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

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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).

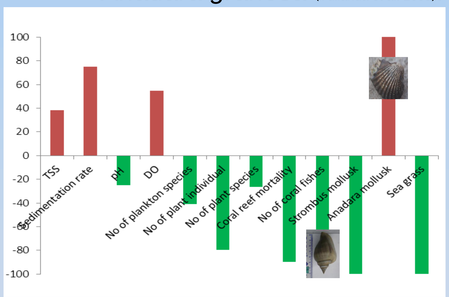

Fig. 2. Increase and decrease percentage of water quality and offshore biotas (Nurtjahya et al. 2014)

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.

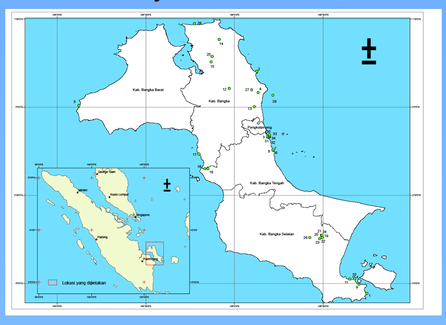

Fig. 1. In land and offshore study sites in Bangka Island from primary and secondary data (Nurtjahya et al. 2015)

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:

The first author gratefully acknowledges the funding of this research by Directorate General of Higher Education, Republic of Indonesia (Hibah Bersaing 092/SP2H/PP/DP2M/III/2007; 086/SP2H/PP/DP2M/III/2008), and to thank Fulbright for funding the research (68150141). The first author would like to thank Department of Forestry, Wildlife and Fisheries, University of Tennessee kindly provided facilities to undertake the research. Universitas Bangka Belitung is thanked for its permission allowing the first author to conduct research.The authors acknowledge Mr. A. Akbar and Ms. W.E.A. Putri, students of UBB, Dr. Zhi Qin Liu, and Mr. Jason Seaton for the valuable data and help.

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SICEST2016
SRIWIJAYA INTERNATIONAL CONFERENCE on ENGINEERING, SCIENCE and TECHNOLOGY
Bangka, 8-10 November 2016