

Two-year post-doctoral position

Ecological reclamation of Ni-mined Technosols

Conditions of appointment

- **Employer:** Excellence Laboratory (LabEx) Ressources 21 (www.ressources21.univ-lorraine.fr)
- **Location:** Soils and Environment Laboratory (Laboratoire Sols et Environnement, lse.univ-lorraine.fr), Nancy, France.
- **Salary:** 45 k€ annual gross salary
- **Tenure:** 2 years
- **Scientific team involved:** Pr. Guillaume Echevarria, Pr. Emile Benizri, Dr. Geoffroy Séré, Dr. Apolline Auclerc, Dr. Sophie Leguédois, Dr. Françoise Watteau
- Oversea field campaigns in Indonesia

Required skills and qualifications

- PhD in Soil Science, Ecology, Microbial ecology or Environmental Science
- Scientific expertise in soil biology or soil geochemistry.
- Experience in the management of field surveys and laboratory experiments.
- Valued knowledge of the laterite and Ni-bearing soils.
- Valued knowledge of the mining industry and processes.

Background and objective

Mining operations for Ni recovery generate a high level of disturbances in the soils and the ecosystems, *e.g.* clearance of the endemic vegetation, removal of topsoils, loss of the biological fertility in the stocked topsoils, low fertility of the residual materials, increase in Cr VI toxicity. Reclamation schemes are now compulsory before the start of the mine. However, today, most of the existing reclamation techniques focus only on a given ecosystem service like geotechnical stability, pollution limitation or biomass production. The development of sustainable reclamation techniques embracing the multifunctionality (*i.e.* the diversity of desired ecosystem services) of the rehabilitated ecosystems is needed. Soil reclamation and more particularly the reclamation of its biological activity is a key process to understand to design innovative and multifunctional reclamation techniques for Ni-mined Technosols. Actually, an agroecological approach to the reclamation of mining soils is needed.

Previous works show that to take biological activity into account in soil rehabilitation, the techniques of reclamation must be integrated right at the beginning of the mining operations. In fact, reclamation techniques have to consider characteristics like the availability of the raw materials that could be used to construct a functional Technosol (*e.g.* overburden, topsoils, spoils, urban or agricultural wastes), the biological potential of these materials, their correct handling and stocking to preserve a biological activity (fauna, microbes, seed).

The aim of this post-doctoral position is to better understand the evolution of soil biological activity in Ni-mined Technosols in order to design ecologically-based reclamation techniques for multifunctional soils. Works will be conducted on natural rich Ni-soils as well as mining Technosols.

Application

For application, please provide the following documents by the 15/06/2015:

- a curriculum vitae,
- a list of publications,
- a cover letter.

The presentation of a research project on the topic of this post-doctoral position will be asked to the applicants selected for audition.

Contacts

Dr Sophie LEGUÉDOIS
Researcher, INRA
sophie.leguedois@univ-lorraine.fr
+33 (0)3 83 59 57 51

Pr Guillaume ECHEVARRIA
University of Lorraine
guillaume.echevarria@univ-lorraine.fr
+33 (0)3 83 59 57 92