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NEWSLETTER



Perspectives on sustainable land use & mineral resource management in Europe. How can the MinLand project help? An interview with the stakeholders of the MinLand workshop

Interview with **Mr. Luis Chambel**
Exploration & Research
Mining Engineer

What are the main challenges of the future land use & minerals resource management?

Mineral resources are essential to human life. The human population growth (now 7.000 million and expected to reach 11.000 million by the end of this century), its increasing global spending power and the technological evolution demand ever increasing volumes and diversity of raw materials.

Mineral and non-renewable energy deposits are increasingly difficult to mine (with lower grades, complex mineral compositions and harder to find and access- deeper in the crust, on the deep sea bed or in space); at the same time society, especially in Europe, seems averse to new mineral projects.

We live in a time when ghosts from the past – the environmental, social and human impacts of greedy or just incompetent mining companies – haunt us in the form of collapsing tailings dams, contaminated soils and water streams (and their costs in terms of human health and safety).

The social impact of these disasters (mostly originated in past activity) is amplified in the present by social media in a society that believes complex challenges have simple and cheap solutions.

The exploration and mineral and energy industries – or at the least their most successful companies – invested heavily in new technologies and a drastically changed behavior. As a result of its effort, the industry evolved dramatically in the last generation; yet it's disruptive technologies and forces external to the industry that most decide its future – including digital technology and economy, data science, political risk, market volatility, climate change, trade wars, circular economy, social

license to operate, the world's population demographics and available income growth. As a result, the mineral and energy industries face a situation where they simultaneously have to address different challenges:

- Clean the mistakes and eradicate the bad practices of the past.
- Struggle to change public perception of the mining industry, facing ever more radical anti-everything activist groups (both with local and global reach).
- Embrace a new economic development paradigm, where sustainability is the key concept: leave it better than you found it.
- Obtain the funding needed to the capital-intensive exploration and mining projects.
- Satisfy the ever-increasing regulation issued by market regulators, national and international agencies and Governments.
- Supply the modern society with the raw materials it dearly needs.

Do mineral resources have appropriate position in EU and land use policies?

No. In the current context, European land use policies are especially restrictive in what concerns mineral projects. That is particularly true in Portugal, where mineral projects (even of exploratory nature) have found increasing local and central administrative challenges – some of these challenges are good, as they stimulate the mineral industry to evolve, to adopt better production processes; other obstacles are unjustified, just Not-In-My-Back-Yard responses.

The European policy has evolved in the last two decades. Remaining restrictive to the exploitation of nonrenewable mineral and energy resources in the European territory, the European Union has blended that policy

with the recognition that its economy needs raw materials. In the last decade, the European Union compiled a list of Critical Raw Materials, reporting it to the markets and the society (first published in 2010, with later versions in 2014 and 2017).

The energy transition, especially the electrical mobility, is a key strategic economic aim of the EU; access to metals – e.g. for the automobile bodies, engines and their batteries – is critical. As a result of the need for metals and other industrial minerals, the European Union (and the Member States):

- Established circular economy policies aiming at a zero-waste economy (reducing the net mineral needs, even if only partially);
- Aimed at the creation of harmonized guidelines on land use and mineral policy strategies within Europe and launched several research and development programs aiming at the safe sustainable supply of raw materials – e.g. from seawater (and their processing brines) and deep seafloor mineral resources.

This European effort, while maintaining the world lead in environment protection, will contribute both to a change in the public opinion, to the much needed update of the national Governments geological knowledge infrastructures – and potentially to the adoption of modern and rational mineral resources and land use policies – and to develop European exploration and mining technologies.

Which solutions is MinLand bringing?

Land access is key to the European mineral industry. The project involves



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European-wide public institutions and it aims to facilitate land access to areas with resources (already identified or potential) in the European territory by:

- Creating a knowledge repository, with current policies, cases studies and identifying best practices on land use planning.
- Facilitating policy making, by developing guidelines for the public administration regarding land use planning and the need to safeguard (the always rare and unrepeatable) mineral resources for use.
- Strengthening transparent land use by acquiring organizing, maintaining and sharing to the public and public administration at all levels a knowledge base concerning geology, land use data, cases of excellent mineral land use and international standards and guidelines.
- Fostering networks of practitioners involved in all administrative levels to allow knowledge exchange and good practices dissemination.

As a mining engineer and manager involved in exploration, (e)valuation and mining projects - especially in Europe, South America and southern and central Africa - I find extremely important that national and local institutions centralize, validate and make easily available information on geology, mineral occurrences, geophysical and geochemical data and on the national legislation and regulations concerning mineral projects (with land use permitting having a top place).

Without strong and knowledgeable public administration institutions and their technicians, uncertainty increases, shying away mineral investment opportunities. Weak and underfunded institutions in the current context lead to unjustified, just Not-In-My-Back-Yard public responses – ignoring the development, wealth and job creation opportunities created by sustainable mineral projects.

The MinLand project is a clear step in the good

direction towards a good management of the European mineral resources, contributing to the development of a free, modern, rational, socially and environmentally sustainable mineral economy – Europe leading towards a better world.

Biography:

Luís Chambel

Exploration & Research

Mining Engineer, MBA, MSc Engineering Geology, PhD Engineering Sciences

Fellow of the SEG – Society of Economic Geologists

European Geologist – EUR GEOL

European Engineer – Eur Ing

Senior Engineer – OE

Advisor of the Center of Entrepreneurial Geosciences of UTEP (University of Texas @ El Paso)

My current professional activity revolves around Economic Geology (primarily) and Data Science.

I am currently partner and general manager of Sínese, a consulting company created in 1995. My professional activity in the field of Economic Geology has been diversified, although most major projects I have been involved in are related to diamond deposits in Angola and Brazil, precious and base metals (Au, Sn, Fe, Nb – Ta, Mn) and industrial minerals and natural stone in Portugal, Republic of Congo, and Brazil and other mineral resources elsewhere (oil, underground water, etc.).

In a more distant past, my professional activity also included work as a manager of an IT company (OCTOPUS, Sistemas e Informação Geográfica, S.A.) and as Technical manager of SPE – Sociedade Portuguesa de Empreendimentos, a Portuguese diamond mining company active in Angola.

In an earlier stage of my professional life, I was lecturer at Instituto Superior Técnico (Universidade de Lisboa) in the domains of Economic Geology and Mining Engineering. I have since then maintained continuous research and teaching activities in several universities and research centres in different areas: Exploration, Evaluation and Valuation of Mineral Deposits, Diamonds and Diamond Deposits, Data Science, Circular Economy and Marine Raw Materials.

I hold degrees in Mining Engineering (Applied Geology), Engineering Geology (MSc), Business Administration (MBA) and Engineering Sciences (PhD) and a postdoc in Mining Engineering.

I am a Fellow of the Society of Economic Geology and I hold the qualifications of European Engineer – EUR ING, European Geologist – EUR GEOL and I am a Senior Engineer (Ordem dos Engenheiros).

I am member of the following professional societies and organizations:

- SEG – Society of Economic Geology (Fellow since 2015).
- SME – The Society for Mining, Metallurgy, and Exploration.
- Associação Portuguesa de Geólogos – Portuguese Geologists Association.
- Ordem dos Engenheiros – Portuguese Engineers Professional Association.

Interview with

Ms. Margarida Nicolau

Senior Official of the General Directorate for Land Planning in the Ministry of Environment and Energetic Transition in Lisbon, Portugal



What is your perspective on mineral use in the context of sustainable land management?

The mapping of mineral resources of public and economic interest must be part and parcel of the preparation of territorial management plans, in order to fully inform a sustainable economic, social and environmental decision-making process. Land management plans must, therefore, represent a safeguard against unnecessary loss of the option to exploit a given mineral resource. Thus, the starting point for a sustainable territorial management policy is a comprehensive and updated assessment of existing resources, their geo-location and their registry in database, in order



to allow prompt access to information and data cross-checking whenever necessary to inform the territorial management process.

Main challenges to sustainable land management in mining areas are related to the issues of land disturbance, mine waste management and post-mining land rehabilitation. Access to land for mining purposes and communities and civil society concerns for sustainable mining also raise considerable challenges. Another important aspect, finally, refers to the management of these issues both in legislation and practice.

Although, technically speaking, it would be feasible to do some underground exploitation of mineral resources not interfering with surface land uses, in Portugal the possibility of mining activity is only considered on rural soil, urban soil being exclusively reserved for building and landscaping.

In Portuguese land-management legislation, therefore, areas for exploitation and/or safeguard of geological resources are represented in “conditioning maps” (plantas de condicionantes), which are an important component of land management plans, defining Servitudes and Public Interest Restrictions (Servidões e Restrições de Utilidade Pública - SRUP). These conditioning maps define current and exploitation areas (as well as rehabilitation areas) in order to prevent activities that might compromise public interest in terms of the exploitation of valuable mineral resources.

What are the most important issues regarding the use of mineral resources in Europe today?

Recycling is an absolute must in order to respond both to environmental and economic problems related to an ever-increasing demand for mineral resources in European economies. Obviously, however, recycling will never be sufficient to comply with demand and it will always be necessary to extract minerals

from the subsoil and, despite having some considerable reserves of mineral resources (Portugal, for instance, has important reserves of zinc, tin, pyrite and lithium) Europe is very dependent of imported minerals.

In order to address this situation, a comprehensive European policy on mineral resources use is a strategic issue of paramount importance. This is the only way to correctly ascertain the real European potential in terms of mineral availability and plan for a coherent mineral management policy. It is also fundamental for Europe to join efforts in developing technologies aiming at a more efficient and environment-friendly mineral mining and processing. Finding ways to minimize consumption and maximize recycling of imported minerals is also important to decrease Europe's dependence on external suppliers.

Another relevant issue in terms of public perceptions towards mining activity relates to mine decommissioning management. If former mining areas are not conveniently rehabilitated, civil society will, rightly so, resist to the development of new mining areas. Mining companies, therefore, must not be allowed to avoid proper environmental rehabilitation for the sake of cost reduction.

What is the take-away message that you got at the MinLand workshop?

Some brief bullet points:

- Maybe a little surprisingly, one of the take-away messages was the realization that both the concept pushing for the delimitation of potential mining areas for future exploitation and the assumption that those areas are incompatible with sustainable development are still

prevailing. This can probably be explained, however, by the different backgrounds of participants;

- True, the delimitation of potential mining areas is a safeguard for the possibility for future mining activity, should the access to a given mineral resource proves to be vital by then.
- It is also true that if the safeguard of those areas is not contemplated when designing our current land management plans, future access to those mineral resources can be seriously compromised;
- Legislation concerning mineral resources tends to more oriented by economic value than public interest;
- Servitudes do not contemplate the tri-dimensional aspects of the territory and the possibility of multi-use, thus potentially discarding the use some underground mineral resources;
- Opinions of relevant technical staff are divided between two different approaches, one emphasizing environmental and land management issues, the other more focused on mineral mining and transformation;
- Mining activity is essential for our way of life. However, it is necessary to ensure that the mineral extraction and transformation industries are not allowed to use unsustainable or obsolete technologies or discard latest environment-friendly technology in order to maximize profit.

Biography:

Margarida Nicolau

Masters degree in Physical Geography and Land Management, Lisbon University. Thesis: Subsidies for a Critical Analysis of Coastal Management Actions in the Alcobaça and Nazaré Municipalities. Degree in Geography and Regional Planning (Physical Geography), Lisbon University, Lisbon, Portugal. Senior Official of the General Directorate for Land Planning in the Ministry of Environment and Energetic Transition, Lisbon.

