IB–3

Land-Use Change-Related Environmental Impact Assessment for the Coal Mining Industry in Indonesia

Imam Eko Setiawan[1], Kazuyo Matsubae[1]
[1] Graduate School of Environmental Studies, Tohoku University, Japan
*E-mail: imam.eko.setiawan.q5@dc.tohoku.ac.jp

TOHOKU UNIVERSITY

Background

Figure 1. Indonesia geographical position and coal mining site location

- Coal mining generates impacts into the environment, including land-use change
- The objective: to evaluate the land-use change impact to the climate regulation during the coal mining operation.

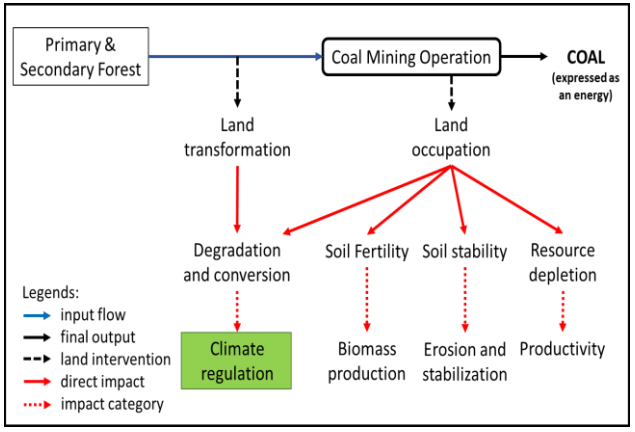

Figure 2. Land intervention-related impact assessment on the coal mining

Method and Materials

- A Life Cycle Assessment to assess the impact of land interventions
- Case study in one of coal mining sites in Indonesia
- The carbon transfer calculation follows the Muller-Wenk and Brandão's model (2010) with several assumptions developed.

Results

Carbon content (t-C/ha)

Primary dryland Forest
- Above-ground biomass: 266.23
- Soil: 102.15

Secondary dryland Forest
- Above-ground biomass: 83.15
- Soil: 43.97

Source: Forest Carbon Partnership Facility, http://karbon.puspijak.org/

Table 1. Impact of land intervention on climate regulation

Land Intervention	C transfer to air (t-C/ha)	Annual C backflow (t-C/ha)	Relaxation time (year)	Mean carbon stay in air (year)	Duration factor	Fossil combustion-eq. Carbon (t-C eq/ha)
Land transformation	127.12 - 368.38	6.4 - 10	13 - 58	7 - 29	0.05 - 0.19	6.36 - 69.99
Land occupation	77,924.56 - 225,816.94	-	-	25	0.16	12,467.93 - 36,130.71

Results *(Cont.)*

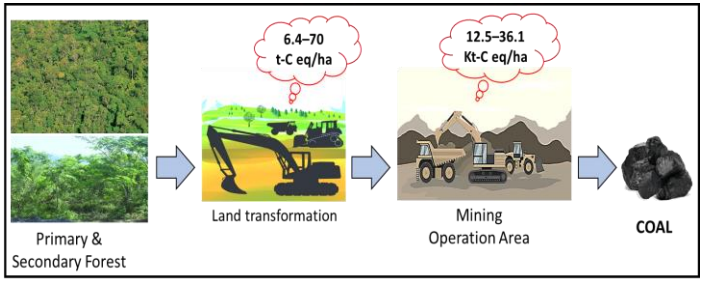

Figure 3. Carbon transfer on land intervention at coal mining operation

Discussion and Conclusion

- Mined reclamation shortens the relaxation time and the imputable mean carbon stay in the air
- Revegetation lessen the impact of land interventions on the climate regulation
- Calculation only for the entire extraction process area
- Improvement to the life cycle inventory data.

Future Works

- Impact assessment to the biotic production, erosion, and resource depletion
- Further improvement to land use management