
*Corresponding author: herdis@ui.ac.id

ABSTRACT

Waste treatment, especially in liquid waste has been neglected by most industries due to economic factor. Disposal of wastewater without a purification process will increase the level of pollution where the waste is disposed of. On the other hand, the limited amount of clean water has led the industry to search for alternative materials that can be reused to fulfill water needs in operating companies or industries. Wastewater treatment plant is able to convert wastewater until it is suitable for use or even consumed. The XYZ company has added recycled units to its liquid waste. It is expected that the water produced by the XYZ company's waste can be reused both for the company's operational activities or even towards consumption in the future. This study aims to prove performance evaluation of recycling unit and the feasibility of recycled water according to clean water quality standards based on the Regulation of the Minister of Health of the Republic of Indonesia No. 416 of 1990 that concerning in Conditions and Monitoring of Water Quality. This research was

conducted using a quantitative approach to analyze the quality of water produced after the addition of recycling units. The waste water treatment method used is using activated sludge (containing bacteria), bio-nutrients, urea and phosphate fertilizers with aeration techniques. The water sampling method was carried out at the influent point and liquid waste as well as examining the PDAM water ((Indonesian regional water utility company). The result showed that physical, chemical and biological wastewater treatment in the recycling unit of XYZ company can reduce heavy metals in wastewater. The results of this study were able to answer the problem of drought and clean water crisis in several regions in Indonesia by distributing clean water from the wastewater treatment plant to households around the industry as a replacement for PDAM water. Positive perceptions of society can be built by the time. This research is expected to be a recommendation for other companies or related institutions in the management of their liquid waste as raw water for the company's operational water sources.

Keywords: *performance evaluation, water recycling, recycle units, chemical wastewater, clean water parameters*

A14

PHYTOREMEDIATION USING Pistia stratiotes L. TO REDUCE HEXAVALENT CHROMIUM FROM NICKEL ORE MINING WASTEWATER

Erikha Maurizka Mayzarah[1*], Setyo Sarwanto Moersidik[1], Lana Saria[2]

[1]School of Environmental Sciences, Universitas Indonesia, Indonesia
[2]Ministry of Energy and Mineral Resources, Indonesia
*Corresponding author email:
erikha.maurizka@gmail.com

ABSTRACT

This paper discusses the phytoremediation technology using water lettuce (pistia stratiotes L.) for hexavalent chromium removal. Phytoremediation is designed as an efficient wastewater treatment for heavy metal removal, eco-friendly, and low cost. This studied undertake in situ to explore the potential of the water lettuce (pistia stratiotes L.) as phytoremediation aquatic macrophytes for hexavalent chromium removal from nickel ore mines contaminated by using self-designed experimental devices. Sample of plant and water were collected from April 16 to 12 Mei, 2018 at PT Vale Indonesia Tbk, Sorowako, South Sulawesi, Indonesia. This research used efficiency analysis with quantitative approach. The result showed that the efficiency of phytoremediation using D lagoon plant as a source with HRT 1,5hour, 2 hour and 3 hour was 27-30 %. The concentration of Hexavalent chromium in leaf was <0,001 mg/kg while in root was 122mg/Kg (HRT was 1,5 hours), 167 mg/Kg (HRT 2 hour), and 198 mg/Kg (HRT 3 hour). The use of

P. stratiotes as a phytoremediator shows potential in removing hexavalent chromium.

Keywords: *phytoremediation, wastewater, nickel ore mines, water lettuce, hexavalent chromium*

A15

SEAGRASS COMMUNITY STRUCTURE OF KEPULAUAN SERIBU, JAKARTA

Nurul Hidayati[1]
[1]Universitas Indonesia

ABSTRACT

Seagrass meadows are important for providing ecological functions and ecosystem services. In spite of their significance, they remain in decline. In order to protect seagrass ecosystems, studies on the current status of the seagrass need to be done. The aim of this study was to analyze the community structure of seagrass in Kepulauan Seribu, Indonesia. Assessment of seagrass community used line transect-quadrat method. The line transects were deployed in each station perpendicular to the shoreline for 50 meters. Species identification, number of shoots, and percent cover were conducted in each quadrat transect. The current study found that 8 species of seagrass in Kepulauan Seribu. In Panggang Island, 8 species with a percent cover 22% were found and *Enhalus acoroides* had the highest density. In Tidung Kecil Island, 6 species with a coverage cover of 58% were found and *Cymodecea rotundata* was of the highest density. These results indicated that seagrass ecosystem in Kepulauan Seribu was not in a healthy condition. This study provides baseline data for development of the short term and long-term conservation management strategies.

Keywords: *Seagrass, diversity, community structure, Kepulauan Seribu*

A16

MODELLING OF MULTIHAZZARD POTENTIAL BASED ON SATELITE IMAGERY FOR ENVIRONMENTAL MONITORING IN JATINANGOR, WEST JAVA, INDONESIA

C. Endyana[1,2], K. Susanto[3], I.A. Dharmawan[3], B.M. Pareira[4], Faisal Helmy[1], J.M. Aji[5], Hendarmawan[1,2]

[1]Faculty of Geology, Universitas Padjadjaran, Indonesia
[2]Postgraduate School, Universitas Padjadjaran, Indonesia
[3]Faculty of Mathematics and Natural Science, Universitas Padjadjaran, Indonesia
[4]Faculty of Agricultural Industrial Technology, Universitas Padjadjaran, Indonesia
[5]Faculty of Communication Science, Universitas Padjadjaran, Indonesia

ABSTRACT

Indonesia archipelago is a rich country with many natural resources. Energy, oil and gas, groundwater, bioresources, minerals and coal, etc. the highly potential resources present because Indonesia is in volcanic belt with complecity of tectonic. There is not only mineral resources developed in Indonesia but also potential of mitigation and unstable area as an earthquake, flooding, volcanic eruption, landslide, etc. The West Java which is the one province in western of Java Island has a interested area for research of mitigation. There are several reasons for choosing Jatinangor (Universitas Padjadjaran Campus), West Java Province become study area of multihazzard such as critical groundwater zone, landslide, and floodplain. The development of earth science disciplines for environmental applications

and natural disaster mitigation is increasingly high. Earth observation through satellites, drones or unmanned aircraft, laser scans, and geophysical surveys are some examples of variations in technology used for environmental and mitigation studies. Correction of multy spectral imagery, fractures analysis, floodplain modelling and landslide prediction has been calculated and measured geometrically with GIS applied. The landslide parameters such as slope, direction of slope, distance to geological structure, distance to river, distance to road, vegetation index, and topographic height are then calculated for the potential landslide index for each of these parameters. Whereas in the development of floodplain areas a modeling of surface water increases that might occur in the study area.

KeywordS: *Environmental Monitoring, Multihazzard, Mitigation, Modelling, Volcanic, Tectonic*

A17

CONSERVATION AND MANAGEMENT STRATEGIES FOR SUSTAINABILITY OF RAPTOR IN HUMAN MODIFIED LANDSCAPE

Susanti Withaningsih[1,2,3], Parikesit[1,2,3], Johan Iskandar[1,2,3],

[1]Department of Biology, Faculty of Mathematic & Natural Sciences, Universitas Padjadjaran, Jl. Raya Bandung-Sumedang Km. 21 Jatinangor Sumedang 45363, West Java, Indonesia. Tel. +62-22-7796412 ext. 104, Fax. +62-22-7795545
[2]Center for Environment & Sustainability Scince – Universitas Padjadjaran, Jl. Sekeloa Selatan I Bandung 40213, West Java, Indonesia
[3]Graduate School of Environmental Science & Sustainability Science, Universitas Padjadjaran. Jl. Dipatiukur No. 35 Bandung, West Java Indonesia.
*Corresponding author:
susanti.withaningsih@unpad.ac.id

ABSTRACT

Raptors are considered biologically important, environmentally sensitive and indicators of the health of the ecosystem. Breeding period is a critical phase for raptors, that at present are categorized as rare and threatened species. Nest site selection can have important nesting success consequences in raptors. In relation to this, a spatial analysis has been undertaken to assess the relationship between landscape structure and the presence of predators' nests in the human modified landscape of Panaruban and Telaga Warna, West Java Indonesia. The result shows that the landscape of Panaruban and Telaga Warna is a mosaic consisting of

natural and artificial vegetation of different structures. The four species of raptors are javan hawk eagle (*Spizaetus bartelsi*), changeable hawk eagle (*Spizaetus cirrhatus*), crested serpent eagle (*Spilornis cheela*) and indian black eagle (*Ictinaetus malayensis*) tend to select a nesting site that has low degree of landscape contrast at distance of 250 m around nest. However, in terms of landscape complexity, there is no great differences among the nesting sites at distance of 250m. Edge density around black eagle nest is higher compared to the other nest at distance of 250-1000 m. Characteristic differences in nest site selection may be due to landscape structure at different scales around the nest. Some management strategies should be done step by step in order to maintain the sustainability of raptor and, at the same time, contribute positively for local people living in the human modified landscape in Panaruban and Telaga Warna.

Keywords: *landscape, raptor, nesting site, spatial analysis*

Theme:

Ecology, Bio-economy and Circular Economy

B1

TRANSITIONING TOWARDS A SOCIALLY INCLUSIVE CIRCULAR ECONOMY ON BRAZIL: CRITICAL ASSESSMENT OF ECOLOGICAL AND SOCIAL IMPACTS OF SOLID WASTE POLICIES

Ana Carolina Gonçalves Caetano[1], Lucila M. de Souza Campos[1], Mônica M. M. Luna[1], Diego Vazquez-Brust[2]
(Authors are listed in alphabetical order)

[1]Universidade Federal de Santa Catarina, Brazil
[2]University of Portsmouth, UK, Visiting Professor at Universidade Federal de Santa Catarina
*Corresponding author: diego.vazquez-brust@port.ac.uk

ABSTRACT

Brazil has alarming levels of waste generation, being the world's 3rd solid waste generator (What a Waste, WB Report, 2015). The National Policy on Solid Waste (NPSD), Law 12305/2010, address mounting solid waste challenges and its major environmental, social and economic impacts. With adequate strategies to extend responsibilities for the generation of waste in a sustainable supply chain perspective for waste management and resource efficiency (WM&RE), this regulatory context aimed to trigger inclusive economic transformation towards resource efficiency in productive sectors; leading to reduced landfilling and illegal dumping of waste in protected ecosystems, less pressure on natural resources enhanced, economic development and welfare. NPSD made producers,

retailers, consumers and local authorities jointly responsible for the final destination of used products and the reduction of solid waste, encouraging the use of reverse logistics, recycle, reuse and manufacturing to trigger a transition towards a circular economy. The Law delegated to federal states the negotiation of agreements specifying industry responsibilities in their territories. Centrally, the law aimed to foster social inclusion by requiring municipalities to send all their waste to cooperatives of waste-pickers (called "catadores" in Brazil), so these cooperatives could classify and sell valuable material for its industrial use. However, it is unclear the extent to which progress towards intended objectives has been made and what factors have influenced this progress. This paper examines the impact of the law in terms of a) reduction of waste to landfill achieved, b) improvement in the welfare of vulnerable populations, c) ecoefficiency gains and d) formalization. We use and abductive research approach drawing on case studies involving a range of stakeholders and waste streams, including for instance glass, electronics, tyres and meat. Transition towards a fully resource efficient and socially inclusive economy requires redesign of flows of products, resources and waste across multi-tiered supply chains. Our analysis that achievement of the environmental and social goals of Law 12305 has been hindered by the lack of progress in the negotiation of agreements with industry from a supplychain perspective, the rigidity and failure of legislation to account for differences in the structure of supply chains for collecting and taking back different waste streams, the reluctance of informal waste-pickers to formalize their activities by organizing cooperatives and the lack of corporate engagement. In addition, a major obstacle had been the lack of consensually

accepted systems of socially inclusive and context-based supply chain indicators and metrics for waste management. Without a suitable and generally accepted system of metrics, there is no solid basis to develop generalised policy or guide firms. Moreover, if metrics are not context-based and systematic, they can lead to outcomes excluding vulnerable actors, failing to maximise benefits for disadvantaged groups and ignoring critical interdependencies between social, economic and environmental impacts.

B2

SUBCONTRACTING ENVIRONMENTAL DESIGN AND ITS IMPACT ON ENVIRONMENTAL COMPLIANCE

Diego Vazquez-Brust[1], Miguel Pérez-Valls[2], José Céspedes-Lorente[2], Eva CarmonaMoreno[2]

[1]Portsmouth Business School, University of Portsmouth, Portland Street, Portsmouth. PO1 3DE. United Kingdom.
[2]Universidad de Almería, Carretera de Sacramento s/n E04120 Almería. Spain
Corespondent authors: diego.vazquez-brust@port.ac.uk; mivalls@ual.es; jcespede@ual.es; ecmoreno@ual.es

ABSTRACT

Growing social awareness of ecological deterioration has resulted in increasing environmental regulation requiring companies to adopt and implement practices that are aimed to redesign their productive processes and improve environmental protection. The implementation of corporate environmental practices can be developed internally or outsourced to a specialized contractor. When managers make such decisions, they chose a governance mode for economic transactions, set the boundaries of their firm and determine its organizational structure. Surprisingly, despite evidence pointing out towards the use of contractor for environmental compliance, to date researchers have neither theorized nor empirically tested to what extent and under what conditions, different governance modes lead to different compliance outcomes. Therefore, we aim to investigate to what extent outsourcing environmental practices

results in better compliance outcomes than implementing the practices in-house and to what Drawing on Transaction Cost Economics (TCE), agency and search theory, we conceptualize the impact of boundary-setting decisions on corporate environmental performance, measured as full compliance with environmental regulations. We test our hypothesis using a sample of 357 Welsh companies and follow-up interviews. Our results show performance is optimized when a) firms outsource some of their environmental practices b) firms outsource several practices to one vendor, c) firms have long- term relations with contractors, d) firms use more than one contractor and; e) uncertainty of supply is low.

Keywords: *Environmental Performance; Environmental design; Outsourcing; Transaction Cost Economics*

B3

STATE OF THE ART: CONCEPTUALIZING CIRCULAR ECONOMY AT THE CITY LEVEL

Nurdiana. J[1*], Franco-Garcia. M[1], Heldeweg. M[1]

[1] Department of Governance and Technology for Sustainability (CSTM), University of Twente, The Netherlands
[*]Corresponding author: j.nurdiana@utwente.nl

ABSTRACT

Though there is a growing interest of circular economy as a new development strategy, however in which way it has been adopted in developing countries is not widely discussed. Further, it is also interesting to understand how developing countries position and translate circular economy in a city context, in particular in the perspective of policies and another precedent of city concepts. To this regards, this study comes up with the idea to understand what are the fundamental concepts and indicators to evaluate circular economy at the city level and in which way the indicators are different from other city concepts. Also, this study also addresses to what extent a circular economy can be implemented in a developing country. The idea is that this study may bring up and enrich the discussion in circular cities by providing a framework and indicators that enable cities to achieve a circular economy state. To this end, we believe that this paper could fill the knowledge gaps in the recent discussions among scholars and practitioners in a circular city context.

Keywords: *circular economy, circular city, developing countries, city, policy*

B4

ENVIRONMENTAL & ECONOMIC VALUATION OF RAW WATER RESOURCE OF EAST FLOOD CANAL DKI JAKARTA

R. Suwarti[1], S.S. Moersidik[1*], TEB. Soesilo[1]

[1]School of Environmental Science, Universitas Indonesia
*Corespondent author: ssarwanto@eng.ui.ac.id

ABSTRACT

The increasing of raw water requirement for people in DKI Jakarta is caused by population growth, so there is a need to improve water source to fulfill daily need of raw water. One of the sources of raw water in DKI Jakarta PDAM comes from Jatiluhur / STB (Kalimalang) reservoir, 81% of raw water in DKI Jakarta PDAM uses raw water in the Jatiluhur Reservoir (PDAM DKI Jakarta, 2014 Efforts to improve raw water sources one of them by utilizing the east flood canal river (BKT), then a proper calculation of economic and environmental analyzes is required. This study aims to analyze the economic and environmental feasibility of STB (Kalimalang) and BKT River as raw water utilization. Pollutant source factor analysis using the water quality test method on the source and economic feasibility was carried out using Net Present Value (NPV), Benefit Cost Ratio (BCR), and Internal Rate of Return (IRR). The results of the economic feasibility value of the indicator used with the BCR, NPV method, IRR shows that it is feasible to be used as raw water utilization on the BKT River, because it shows the feasibility indicator is positive NPV, IRR value is 20.3% and BEP is 13.5. The conclusion of economic analysis and environmental feasibility is that

the BKT river is feasible to be used as a sustainable source of raw water and can be used as additional raw water for people in DKI Jakarta.

B5

DETERMINANTS OF FARMERS' BEHAVIOR IN UTILIZING STRAW AS ORGANIC FERTILIZER IN THEIR RICE FIELD (A CASE IN SUBANG, WEST JAVA, INDONESIA)

Lies Sulistyowati[1*], Handoko[2], Trisna Insan Noor[1], Adi Nugraha[1]

[1] Lecturer in Faculty of Agriculture, Padjadjaran University-Indonesia
[2] Master of Science in Faculty of Agriculture, Padjadjaran University-Indonesia
*Corresponding author: liesindra@yahoo.com

ABSTRACT

Green revolution has succeeded in increasing Indonesia's rice production, but it also has an impact on decreasing the level of soil fertility, due to the excessive use of chemical fertilizers. Subang Regency is one of the rice production centers in West Java, where some farmers have begun to utilize straw as organic fertilizer as an effort to improve soil fertility, as well as the sustainability of their farming. This study aims to compare the production, farmers' income, and R-C ratio of farmers who use straw compared to those who do not use straw as organic fertilizer, as well as analyzing the factors that influence farmers to utilize straw. The study uses quantitative inquiry, sample was taken by using multi stage cluster sampling. Research was conducted on 228 respondents in Binong, Pusakanegara, and Patokbeusi Sub-District, Subang, West Java. Data were collected through semi-structured interviews. Data were analyzed with descriptive analysis and logistic regression

function. The results showed that the level of production, income, and R-C ratio of farmers who return straw is higher than the farmers who do not return. Aside of that, factors that influence farmers' decision to return straw to rice fields are income level and nature of innovation.

Keywords: *Rice straw, logistic regression, factors, income*

B6

ORGANIC RICE FARMING FOR SUSTAINABLE DEVELOPMENT IN THE NURANI SEJAHTERA FARMERS GROUP

Tuti Karyani[1], Ery Supriyadi[2], Hepi Hapsari[1]

[1]Agricultural Faculty, Padjadjaran University, Indonesia
*Corespondent author: tuti.karyani@unpad.ac.id

ABSTRACT

The green revolution was able to make Indonesia a food self-sufficiency country in 1984, but on the other hand there were negative impacts caused by the green revolution such as the emergence of environmental and social and health problems. Organic farming is one solution to overcome the negative impacts caused by the green revolution. Public awareness of health and environmental care encourages people to adopt a "back to nature" lifestyle that is consuming organic food even though the price is more expensive. Such conditions open opportunities for the development of organic agriculture among farmers, including in the Nurani Sejahtera Farmers Group who cultivate organic rice using the SRI method. However, in recent years there has been a trend in the extent of certified organic land in the Nurani Sejahtera Farmers Group, which has decreased as well as the number of farmers. Therefore this study aims to explore internal and external factors that influence the development of organic rice in the Nurani Sejahtera Group, by using SWOT analysis. The results show that the strategy should be taken by the Nurani Sejahtera farmer group is a survival strategy and

safeguarding, as well as market penetration through network development.

B7

THE KNOWLEDGEMENT OF GREEN MARKETING AND CONSUMER DECISIONS IN BUYING ORGANIC PRODUCT WITH FUZZY ANALYSIS

Yosini Deliana[1*], Irlan Adiyatma Rum[2]

[1]Faculty of Agriculture, Department of Agribusiness Universitas Padjadjaran, Jatinangor 45363, Indonesia
[2]Faculty of Economics and Business, Department of Economics Universitas Padjadjaran, Jatinangor 45363, Indonesia
*Corresponding author: y.deliana@gmail.com

ABSTRACT

In an effort of environmently friendly, all elements related to the environment must be considered from producers to consumers. Similarly, the knowledge of the community about green marketing starts from green products, green finance, green living, green transportation, green producers, green consumer and green communication. The problem is that even though people understand the importance of protecting the environment, behavior in protecting the environment and purchasing environmentally friendly products is still not appropriate. The purpose of this study is to analyze the clusters of green marketing knowledge of consumers in the buying behavior of organic products, the knowledge matrix of green marketing with the decision of consumers to buy organic products, and what is most dominant factors of green marketing encourages consumers in purchasing organic products. The study was conducted from September to December 2017 in Bandung, the sample

was taken by random sampling of 205 respondents. This research is useful for policy makers, market participants and stakeholders in educating consumers.

Keywords: *Green marketing, decision making, organic product, dan analysis Fuzzy*

B8

ECO-LABEL AS POLICY INSTRUMENTS TO PROMOTE GREEN PURCHASING BEHAVIOR AND A RESPONSE TO CLIMATE CHANGE

Herdis Herdiansyah[1*], Aloysius Suratin[1], Retty D. Handayani[2]

[1]School of Environmental Science, Universitas Indonesia, Salemba, Indonesia
[2]School of Strategic and Global Studies, Universitas Indonesia, Salemba, Indonesia
[*]Corresponding author: herdis@ui.ac.id

ABSTRACT

Ecolabel has an essential role in promoting green-consumption. This study aims to identify the preferred alternatives in the implementation of green purchasing behavior policy. The green economy reflected a solution for the critical situation affected by economic activities. Ecolabel implementation is a way to apply purchasing behavior shifting and encourages the consumer to consider the environmentally friendly products. Furthermore, ecolabel is an alternative option back when climate change has become a global issue that requires significant treatment. The alternatives presented are creating a market of ecolabel product, establishing regulation and government intervention by providing incentives to research and development activities. The study uses AHP ANP method to determine the priority of some strategies. The hierarchy distributes criteria and alternatives into three levels. The study sets four criteria (benefit, opportunity, cost, and risk) and conducts the pairwise comparison to calculate the network analysis.

The assessments involve several aspects on different dimensions. The model illustrated reasonable and applicable solutions for the case. The summary of the study determined that a creating market becomes the first option by 60,88%, providing incentives to the research and development program as the second choice by 19,93% and establishing regulation is the latest strategy by 19,20%. Meanwhile, the rank of the criteria sequentially is opportunity (57,13%), benefit (25,68%), risk (10,95%) and cost (6,30%). Finally, the research supports the assumption that consumer awareness about ecolabel products implementation is the preferred strategy to minimize climate change effect. The government could encourage the private sector to enhance the product knowledge through a massive public campaign, through social media, both formal and informal education activity and involving celebrities in the campaign program.

Keywords: *ecolabel, green economy, sustainability, purchasing behavior, Indonesia*

Theme:
Ecology, Business and Policy

C1

SUSTAINABLE FINANCE IMPLEMENTATION: A CASE STUDY OF AN INDONESIAN STATE-OWNED BANK

Naufal Daffaveda Adam[1], Desi Adhariani[1]

[1]Department of Accounting, Faculty of Economics and Business, Universitas Indonesia
*Corespondent authors: naufal.daffaveda@gmail.com; desi.adhariani@ui.ac.id

ABSTRACT

Purpose - This study is aimed at analyzing the implementation of sustainable finance in ABC Bank using parameters from Soppe (2004) and Indonesia Regulation POJK 51
Design/methodology/approach – A case study approach is employed to deeply analyse the implementation with data collected through interviews with several key persons in ABC Bank as well as review of related company's documents.
Findings - This study shows that ABC has fulfilled all parameters of sustainable finance implementation by Soppe (2004), such as Theory of the Firm, Human Nature of Economic Actors, Ownership Paradigm, and Ethical Framework. In addition, ABC has also demonstrated its maximum effort in fulfilling sustainable finance implementation obligations under POJK 51 which require financial institutions to apply eight principles of sustainable finance, prepare a Sustainable Financial Action Plan and sustainability report. Based on the analysis, it can be concluded that ABC has implemented sustainable finance.

Originality/value – The concept of sustainable finance is quite new in Indonesia. This study contributes to the literature by exploring the initial adoption in a state-owned bank that always try to balance the interests of public and the management.

Keywords: *sustainability report, moral economic man, stakeholder theory, sustainable finance, the theory of the firm, virtue ethics*

C2

A GOVERNANCE OF CLIMATE CHANGE MITIGATION IN TRANSPORT SECTOR AND SELECTED COBENEFITS IN INDONESIA: THE CASE OF BANDUNG CITY

Helmi Gunawan[1,2], Hans Bressers[1], Erri N. Megantara[2], Tb. Benito A. Kurnani[2], Thomas Hoppe[3], Nthabiseng Mohlakoana[1], Parikesit[2]

[1]Department of Governance and Technology of Sustainability (CSTM), Faculty of Behavioural, Management, and Social Science, University of Twente, 7522 NB Enschede, The Netherlands;
[2]Graduate School of Environmental Science, Padjadjaran University, Jawa Barat 45363, Indonesia;
[3] Policy, Organisation, Law and Gaming (POLG), Department of Multi-Actor Systems (MAS), Faculty of Technology, Policy and Management (TPM), Delft University of Technology, Jaffalaan 5, 2628 BX Delft, The Netherlands
Corresponding authors: j.t.a.bressers@utwente.nl (H.B.); n.mohlakoana@utwente.nl (N.M.); erri311@gmail.com (E.M); tbbenito@yahoo.com (T.B); parikesit@unpad.ac.id (P); T.Hoppe@tudelft.nl

ABSTRACT

Climate change mitigation policy has a strong influence on policy processes in worldwide. Indonesia as a developing country has committed to reducing greenhouse gas (GHG) emissions by 29 percent by the year 2030. This calls into question the extent of how the cities or local governments can cope with the challenges of the current transport sector climate change mitigation in Bandung City. This paper aims to assess the governance context of climate policies in

Bandung City and support further co-benefits. The preliminary stage of study shows that the policies in reducing GHG emissions are not in accordance with what was written by the government. The provincial and local government was aware that the stipulation delivered by the central government regarding mitigation on climate change stated in the regulation both in provincial and local level. Based on the actor's characteristic, the policies that encourage to reduce GHG emissions drive as a multi-actor interaction process namely The Paratransit, Trans Metro Bandung (TMB) and Vehicle Emissions Test. The research design involved an empirical case study on governance and policy relevant to climate change efforts to lower GHG in Bandung City, Indonesia.The analytical framework used for this analysis is the Governance Assessment Tool and the co-benefits approach. Data collection involved semi-structured interviews, a review of policy documents, and secondary quantitative data. The results reveal that the governance qualities create a context that there still are somelimits,
although several improvements have shown the positive trend at the local level. This is due to the qualities of the extent aspect as a low to moderate, the flexibility as a restrictive, and the coherence and intensity as moderate. The assessment of the criteria of co-benefits is more relevant to the public transport. The TMB has met all of the criteria of co-benefits. Thus, this TMB program has the highest impact to attain the co-benefits. The paratransit has the positive value of the criteria for lowering GHG emissions, energy and environmental sustainability, and development goals. The vehicle emission test met the criteria of sustainability and technical feasibility.

Keywords: *climate change mitigation, greenhouse gas (GHG), governance, co-benefits*

C3

Fitri Awaliyah[1]; Wawan Gunawan[1]; Muhammad Tasrif[1]

[1]Institut Teknologi Bandung
*Corresponding author: fitriawaliyahp01@gmail.com

ABSTRACT

The existence of floating net cages/KJA (*Keramba Jaring Apung*) in the Cirata reservoir is one of the sources of fisheries needs in West Java by 40%. But along with this, the number of KJA is also increasing and its existence has exceeded the amount determined by the Decree of the Governor of West Java No. 41 of 2002 as many as 85,393 plots. The increase in the number of KJA in the Cirata reservoir has an impact on the decline in water quality and fish productivity. This study aims to determine the processes that cause the dynamics of fish productivity and changes in water quality for KJA aquaculture, building models that can be used as a means of analysis to explain the dynamics that occur, designing a sustainable KJA policy. The depiction of the situation is carried out using a system dynamics approach. System dynamics methodology is one of the policy modeling approaches, especially in terms of increasing understanding of how and why dynamic symptoms of a system occur. This model shows actual behavior and simulation behavior, based on historical data 2007-2017. The actual model and simulation show that the model and structure of the model are valid according to the Theil statistical test, while the model reference has also reflected its historical behavior. Thus the model can be used for policy analysis. To formulate a sustainable KJA (floating net cage farming) policy,

policy analysis uses the 2007-2040 (time period). The model structure in this research is made based on the relationship between KJA farming dynamics, productivity, policy, KJA waste, eutrophication cycle, O2 availability and technology. These variables cause eutrophication in the Cirata Reservoir and affect the production and productivity of fish for the long term. Based on these differences, two hypotheses have been proposed which cover farming of KJA productivity and eutrophication of reservoir waters. First, the model is used to simulate the likelihood of the increasing presence of KJA and the deteriorating water productivity and quality in the next 20 years. Then, by analyzing the possible scenario, the policy scenario is designed to overcome the problems that occur.

Keywords: *System Dynamics, floating net cage farming (KJA), sustainability, eutrophication, productivity, water quality*

C4

COSRPORATE SUSTAINABILITY AND GOVERNANCE: AN ANALYSIS OF THE LITERATURE

Roberta Souza[1], Mary Melo[1], Rodrigo Yaryd[1], Diego Vazquez-Brust[2*], Eva Carmona Moreno[3]

[1]University of São Paulo, Brazil
[2]University of Portsmouthm, UK
[3]University of Almeria, Spain
*Corresponding author: diego.vazquez-brust@port.ac.uk

ABSTRACT

Sustainability Science is still lacking in the integration of management science. This is an important gap since enviornmtal externalities generated by firms pose a majoir threat to ecological sustainability, particularly in areas where legislation and enforcement is wanting. As a case in point, it is estimated that 85% of projected losses in biodiversity will be caused by agriculture and forestry (Castka et al, 2016). Both sectors are characterized by the presence of large multinational firms, many of which voluntarily endorse sustainability and biodiversity protection standards. Voluntary sustainability standards are governed and managed by private entities that establish criteria for sustainable production and sustainable management practices In this paper the main objective is to investigate how voluntary Corporate Sustainabily (CS) actitivities are coordinated. CS could be defined as the social, environmental, ethical, and philanthropic obligations of companies towards society (Carroll and Shabana, 2010). For Husted (2003) these coordination of CS activities is called CS governance. Jackson and Rathert (2017)

called private governance “the ability of private actors to devise and implement behavioural norms that regulate their activities” (p.446).. CS practices could be organized internally by firms, developing resources and capabilities for this. However, companies could also outsource CS actions, thought the creation of philanthropic corporate foundations (Yakovleva, 2017) or using specialist consultants and contractors. Companies can also collaborate which means establish partnerships with local communities, other companies, government, and NGOs for undertaking CS practices (Acquier et al., 2017; Husted, 2003; Yakovleva, 2017). This mode of governance requires cokllective action and it is more closely aligned with Sustainability Science approaches (Yakovleva and Vazquez-Brust, 2018) Concerning collaboration the literature points out the different types of partnerships that companies could establish, such as: long-term contractors (Liao et al., 2017; Ritson et al., 2017), local communities (Dorobantu and Odziemkowska, 2017; Fordham et al., 2017; Yakovleva and Vazquez-Brust, 2018), and non-governmental organizations (NGO) (King, 2007; Rodríguez et al., 2016). Thre is however an outstanding gap in terms of understanding ecological equifinality (i.e. to what extent each of these alternative governance modes is equally effective to improve environmental protection) Taking this, we conducted a systematic literature review about how CSR practices could be coordinated, evaluated it, and outlined avenues for future research. The sample is composed of 115 papers. Results suggest a profusion of terms refering to the same penomenam. This difficults accumulative knowledge. However, results suggest that collaboration is indeed fundamental in undertaking effective CS practices (Husted and Sousa-Filho, 2017; Schneider et al., 2017; Arenas et al, 2013; Vock et al,

2013; Sakarya et al, 2012), but the impact of CS governance is moderated by quality of regulation and standards (Rueda et al., 2017; Sartor et al, 2016).

C5

ECO INNOVATION AND COST OF EQUITY: CURRENT PRACTICES IN INDONESIAN COMPANIES

Grazecelda Latupeirissa[1], Desi Adhariani[1]

[1]Department of Accounting, Faculty of Economics and Business, Universitas Indonesia
*Corespondent authors: sesillatu@gmail.com; desi.adhariani@ui.ac.id

ABSTRACT

The aim of this study is to analyze the effect of eco innovation on the cost of equity capital in order to find an empirical evidence on the appreciation of eco innovation from investors. Using all companies listed on the Indonesia Stock Exchange, except companies in the financial sector, this study found that innovation does not affect the cost of equity capital, implying that efforts still have to be performed to give companies pressures from the stock market participants towards innovative and cleaner production.

Keywords: *Eco Innovation, Cost of equity capital, firm performance, political connection*

C6

POLITICAL ECOLOGY OF HOUSEHOLD SOLID WASTE MANAGEMENT IN CIMAHI CITY, WEST JAVA PROVINCE, INDONESIA: SOCIAL ASPECTS

Vina Septi Suherman[1], Oekan S. Abdoellah[2], Denny Kurniadie[2], Yuli Astuti Hidayati[2]

[1]Doctoral Program in Environmental Sciences, Universitas Padjadjaran, Bandung, West Java Province, Indonesia
[2]Graduate School on Environmental Sciences, Universitas Padjadjaran, Bandung, West Java Province, Indonesia
*Corresponding authors: vintse03@yahoo.com; oekan.abdoellah54@gmail.com

ABSTRACT

Indonesia has targeted 100% solid waste management in 2019 and promotes the zero waste Indonesia in 2020 to tackle solid waste generation. Although Indonesia already has Solid Waste Management Law Number 18/2008, it still fails to reduce and handle solid waste generation. The only city in Indonesia that has 3 sub-districts and population density reaching 14.573 inhabitant/km2 (BPS, 2016) is Cimahi City. Limited land area and high population increase solid waste management complexity. Therefore, a holistic approach is needed and it can be done by political ecology that can analyze environmental problems from local, regional to global levels. This paper seeks to unravel of household solid waste management failures and

alternative solutions by political ecology from Bryant and Bailey (1997), which will be stressed on social aspects. Few researchs has been done to link between social aspects in political ecology perspective and the household solid waste management failures. The research was conducted by qualitative method. Data collection techniques consisted of in-depth interviews, non-participant observation, and documentation. Data validation used triangulation. The result showed that household solid waste management failures from social aspects are influenced by interaction differences between community with their environment and other actors, as well as community involvement differences in household solid waste management. These differences cause inequality in waste management services. Based on the study, low-income community levels have to spend more incurred to get waste management services. In addition, the involvement of these community groups to manage their household solid waste independently is highly dependent on subsidies. Alternative solution can be gained by understanding the different of interaction patterns and community involvements in household solid waste management. It aims to equalize the household solid waste management services to achieve the target of 100% solid waste management in 2019.

C7

GO URBAN OR STAY RURAL: DETERMINANTS OF YOUNG FARMERS STAYING IN OR LEAVING AGRICULUTURAL FIELD (A Case Study in Cisondari, West Java, Indonesia)

Iwan Setiawan[1], Adi Nugraha[2*], Siska Rasiska[3]

[1,2] Department of Agricultural Social Economics, Faculty of Agriculture, Universitas Padjadjaran
[3] Department of Pest and Plant Diseases, Faculty of Agriculture, Universitas Padjadjaran
*Corresponding author: adi.nugraha@unpad.ac.id

ABSTRACT

Although agriculture workforce plays an important role in agricultural development aging workforce in agriculture is often put in the periphery. The interest of youth in agriculture is declining due to the diminishing popularity of agricultural field compared to non-agriculture sector in term of future personal welfare security. However, Cisondari, a village in Bandung Regency showed an anomaly. Organic farming in that area is proliferating and growing and is motored by the youths. This study aims to identify the determinants of young farmers for choosing to stay in the rural area and develop their agriculture, despite its adjacent location to Bandung city and amid high rate of urbanization; and how their role contributed to the development of organic farming in the area. The study applies sequential exploratory mixed methods, which relies heavily on qualitative approach which is then complemented by quantitative approach. Data were collected through in-depth interview to key informants, participant observation, field observation, document and

artefact analysis; while quantitative data were collected through structured interviews to selected respondents. The results showed that farmers characteristics, innovativeness, and environment became the most dominant factors in determining their motives to stay in rural areas.

Keywords: *agriculture aging, farmers regeneration, organic farming, young agriculture workforce*

C8

HEADING TOWARDS SUSTAINABLE COCOA AGRIBUSINESS SYSTEM (A Case Study in North Luwu, South Sulawesi, Indonesia)

Adi Nugraha[1*], Mahra Arari Heryanto[1], Eliana Wulandari[1], Pandi Pardian[1]

[1]Department of Agricultural Social Economics, Faculty of Agriculture, Universitas Padjadjaran
*Corespondent author: adi.nugraha@unpad.ac.id

ABSTRACT

Cocoa is one of the most potential estate crops in Indonesia, which are traded worldwide. Thus, many efforts were conducted to improve its performance in terms of production, productivity, value added, and competitiveness. These efforts came from various development agents including government, NGOs, private sectors, and grassroot communities, costing a huge sum of money in the processes. However most of those efforts were not able to give significant changes especially to farmers' welfare. This study was aimed to reveal the complexity of the pathway towards sustainable cocoa development in North Luwu, South Sulawesi, by providing a generic map of causal effect between elements that has role in North Luwu's cocoa agribusiness system. The study was a qualitative study, relying on the depth of information gained through in-depth interviews with key actors, participant observation, document and artefact analysis. Information were then analyzed by using system thinking approach, which then illustrated in a causal loop diagram to show the

dynamics in the system. The result shows that in practice, cocoa agribusiness system is very complex due to the interrelatedness of technical aspects, social aspects, environmental aspects and economic aspects. The synchronization of all those aspects are very important in order to reach sustainability in cocoa agribusiness system.

Keywords: *System thinking, sustainability, cocoa, agriculture development*

C9

THE ECOLOGICAL STRATEGY OF FISH PROCESSING INDUSTRY TO REDUCE POLLUTION THROUGH WASTE MINIMIZATION APPROACH

Setia Devi Kurniasih[1], Tri Edhi Budhi Soesilo[1], Roekmijati W. Soemantojo[1]

[1]School of Environment Science, Universitas Indonesia
Corresponding authors: setdev.sdk@gmail.com, soesilo@indo.net.id, roemws@gmail.com

ABSTRACT

The subject of my research is about ecology of fish processing industry to reduce pollution and saving water resources through waste minimization approach. My research question is how to reduce pollution the wastewater of fish processing industry with waste minimization approach. This research aims to arrange the strategy of pollution prevention fish processing industry through waste minimization approach. The subject of the research is important because wastewater from fish processing industry produce highly complex waste. This potentially disrupts the water ecosystem and causing water pollution. This research will use descriptive analysis method with quantitative approach. Data will be obtain by field survey and interviews of industrial workers. Then, it will show in narration. My contribution will be give the strategy of fish processing industry to reduce pollution and saving water resources through waste minimization approach. The result of this research refers to SDG's number sixth (6^{th}) to ensure availability and sustainable management of water and sanitation for all.

Keywords: *Ecology of Fish processing industry, Pollution prevention strategy, Waste minimization approach*

Theme:

Ecology, Governance and Policy

D1

GOVERNMENT SOVEREIGNTY OVER NATURAL GAS PRICE SETTLEMENT AND ALLOCATIONS IN THE REPUBLIC OF INDONESIA'S TERRITORY

Zainal Muttaqin; Adrian E. Rompis; Amelia Cahyadini[1]; Rafika Fajriati Nastiti; Irvan Duwana; Muhammad Agus Salim

[1]Faculty of Law, Universitas Padjadjaran
*Corresponding author: amelia.cahyadini@unpad.ac.id

ABSTRACT

Indonesia's natural resources has its own interest in the international community, specifically oil and natural gas. The conduct of nation and state activities and actualization of the prosperity of the people must be landed by a governing law, including the management of oil and natural gas. Oil and natural gas as one of the contributor to The Indonesian Budget (APBN) is now under the control of globalization. With open market projects, privatisation, and energy consumption intervention, in this context the state's mega project is no longer development law politics but natural resource economy occupation, vital economic assets and the control of local markets by foreign companies, therefore globalization poses as a challenge for the government on its authority to manage natural resources, especially non-renewable resources. The concept of state sovereignty over the management of oil and natural gas has been raised as a research topic by law graduates because there are still many issues with oil and natural gas management, especially in the field of administration. This paper will examine how far does the

state have authority over price settlement and natural gas allocations after the Constitutional Court Verdict number 002/PUU-I/2003 in relation with Article 33 of the 1945 Constitution. This paper will examine a case relating to natural gas reallocation between PT. Parna Raya and The Ministry of Energy and Natural Resources of Indonesia in dispute number 181/G/2017/PTUN-JKT dated August 30th 2017.

Keywords: *Sovereignty of the Republic of Indonesia, Natural Resources, Natural Gas Allocation, Natural Gas Price Settlement, Article 33 of the 1945 Constitution*.

D2

RECLAMATION OF JAKARTA BAY: BETWEEN ENVIRONMENTAL ASPECT, SOCIAL AND POLICY

Yulinda Adharani[1]*, Nadia Astriani, Yusuf S Zamil

[1] Lecturer and Researcher on Environmental Law, Faculty of Law, Universitas Padjadjaran
*Corresponding author: yulinda.adharani@unpad.ac.id

ABSTRACT

Coastal areas have strategic value for the development of the national economy and the improvement of people's welfare and are at the same time very vulnerable to damage and destruction. Therefore, it is necessary to manage wisely by placing economic interests in proportion with the environmental and social interests, both in the short and long term. A policy should be in accordance with the needs of the community and its benefits to the community, as well as the policy of reclamation of the bay of Jakarta, whether it is needed and beneficial to the interests of the public or for the benefit of the owners of capital. The environmental review of the reclamation of Jakarta is considered unclear and transparent, including permits issued not with regard to the environmental impacts that will be generated. Management of coastal areas through reclamation in Jakarta Bay, has pros and cons in its development since 1995. This paper describes the non-conformity of environmental, social and policy aspects in coastal area management through reclamation in Jakarta Bay, using juridical-normative research method, this research will present theories on environmental law compliance especially licensing and spatial arrangement

and sustainable development related to the case of development of Jakarta Bay Reclamation.

Keywords: *Reclamation of Jakarta Bay, Environmental, Social, Policy, Sustainable Development*

D3

ENVIRONMENTAL INJUSTICE IN THE 'BLACK HOLE': AN OVERVIEW OF COAL MINING RECLAMATION FAILURE IN EAST KALIMANTAN

M. Muhdar[1], Laurens Bakker[2], Rikardo Simarmata[3]

[1]Faculty of Law, Mulawarman University, Indonesia
[2]Anthropology and Contemporary Asian Studies, University of Amsterdam, Netherlands
[3]Faculty of Law, Universitas Gadjah Mada, Indonesia

ABSTRACT

This article investigates the issues related with existing coal mining laws resulting in problems with the implementation and enforcement of these laws through a case study in East Kalimantan, a province with the most coal mining permits in Indonesia due to the explosion of coal mining post decentralization coal boom, where the mining sector has resulted in serious environmental and social impacts. This article argues that due to legal weaknesses in the coal mine permitting process, the coal mining sector in East Kalimantan has been managed and governed poorly resulting in serious and extensive impacts on human health and the environment. Recently, government has introduced Clean and Clear regulations based on a desk-based review process for ensuring that mining operations adhere to permitting requirements, however obtaining Clean and Clear status does not involve a ground check of operations. In empirical reality, there is no correlation between Clean and Clear status and good environmental management. In fact, Clean and Clear standards may in

fact enable poor governance by allowing companies to avoid effective post-mining clean up. In addition, civil society groups have explored various avenues to address environmental injustices from the poorly managed coal mining sector in East Kalimantan. Their strategies have included pursuing legal avenues through a Citizen Lawsuit, as well as various domestic and international focused advocacy efforts to push for reforms to the mining governance.

Keywords: *coal mining permitting, coal mining governance, environmental injustice, civil society movements*

D4

WORKING WOMEN, PARITY, AND MODERN CONTRACEPTION METHODS

Dona Dewi Putri[1], Dwini Handayani[2]

[1]Master Program in Economics of Population and Labor, Faculty of Economics and Business, Universitas Indonesia
[2]Faculty of Economics and Business, Universitas Indonesia
Corresponding authors: dona.tnxi@gmail.com; dwiniarianto@yahoo.com

ABSTRACT

The role of women as wives and mothers taking care of husbands, children, and households is not easy. When women decide to work, improve education by continuing school, follow community activities, or do other activities with the goal of self-actualization, it ultimately leads to the emergence of role conflict between her maternal and non-maternal roles. The presence of children is considered as an inhibiting factor. Consequently, the working wives are thought to wish to limit birth by using contraceptives. This study uses National Social Economic Survey (SUSENAS) 2017 data with an analysis unit of married women aged 15 to 49 years whose status are as wives of the households. This study used multinomial regression method and found that women play a dual role (performing a maternal and non-maternal role), they feel that adding more children to the family means an increase in the opportunity cost; therefore, they choose to limit the number of childbirths using both long-term and short-term contraception methods. In women with fewer live births, the presence of toddlers in the household is the most influencing factor

for women to use long-term contraceptive methods. Among the married women who had more than two children, older women are significantly more likely to use a long-term method than younger women.

Keywords: *Women dual role, contraceptive*

D5

THE STATE OF MINING RECLAMATION PERFORMANCE IN EAST KALIMANTAN PROVINCE

Rina Kristanti[1], Hariadi Kartodihardjo[1], Bramasto Nugroho[1], Irdika Mansur[1]

[1]Faculty of Forestry, Bogor Agricultural University
*Corresponding authors: cumieinfahutan@yahoo.com, hakabgr@gmail.com, bramasto2001@yahoo.co.id, irdikam@gmail.com

ABSTRACT

Mining and its productivity in producing coal and mineral are important to support Indonesia national development. Indonesian Government allows mining to be conducted in forestland based on Forestry Law Number 41/1999 to support mining development. Mining in forestland not only creates positive influence but also carries negative impact. It can harm the environment and creates social conflict. Due to environmental degradation caused by mining in forestland, reclamation has to be undertaken as soon as mining activity is accomplished. It is defined as the effort to remediate the degraded land caused by mining activity. It covers the activity of soil treatment, land management as well as replantation and community development. Reclamation becomes the responsibility of all mining companies. At present time the Ministry of Environment and Forestry (MoEF) has released approximately 500,000 hectares of forestland borrowed by 400 units mining concessionaire. In East Kalimantan Province, there are almost 90 mining concessions in forestland have been released by MoEF with the total area reach 150,000 hectares. The

reclamation progress has reached 13,000 hectares over the 65,000 hectares of degraded area over the concession area. Extensive coal and mineral production will affect forest sustainability. East Kalimantan Province will be the biggest taker of forest degradation caused by mining since it becomes the biggest coal producer province in Indonesia. As we know that Indonesian rain forest plays important role in climate change mitigation, its degradation becomes serious problem. Many challenges occurred in implementing mining reclamation in forestland. The challenge covers the technical and non-technical aspect. This research discovered the state of mining reclamation performance in East Kalimantan Province and factors influencing its state. Based on field result, the government have issued policies in managing mining reclamation. Those policies are complex with the strength and the weakness. The policies influence the cost and benefit, stakeholders and responsibilities, actors and behavior, governance as well as transaction cost of mining reclamation in forestland that define the state of mining reclamation performance in forestland. The development of proper regulations is urgently required to improve the stake holder capacity, low cost technology, incentive and behavior to achieve mining sustainability, good mining practice and sustainable forest management.

Keywords: *regulations, mining permit holders, good mining practice responsibility and sustainable forest management*

D6

THE SUSTAINABILITY OF AN ENVIRONMENTAL POLICY: A REVIEW OF INDONESIA PEAT RESTORATION PROGRAM

Mahardika Fadmastuti[1]

[1]Universitas Indonesia
*Corresponding author:
mahardika.fadmastuti@gmail.com

ABSTRACT

Indonesia's forest fires and peatlands became a global concern in 2015, when 33% of the 2.6 million hectares of land that burned that year occured on peatlands. One of the current strategies to control the spread of forest fires is to restore 2.4 million hectares of the peatland which had burned in 2015, by 2020. Although it has been more than half of the period of the program, the idea of restoring the peatlands to control the spread of fires has not shown any signs of success; the Disaster Management Agency of Indonesia reported that forest fires have increased by over 60%, compared to the same period last year. Since the implementation of peat restoration policy in Indonesia over three years ago, there is still no example of a successfully restored peat area. However, the peat restoration report in 2017 claimed that 50% of the destroyed peatland has been restored. The peat restoration program includes a minimum three components of restoration: 1) Ecology, 2) Economy, and 3) Society (Mizuno, 2016), which often remain unbalanced. This research aims to review the environmental policy program of restoring 2.4 million hectares peatland which was established at the

beginning of 2016. The research will conduct a geographic analysis on the program implementation in Indonesia, also comparing this with sustainable environmental theories and successful restoration projects in world wide wetlands.

Keywords: *Peat restoration; Restoration program; Sustainable; Implementation*

D7

THE STRATEGY ANALYSIS OF ENVIRONMENTAL MANAGEMENT IN TRADITIONAL MARKET

Sessario Bayu Mangkara[1*], Hayati Sari Hasibuan[1], Herdis Herdiansyah[1]

[1] School of Environmental Science, Universitas Indonesia
*Corresponding author:
sessariobayumangkara@gmail.com

ABSTRACT

The traditional market has a very important role in national development, especially in terms of state and regional income and the place of interaction between communities. The current condition of the traditional market is still seen as negative as slums, dirty, uncomfortable, and inadequate facilities. This has resulted in a decline in the competitiveness of the traditional market with reduced income from traders and market managers and a decline in the social and institutional quality of the market community. This study aims to analyze the efforts of an ideal traditional market embodiment in the Metropolitan area (Mayestik Market, South Jakarta), the Big City (Pandansari Market, Balikpapan City), and the Medium City (Pasar Ibuh, Payakumbuh City) which apply sustainable concepts and environmental management strategies in traditional market. Data were collected from three markets in three different city areas with a total sample of 300 traders and market managers including data on environmental, social, and economic conditions, review of regional regulations, and local government policies on managing

the traditional market. Data on environmental, social, and economic conditions were analyzed using non-hierarchical cluster analysis, and data on regional regulation studies, local government policies on community market management were analyzed by Analitical Hierarchy Process (AHP). The results show that the sustainable concept of traditional market management shows the relationship between economic, social, and environmental aspects. The relationship between the income of traders and market managers and the social and institutional quality of market communities has the potential positive influence on the optimization of waste management and the efficient use of electricity and water energy. The strategy of environmental management in traditional market is carried out collaboratively management with the role of the community, cooperatives, and traders' creative organizations and the improvement of the quality of market management by the local government or market manager. The top down policy strategy is the main function of improving traditional market management and supervision is carried out at the level of the merchant community.

Keywords: *traditional market, management, sustainability, analitical hierarchy process (AHP)*

Theme:

Ecology, Industry and Supply Chains

E1

A JOINT BAYESIAN NETWORK AND ANALYTIC HIERARCHY PROCESS FOR SUSTAINABLE SUPPLIER EVALUATION AND SELECTION

Nadine Kafa[1], Anicia Jaegler[1], Joseph Sarkis[2]

[1]Kedge Business School, Talence, France
[2] Foisie School of Business, Worcester, USA
*Corresponding author: anicia.jaegler@kedgebs.com

ABSTRACT

Environmental and social criteria in supply chain management has become a practical and research concern due to regulatory, stakeholder, and economic pressures. Central to an effective holistic sustainable supply management scheme is evaluating and selecting suppliers. Supplier evaluation at its core requires balancing multiple criteria. Thus, multiple criteria tools, each with advantages and limitations, are central to the supplier evaluation and selection problem. This paper introduces a novel methodological approach taking advantage of complementary Bayesian Network (BN), analytic hierarchy process (AHP) and decision-making trial and evaluation laboratory (DEMATEL) techniques. A literature foundation helps support the development of a set of environmental, social and economic criteria for supplier selection; this criteria set is validated by experts. The combination of Bayesian, DEMATEL, AHP approaches, although they are supportive and complementary methods has seen limited investigated. The Bayesian network approach can complement DEMATEL and AHP to help improve the accuracy of input data used in AHP. Alternatively, DEMATEL and

AHP can provide expert and more objective inputs for intangible factors, for application in the Bayesian network approach. The validity and efficacy of this approach is demonstrated through a real industrial case; using expert inputs. Moreover, the application of this study shows the advantages and disadvantages of each method. Finally, we present results with managerial and research implications and future research directions identified.

Keywords: *Bayesian network, AHP method, DEMATEL method, sustainable supplier evaluation, sustainable supplier selection, supply chain management*

E2

IDENTIFYING SUSTAINABILITY METRICS AT REAL APPLICATIONS OF THE SUPPLY CHAIN NETWORK DESIGN PROBLEM: A SYSTEMATIC LITERATURE REVIEW

Carlos A. Moreno-Camacho[1,2,3], Jairo R. Montoya-Torres[1], Anicia Jaegler[2,3] and Natacha Gondran[3]

[1] Grupo de investigación en Sistemas Logísticos, Faculty of Engineering, Universidad de La Sabana, km 7 autopista norte de Bogotá, D.C., Chia, Colombia
[2] Center of Excellence in Supply Chain - Kedge Business School, 680 Cours de la Libération, 33405 Talence, France
[3] UMR cnrs 5600 EVS, Ecole des Mines de Saint Etienne, Institut Fayol, 158 cours Fauriel, 42023 Saint-Etienne, France
Corresponding authors:
carlosmorca@unisabana.edu.co;
jairo.montoya@unisabana.edu.co;
anicia.jaegler@kedgebs.com

ABSTRACT

Sustainable development receives an increasing attention in the supply chain context from both academics and practitioners. This is shown by the growing number of published papers addressing this topic. This paper presents a systematic literature review of works addressing the Supply Chain Network Design (SCND) problem, in which at least two of the three dimensions of sustainability were assessed. The aim of the paper is to identify indicators that are used when sustainability is assessed in applied cases. A total of 87 papers from 2015 to 2018 were selected including

papers studying forward, reverse, a closed loop supply chains. Indicators in the economic, environmental and social dimension were classified according to an existing framework in the sustainable supply chain literature. The review finds a highlighted emphasis on environmental considerations and that there is still a lack in the consideration of social factors. One of the first distinction of the works dealing with carbon cap, carbon tax and carbon cap and trade policies is whether they embrace weak or strong sustainability perspectives. Regarding the environmental dimension, the literature review showed a strong development in the evaluation of air pollution caused by operation facilities and transportation, however, other categories such as water pollution and land pollution are more rarely evaluated. Jobs creation keep being one of the most important factors to measure social impact from supply chain but the analysis of fair work conditions is scarcely studied. The multiplicity of approaches is shown since the paper includes studies using mathematical models, analytical models, and simulation models dealing with both determinist and stochastic data. The analysis also shows an increasing concern of sustainable practices in developing economies, mainly in Asia. Although most of the studies were focus on the energy sector, crude oil, and biofuel, it is noted an increasing interest in sectors like manufacturing, textile and food to consider sustainable conditions from the design of their supply chain network. The paper concludes with a brief description of the areas where research opportunities exist including sectors, measures, and methodologies to assess sustainability in the SCND problem.

Theme:

Ecology, Resilience, and Environmental Hazard Vulnerability

F1

BIODEGRADATION OF PHENOL, ANTHRACENE, AND ACENAPHTHENE BY SINGLY AND CONSORTIUM CULTURE OF INDIGENOUS MICROORGANISMS ISOLATES FROM UNDERGROUND COAL GASIFICATION AREA

Ratu Safitri[1,3*], Sri Handayani[2,3], Wulandari Surono[2], Hasniati Astika[2], Retno Damayanti[2], Fawziyah Dwi Kusmaya[1], Rukiah[1,3]

[1]Biology Department, Universitas Padjadjaran, Jatinangor, Indonesia
[2]R&D Centre for Mineral and Coal Technology, Jl. Jend. Sudirman 623 Bandung, Indonesia
[3]Program Study of Biotechnology, Post Graduate School Universitas Padjadjaran, Jl. Dipati Ukur no. 35, Bandung, Indonesia.
*Corresponding author: ratusafitrie@yahoo.com

ABSTRACT

Research on the biodegradability of phenol, anthracene and acenaphthene by single culture and consortium of Stenotrophomonas maltophilia and Bacillus velezensis, indigenous microorganism isolated from the area of Underground Coal Gasification (UCG) has been conducted. As it is known that the gasification of Coal has a potential for long term energy supply in the future by conversion of non-mineable coal seams to syngas for various industrial applications. However, recalcitrant aromatic compounds such as phenol, anthracene and acenaphthene from UGC are potential to contaminate groundwater, soil and the broader environment. Therefore, bioremediation is required in the polluted

environment. In this research, we have done research on biodegradation ability of phenol, anthracene and acenaphthene compounds by single culture and consortium of Stenotrophomonas maltophilia and Bacillus velezensis, indigenous microorganism isolated from Underground Coal Gasification (UCG) area. This study focuses on finding indigenous microorganisms capable of degradation and evaluate their biodegradability. The method used experimentally using Completely Randomized Design (RAL) factorial patterns. The result of biodegradation test of compound with 500 ppm concentration for 14 days showed that biodegradation ability of S. maltophilia was 60,2% to phenol, 80,4% anthracene and 82,5% acenaphthene. Meanwhile B. velezensis has biodegradability, 79% to phenol, 79.8% to anthracene, and 81.1% to acenaphthene. The consortium has biodegradation capability of 83,4% to phenol and acenaphthene and 83,53% to anthracene respectively. The results showed that UGC indigenuos microorganisms have the potential to be utilized in bioremediation efforts of UGC hydrocarbon pollutants that may contaminated groundwater, soil and the broader environment.

Keywords: *Phenol, anthracene, acenaphthene, biodegradation, mixed culture,* S. maltophilia, B. velezensis

F2

THE DYNAMICS OF MANGROVE FOREST: THE RELATIONSHIP BETWEEN MANGROVE COMMUNITY STRUCTURES AND CARBON STOCK IN THE JAKARTA BAY

Nilam Sari[1*], Mufti P Patria[2], Tri Edhi Budhi Soesilo[3], Iwan Tejakusuma[4]

[1]Sekolah Tinggi Teknologi Industri Bontang (STTIB), MT. Haryono street, number 75, Bontang-East Kalimantan.
[2]Biology Department-Ecology Laboratorium, E Building 1st floor, FMIPA, Universitas Indonesia-Depok.
[3]Environment School-Postgraduate-Universitas Indonesia, Salemba street, center of Jakarta.
[4]The Agency for assessment and Aplication of Technology (Badan Pengkajian dan Penerapan Teknologi/BPPT), MH. Thamrin street, number 8, Jakarta.
*Corresponding author: ninanilamsari.ns@gmail.com

ABSTRACT

Pollution in the Jakarta Bay has resulted degradation that affects carbon stocks and mangrove composition and structure. Ecologically this relationship creates conditions that are interrelated with each other. This research has been conducted along in the shores of Jakarta Bay, from Tangerang (Banten Province)-North Jakarta (DKI Jakarta)- Muara Bendera (Bekasi-West Java province). The purpose of this research is to design the relationship between mangrove community structure and carbon stock. The method used vegetation analysis, allometric, Pearson correlation, and system dynamic. The result is the average of import value index at tree level is 113.57%, at tillers level is 92.03%, and the

seedling levels is 80.6%. The average coverage for all levels was 38.62%, and according to regulation ministry of environment and forestry (MoEF) number 201 in years 2004, it was put into damaged criteria. Dominant species are performed by *Avicennia marina*, *Avicennia lanata*, *Rhizophora apiculata*, *Soneratia caseolaris*, and *Soneratia alba*. The average of carbon stock was 204.25 grC.m^{-2} with an average of 454.04 grC.m^{-2} biomass, an average litter of 271.59 grC.m^{-2}, an average sediment of 206.31 grC.m^{-2}, an average of roots of 45.4 grC.m^{-2}, and average of nekromassa of 43.88 grC.m^{-2}. Carbon stocks in above of soil surface was 67% of the total, and in below ground level was 33% of the total. The result of Pearson correlation show a negative relationship between mangrove community structure and carbon stocks. This linear relationship shows the interplay between them. The low value of the mangrove community structure causes a low value in carbon stocks, and they were trying to balance in ecosystem. This is strengthening the hypothetic that the degradation occupied the mangrove forest and occurred for a long time. By looking at the ecological design which is explains their relationship, it is predicted that the Jakarta Bay will lose mangrove forest in the next 50-60 years, if the habitat condition remains the same as it is today.

Keywords: *average carbon stocks, ecological design, important value index, mangrove forest degradation*

F3

ANALYSIS OF LEAD CONTAMINATION MANAGEMENT IN SOIL (CASE: PESAREAN VILLAGE, TEGAL DISTRICT AREA)

Lestari, Indah. [1], T. E. Budhi Soesilo [1], H. Agustina [1]

[1]School of Environment Universitas Indonesia, Salemba 4 Jakarta Pusat 10430, Indonesia
Corresponding authors: indahlsurbani94@gmail.com; soesilo.indo@net.id; harukiagustina@gmail.com

ABSTRACT

The smelting of metal and used battery which was carried out in Pesarean Village, Tegal District has resulted a huge amount of openly waste that has not been processed properly. This waste contains heavy metal such as lead that counted as hazardous and toxic waste materials. It can affect the quality of environment not only polluting the air but also the soil and groundwater. The aims of this study were to analyze the effect of lead concentration on the environment, especially soil and groundwater and analyze the appropriate techniques for controlling the pollution of the soil due to this activity. The method that used in this study was quantitative and qualitative methods with analyzing secondary data, literature and previous research review and analyzing using SWOT method which was supported by interviewing some stakeholders. The results showed that in 2012 concentration of lead in soil of waste disposal area reached 14,343 ppm, and in 2015, the highest concentration was in residential and

dumpsite area with concentration 398,489 ppm. In groundwater, lead concentration was still below the water quality standard. The current pollution control technique that can be conducted is ex-situ remediation using physics method by replacing contaminated soil (dig and take the contaminated soil) with uncontaminated soil.

Keywords: *lead, smelting waste, soil pollution, remediation technique*

F4

AN OVERVIEW OF BIOGAS UTILIZATION FROM TEMPEH WASTEWATER

S.W. Puspawati [1], T. E. Budhi Soesilo [1], R. W. Soemantojo[1]

[1]School of Environment Universitas Indonesia, Salemba 4 Jakarta Pusat 10430, Indonesia
Corresponding authors: indahlsurbani94@gmail.com; soesilo.indo@net.id; harukiagustina@gmail.com

ABSTRACT

Tempeh is a traditional soy product originating from Indonesia. It is a high-protein food whose per unit chost is cheaper than other animal protein sources. However, tempeh industry will produce waste by the process. The process production of tempeh needs a lot of water used for boiling, soaking, leaching and soybean skin peel. The study issue is practice of tempeh industry that has not managing wastewater properly, which has potential to cause wastewater quality of tempeh industry exceeds water quality standards and cause negative impact on the environment and communities living around the industry, so an alternative to improving wastewater management is needed. one of them is by converting liquid waste into renewable energy. Biogas is a type of biofuel that originates from living things and renewable energy. This study aims to overview of biogas utilization from tempeh wastewater. The results showed that biogas whose suitable for small-scale industries is by using balloon biogas digester. Selection of biogas types based on management and resource analysis, economic

analysis, and environmental analysis. Biogas technology is the right choice to convert tempeh waste into energy so that it can obtain economic and environmental benefits.

Keywords: *tempeh wastewater, biogas, management and resource analysis, economic analysis, and environmental analysis*

F5

SOCIAL RESILIENCE PROCESS TO DROUGHT DUE TO EL NINO 2015 (A DESCRIPTION OF THE PROCESS OF COMMUNITY AT BORDER ISLAND)

Ady Suryawan[1,2], Isdomo Yuliantoro[1], Subarudi[3], dan Hadi Prayitno[4]

[1] Enviroment and Forestry Research and Development Agency of Manado
[2] Magister of Enviroment Science, Postgraduate Padjadjaran University
[3] Social Economic Forest Policy and Climate Change Center of Enviroment and Forestry Ministry
[4] Marine and Fisheries Ministry

ABSTRACT

Marampit Island has a geostrategic role because it is at the outermost point so that it determines the Republic of Indonesia's national boundaries. El Nino events in 2015 have caused a prolonged drought. This phenomenon has influenced the attitudes and perspectives of the people towards nature. This study aims to describe the change in natural management post-drought at El Nino 2015. The research analyzes satellite images to determine land cover, conducts FGDs to determine the changes of attitudes and natural resources management post El Nino 2015. The landcover is dominated by gardens and dry land farming reaches 84%, settlements are 1% and natural forests only 15%. The surounding of water spring are dominated by plantations. Soil fertility is low based P and K values are below 10 ppm and 10%. El Nino has caused the debit of 5 water spring decrease and not flowed. This condition has led to a conflict of

ownership of the spring betwen Laluhe and Marampit Village. The community began to realize the importance of trees around the spring so that they tried to replant and provide a regulation in managing nature. Based on the agreement, Marampit Village issued a Village Regulation on the Management of Natural Resources and the Environment of Marampit Island in 2015. Marampit villagers began to realize the importance of trees around the spring so that they replanted and gave some limitations in managing nature. Marampit Village issued a Village Regulation concerning the Management of Natural Resources and the Environment of Marampit Island in 2015. The 4 Villages other on Marampit Island agreed to support the efforts of tree planting and protection of springs carried out by Marampit Village in 2017. The Head of Marampit Village does coordination with the Indonesian Navy and the Environment and Forestry Research and Development Agency to get support for the planting movement. The community really hopes that seedling assistance can grow as an investment and protection of springs. The Marampit indigenous people have a higher perspective and concern for nature than the Laluhe indigenous people and the Dampulis custom. Changes in natural resource management are more influenced by culture than other social factors.

Keywords: *Community, El Nino, Marampit Island, Natural Resources, Resilience*

F6

MONITORING ON POST OIL SLUDGE PHYTOREMEDIATION: ACUTE TOXICITY TEST AGAINST FEMALE WISTAR RAT (Rattus norvegicus Berkenhout, 1769)

Nia Rossiana[1], Kartiawati Alipin[2], Mohammad Raihan Amin[1], Ida Indrawati[1], Sri Rejeki Rahayuningsih[3], Jetty Nurhajati Murad [4]

[1,4]Laboratory of Microbiology Departement of Biology Faculty of Mathematics and Natural Sciences University of Padjadjaran Jl. Raya Jatinangor Bandung 40153
[2]Laboratory of Biosistem Departement of Biology Faculty of Mathematics and Natural Sciences University of Padjadjaran Jl. Raya Jatinangor Bandung 40153
[3]Laboratory of Biomoleculer dan Genetics Departement of Biology Faculty of Mathematics and Natural Sciences University of Padjadjaran Jl. Raya Jatinangor Bandung 40153
Corresponding authors: niarossiana@yahoo.com; kartiawati@yahoo.com; ida.indrawati81@gmail.com; raihanamin30@gmail.com; rahayuningsih.sr@gmail.com

ABSTRACT

Oil sludge is a waste derived from the petroleum industry and includes hazardous and toxic substances that must be biologically managed. One of the efforts to overcome oil sludge waste is by using bioremediation. The toxicity from oil sludge derived from phytoremediation that has been done by using consortium bacteria (Bacillus sphaericus, Pseudomonas sp.) and mycorrhiza of Chinese albizia plant (Paraserianthes falcataria) for up to 14.5 months needs to be monitored and evaluated to

female wistar rat (Rattus norvegicus) as biological model. The purpose of this study was to obtain LD_{50} from oil sludge extract of phytoremediation and to determine its toxicity on rats based on histological observation. The laboratory experiment with complete random design method was conducted. Acute toxicity test was performed based on protocol from OECD 425 in 2008 with modification. The parameters observed consist of animals mortality, changes in body weight, and liver histological damage levels. Probit analysis showed that LD_{50} from oil sludge extract was 9,785.184 mg / kg bw which is categorized as slightly toxic. This value still did not meet the results of the bioremediation process (> 15.000 mg / kg bw or not toxic). Therefore, the oil sludge phytoremediation process needs to be improved until the required policy is fulfilled. This study provides information on the evaluation approach when bioremediation used as an alternative method to restore the oil contaminated soil.

Keywords: *Oil sludge, phytoremediation, acute toxicity, Rattus norvegicus*

F7

ARTIFICIAL RECHARGE AS AN EFFORT TO INCREASE URBAN WATER RESILIENCE

Rizka Maria[12*], Wilda Naily[12], Nyoman Sumawijaya[2], Hendarmawan[1], Ahmad Taufiq[3]

[1]Faculty of Geology, Padjajaran University, Dipati Ukur Bandung 40134, Indonesia
[2]Research Center for Geotechnology LIPI, Sangkuriang, Bandung 40135, Indonesia
[3]Research Center for Water Resources, Ministry of Public Work and Housing, Juanda 193, Bandung 40135, Indonesia
*Corresponding author: rizka_maria@yahoo.com

ABSTRACT

The government realizes economic independence with development priorities by increasing food sovereignity and increasing water resilience which is focused on availability, accessibility, sustainability and security. The decrease in groundwater level that occurs in the Bandung Groundwater Basin indicates the occurrence of groundwater extraction that exceeds natural recharge which will threaten water security. The purpose of this study is to improve water resilience in urban areas in order to increase water supply for the community and reduce the risk of flooding. The method used is qualitative descriptive. The results of the field survey showed that shallow groundwater levels in the built area ranged between 2 m - 20 m below groud level, the groundwater level was at a depth of between 15 m - 91 m below groud level. This condition indicates the need

for artificial recharge. The area of land constructed in the Bandung Basin ranged between 92,379.99 Ha. The average rainfall in 2017 is 2164 mm / year, there will be 1,599,282,386.88 m^3 of roof water that can be absorbed into the soil to increase the potential of groundwater in the Bandung Basin. If 50% of the roofs of buildings in the built area can be accommodated by roofing water, it will increase the availability of groundwater of 799,641,193.44 m^3 / year and reducing surface runoff. The successful application of artificial recharges will improve the water resilience of urban areas.

Keywords: *decreasing groundwater, flooding, artificial recharge, water resistance*

F8

ANALYSIS OF ECOLOGICAL MANAGEMENT OF FLOATING NET CAGES AQUACULTURE IN CIRATA RESERVOIR

Atikah Nurhayati[1*], Isni Nurruhwati, Titin Herawati, Ayi Yustiati[1]

[1]Faculty of Fisheries and Marine Science, Padjadjaran University
*Corresponding author: atikah.nurhayati@unpad.ac.id; nurhayati_atikah @yahoo.com

ABSTRACT

Cirata Reservoir is one of the reservoirs built in the Citarum River Basin. Fish farming activities are developed is an aquaculture system floating net cages. Utilization of Cirata reservoir as a location for fish farming with the floating net cage system has developed very rapidly. This research aims to analyze the management of ecological fisheries management of the floating net cage to support the sustainability of environmental conservation. The research time in February 2017 - March 2018. The research method used primary and secondary data. The analysis tool used is a water quality test and sociometry in Cirata reservoir management. Based on the observation in the field the attributes analyzed include primary production, species, carrying capacity, aquatic ecosystem, productivity, turnover, coefficient variability, water quantity of chemical, water quantity of biological, water quantity of physics. Ecological parameter indicates the condition of the turnover has a high sensitivity level all the weather changes. Climate change effect on water quality both in

biology, chemistry and physics. The management of reservoir water resources should involve all stakeholders from planning, implementation and monitoring. Model management refers to the bio-physical aspects of the environment, economy and local institutional values.

Keywords: *ecology, management, reservoir cirata*

F9

ANALYSIS OF MANGO FARMER ADAPTATION IN OVERCOMING CLIMATE CHANGE.

Vierdiananda Ryadithia[1], Dhany Esperanza[1*]

[1] Faculty of Agriculture, Universitas Padjadjaran, Jl. Raya Bandung-Sumedang km 21, Jatinangor
*Corresponding author: dhany@unpad.ac.id

ABSTRACT

Climate change is affecting all agricultural commodities, one of which is mango. It is particularly affecting agriculture production results, thus it is necessary for farmers to adapt in order to maintain the existing farming. This research was conducted in Panyingkiran district, Majalengka regency. The purposes of this study is to: (1) identify factors influencing farmer adaptation, and (2) modeling and simulating the effect of farmer adaptation in overcoming climate change to production result. The research design is modeling, with case study method. The analysis tool in this research is Agent Based Modeling, consisted of four agents in the system being studied. The results show that the mango farmers in Panyingkiran has applied proper adaptation, the factors influencing farmer adaptation were knowledge, skill, and resources, and the adaptation efforts made were influential in assisting the farmers to be able to maintain and even improve the yield production. The simulation model in this study can be used as a policy analysis tool.

Keywords: *Climate change, Agent Based Modeling, Agent Based Simulation, Mango*

F10

WATER CORROSIVITY OF POLLUTED RESERVOIR AND HYDROPOWER SUSTAINABILITY

Sunardi[*1], Miranti Ariyani[1], Mochammad Agustian[2], Susanti Withaningsih[3], Parikesit[1], Hafizan Juahir[4], Azimah Ismail[4], Oekan S. Abdoellah[8]

[1]Graduate Program of Environmental Studies, and Center for Environment and Sustainability Science, Universitas Padjadjaran, Jl. Sekeloa Selatan 1, Bandung 40132, West Java Province, Indonesia
[2]BPWC – PT PJB (Cirata Reservoir Management Agency – PT Jawa Bali Powerplant), Indonesia. Jl. Raya Cirata, Cikalongwetan, Bandung Barat, West Java Province, Indonesia
[3]Department of Biology, Faculty of Mathematics and Natural Science, Universitas Padjadjaran. Jl. Raya Bandung-Sumedang Km. 21 Jatinangor, Sumedang 45363, West Java Province, Indonesia
[4]East Coast Environmental Research Institute, Universiti Sultan Zainal Abidin, Gong Badak Campus, 21300, Kuala Terengganu, Terengganu Darul Iman, Malaysia
[5]Department of Anthropology, Faculty of Social and Political Science, Universitas Padjadjaran. Jl. Raya Bandung-Sumedang Km. 21 Jatinangor, Sumedang 45363, West Java Province, Indonesia.

Corresponding authors:sunardi@unpad.ac.id, miranti.ariyani@gmail.com, m.agustian@gmail.com, susanti.withaningsih@unpad.ac.id, parikesit@unpad.ac.id, hafizanjuahir@unisza.edu.my, azimahismail@unisza.edu.my, oekan.abdoellah54@gmail.com

ABSTRACT

Reservoirs play a strategic role in the context of sustainable energy supply. Unfortunately, the majority of the reservoirs are facing water-quality degradation due to complex pollutants originating from activities both in the catchment and inside the reservoir. This research was aimed at assessing the extent of the water degradation, in terms of corrosivity level, and at examining its impacts on hydropower capacity and operation. Data were obtained from 20 sampling stations in the Cirata Reservoir from 2007 to 2016. Water analysis was compared to SNI 03-7016-2004, focusing on total dissolved solids, acidity (pH), calcium, bicarbonate, and temperature. The results show that the river water is already corrosive (Langelier Saturation Index, LSI = -0.21 to -1.08), and, the corrosiveness becoming greater when entering the reservoir (LSI = -0.52 to -1.49). The water corrosivity has caused damage to the hydromechanical equipment, lowering production capacity. The external environment of the catchment hosts complex human activities, such as agriculture, land conversion, urban and industrial discharge, which have all played a major role in the water corrosiveness. Meanwhile, the internal environment, such as floating net cage aquaculture, has intensified the problem. As the water corrosiveness has increased, the maintenance of the hydromechanical facilities (predictive maintenance, overhaul, and corrective maintenance) has also increased. To mitigate the situation, strategies must be applied to both the catchment and the reservoir as a matter of priority;

current conditions are certainly a threat to the sustainability of the hydropower operation and, hence, the energy supply.

Keywords: *Cirata Reservoir; hydropower sustainability; pollution; water corrosivity*

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Theme:

Ecology, Rural and Urban Development

G1

SUSTAINABILITY OF OFF-GRID TECHNOLOGY FOR RURAL ELECTRIFICATION: A COMPARATIVE STUDY USING THE IAD FRAMEWORK

Heksi Lestari[1,2*], Maarten Arentsen[1], Hans Bressers[1], Budhi Gunawan [2], Johan Iskandar [2], Parikesit [2]

[1]Department of Governance and technology for Sustainability (CSTM), University of Twente, The Netherlands
[2]Postgraduate Program on Environmental Science, Universitas Padjadjaran, Indonesia
*Corresponding author: h.lestarisoewignyo@utwente.nl; heksi.lestari@gmail.com

ABSTRACT

This paper provides an analysis of the implementation of off-grid technologies in rural areas, especially in areas where extension of the national electricity grid was economically infeasible due to high costs and some technical barriers. The implementation of the technology that should provide sustainable electricity access rarely has failed to accomplish this goal. Many planned projects were not realized or have already been abandoned. Moreover, the importance of off-grid technologies to increase access to electricity as a critical aspect for regional competitiveness and development is weakened by the government's preference for the centralized and conventional technology: the grid connection. Our initial assumption that the higher the scores on sustainability indicators, the more benefit the technology provides and consequently the more likely its

endurance as a project, but the impact of high sustainability scores was overruled by such other factors. Empirically, the study compares three cases of micro-hydro power projects and three cases of solar photovoltaic projects in Bogor Regency, Indonesia. It is based on qualitative document analysis, complemented by semi-structured interviews and observation. Firstly, the paper assesses to what extent each project meets the indicators of technical, economic, social, environmental, and institutional sustainability. Then, using Ostrom's Institutional Analysis and Development (IAD) framework, the paper explores what happened in the action arena where the community takes up and implements the rules-in-use, and thereby explains the degree of the endurance: the project was kept operating or breaking down. The findings show that the tendency to be connected to the grid has counteracting the positive impact of the level of sustainability of the project. Even a very sustainable off-grid rural electrification project might be unable to maintain its endurance, when the grid becomes accessible. The implementation of the off-grid rural electrification has been regarded as temporary access, without considering that the grid extension discontinued more sustainable based electricity.

Keywords: *rural electrification, off-grid, sustainability, rules in use, endurance*

G2

DEVELOPMENT OF A SOLID WASTE SERVICE LEVEL INDEX

Abdul Asis Rumakat[1], Iwan Juwana[1], Siti Ainun[1]

[1]Department of Environmental Engineering, Faculty of Civil Engineering and Planning, National Institute of Technology, Bandung, Indonesia
*Corresponding author: asis.rumakat17@gmail.com

ABSTRACT

The performance of municipal solid waste management system can be determined by assessing its level of solid waste services. In Bandung City the level of solid waste service determined by based on the amount of solid waste being transported to the final landfill area. According to the data from Cleaning state Company of Bandung City, in 2017 the percentage of solid waste service level was 98.14%. However, it is visible that a large amount of solid waste at some of the temporary collection sites, riverbanks and runnels are left un-transported. This, and other evidences, indicates that the existing service level performance value is unable to represent the overall solid waste service. Thus, this study aims to develop a solid waste service level index, which can be used to assess the level of solid waste service at the city-scale. This study was undertaken by selecting components, indicators and sub-indicators related to municipal solid waste services, determining the weights for the components, indicators and sub-indicators, as well as defining the aggregation and interpretation of the final index. During the selection of components, indicators and sub-indicators, main

literatures used were the Indonesian Government Regulation Number 81 of 2012, the Ministry of Environment Regulation Number 6 of 2014, Integrated Waste Management Scoreboard (IWMS) and Key Performance Index (KPIs) for Solid Waste Management. Thorough this study, 5 components, 26 indicators and 21 sub-indicators were identified. The components were Technical Operation, Institution, Regulation, Finance and Community Participation. The chosen weights for the index was the subjective weighting. Aggregation index using arithmetic method with the interpretation of the final index will be based on 5 categories of 0-100 scale. In the near future, the developed index will be used to assess the solid waste service level in Bandung City.

Keywords: *service level, index development, component, indicator, sub-indicator*

G3

SUSTAINABLE URBAN TOURISM IN AN EMERGING CREATIVE CITY: A CASE OF BANDUNG CITY, INDONESIA

Nurrohman Wijaya[1*]

[1]Study Program of Urban and Regional Planning, Bandung Institute of Technology, Indonesia
*Corresponding author:
nurrohman.wijaya@sappk.itb.ac.id

ABSTRACT

This paper examines to which extent the adoption of sustainable urban tourism (SUT) concept in one of the emerging Southeast Asian cities, which is Bandung City in Indonesia. The city is well-known as the emerging creative economy development with knowledge creation and innovation in Indonesia. Indirectly, the creativity has influenced the tourism development through the potential attractions and new destinations for tourists. In this context, some of the related tourism in the urban area are such as shopping and culinary tourism, cultural tourism, and natural tourism (urban thematic parks). To assess the implementation of SUT in the three types of tourism in the study area, this study emphasizes four major aspects including economy, environment, social and culture of society. A combination of primary survey and secondary desk study was employed. In-depth interviews with key stakeholders were conducted consisting of the public sector, the tourism industry, and civil society organization. Strength-Weakness-Opportunity-Threat (SWOT) method was used for the analysis. The findings were revealed that currently the

implementation is limited only in economic aspect, not many concerns on environment, social and cultural aspects. The activity of tourism positively contributes to the development of cities and the citizens' wellbeing. However, it gives a negative impact on the environment, socio-cultural and economic issues. Some further improvements to achieve SUT are needed including the increase of awareness and capacity building for all related stakeholders, the application of integrated tourism development into the urban development plan, and the enhancement of local communities' involvement. It can be concluded that the creative urban tourism in the city is not wholly sustainable at present. These findings suggest that assessment of SUT can be the valuable inputs for urban policy decision makers to develop sustainable tourism approaches to be adopted in the future.

Keywords: *Creative city, urban tourism, sustainable tourism, Bandung City*

G4

MANAGING WATER RESOURCES FOR A SUSTAINABLE COASTAL CITIES, A STUDY IN CILEGON WATERFRONT CITY.

Adipati Rahmat Gumelar[1*], Abimanyu Takdir Alamsyah[2], Dwita Sutjiningsih[3], Setyo Sarwanto Moersidik[4]

[1]School of Environmental Studies, Universitas Indonesia, Jakarta, Indonesia
[2]Faculty of Civil Engineering, Universitas Indonesia, Jakarta, Indonesia
[3]Faculty of Civil Engineering, Universitas Indonesia, Jakarta, Indonesia
[4]Faculty of Civil Engineering, Universitas Indonesia, Jakarta, Indonesia
*Corresponding author: adipatirahmat@gmail.com

ABSTRACT

This paper discusses efforts to build the concept of an independent coastal city in meeting water needs in order to be sustainable, with studies of a city in Indonesia's coastal areas, namely in the City of Cilegon, Banten Province. The coastal city in this study is important because the coastal area is an area that is very vulnerable to water resources, but as a city, coastal cities actually have 5 main functions, namely settlement, tourism, conservation, services and services, and industry; which will put more pressure on its water resources. This pressure will disrupt the sustainability of the coastal city in the future. The research question of this paper is how to plan a coastal city concept in Indonesia that can be sustainable in meeting its water needs from the point of view of the availability of water

resources with water fulfillment to support the five functions of the coastal city of Cilegon. Cilegon city in this case is a city that has not been able to meet the water needs of the community and its activities. This study uses a dynamic system method to build a simulation model of balance between water requirements and water availability in the city of Cilegon. By studying simulation results that predict sustainable future scenarios, this paper will present the concepts and strategies that need to be taken to achieve that sustainability. This study found that to be able to meet its water needs but remain sustainable, the coastal city of Cilegon must strive to balance its water needs with the availability of its water resources. The sustainability context will be achieved if the water conservation variable is also integrated in the simulation as an effort not only to build a balance between the needs and availability, but also to make sure that one day the water carrying capacity in the coastal city of Cilegon can be surplus water. This finding will be able to contribute to efforts to build the sustainability of Cilegon city to fulfill its water needs, plan sustainable coastal cities in Indonesia in terms of meeting water needs, balancing water needs with availability in coastal cities, and developing discourses related to the benefits of water resources conservation. Thus, this paper suggests that to achieve the sustainability of coastal cities, an understanding of efforts to manage water availability with water needs is needed.

Keywords: *Sustainable coastal cities, water resources management, water demand-supply, system dynamics, water conservation*

Theme:

Inclusive Education for Ecology and Sustainability Sciences

H1

COMMUNICATION STRATEGY FOR FARMERS IN RISK MANAGEMENT (CASE OF COFFEE CULTIVATION)

Sri Fatimah[1*], Ganjar Kurnia[1], Hepi Hapsari[1]

[1]Department of Social Economics, Faculty of Agriculture, Padjadjaran University
Jl Raya Bandung-Sumedang km 21
*Corresponding author: srifatimah.sf@gmail.com

ABSTRACT

Natural disasters that occur in Indonesia due to climate changes require the right communication strategy through the selection of the right media in communicating it to the community, especially for coffee farmers. Environmental degradation and global warming cause Indonesia to become vulnerable to disasters. For that reason, information regarding the situation of pre-disaster, at the time of occurrence, and post-disaster determine the preparedness of coffee farmers to face the potential disaster risks for coffee farmer. The purpose of this study is identifying the context and stages of coffee farming risk management, and communication strategies in dealing with farming risks and their implications for future improvements in coffee farming. By using a qualitative descriptive approach from the information and data collected through primary surveys to coffee farmer, an analysis was conducted to answer the above objectives. A coffee plantation in West Java is chosen as a case because it already had a clear plan in dealing with the risk of coffee farming. The results show that the context of risks significantly determine the success of

delivering messages and information about risks. Disaster mitigation that can be done by farmers is adopting the dominant cropping pattern, as well as the use of climate change adaptive planting material, using superior seeds from lower stem/drought resistant varieties and parasite nematodes. Interactive risk management strategies implemented through the use of organic fertilizers and plant pesticides and pruning deserves to be an option to reduce risk. Besides that, agroforestry is considered the right innovation to anticipate if there is a pest attack, it can provide income substitution so that it does not interfere with the sustainability of coffee farming. Farmer tend to choose to sell part of their assets as a manifestation of ex post risk management strategies. The risk communication strategy needs to be improved in order to increase the awareness of coffee farmers to care and risk responsiveness.

Keywords: *Agroforestry; Superior seed clones; Risk Communication, mitigation*

H2

ANALYSIS THE MANAGEMENT OF WASTE DOMESTIC SYSTEM IN POPULOUS NEIGHBORHOODS WITH INTERPRETATIVE STRUCTURAL MODELING (ISM)

Arika, Shabrina Zahra[1], Tri Edhi Budhi Soesilo [1]

[1]School of Environmental Science, Universitas Indonesia, Salemba, Indonesia
Corresponding authors: shabrinaarika@gmail.com; soesilo.indo@net.id

ABSTRACT

Population growth increases the disposal of domestic waste water generated by the community. Residents that living in neighborhoods and slums to become one of the factors the incidence of domestic wastewater management problems are dumped into the environment is done at a place that's not exactly the way the surface of the soil, drainage, directly into the river and any place without processing a simple example though preceded through the septic tank. These problems can be overcome with increased domestic waste water management in order to be better. The management of domestic waste water centralized system is one of the conditions for the management of alternative settlements and slums in RT 09, Bidara Cina's. This research aims to plan domestic waste management model that fits. This research will use the descriptive analysis methods with quantitative approach. Data will be obtained through the survey field and interview residents. Then, it will be shown in the form of a table. My contribution will provide a model of domestic waste water management planning

is appropriate. The results of this study refers to number of six (6) SDGs namely, clean water and sanitation to ensure domestic waste water management and sustainable sanitation.

Keywords: *domestic wastewater, management systems centralized systems of domestic wastewater, Bidara Cina*

H3

SELF SUFFICIENCY IN PRODUCTION INPUT PROVISION (Lesson Learns from Organic Rice Development in Pasawahan, Purwakarta Regency)

Dika Supyandi[1], Yayat Sukayat[1], Yosini Deliana[1]

[1]Faculty of Agriculture Universitas Padjadjaran
Corresponding author: dika_supyandi@yahoo.com

ABSTRACT

Organic rice cultivation has been increasing significantly along with people awareness towards healthy food and environmentally friendly agriculture. It requires strict quality assurance in terms of the produce, the producers and the methods used in production. Philosophically, organic agriculture is not dependent on external inputs, therefore the availability of inputs provided at the local level is imperative. One of locations of organic rice development in Purwakarta Regency is Pasawahan District. Consider the potential of livestock in Pasawahan District, the utilization of animal waste to become inputs of organic farming production and other benefits, such as an energy source, is still not optimal. Hence, re-introduction of knowledge of organic fertilizer, organic pesticides, and introduction of biodigester technology can be solutions. Re-dissemination of these technology is indeed an empowerment process, which are influenced by level of farmers' participation, innovation, and inclusion. This paper briefly describes an empowerment model of organic rice farmers in order to improve organic rice production, in particular related to local input provision. Community empowerment

viewpoint dominates the point of view of the paper writing. The study is a qualitative study, data were gained through field observation, FGD, as well in-depth interviews with key informants. The conclusion is that farmers' inclusion remained the major problem, which among others are due to farmers' suspicion towards external intervention, and less of farmers' commitment. The situation brought about low local production inputs resulting in farmers' dependences to external input sources. Involvement of farmers started from the plan of activities, the implementation, as well as their monitoring and evaluation participatorily will lead to the success of the empowerment process. Moreover, demonstration plot and examples of the technologies reintroduced has increased farmer interests and farmer willingness to involve that foster their belief to the empowerment process, which lastly is expected to increase their quality of life.

Keywords: *organic rice, farmer empowerment, input provision*

Theme:

Social and Technological Innovations in Ecology and Sustainability Science

I1

DYNAMICS OF TRADITIONAL AGROFORESTRY SYSTEM MANAGEMENT IN WEST JAVA: ALTERNATIVES TO BAMBOO GARDEN CONVERSION

Budhi Gunawan[1], Dwi Rustam Kendarto[2], Budi Irawan[3]

[1]Departement of Anthropology-Faculty of Social and Political Sciences and Center for Environment and Sustainability Science, Universitas Padjadjaran)
[2]Department of Agricultural Engineering-Faculty of Technique and Agricultral Science, and Center for Environment and Sustainability Science, Universitas Padjadjaran
[3]Departemen of Biology-Faculty of Mathematics and Natural Sciences and Center for Environment and Sustainability Science, Universitas Padjadjaran

ABSTRACT

Bamboo gardens, locally known as *kebon awi* or *talun awi*, in many places in West Java are being converted to other types of land use for economic reasons. The conversion of bamboo gardens, along with other factors, is thought to have caused land degradation in mountainous areas. Therefore, it has been suggested that gardens should be protected and enhanced in ways that retain the benefits of their traditional management while meeting changing community needs. In this regard, there is no information about efforts to improve bamboo gardens, nor is there any information about bamboo garden owners' responses to changes in socio-economic and environmental conditions. This article examines the tendency to convert bamboo gardens by taking a case in a village located in the upper degraded Citarum

watershed. By interviewing the garden owners, this study documented owners preferences in managing the garden and their responses to changes in socioeconomic and environmental conditions. The study was supported by spatial analysis and data collection of biodiversity and vegetation structure. The study shows that prior to 2003 and between 2003 and 2017, the relatively rapid change of land use from bamboo gardens to other land uses, mostly to commercial crop gardens, occurred in the study area. The high market demand for highland commercial crops had attracted a number of owners to transform their bamboo gardens into vegetable gardens. Nevertheless, about half of the owners in 2003 and 2017 revealed about their preference to keep their bamboo gardens. In addition, the study also identified the process of changing land use from bamboo gardens to other agro-forestry types, the multistoried inter-culture of perennial and annual/biennial crops (tree-dominated garden) or shelterbelt-type mixed garden. Induced by the development of joint forest management system in nearby areas, some owners were keen to start planting coffee in their bamboo gardens. In general, research shows that bamboo garden owners are responsive to socio-economic and environmental changes. However, their responses might ultimately result in undesirable and desirable consequences. To prevent further disappearance of bamboo gardens, appropriate policy that promotes agroforestry development is needed, including the development of community-based agroforestry management system.

I2

WOMEN'S ADAPTATION STRATEGY IN *BUBULAK* MANAGEMENT IN CISUKADANA VILLAGE, KADUGEDE DISTRICT, KUNINGAN REGENCY - WEST JAVA

Dede Tresna Wiyanti[1], Hardian Eko Nurseto[1], Mutia Latifah[1]

[1]Departement of Anthropology-Faculty of Social and Political Sciences, Universitas Padjadjaran)

ABSTRACT

This study aims to describe the strategies undertaken by women in managing *bubulak*. *Bubulak* is one type of dry land farming in Cisukadana Village. *Bubulak* is often located near the forest. The study was conducted in Cisukadana Village, Kadugede District, Kuningan, West Java. Cisukadana village was chosen because women farmers in this village must adjust to the changes in the division of labor in the management of *bubulak*. This change occurs because male workers (Head of Household) in the management of *Bubulak* work as seasonal workers in cities like Jakarta. The research used qualitative method with a case study model. Data collection is done through secondary data collection, observation, and interviews. The results showed that there are changes in the division of labor system in *Bubulak*. Related to these conditions, women conducted several adaptation strategies. Those strategies are, (1) conducted bubulak management by themselves (only women), (2) employing male farm laborers for several types of work that are considered heavy, (3) adjusting management with the husband's seasonal work

schedule, and (4) choosing plant types that do not require intensive maintenance. Those strategies are needed to maintain the sustainability of *bubulak* system in the Cisukadana village.

Keywords: *women*, *Cisukadana*, *farming*, *bubulak, adaptation strategy*

I3

ADAPTATION OF INDIGENOUS PEOPLE'S AGRICULTURE SYSTEM AGAINST CLIMATE CHANGE

(Case Study of Kasepuhan Ciptagelar, Sukabumi Regency, West Java)

H Hapsari[1], D Hapsari[2], T Karyani[1], S Fatimah[1]

[1] Department of Social Economy, Faculty of Agriculture, Padjadjaran University
[2] Program Study of Agribusiness, Faculty of Agriculture, Padjadjaran University
*Corresponding author: hepihapsari14@gmail.com

ABSTRACT

Climate change is a threat to agricultural systems, especially indigenous people who depend on nature, and do not accept technological engineering. Kasepuhan Ciptagelar is a Sundanese indigenous community that lives around the Halimun-Salak National Park. This indigenous community has local wisdom in regulating agricultural systems that are in harmony with nature. But nature or the climate are beginning to change in an extreme way, so that this indigenous people make an extraordinary adaptation effort. The aim of the study was to identify the adaptation strategies of the indigenous people towards climate change, to remain in harmony with nature. The focus of the research is the strengths, weaknesses, opportunities, and threats of traditional agricultural systems, in terms of social, economic and cultural aspects. qualitative research design, with case study methods. Data analysis with descriptive narrative

and confirmed through focus group discussion. Research informants are indigenous community leaders, village heads, agricultural extension officers, school head master, and relevant residents as informants. The results of the study show that the strategies adopted by indigenous peoples to adapt to climate change include: (1) conducting crop rotation; (2) managing communal rice barns (lumbung padi); (3) accept environmentally friendly technology; (4) open interaction with the outside system; (5) has a profit oriented non-rice farming; (6) instilling the values of local wisdom in the younger generation

Keywords: *adaptation, climate change, indigenous people*

I4

READINESS OF YOUTH IN RURAL AGRIBUSINESS (CASE OF WEST JAVA, INDONESIA)

Iwan Setiawan[1], Sumardjo[2], Arif Satria[2] and Prabowo Tjitropranoto[2]

[1] Department of Social Economics of Agriculture, Universitas Padjadjaran
[2] Graduate School, Bogor Institute of Agriculture
*Corresponding author: iones73@yahoo.com

ABSTRACT

As a system, agribusiness is complex in its nature. The consequence is, whoever wants to enter the system is required to be ready. The complexity of agribusiness has made it less liked and under-valued by the youth. The implication of this is that the age structure of agribusiness agents in Indonesia became older. Paradox to that, it is identified that in West Java plateau, educated and skilled youths choose to enter into agribusiness. This research aimed to: (1) descriptively analyze the readiness of agribusiness young actors (AYA) in performing agribusiness; (2) analyze the readiness difference of AYA; (3) analyze personal, interesting and push factors that influence the readiness of AYA, and; (4) formulate readiness reinforcement strategy for AYA. This research designed integrally and conducted in West Java for 10 months (July 2014 - July 2015). Primary data collected from structured interview with 280 respondents are then tabulated and analyzed statistically using SEM and LISREL 8.80 analysis tools. The result of the research shows that the readiness of AYA is high. The readiness of AYA is evidently different

across areas. This readiness is manifestly influenced by pull factors as well as personal characteristic. In order to gain readiness more early, those interesting factors as well as dominant personal character should become the primary contents in young agents extension. The recommendation is to develop a synergy with stakeholders through multiple helix extension

Keywords: *readiness, educated and skilled young agents, agribusines*

I5

RISK MITIGATION OF MANGO FARMING IN AGRO-TOURISM DEVELOPMENT IN CIREBON REGENCY

Nur Syamsiyah[1], Lies Sulistyowati[1], Sulistyodewi[1], Sara Ratna Qanti[1]

[1]Department of Agricultural Economics and Social Sciences Faculty of Agriculture Universitas Padjadjaran, Jl. Raya Bandung-Sumedang Km 21, Jatinangor West Java Indonesia 45363
*Corresponding author: nur.syamsiyah@unpad.ac.id

ABSTRACT

Development of the agricultural sector is eternally involved the problem of uncertainty of the results and a considerable risk. In the development of Agro tourism in Cirebon Regency, will directly develop mango agribusiness. Mango represent of the leading fruit commodity in Cirebon Regency. Increased interest in tourism creates opportunities for agricultural tourism development (agro-tourism). Mango demand is very high, making opportunities as well as challenges for mango farmers in Kabupaten Cirebon. In the struggle can not be separated from input, cultivation, processing to marketing. This study aims to consider risks in mango agribusiness, risk assessment and mitigation of mango agribusiness risk in the development of agro-tourism area in Cirebon regency. Data collection event through observation, interview, documentation, and questionnaire. The method used is Failure Mode and Effect Analysis (FMEA). The method of Mode Failure

and Securities Analysis (FMEA) identified risks are classified into four categories: input risk, operational risk, environmental risk and financial risk. Risk Causes based on Risk Priority Number (RPN) and Risk Value (RSV). This type of research uses a quantitative approach, with primary and secondary data. The respondents were taken by purposive sampling. The highest risk faced by actors in mangrove agribusiness in Kabupaten Cirebon based on the highest risk of Risk Priority Number (RPN) and Risk Score Value (RSV) are Pest and Plant Disease, uncertain weather or difficult to predict, low productivity of farmers, high price agroinput, excessive use of pesticides, less skilled labor. Mitigation actions that can be done in reducing the effects of the risks faced are as follows: Improving knowledge and training on Good Agriculture Goods Practices (GAP) Good Handling Practices (GHP), Improving the role of government through extension agents and related agencies, increasing knowledge of food safety, the creation of technology in agriculture from inputs, cultivation techniques, postharvest to marketing.

Keywords: *Risk Mitigation, Mango, Agro-tourism, FMEA*

I6

STUDY ON COMMUNITY-BASED ECOTOURISM DEVELOPMENT AT JATIGEDE'S RESERVOAR AREA IN SUMEDANG DISTRICT

E Djuwendah [1], E Wulandari [1], E Rachmawati [1]

[1] Departemen of Socio-economic Agriculture, Paadjadjaran University,
Jl. Raya Bandung-Sumedang Km 21 Jatinangor West Java, Indonesia
*Corresponding author: endah.djuwendah@unpad.ac.id

ABSTRACT

Jatigede Reservoir area is an area with a combination of land and water areas that have multiple functions as a power plant, provider of irrigation water, fisheries, and tourist destinations. Community-based ecotourism development is expected to increase land carrying capacity, expand local community employment while maintaining natural conservation. The purpose of this study was to identify: (1) the potential of Jatigede reservoir area as an ecotourism attraction, (2) community participation in ecotourism management and (3) obstacles in the development of ecotourism in the Jatigede's reservoar area. The study used descriptive qualitative method with case study techniques. Data sources are obtained through interviews, documentation and observation. The results showed that the potential of forest resources, rice fields and waters around the reservoir is potential for ecotourism. However, the utilization of potential and community involvement in the ecotourism management of Jatigede Reservoir is still

limited. The main obstacles in the development of ecotourism in this area are the poor road infrastructure, limited facilities and institutional support for ecotourism.

Keywords: *Development, ecotourism, Jatigede reservoir community empowerment*

I7

IMPROVING COVERAGE AREA OF WATER SUPPLY USING BUILD, OPERATE AND TRANSFER PPP IN INDONESIA. AN INSTITUTIONAL APPROACH.

Nicco Plamonia[1], Michiel A. Heldeweg[2], Kris R.D. Lulofs[3]

[1] PhD Researcher at CSTM – University of Twente, Contact: n.plamonia@utwente.nl.
[2] Professor of Law, Governance & Technology at CSTM, University of Twente
[3]Associate Research Professor (OZ1) at CSTM, Manager Twente Water Centre, University of Twente

ABSTRACT

The PPP arrangement studied in Indonesia is the so-called Build, Operate and Transfer (BOT) arrangement. Involving PPP / BOT as a funding source to increase coverage of piping water systems challenged by the socio-technical complexity of water-supply. Outcomes/ performances of three cases of PPP/BOT arrangements in Indonesian water supply are analyzed in this research. The first, most recent, case covers 5 years (January 2013-December 2017), the second case covers 10 years (January 2008-December 2017) and the third, oldest, case covers 20 years (January 1998-December 2017). In this research the IAD Framework was used to analyze the cases. This was done by focusing on the rules in use at the collective choice level where the planning of PPP/BOTs is done and on the performances of the PPP/BOT arrangement at the operational level. The rules in use at the collective choice level and the performances on the operational level are thus the core

ingredients. In the first case, operational from January 2013 to December 2017, departing from 7.33% before the PPP/BOT, the coverage increases by 14.35% but below the contractual target of 31.52%. In the second case, operation from January 2008- December 2017, the coverage departs from 0% and increased during the first four years to 66% beyond the contractual target of 43%. In the third case, timespan January 1998-December 2017, departed from 32.69% coverage and only reached 61% of the target of 95% after 20 years. As the result, the three cases confirmed that there can be huge differences between rules in form and rules is use, the more the rules in use at strategic choice level showed compliance to the preconditions the better the performances of the PPP/BOT proved to be.

I8

BIOCONVERSIONS CHEESE-MAKING WASTES TO BIOETHANOL AND THEIR LINK TO SUSTAINABILITY

Gemilang L. Utama[1,2,3,4] and Roostita L. Balia[5]

[1]Graduate School on Sustainability Science – Universitas Padjadjaran
[2]Centre for Environment and Sustainability Science – Universitas Padjadjaran
[3]Centre for Innovation and Technology of Environment – Postgraduate School, Universitas Padjadjaran
[4]Faculty of Agro-Industrial Technology, Universitas Padjadjaran
[5]Faculty of Animal Husbandry, Universitas Padjadjaran
*Corresponding author: g.l.utama@unpad.ac.id

ABSTRACT

Most of the cheese producers in Indonesia still dispose cheese-making wastes directly to the ground and water bodies and tend to cause environmental problems. The utilization of cheese-making wastes on bioconversions into bioethanol aimed to generate social economic and environmental benefits. Cheese-making wastes utilization in the cradle-to-cradle concept has been carried out in various ways. Bioconversion of cheese-making wastes into bioethanol can be role as an alternative in wastes utilization through waste to product approach. Bioethanol can be purified to the expected purity and then used as biofuel or fuel supplement. Bioethanol refinery still leaves the distillery wastes that can be used for organic fertilizer. However, the quality of the distillery wastes produced is still not able to meet the

required standards so it is less feasible to be traded. Cheese-making wastes utilization resulting economic benefits that represented by additional income generated and a decrease in the cost of goods produced by joint cos allocation approach. Social benefits including appearance of community engagement which resulted from support, trust and participation potential from the community. While, the environmental benefits resulting reduction of pollution load and CO2 emissions potential. The consideration of the three pillars (social, economic and environmental) holistically and comprehensively can be implemented in solving environmental problems caused by the disposal of cheese-making wastes and in creating sustainability.

Keywords: bioethanol, cheese-making wastes, utilization, sustainability

I9

SUSTAINABILITY OF LOCAL BIO-RESOURCE BASED PRODUCTION SYSTEM ON EXTREME LANDSCAPES
(Case Study *Arenga pinnata* Production System in Sukaresmi, West Bandung District)

Susanti Withaningsih[1,2,3], Parikesit[1,2,3], Aviza Karinda[1,2]
[1]Graduate School on Sustainability Science – Universitas Padjadjaran
[2]Centre for Environment and Sustainability Science – Universitas Padjadjaran
[3]Department of Biology, Faculty of Mathematic and Natural Sciences Universitas Padjadjaran
[4]Department of Anthropology, Faculty of Social Science & Politic Universitas Padjadjaran
*Corresponding author:
susanti.withaningsih@unpad.ac.id

ABSTRACT

The diverse socio-ecological condition of the rural landscape in Indonesia produces diverse production systems, many of which rely on local biological resources as the main raw material. Even on production landscapes with extreme biophysics and social condition, various systems of production can still be encountered. In the rural areas of West Java there are many production systems that rely on local biodiversity and take place in extreme landscape conditions. One such production system is the palm-based production system (*Arenga pinnata*) which usually involves the poorly-resourced (in terms of capital, raw

materials, and market access) local community. Rural production systems typically involve poorly-resourced communities so that they are done on a small scale. Based on this reality added to the fact that it is done in an extreme condition, the major problem that is faced is related to the sustainability of the production system. The method used in this research is point centred quarter, direct observation and in-depth interview with key informants at the research area. The result shows two of the central factors to the sustainability of this production system are the availability of the local resources in the form of palm trees and human resources who become craftsmen of various product from palm sugar trees. Preliminary research done showed that the abundance of palm trees in the research area showed a stocking density of 313 trees per hectare. This density was much higher than in other regions when similar survey was conducted. There were 2590 household living in research area and 43% of the population become craftsmen of various product from palm sugar trees. The tentative conclusion of this research is that the sustainability of local productive system of palm sugar in the research area will still thrive because the capital in the form of natural and human resources still adequate.

Keywords: *Arenga pinnata*, *bio-resources, extreme landscape, sustainability*

I10

IN UNION THERE IS STRENGTH: COMPETITIVE AND SUSTAINABLE LOCAL RICE DEVELOPMENT (A Case of Pandanwangi Rice Development in Warungkondang, Cianjur, Indonesia)

Dika Supyandi[1], Yayat Sukayat[1], Anne Charina[1]

[1]Department of Social Economics of Agriculture, Faculty of Agriculture, Universitas Padjadjaran
Corresponding author: dika_supyandi@yahoo.com

ABSTRACT

The development of local rice in Indonesia must always be encouraged, in addition to a way to maintain the wealth of germplasm, also because its uniqueness is the source of its advantage. Although a lot of local rice varieties have not been developed, a number of unique rice varieties have their own market share and make them premium rice varieties. One of them is pandanwangi variety. In Indonesia, pandanwangi rice has been known as a superior rice having a distinctive taste and aroma, and has high economic value. Technically, pandanwangi rice cultivation is different from other rice varieties that are massively developed in Indonesia such as IR or Ciherang. Due to its characteristics, pandanwangi rice cultivation requires a higher effort and longer cultivation time than the others. This paper briefly describes the objective conditions of pandanwangi rice, particularly related to the potential and problems in its development at this time, describes the motivation of farmers to develop pandanwangi varieties, and describes behaviour of farmer adaptations

in facing various internal and external changes in rice farming. Community empowerment and social-ecological system viewpoints, instead of initial agribusiness model, dominates the point of view of this paper writing. This paper is a mix of field visit results, through in-depth interview and FGD, and literature review relating to issues above. The conclusion shows that in pandanwangi case, high potential has not resulted in high development of the variety as well as farmer wealth. Several problems from on farm conditions to regulatory policies have brought about low growth or even stagnant development of pandanwangi. Economic aspects were not the main motivation of farmers to cultivate, compared to social aspects and the power of regulator. Hence, in order to improve pandanwangi performance to be competitive, integration among actors, institutions and learning processes is definitely necessary.

Keywords: *pandanwangi rice, social-ecological system, competitiveness*

POSTER PRESENTATION

PA1

FISH AAD FISHERIES OF BADA (*Rasbora* Spp) IN LAKE MANINJAU, WEST SUMATRA

Rahmi Dina[1]*, Octavianto Samir[1], Lukman[1], Gadis S. Haryani[1], and Syahroma H. Nasution[1]

[1]Research Centre for Limnology, Indonesian Institute of Sciences (LIPI)
*Corresponding author: rahmi.dina@limnologi.lipi.go.id

ABSTRACT

Bada is the local name for *Rasbora* spp in Lake Maninjau. This fish is an economic fisheries commodity for consumption and has become one of the culinary icons of Maninjau area. Many studies have been carried out related to bada fish in Lake Maninjau, but continuous studies are needed to complete aspects that have not been done or for evaluation purposes, in order to take conservation or management actions. Therefore this study aims to convey the latest status of fish and bada fisheries including the species and its distribution in inlet waters, the distribution of catches, and the distribution of bada fishing activities in Lake Maninjau. Sampling was carried out in four stations of lake waters, namely Bayur, Muara Tanjung, Sigiran and Galapung from April to November 2017 and in three stations of river waters (Kularian River, Muara Tanjung River, and Galapung River) in April 2017. In addition, interviews were also conducted with several stakeholders. Sample fish are caught using gillnet and liftnet. Species of bada are determined based on morphological identification. In the rivers observed two species of bada fish were found, *Rasbora lateristriata* and *R. argyrotaenia. Rasbora*

argyrotaenia was found in Muara Tanjung river dan *R. lateristriata* was found in Kularian and Galapung rivers. Descriptively the catch of bada in Bayur and Galapung were relatively higher other locations. Catch of bada in recent years declined sharply compared to 2008, for example catches in Bayur decreased by 80%. Bada fishing activities also experienced a decline as fishermen using gillnet were not found. Fishing using a trap (*lukah*) were found in two locations, namely Sungai Rangeh and Sungai Batang. Lifnet which use a lamp as an attractor (*bagan*) were found in Bayur, Muara Tanjung, Muko-muko, and Sigiran.

Keywords: *bada fish, Lake Maninjau, fisheries activities*

PA2

BIODEGRADATION OF CIBALIGO RIVER IN CIMAHI CITY INDUSTRIAL ESTATE CONTAMINATED TEXTILE WASTEWATER, REMAZOL BLACK AND RED DYESTUFF BY MICROORGANISM ISOLATED FROM TEXTILE WASTEWATER

Ratu Safitri[1,2*], Mia Miranti[2] Ani Royani[1], Nia Roosiana[2], Ida Indrawati[2,] Jetty Nurhayati[2]

[1]Study Program of Biotechnology, Postgraduate Study, Universitas Padjadjaran, Jl. Dipati Ukur no. 35, Bandung, 40132 Indonesia.
[2]Dept. Of Biology, Faculty of Mathematics and Natural Sciences, Universitas Padjadjaran, Jl. Bandung – Sumedang Km 21 Jatinangor, Indonesia
*Corresponding author: ratusafitrie@yahoo.com

ABSTRACT

Cibaligo River as a seven km research area flows through North Cimahi Subdistrict Cimahi Tengah District and South Cimahi Subdistrict is one of the rivers used as a waste water disposal from textile and domestic waste from various human activities such as settlement, agriculture, industry that cause pollution and degradation of water quality of cibaligo river water. The ability of microbial biodegradation of black and red remazol dyes was investigated. Microbes was isolated from textile waste and used in a single form and consortium for biodegradation of black and red remazol dyes which contaminated Cibaligo River. The method that used in this research is descriptive and experimental method. Descriptive methods was used in isolation, screening,

and bacterial identification. The experimental method was used in the biodegradation of textile wastewater. The isolates of microorganisms consist of 4 isolates of bacterial species (Bacillus subtilis, Bacillus licheniformis, Bacillus coagulans, Bacillus cereus) and 1 isolate of mushroom (Penicillium sp.). Textile waste biodegradation process using Bacillus subtilis, Bacillus licheniformis, Bacillus coagulans can grow on black and red remazol dyes in concentrations of 500 ppm, 1000 ppm and 1500 ppm. Textile waste biodegradation process using bacterial consortium at concentration of 500 ppm, 1000 ppm, and 1500 ppm on black remazol could lowered COD by 77.63%, 75.84%, 72.92%, lowered BOD by 77.31%, 76.59 %, 75.46%, lowered TSS by 67.68%, 66.9%, 52.72%, and lowered ammonia by 62.85%, 56.44%, 53.69%. On red remazol, BOD by 78.07%, 76.7%, 76.33%, lowered TSS by 70.14%, 60.94%, 58.72%, and lowered ammonia by 68.51%, respectively, 55.56%, 55.47%. Decolorization of black remazol dye at concentrations of 500 ppm, 1000 ppm, and 1500 ppm respectively were 64.2%, 60.1%, and 54.3%. Decolorization of remazol dye at concentrations of 500 ppm, 1000 ppm, and 1500 ppm respectively were 65.5%, 63%, 56%.

Keywords: *Biodegradation, Black Remazol, Red Remazol, COD, BOD, TSS, Ammonia, Decolorization*.

PA3

INTEGRATED CATCHMENT MANAGEMENT IN THE NON-CONSERVATION AREA, CISOKAN HYDROPOWER PLAN AREA, CIANJUR, WEST JAVA

Teguh Husodo[1,2,3], Sya Sya Shanida[3*], Erri Noviar Megantara[1,2,3]

[1]Department of Biology, Faculty of Mathematics and Natural Sciences, Universitas Padjadjaran. Jl. Raya Bandung-Sumedang KM 21, Jatinangor, Sumedang 45363, West Java, Indonesia. Tel. +62-22-7796412 ext. 104, Fax. +62-22-7794545.
[2]Program of Environmental Science, School of Graduates, Universitas Padjadjaran. Jl. Sekeloa, Coblong, Bandung 40134, West Java, Indonesia
[3]Institute of Ecology, Directorate of Research, Community Services and Innovation, Universitas Padjadjaran. Jl. Raya Jatinangor KM 21, Sumedang 45363, West Java, Indonesia. Tel-Fax +62-22-7796412
*Corresponding author: syasyashanida@gmail.com

ABSTRACT

Hydropower Company (PT PLN), the Indonesian State-owned power company, is in the final stages of preparing to start construction on the Upper Cisokan Pumped Storage (UCPS) Hydropower Scheme. Hydropower company (PT PLN) is committed to sustainability and consistently seeks to put the economic, social and environmental performances in balance, in order to make sustainable business growth. The greatest two threats to the future of Cisokan's endangered wildlife appear to be 1) development of the hydrological project and its direct and induced impacts; and 2) ongoing human impacts from slash-and-burn agriculture and

unsustainable collection of forest and wildlife resources. Biodiversity surveys team found several species listed by as Critically Endangered or Endangered by the IUCN, such as Javan Leopard and Javan Slow Loris, which according to World Bank policies require conservation management. The aims of this review are to: (1) investigate fundamentals of Biodiversity Management Plan and (2) strategy and action plan of Biodiversity Management Plan in Cisokan. Methods of this study based on several years of qualitative and descriptive-analytical studies, which updated information from earlier studies. Information on the area's biodiversity was obtained directly through field surveys and indirectly through semi-structured interviews and focus group discussions (FGD) with local community members and other stakeholder in the area. Fundamentals of BMP are managing impacts on biodiversity and targeting net-beneficial outcomes for Cisokan's species, adapt biodiversity management through continuous improvement, eading Practice, identifying opportunities to enhance biodiversity conservation, engagement and partnerships, performance and measurement. Strategies and action plans of BMP are construction-related impact management and landscape-based biodiversity management.

Keywords: *Biodiversity Management Plan, Integrated Catchment Management*

PA4

HUMAN-WILDLIFE COMPROMISE: SPACE UTILIZATION BETWEEN HUMANS AND JAVAN LEOPARDS IN NON- CONSERVATION AREA AT WEST JAVA

Puput Febrianto[1,3]•, Teguh Husodo[2,3], Erri N Megantara[2,3], Parikesit[2,3], Syasya Shanida[3]

[1]Magister of Environmental Science, School of Graduate, Universitas Padjadjaran. Jl. Dipatiukur No. 35, Bandung 40132, West Java, Indonesia. Tel +62-22-2504970,
[2]Department of Biology, Faculty of Mathematics and Natural Sciences, Universitas Padjadjaran. Jl. Raya Bandung-Sumedang KM 21, Jatinangor, Sumedang 45363, West Java, Indonesia. Tel. +62-22-7796412 ext. 104, Fax. +62-22-7794545.
[3]Center Environment and Sustainable Science, Universitas Padjadjaran. Jl. Sekeloa Selatan I, Bandung 40132, West Java, Indonesia. Tel. +62-22-2502176, Fax. +62-22-2504982

ABSTRACT

Distribution of javan leopards not only found in the conservation areas. Ecological studies of Leopards, Panthera pardus melas (Cuvier, 1809) in non-conservation areas in West Java have been carried out in several regions such as Ciletuh, Kab. Sukabumi, Cisokan, Kab. Bandung, Cijedil, Kab. Cianjur and (Darajat- kamojang, Kab. Garut). The abundance of evidence of the existence of leopards collected by field survey methods, structured interviews and literature studies shows the interaction and overlapping patterns of space use between leopards and local communities. Several conflicts between humans and leopards in the research location in the last six years have been collected. Still it shows the high potential for conflict between humans and leopards in the

area, consider the status of the study site is non-conservation area, it is necessary to consider the sustainability-based management for the conservation of leopards and welfare of local residents.

Keywords: *javan leopards, conflict, compromise, non-conservation area*

PC1

INEQUALITY ACCESS TO CLEAN ENVIRONMENT

Eneng Rahmi[1]
[1]Development Planning Body of City of Sukabumi
*Corresponding author: erahmisalimudin@gmail.com

ABSTRACT

Clean environment is being rare in developing country, from like Indonesia. The changing condition of social cultural from rural to urban without any discipline can harm the environment. It makes pollution in air, water and also soil so that give much contribution to climate change and give so many impacts to the citizen. However, this impact is not equal to all of citizen. The rich people can protect their selves from this impact. They can isolate their houses in the exclusive housing with clean water, garden and fresh air, and also could choose the good region without soil pollution. On the other hand, the poor people deserve the opposite of it. They have limited land so that they cannot avoid from any pollution such air pollution, soil pollution and also water pollution including limited access to clean water. The most problem from this pollution is waste because it can be causing the pollution in the air, water and also soil. Actually, the fund to manage the waste such infrastructure in high amount and also the processing of reduce, recycle and reuse by physic or social still happened. This research is intended to give alternative solution about management of the public service, especially waste management. A mixed method approach was used involving interviews of the community leaders, local NGOs, and government

agencies. The research result indicates that is a gap between the policy or planning and the implementation. This gap is caused by the government structure is over multiple agencies, inconsistency of giving permit and lack of monitoring and evaluation for any development in the city. Social ecological system framework used to analyst and diagnose the phenomena until evaluation of all development in the city. The framework able to mixed with circular economy so that give solution for the necessary step to change the situation, particularly things that can reduce harm activity for the environment. One of alternative solution is raising the local economy from organic and non-organic waste. If the waste has a value so that the clean environment can be possessed not only by the rich and also the poor one.

Keywords: *access, inequality, SES*

PE1

THE EFFECT OF ALUM ADDITION ON SHRINKAGE TEMPERATURE, CHEMICAL PROPERTIES AND MORPHOLOGY IN THE MANUFACTURE OF VEGETABLE-TANNED LEATHER

Emiliana Kasmudjiastuti[1], Bidhari Pidhatika[1], Gresy Griyanitasari[1], Iwan Fajar Pahlawan[1]
[1]Center for Leather, Rubber and Plastics

ABSTRACT

Vegetable-tanned leather has several disadvantages, which one of them is low thermal stability due to insufficient cross-linking with the collagen. The addition of aluminium sulfate in the vegetable tanning process will strengthen the cross-linking between the polyphenol and collagen, as well as forms the matrix in collagen. Thus, it will improve the thermal stability. The research aimed to figure out the addition of mimosa and aluminium sulfate on the shrinkage temperature, chemical properties, and morphology of leather. The research was conducted by using a variation of mimosa concentration (15%, 20%, 25% w/w) and aluminium sulfate concentration (3%, 6%, 9% w/w). The results showed that the treatment influenced the chemical properties and shrinkage temperature. The optimum treatment was the addition of 9% (w/w) aluminium sulfate to 25% mimosa which resulted to shrinkage temperature of 99,33° (rise 18,34%); nitrogen content (8,00 ± 0,0141) %; raw skins substance content (44,46 ± 0,0778) %; tannin bound content (28,29 ± 0,0424) % and the degree of tannage (62,93 ± 0,0141) %. Based on the SEM image, the addition of aluminium sulfate after mimosa has made the

collagen fiber structure to be dense, which indicates the improvement of the cross-linking between the polyphenol and collagen.

***Keywords**: Vegetable-tanned leather, alum, shrinkage temperature, tannin content, degree of tannage.*

PF1

EXTRACTION AND CHARACTERIZATION OF GELATIN FROM PICKLED SKIN TRIMMING WASTE TANNERY

Dona Rahmawati[1]*, Noor Maryam Setyadewi[1], Sugihartono[1]

[1]Center for Leather, Rubber and Plastics, Jl. Sokonandi No. 9 Yogyakarta 55166, Indonesia
* Corresponding author. Telp.:+62 274 512929, 563939, Fax.: +62 274 563655
*Corresponding author:
donna_rahma@kemenperin.go.id

ABSTRACT

Pickled skin trimming is one of the solid waste derived from the tanning process and has a high acid content. Suspected acid on the pickled skin trimming can be used to produce type A gelatine without the addition of acid from the outside. Pickled skin trimming was washed using limited water intended to remove the salt and to maintain the acid content so that the collagen can be partially hydrolyzed in situ into gelatine. The purpose of this research was to determine the characteristics of pickled skin trimming's gelatine was produced from in-situ acid hydrolyzed. The variations of washing were 1:10; 1:15; 1:20; 1:25; 1:30 pickled skin parts: parts of water (w / v). Hydrolysis for 48 hours by adding water as much as 5 parts by weight of the skin. Extraction with water as much as 4 parts by weight of the skin at a temperature of 70-80^{o} C for 3 hours. The highest yield of 49.73±0.14% was obtained from the salt separation with

pickled skin/water ratio of 1:20(w/v). Proximate composition, pH, functional group profiles, molecular weight distribution, and viscosity of gelatin extracted from pickled skin trimming produced similar characteristics (P>0.05). Gelatin had the characteristic that met GMIA standard for moisture content and viscosity, also had the identical functional properties with commercial gelatin. Therefore, gelatin from pickled skin trimming waste can be utilized for pharmaceutical, biomaterial, tissue engineering and cosmetic industries with a relatively cheap price.

Keywords: *pickled skin trimming; in situ acid; hydrolysis; gelatin, characteristics*

PG1

"SUSTAINABLE PRACTICES USING ECOVILLAGE'S CONCEPTS IN WEST JAVA, INDONESIA" (STUDY CASE IN BENDUNGAN VILLAGE, WEST JAVA, INDONESIA)

R. D. D. Wiradimadja[1], E. N. Megantara[2]Y, T. Husodo[2]Y, H. Tokuda[3]Y, Sunardi[2], R. A. Mutiara[1]

[1]Natural Resources and Environmental Management, Environmental Science Magister Program, Universitas Padjadjaran, Bandung, Indonesia
[2] Institute Ecology of Universitas Padjadjaran, Bandung, Indonesia
[3] Mie University, Faculty of Bio Resources, Tsu City, Mie Prefecture, Japan
YThese authors contributed equally to this work.
,These author also contributed equally to this work.

[*] Corresponding Author. Tel.No: +62-8562192288, email: dafikido@gmail.com

Ecovillage is one of the holistic solution to solve environmental problems, which the concept and theory of sustainability is practiced. Ecovillage is a concept where the community have to manage the environment properly and all the activities have a positive impact on the environment. In practice, the ecovillage should follow four aspects as follow: Ecology, Economy, Social and Spiritual aspect, on which of each this aspect are evaluated and analyzed. This research is different from the existing research because it will assess four sustainability aspects of the ecovillage. This research focused its

research on the West Java Environmental Agency's Ecovillage program in Bendungan Village, Bogor Regency, West Java, Indonesia. Ecovillage program in this village are interesting to research because it is the first program top-down ecovillage in Indonesia and the world. This research used Mixed Methods approach (quantitative and qualitative), secondary data review, direct observation and semi semi-structured interviewing to collect the data. This research found that the ecovillage practice in this village is mostly in line with the Global Ecovillage standards, it also found that circular economy is the most prominent practice to achieve sustainability in this village. The main factor for the success of this program is the people who willing to be open concerning the program and its concepts, thus becoming aware about their environmental problems, they willing to work for the benefit of their village. The people are also able to work together even though they have low environment awareness before. Lastly, it also shows that sustainability is a very complex term, sustainability studies need to include the interactions between natural and social systems.

Keywords: *Sustainability, Ecovillage, GEN, Environmental problems, top to bottom, social, economic, social and spiritual*

PH1

SUSTAINABILITY ANALYSIS OF FOREST RESOURCES MANAGEMENT AT YOGYAKARTA FOREST MANAGEMENT UNIT

Dwi Rama Nugraha[1], Parikesit[2], Teguh Husodo[2], dan Endang Karlina[3]

[1]Trainer candidate of Forest and Environmental Training and Education Body of Samarinda
[2]Environmental Science Magister Program, Universitas Padjadjaran, Bandung, Indonesia
[3]Researcher at Research and Development Body of Environment and Forestry Innovation

ABSTRACT

The Forest Management Unit (FMU) is a forest resource organization that has task of protect forests sustainable. Management of resources by FMU of Yogyakarta to achieve good and useful goals. This study aims to determine the level of sustainability of resource management in FMU of Yogyakarta. This research uses Rapid Appraisal Analysis (RAP) with Multi-Dimensional Scaling (MDS) method to analyze level of resource sustainability of FMU of Yogyakarta in ecology, economic, social, technological and legal / institutional dimension. The results showed that the sustainability of forest resources in FMU of Yogyakarta was sustainable enough (57,18%) on ecology dimension, sustainable enough (58,14%) on economic dimension, sustainable enough (67,31%) on social dimension, sustainable (76,62%) on technological dimension, and sustainable

enough (74,38%) on legal/institutional dimension. By the value of sustainability dimensions, sustainability forest management levels at FMU of Yogyakarta on sustainable enough (66,73%). The most important indicators for sustainability of forest resource management in FMU Yogyakarta include: (1) frequency of forest fires; (2) flora fauna identification; (3) feasibility of business; (4) level of community education; (5) community empowerment program; (6) forest fire mitigation technology; (7) technology database and information; and (8) number of human resources FMU of Yogyakarta.

Keywords: *FMU, sustainability, forest resources, multidimensional scaling*

PI1

NON-CONSERVATION FOREST AS JAVAN GIBBON HABITAT (HYLOBATES MOLOCH AUDEBERT, 1797) IN WEST JAVA

Zamzam l'lanul Anwar Atsaury[1,3], Teguh Husodo[2,3], Erri Noviar Megantara[2,3], Parikesit[2,3], Puput Febriato[2,3], Pinandita Mufqi[3]

[1]Masters Program in Biomanagement, School of Life Sciences and Technology, Institute of Technology Bandung. Bandung 40132, West Java, Indonesia.
[2]Department of Biology, Faculty of Mathematics and Natural Sciences, Universitas Padjadjaran. Sumedang 45363, West Java, Indonesia

[3]Institute of Ecology, Directorate of Research, Community Services and Innovation, Universitas Padjadjaran. Bandung 40134, West Java, Indonesia.
*Corresponding author: zamzam.atsaury@gmail.com

ABSTRACT

Javan gibbon (Hylobates moloch Audebert 1797) is one of the endemic primates in Indonesia. The spread of javan gibbon which is currently known to be concentrated only in conservation areas that are slightly disrupted by human activities, was also found in non-conservation areas in West Java. This research was conducted in Ciletuh, Sukabumi; Cisokan, West Bandung; and Cijedil, Cianjur. The existence of Javan gibbon collected by survey method and an inventory of plant species collected too. In the Ciletuh location there were 4 anisa Cisokan location there were 4 groups, Cijedil 3 groups and Ciletuh 3 groups javan gibbon. Habitat condition in these three locations are very close to human activities which are a source of threats, but it

still support the survival of Javan gibbon. Besides that, the habitat is very limited and separated from the primary forest. Exixtence of the forest in the location of this study shows the function as habitat protection for Javan gibbon. This uniqueness needs to be optimized for sustainable forest and the preservation of Javan gibbon is maintained.

Keywords: *Javan gibbon, Non-conservation forest, West Java, Ciletuh, Cisokan, Cijedil*

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