

## COURSE REPORT

# Forest Rehabilitation of Post-mining Areas: Mitigating the Ecological and Socio-Economic Impacts of Mining

Banjarbaru & Jorong, South Kalimantan, Indonesia  
September 15-21, 2015

An international seminar and training organized by:

- Environmental Leadership & Training Initiative (ELTI)
- Lambung Mangkurat University (UNLAM)
- Research Consortium for Sustainable Forest Management (PUI KR PHB)
- PT Jorong Barutama Greston (JBG)



**Background:** Coal mining is a major economic driver of environmental change in Indonesia. Total production has tripled over the last decade, making Indonesia the world's largest producer of thermal coal. Kalimantan is the largest source of Indonesia's coal with millions of hectares of mining concessions having been granted to small-, medium-, and large-sized companies. These concessions exist both within the official forest estate, as well as outside in "other use areas."

ELTI is an initiative of:

**Yale** SCHOOL OF FORESTRY &  
ENVIRONMENTAL STUDIES

In collaboration with:

Smithsonian Tropical Research Institute  PANAMA



Indonesian government regulations require that the mining companies set aside a reclamation guarantee and engage in progressive reclamation and re-vegetation in order to return the environmental, social, economic, and cultural functions of the former mined sites. For a number of reasons, related to both limitations of technical knowledge and poor government oversight, however, successful reclamation remains quite rare in the country. Due to this lack of effective mitigation measures, mining is having an increasingly negative impact on the region in terms of deforestation, water and air pollution, flooding, loss of biodiversity, and numerous social conflicts.

As part of their efforts to address these challenges, ELTI and UNLAM, working in collaboration with JBG mine company, organized an international seminar and training. The seminar, which was held on September 15, brought together experts and practitioners from Indonesia and abroad to provide guidance to mining companies, decision makers, and other stakeholders on how best to rehabilitate former mined sites in Kalimantan and Indonesia more generally. The seminar was then followed by a fieldtrip to JBG mine on September 16 for all seminar participants. The training, which ran from September 17 to 20, then provided a limited number of participants—some of whom attended the seminar and some of whom did not—with more detailed instruction on forest rehabilitation in former mined areas.

**International Seminar:** The seminar, which was held in the ballroom of the Rodhita Hotel in Banjarbaru, was opened with formal remarks by Prof. Dr. Sutarto Hadi, Rector of UNLAM. Two keynote speeches were provided by Dr. Hilman Nugroho (Director General of Watershed Management and Protection Forests from the Ministry of Environment & Forestry) and Ir. Gusti M. Hatta (Former Minister of Environment and Minister of Research & Technology). Invited speakers, Prof. Dr. Tim Roberts (University of Newcastle), Prof. Peter van der Meer (Larenstein University of Applied Sciences), and Dr. Yadi Setiadi (Bogor Agricultural University) then explored different aspects of mine rehabilitation practice in different parts of the world. This was followed by a plenary session with presentations by Dr. Ir. Mahrus Aryadi (PT Adaro) on mitigating the ecological impacts of mining and preparing for mine closure, and Prof. Dr. Yudi Firmanul (PUI KR PHB) on evaluating re-vegetation efforts. In the afternoon, the seminar continued in three parallel sessions based on the following themes: 1) Mine regulations, 2) Socio-economic aspects of mining, and 3) ecological aspects of mine rehabilitation. There were a total of 21 presenters.





**Field Trip:** The field trip was taken to the JBG mine site in Jorong. Upon arriving at the site, participants were given an introductory presentation about the mine and the company's rehabilitation efforts and a safety briefing, after which protective gear was distributed. Participants were then taken on a tour of several sites. The first site was a former coal loading area near the port, which due to decreased production was in need of rehabilitation. Discussions revolved around rehabilitation methods and appropriate post-mining land use. The second site overlooked one of the companies active mining operations where the discussion focused on an explanation of the mining process, post-mine land reclamation, and eventual rehabilitation. The third site visit provided an example of erosion control measures established in a reclaimed area overlooking one of the voids, while the fourth site visit was to the company's nursery.

**Field Training:** Initially the plan was to hold the entire field training at JBG mine site, but last minute complications arose requiring that the first two days of the training take place at Hotel Rodhita, while the second two days were at JBG. The objectives of the training were as follows:

- To provide participants with an in depth understanding of the government regulations that pertain to mine site rehabilitation;
- To provide participants with a detailed technical understanding of the steps needed to achieve mine site rehabilitation; and
- To provide a forum for discussing challenges and obstacles faced by mining companies in fulfilling their regulatory responsibilities to rehabilitate their mine sites.

The training was formally opened by Dr. David Neidel (ELTI) and Prof. Yudi Firmanul Arifin (PUI KR PHB). The training started with presentations and a discussion session introducing regulations from the Ministry of Mines and Mineral Resources that apply to all mining operations by Dr. Yadi Setiadi (Bogor Agricultural University) and on Ministry of Environment & Forestry regulations that apply to mining in forest areas by Ir. Karta Sirang (UNLAM). Dr. Ishak Yassir (Balitek-KSDA) then discussed choosing the appropriate tree species for re-vegetating mine sites, while Dr. Acep Akbar (Balai Penelitian Kehutanan) discussed nursery techniques to ensure the

availability of quality seedlings. Mr. Riswan (UNLAM) then discussed techniques for preparing areas for planting, including contouring, land stabilization, and site preparation.

The second day of the training started with a presentation by Dr. Yadi Setiadi on the need for and methods to conduct soils analyses, an important step given that soil toxicity is a common cause of failure in revegetation efforts. Prof. Yudi Firmanul Arifin (PUI KR PHB) discussed appropriate planting methods and the need for ongoing maintenance. Dr. Ir. Bambang Joko (UNLAM) then provided insights into methods for achieving erosion control and land stability. Dr. H. Abdi Fitria (UNLAM) discussed monitoring and evaluation in accordance with the various Ministry regulations. Finally, Dr. Mahmud (UNLAM) discussed the long-term management of voids (i.e., large permanent pits that are left after the end of mining operations).

The third day was spent at JBG mine site and focused on a series of field demonstrations, which reinforced the material that had been delivered through the presentations during the first two days of the training. The first demonstration focused on proper nursery management techniques led by Dr. Acep Akbar. The second revolved around choosing appropriate species and planting strategies in the face of unclear and in some cases contradictory government regulations by Dr. Ishak Yassir. The participants then visited an active reforestation site, which had already been planted, to evaluate the planting design and trees' growth performance. This visit was led by Prof. Dr. Yudi Firmanul Arifin. Finally, the participants were taken to a void in order to further discuss issues related to managing acid mine drainage and water quality, which was led by Dr. Mahmud.

The fourth and final day of the training was devoted to participants discussing ways to apply what they had learned through the training. Each participant was also required to prepare an action plan, so that ELTI could monitor their progress, followed by an evaluation of the training. Ms. Pangestuti Astri (ELTI) then provided a brief introduction to the ELTI Leadership Program, outlining the opportunities that are now open to the training program alumni. The training ended with closing remarks by Dr. Yadi Setiadi, Prof. Dr. Yudi Firmanul Arifin, Mr. Ihsan Noor (Mine Head for JBG) and Dr. David Neidel, and the awarding of certificates.







**Participants:** The international seminar and field trip were promoted regionally and had a total of 44 participants. Meanwhile, the field training had 23 participants consisting of academics, practitioners from mining and consulting companies, and government agencies, who were chosen by the organizers from a larger pool of applicants.

**Course Follow-up:** All of the participants have been added to an ELTI-managed list serve for ease of communication on issues related to mine site rehabilitation. ELTI and its partner organizations will also monitor the training alumni in order to evaluate their success in implementing their action plans. Finally, ELTI will also provide follow-up assistance to the program alumni through the Leadership Program as requested. One such request, i.e., trainings for community members on mine site rehabilitation, has already been forwarded to ELTI and approved for implementation in Pengaron sub-district, South Kalimantan in November 2015.

---

*This event was possible thanks to Arcadia Fund, whose Environmental Conservation grants support programmes that protect and enhance biodiversity, and provide field training and academic research.*