Skills and training in community relations, mining conflicts and artisanal mining in the Andes

International Network of Raw Materials Training Centers

INTERMIN

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This project has received funding from the European Union’s Horizon 2020 research and innovation programme under Grant Agreement No 776642
• Intermin in a nutshell
• Mining in the Andes, short historical overview and main issues
• Skills needed, gaps and current situation in training SLO in the Andes
• The Intermin approach, comming deliverables and tasks
• Intermin is a 36 month lasting project that started in February 2018 (KOM)

• Intermin aims to identify the skills required (graduate) for the mining and mineral raw materials sectors, gaps between formation available and industry and explore future pathways to integrate both.

• INTERMIN will create a self-sustainable long-term lasting international network of training centres for professionals.

• The network will map skills and knowledge in the EU and the third countries, identify key knowledge gaps and emerging needs, develop a roadmap for improving skills and knowledge, as well as establish common training programmes in the raw materials sectors.

• The project involves educational and research institutions in the EU and the leading counterparts in third countries, based on specific country expertise in the primary and secondary raw materials sectors.
Partners, third parties and Advisory board

Global audience of approximately 550,000 professionals from 5 continents
• Spanish Colonial Era 1532- second decade 18th C
• North American and British investments: starting last decades 19th C
• Nationalization of mining (70’s Peru, 1965 Copper Chile, Potosi Bolivia 1952)
• Commodity prices scenario 1980`s and 1990`s. Tin Crisis 1982
• 2000s commodities boom. Attract huge investment in the area
### The reality in Andes in 21st Century

Mining activity has a multiplying effect on local economic and employment - specially relevant in areas without tourism or industry. Where there are no infrastructures, hospitals, etc...

<table>
<thead>
<tr>
<th>Country</th>
<th>Mining Gross Domestic Product (% total) 2008</th>
<th>GDP per capita PPA 2015 dollars</th>
</tr>
</thead>
<tbody>
<tr>
<td>Argentina</td>
<td>1,4</td>
<td>22,400</td>
</tr>
<tr>
<td>Bolivia</td>
<td>6,3</td>
<td>6,400</td>
</tr>
<tr>
<td>Chile</td>
<td>6,7</td>
<td>23,500</td>
</tr>
<tr>
<td>Ecuador</td>
<td>0,4</td>
<td>11,400</td>
</tr>
<tr>
<td>Peru</td>
<td>5,7</td>
<td>12,000</td>
</tr>
</tbody>
</table>

Source: own compilation from several sources

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The reality in Andes in 21st Century

INTERMIN

• Main issues faced by mining in the Andes regions regarding social acceptance:

• Mining background: social conflicts and reputation of companies and inherited environmental problems
• Big projects acceptance, legal, environmental and land ownership and political issues
• Artisanal and small scale mining- legalization “formalización“. Illegal mines. Due to several crisis and lack (or very small) of social state coverage subsides.
• Miners are often not locals
Morococha mine town and Toromocho Project
Underground mine to a new open pit Project
4800 million dollars investment and relocation of 5000 inhabitants

See: http://www.s-c-g.net/es/portfolio-items/reasentamiento-de-la-ciudad-de-morococha-proyecto-toromocho-junin-peru/

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Artisanal and small scale mining: environmental and social issues

Rinconada gold mines (Peru)
5000 m.a.s.l
Artisanal and small scale mining: environmental and social issues

Illegal mining neighbouring medium scale legal mines: Peru
Artisanal and small scale mining: environmental and social issues

Potosí mines. Cero Rico. Bolivia
Increasing safety and environmental standards: social implications at all levels
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Identifying a problem.

Mining Conflicts in Latin America (source: https://mapa.conflictomineros.net/ocmal_db/)
The “first person to arrive” can be critical for the project.

Combination of local speaking guides and social collaborators in early stages.
Skills required

Geologist and engineers many times are the first contact with the community (they also coexist with locals): we need to improve our social and communication skills and multidisciplinary teams.
Indigenous languages in Spanish speaking Latin America

Source: Gladys Zuna Llanos
Universidad San Francisco Xavier de Chuquisaca. Bolivia

Quechua:
“language of the Incas”:
1. Peru
2. Bolivia
3. Ecuador
4. Argentina
5. Chile
Gap identification - Tackling the issue

4th Congress in Community Relations - Peru 20 – 22 May 2019

2 relevant issues:
Legalización of informal (illegal) mining and artisan mining
Social License of big investments

For more information see: Congress in Community Relations
www.congresorelacionescomunitarias.com

Mining formalization (an issue as important as community relations for the big projects)
http://www.eliteperu.net/formalizacion_minera.html
Gap identification - Tackling the issue

Links with society
640 hours!!

Students chose among many projects and social centres guided by professors in real projects, water supply, teaching and training.

Also in artisanal and small scale mining.
Gap identification - Tackling the issue

- Strong commitment from companies that believe in what they are doing
- Improving the way they approach to society the social awareness and sustainability
- Not more “colonial approach”

See: https://www.panamicansilver.com/spanish/sostenibilidad/estrategia-desarrollo-social
### The intermin approach

#### Skills catalogue and questionnaire (coming months)

<table>
<thead>
<tr>
<th>Name of career</th>
<th>Faculty/engineering</th>
<th>Mining value chain</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>exploration</td>
</tr>
<tr>
<td>1 Mining engineer</td>
<td>engineering</td>
<td>X</td>
</tr>
<tr>
<td>2 Industrial mechanical engineer</td>
<td>engineering</td>
<td>X</td>
</tr>
<tr>
<td>3 Chemical Engineer</td>
<td>engineering</td>
<td></td>
</tr>
<tr>
<td>4 Sociology</td>
<td>Faculty</td>
<td>X</td>
</tr>
<tr>
<td>5 Geologist and Engineering Geologist</td>
<td>Faculty/engineering</td>
<td>X</td>
</tr>
<tr>
<td>6 Communication</td>
<td>Faculty</td>
<td>X</td>
</tr>
<tr>
<td>7 Environmental engineering</td>
<td>Faculty/engineering</td>
<td>X</td>
</tr>
</tbody>
</table>

**Skills catalogue**

**Questionary**

- **Skills**
  - Surface and underground mining
  - Ground control and rock mechanics
  - Health and safety
  - Environmental issues
  - Ventilation
- **Knowledge**
  - Mining methods
  - Planning and design
  - Health and safety
  - Environmental issues
  - Ventilation

**Ground control and rock mechanics**

- Fixed subjects related to knowledge
  - Rock mechanics
  - Soil mechanics
  - Geotechnics
  - Monitoring
  - Labo testing

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### 5.4 Skills list proposal (add justification for each skill)

<table>
<thead>
<tr>
<th>Skill / Competence</th>
<th>Knowledge</th>
<th>Occupation</th>
<th>Justification - definition</th>
<th>Current status:</th>
<th>ABET</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface and underground mining</td>
<td>Planning and design and health and safety issues ventilation</td>
<td></td>
<td></td>
<td>classical or consolidated skill</td>
<td></td>
</tr>
<tr>
<td>Rock fragmentation</td>
<td>Explosives Mechanical Fragmentation Blast design</td>
<td></td>
<td></td>
<td>to extinguish or highly decreasing</td>
<td></td>
</tr>
<tr>
<td>Materials handling</td>
<td></td>
<td>ABET</td>
<td></td>
<td>emerging skill or future needs identified</td>
<td></td>
</tr>
<tr>
<td>Mineral processing</td>
<td></td>
<td>ABET</td>
<td></td>
<td>ABET</td>
<td></td>
</tr>
<tr>
<td>Mine surveying</td>
<td></td>
<td>ABET</td>
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<td>ABET</td>
<td></td>
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<tr>
<td>Valuation and resource/reserve estimation</td>
<td></td>
<td>ABET</td>
<td></td>
<td>ABET</td>
<td></td>
</tr>
<tr>
<td>Social license to operate / social skills</td>
<td></td>
<td>ABET</td>
<td></td>
<td>ABET</td>
<td></td>
</tr>
<tr>
<td>Community relations</td>
<td></td>
<td>ABET</td>
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<td>ABET</td>
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<tr>
<td>Project communication</td>
<td></td>
<td>ABET</td>
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<td>ABET</td>
<td></td>
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<tr>
<td>Local knowledge - native languages</td>
<td></td>
<td>ABET</td>
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<td>ABET</td>
<td></td>
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<tr>
<td>Environmental Impact Assessment</td>
<td></td>
<td>ABET</td>
<td></td>
<td>ABET</td>
<td></td>
</tr>
</tbody>
</table>

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Thanks very much!