

TECO Mobility grant

Integrated multidisciplinary approach for improving mining polluted soils and reusing waste as resource

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TECO Project

*Technological ECO-innovations for the quality control
and the decontamination of polluted waters and soils*

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Objective of the project

The project will establish and promote an integrated multidisciplinary exchange of knowledge in the area of manganese and iron ore mine in Odisha (India) with a focus on innovative sustainable methods. In particular, the challenge is to develop an innovative multi-method approach that combine:

- new sensitive exploration technologies (such as remote sensing technologies) for better identification of minerals and metals from mining wastes;
- new solutions for sustainable production / extraction of RMs (such as integrated pyro-, hydro-, bio-, electro-metallurgical, electrochemical technologies) at increased efficiency in terms of better extraction yield and process selectivity;
- eco-innovative remediation / reclamation methodologies of degraded mining land.

In this view, both economic development and environmental protection will be simultaneously promoted.



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Activities carried out during the period of the grant

1. Meetings to organize the work and to find the material available on the study area (maps, technical reports and scientific studies, etc) characterized the first phase of the grant period. The area has never been studied before, so it has not been possible to find study material useful for detailed geological and mineralogical characterization.
2. During the meetings at NEERI, we learned that the sampling time would be short (only a few days), so in the second phase of the work the study area was restricted (only Joda West and not even Joda Est) and sampling points were chosen based on the evolution of the mine from 2016 to 2017 viewed through satellite images.
3. During the sampling campaign, 37 samples were collected with relative GPS coordinates. Some areas of the mine were different compared to the most recent satellite image and some selected points were in areas not safely accessible or not suitable for satellite studies.
4. The 37 samples were quartered and a part was moved to Italy to be subjected to spectral, chemical and physical laboratory analysis at the CNR laboratories of Montelibretti (Rome).



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Main outcomes

The main purposes of the work carried out during the period of the grant were two:

- to put in to effect the project proposed months ago;
- to obtain soil samples to be submitted to laboratory analysis.

To reach the first goal it was necessary to involve many researchers and students of NEERI and this required more time than expected. After an initial phase of frustrating and demoralizing work, which was frequent when new projects were launched, we managed to focus on short-term objectives: the days were spent choosing points and organizing the sampling, taking samples into the mine and organizing the work to do in the months starting from December 2017.

After this experience in India, all the work to do in the host country will be well organized at each stage before leaving Italy and will proceed faster.



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