SICEST 2016

ABSTRACT & PROGRAM

SRIWIJAYA INTERNATIONAL CONFERENCE ON ENGINEERING, SCIENCE & TECHNOLOGY

@Bangka Island Indonesia 8-10 November 2016

A Conference by
Faculty of Engineering
Sriwijaya University

SICEST 2016

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SICEST 2016

SICEST (Sriwijaya International Conference on Engineering, Science and Technology) is the firsrt regular conference organized by The Faculty of Engineering Sriwijaya University focuses on engineering, science and technology in innovation and development.

The objectives of the conference are:

- ☑ To bring together experts active in engineering, science and technology
- ☑ To explore research findings in the field of engineering, science and technology
- ☑ To discuss current development in innovation of Engineering, science and technology issues
- ☑ To enhance collaboration and networking among experts in the field on engineering, science and technology

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PROGRAM AT A GLANCE

Day 1 (Tuesday, November 8, 2016)

08.00-07.30	Participants Arrival
13.00-18.30	Registration (batch 1)
19.00-21.00	Opening Ceremony (Welcome Party)

Day 2 (Wednesday November 9, 2016)

07.00-08.00	Registration (batch 2)
08.00-08.15	Symposium Opening Remarks
08.15-10.00	Plenary Session
10.00-10.15	Coffee Break
10.15-12.30	**Symposium Session I** Poster Presentation Session I
12.30-13.30	Lunch Break & Shalat
13.30-15.30	**Symposium Session II** Poster Presentation Session I
15.30-15.45	Coffee Break
15.45-17.45	**Symposium Session III**
17.45-17.50	Symposium Closing

Day 3 (Thursday, November 10, 2016)

07.30-15.30	SICEST Sightseeing (Tour) Program
15.30-17.30	Awarding & Closing Ceremony

SICEST POSTER HALL 2 - TANJUNG KELAYANG 2 (2nd FLOOR)

SRIWIJAYA INTERNATIONAL CONFERENCE ON ENGINEERING, SCIENCE & TECHNOLOGY

POSTER ROOM 2/ SESSION 1

TIME			PAPER-ID	TITLE	AUTHOR	AFFILIATION
09.00-12.30	SESSION 1 LINE 2	1	GMN-035	Redesign Mining Sequence on Basin Type Coal Deposit to Optimize Stripping of Overburden Cost	M. Taufik Toha	Mining engineering Department, University of Sriwijaya, Palembang
		2	GMN-008	Environmental Value Losses as Impacts of Natural Resources Utilization of in Coal Open Mining	Restu Juniah, Rinaldy Dalimi, Mathius Suparmoko, Setyo S Moersidik and Harry Waristian	Mining engineering Department, University of Sriwijaya, Palembang
		3	ENV-011	Detection of Changes In Mangrove Area at the East Coast of South Sumatra	Yuanita Windusari and Margaretha Sri Lestari	Department of Biology, Faculty of Mathematics and Natural Sciences, Sriwijaya University, Palembang
		4	ENV-010	Combination of CaCO3 and Ca(OH)2 as Agents for Treatment Acid Mine Drainage	Poedji Loekitowati Hariani, Salni Salni and Fahma Riyanti	Department of Chemistry, Faculty of Mathematics and Natural Sciences, Sriwijaya University, Palembang
		5	ENV-020	Options for Land Conservation Practices based on Land Uses and Land Degradation Degree in Upland Luas Watershed Bengkulu Indonesia	Muhammad Faiz Barchia, Khairul Amri and Friski Namura	Soil Science Department, Faculty of Argiculture, University of Bengkulu
		6	ENV-022	Surface-Flow Wetland for Water Reclamation at Batamindo Industrial Park	Chris Salim, Andita Rachmania and Rahma Dewi	Environmental Engineering Department, Faculty of Clean Energy and Climate Change, Surya University, Tangerang
		7	ENV-023	Treatment of Spent Sulfuric Acid using Bentonite Adsorbent	Marwan Asof, Susila Arita, Winny Andalia and Cindi Ramayanti	Mining Engineering Department, Faculty of Engineering, Sriwijaya University, Palembang
		8	ENV-024	The Impact of Tin Mining in Bangka Belitung and Its Reclamation Studies	Eddy Nurtjahya, Jennifer Franklin, Umroh and Fournita Agustina	Biology Department, Faculty of Agriculture, Fisheries and Biology, University of Bangka Belitung, Merawang
		9	ENV-033	Study of Characteristics Habitat of Swamp Buffalo (Bubalus Bubalis) From Pampangan South Sumatra	Yuanita Windusari, Laila Hanum and Rahmat Pratama	Department of Biology, Faculty of Mathematics and Natural Sciences, Universitas Sriwijaya, Palembang, Indonesia
		10	ENV-037	Modification of Southern Bandung Waste Transportation Using Vehicle Routing Problem (VRP) – Nearest Neighbor Model	Anni Rochaeni and Wahyu Katon	Environmental Engineering Department, Faculty of Engineering, Pasundan University, Bandung
		11	ENV-036	The Influence of Sedimentation of The Musi River to The Aquatic Environment	Achmad Syarifudin	Cvil Engineeriang Depatment, Bina Dharma University, Palembang

Measuring Soil Recovery after Coal Minesite Rehabilitation in South Sumatra

Dwi Setyawan*[1], Adipati Napoleon[1], Herlina Hanum[2]

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Soil recovery in minesites is a complex process and needs various methods to measure the progress. Objective: This study integrated static closed-chamber technique together with several soil variables. Method: Soil respiration used 20 ml of 0.25 M KOH and measured with a portable EC-meter. Land reclamation was located in Banko Barat, Tanjung Enim, South Sumatra, which has been revegetated in 1997, 2000, 2007 and 2013. Results: Revegetation patterns have remained relatively the same. Types of plants are generally Acacia, Eucalyptus, Albizia with some local species including mahogany. Post-mining land showed a trend to improve with age reclamation by soil respiration rate. The old location (1997) has a hourly rate of 500 mg CO2/m2. A warmer temperature may lead to higher hourly rate in recently planted 2013 site (680 mg CO2/m2). Soil organic carbon increased significantly (5.41 ± 3.64 %) while soil pH was still acidic (3.61 ± 0.42). Conclusions: Soil recovery may be related to increasing soil respiration, organic carbon, and soil pH. Plant selection is important to ensure future success of site rehabilitation.

Keywords: Coal mine, In-situ method, Plant selection, Soil respiration

ENV-031	Sympo D	R: 5	Session III

Superstructure Optimization Model for Integrated Urban Water Supply System – Bandung City, Indonesia

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An effective urban water supply system needs to address the problems due to the population growth. Integrated Urban Water Supply System (IUWSS) is an alternative water supply system (WSS) that combines all components of the infrastructure such as waste water systems and the drainage system to get a more efficient and effective system. In this paper, we propose an IUWSS for Bandung City, Indonesia as a case of study. In the integration and optimization of the IUWSS, we include raw water sources and recycled waste water for the various categories of needs aiming at reducing the processing cost of water sources and the use of groundwater. The proposed scenario is used as the basis for building a mathematical model for the integration and optimization of IUWSS. The proposed scenario begins with the preparation of the existing Bandung WSS scheme, and then applies the concept of IUWSS. The main contribution of this paper is the developed superstructure model equations for Bandung city, where the model will be used for the optimization of its IUWSS. By employing these superstructure models, the optimization has been carried out to determine the optimal cost of raw water supply for two scenarios using GAMS software.

Keywords: Integrated Urban Water Supply Systems; superstructure model; optimization

ENV-038	Sympo D	R: 5	Session III

The Impact of Tin Mining in Bangka Belitung and Its Reclamation Studies

Eddy Nurtjahya*[1], Franklin Jennifer[2] , Umroh, And Agustina Fournita

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[2] Forestry, Wildlife and Fisheries, University of Tennessee, TN 37996, USA, jafranklin@utk.edu
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Tin mining in Bangka Belitung has been exploited for hundred years. The province is the second largest tin producer in the world. The mining activities increase the wealth of the community, but the other hand they change and decrease the environmental stability, and cause horizontal conflicts. Offshore mining reduced water quality, change sea bed caused the change of biodiversity, and increase the mortality index of coral reefs and their associated fishes. Onshore mining activity reduces biodiversity and causes floods and damages roads and bridges. Mining site occupation and socio economic impact stimulate horizontal conflicts between locals and between local and immigrant. While the more plant species planted in mined soils in the last decade, economic species such as rubber, oil palm, and some fruit species are demanded. Planting local tree species is challenging. To support the successfulness of revegetation, work of finding physiological characteristics to predict ground cover success on mine reclamation sites has being conducted. Secondary data were discussed to show the impact of mining activities and its reclamation studies. Greenhouse and laboratory studies indicate that some physiological characteristics may be used to select plant adaptability to mined soil.

Keywords: tin mining impact; reclamation; plant species selection criteria; physiological characteristics; Bangka Belitung

ENV-024	Poster	P.Hall 2	Session I

The Impact of Tin Mining in Bangka Belitung and Its Reclamation Studies

NURTJAHYA Eddy[1], FRANKLIN Jennifer[2] , UMROH[3], and AGUSTINA Fournita[4]

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Background

Tin mining increases the wealth, but it changes and decreases the environmental stability, and cause horizontal conflicts. Planting local tree is challenging. The best adapted species anatomically and physiologically were not those that best in the field (Nurtjahya et al. 2011).

Results

Socio-economic impacts

The positive impact is economic (Erman 2013). In some areas, fishermen and farmers become miners. The income of fishermen is just one-third of miners (Nurtjahya et al 2008).

Mining stimulate conflicts between locals and immigrant and attitude changes (Nurtjahya et al. 2015).

Water qualities, offshore biotas

Offshore mining reduced water quality, and biodiversity (Fig. 2).

The economic benthic mollusc *Laevistrombus canarium* L. (*siput gonggong*) is replaced by the *Anadara granosa* (Yulianda et al. 2009).

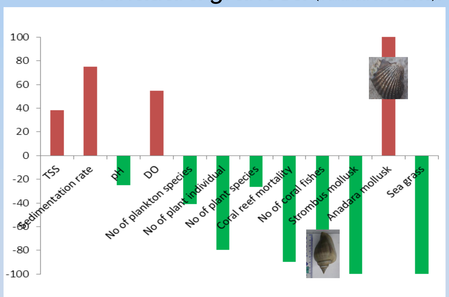

Fig. 2. Increase and decrease percentage of water quality and offshore biotas (Nurtjahya et al. 2014)

Table I. Soil Properties of 0-, 7-, 11-, 38-Year Old Tin-Mined Land, and Riparian Forest (Nurtjahya 2008)

Sites	Sand	Silt	Clay	pH	C	N	P_2O_5	K_2O	CEC
	(%)			H_2O	(%)		(mg/100g)		
0	94	2	4	4,8	0,2	0,0	2	3	0,4
7	94	4	3	4,8	1,0	0,1	49	3	3,3
11	83	5	13	4,9	0,2	0,0	11	4	2,0
38	96	2	2	5,1	0,3	0,0	5	2	1,0
forest	78	13	10	4,7	1,6	0,2	22	5	5,8

C (Walk & Black); N (Kjeldahl); Cation-exchange (NH4- Acetate 1 N, pH 7); CEC (Ca+Mg+K+Na)

Method

Secondary data from across the island (Fig 1) were discussed. Greenhouse and laboratory studies took place in the University of Tennessee, USA.

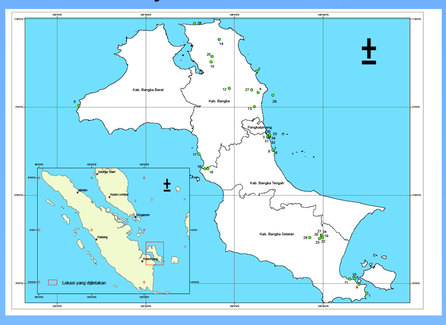

Fig. 1. In land and offshore study sites in Bangka Island from primary and secondary data (Nurtjahya et al. 2015)

Soil degradation, inland biotas

Onshore mining reduces soil properties and biodiversity, causes floods, damages infrastructure (Table I). Recovery is costly, the major portion are for soil amendment (Nurtjahya et al. 2009) .

Physiological character

Species that widely adopted for mine reclamation are in particular tolerant of low water and nutrient availability (Nurtjahya & Franklin 2016).

Table II Summary of Traits Potentially Desirable In Reclamation Ground Covers In Eastern United States (Nurtjahya & Franklin 2016)

	A	B	C	D	E	F	G	H
T. pratense	√	√	√	√	√	√	√	√
H. esculentus	√	√	√			√	√	√
T. repens	√	√	√			√	√	√
L. multiflorum		√	√		√	√	√	
L. corniculatus			√	√		√	√	√
B. napus	√	√				√	√	
B. perviridis	√	√	√				√	
L. perenne	√		√	√				√
P. virgatum			√	√		√	√	
V. unguiculata		√		√		√	√	
D. glomerata			√	√		√		
P. fagopyrum		√	√			√		
S. scoparium			√			√		√
S. nutans	√		√			√		

A= germination >30%, B= cover > 50% within 2 weeks, C= number of germination x pH, D= number of cover x soil type, E= number of height x soil type, F= number of transpiration x soil type, G= low transpiration rate, H= foliar pigments > 0.4 mg/g

Although rapid growth is often cited as a desirable characteristic, the most frequently used species tended to have a moderate growth rate (Table II).

Conclusions

The mining increases the wealth, but it decreases the environmental stability, and stimulate horizontal conflicts. Plant height and cover, transpiration rate, and foliar pigments may be used to select plant adaptability. Species most widely used in reclamation tended to be perennials of moderate rate.

Acknowledgments:

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The Impact of tin mining in Bangka Belitung and its reclamation studies

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Abstract. Tin mining in Bangka Belitung has been exploited for hundred years. The province is the second largest tin producer in the world. Secondary data from studies which took place in all four regencies in Bangka Island were discussed to show the impact of mining activities and its reclamation studies. In order to add plant selection criteria for regevetate mined soil, the greenhouse and laboratory experiment was carried out with fourteen herbs and grass species in Tennessee. The mining activities increase the wealth of the community, but the other hand they change and decrease the environmental stability, and cause horizontal conflicts. Offshore mining reduced water quality, change sea bed caused the change of biodiversity. Onshore mining activity reduces biodiversity and causes floods and damages infrastructure. While the more economic species are demanded, planting local tree species is challenging. An evaluation with local tree species concluded that best adapted species based on anatomical and physiological measurements was not those that showed the best performance in the field. The greenhouse and laboratory findings indicate that some physiological characteristics i.e. plant height and cover, transpiration rate, and foliar pigments may be used to select plant adaptability to mined soil.