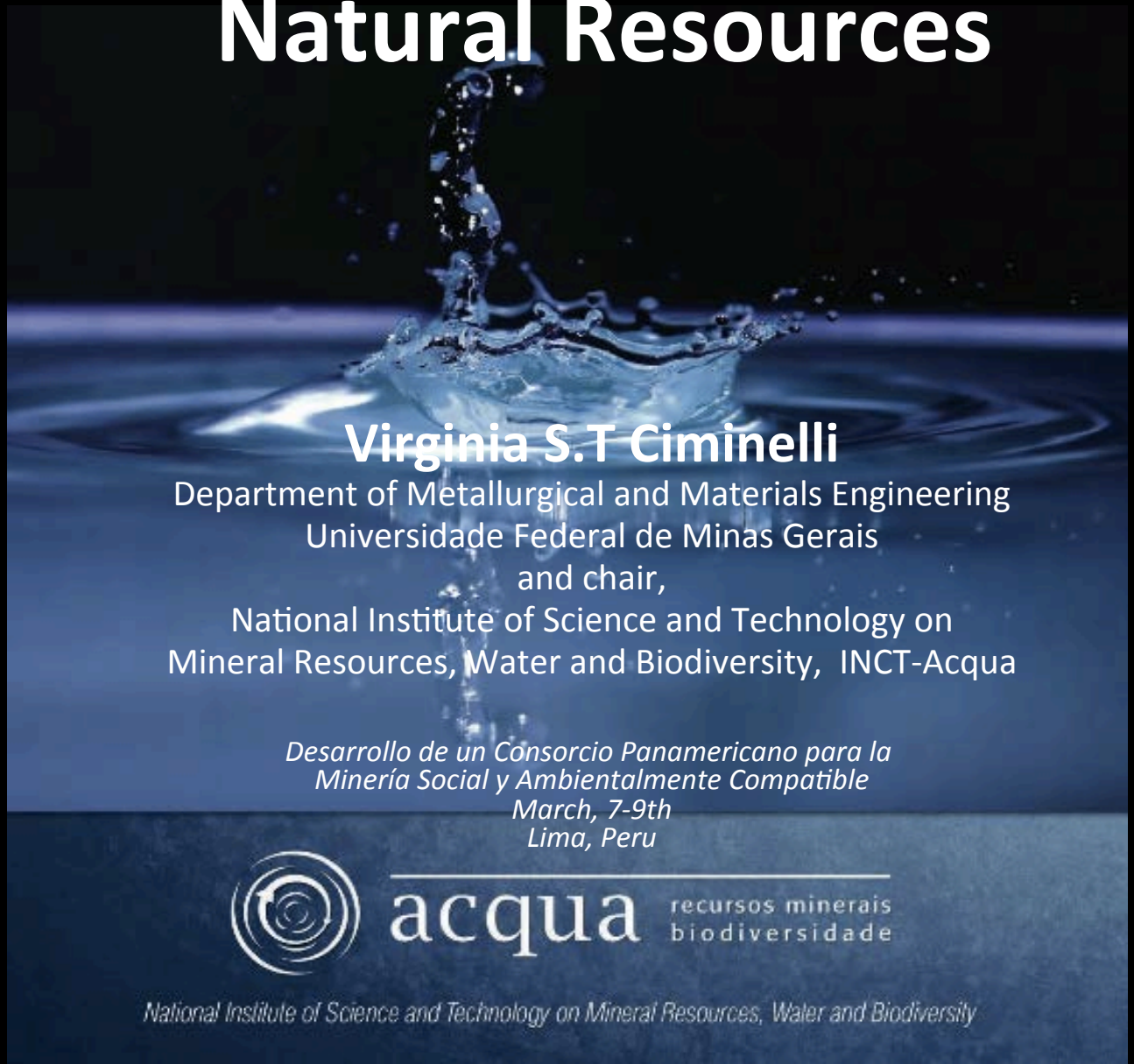
*Sources of Conflict*

# Environmental Health and Natural Resources

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*Desarrollo de un Consorcio Panamericano para la Minería Social y Ambientalmente Compatible*
*March, 7-9th*
*Lima, Peru*

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*National Institute of Science and Technology on Mineral Resources, Water and Biodiversity*

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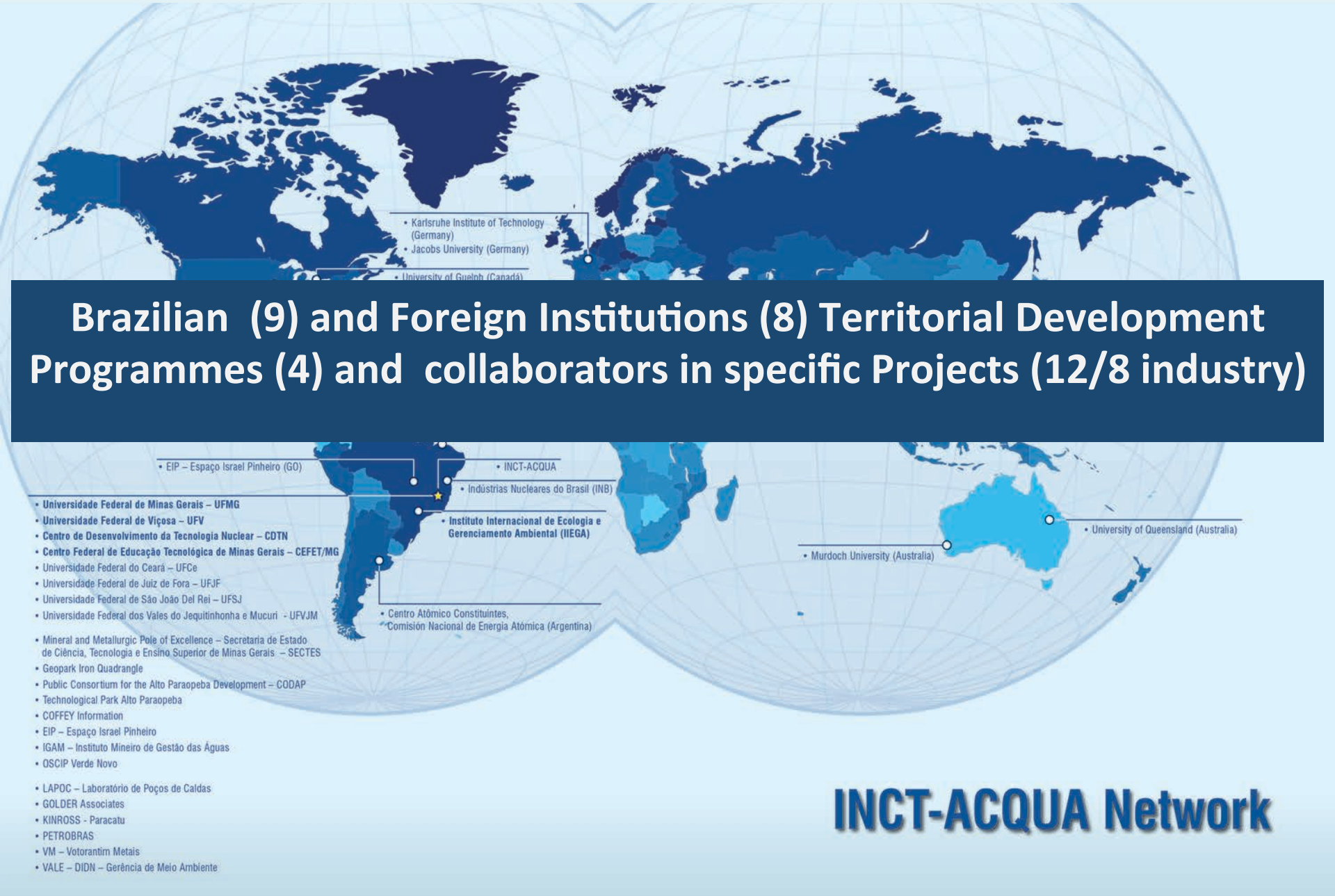


**Brazilian (9) and Foreign Institutions (8) Territorial Development Programmes (4) and collaborators in specific Projects (12/8 industry)**

# INCT-ACQUA Network

# The Mineral Sector in Brazil


8400 mines
Mineral production 4-5 % GNP
10 % value Brazil's exports
MG 53% Me ores ; 2nd most populated
(IBRAM, 2015)

Recent projects
INCT-Acqua

# Sources of conflict: potential impacts on environment quality

| Stage | Potential impacts/risks |
|---|---|
| Mining | Landscape<br>Water – quality and availability<br>Aquatic ecosystems<br>Noise and vibration |
| Mineral Processing and Metallurgy. | From emissions: aqueous, air and solids |
| | |

# Sources of conflict: potential impacts on environment quality

| Stage | Potential impacts/risks |
|---|---|
| Air particulates – mining, transportation | Air quality |
| Waste rock and Tailings disposal | Landscape<br>Soil and water contamination. Acid mine/rock drainage<br>Risks of collapse – minor to catastrophic |

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A combination of large scale mining operations, urban expansion and climate change create significant pressures on the natural resources
How to harmonize the mineral sector's activities with environmental quality and social development?
Ouro Preto, MG

# Sound and reliable information on natural resources should be available

**Case Study 1:**
**Alto Paraopeba** one of the fasted-growing area in the “Iron Quadrangle”, MG.

The state holds 3.5% of the total Brazilian freshwater (~12% world freshwater).

Severe drought. **Water discharge has decreased to 78% of the expected values since 2007.**

**What is the contribution of mining?**

Gasparon et al., 2016

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# Sound and reliable information on natural resources should be available

**Water governance:**

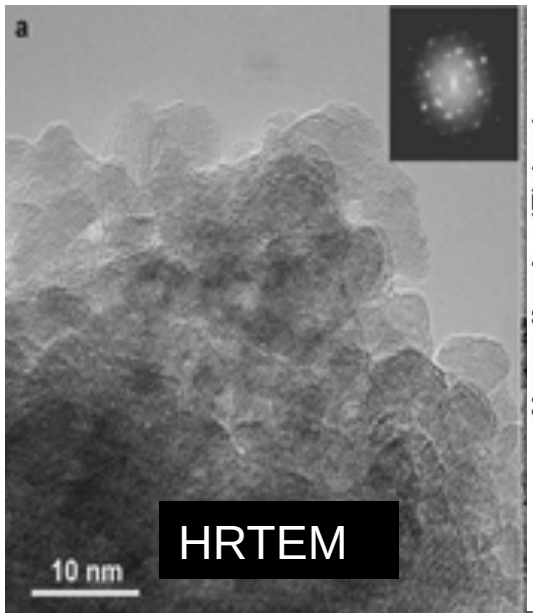
- improved water accounting, with extended network of accurate and reliable monitoring data
- detailed knowledge of the region's hydrology and hydrogeology, with assessment of overlapping effects and connectivity
- innovative approaches to water use, re-use, recycling and conservation
- a redefinition of the "value" of water, by taking into consideration all the services water delivers

# Sound and reliable information on natural resources should be available

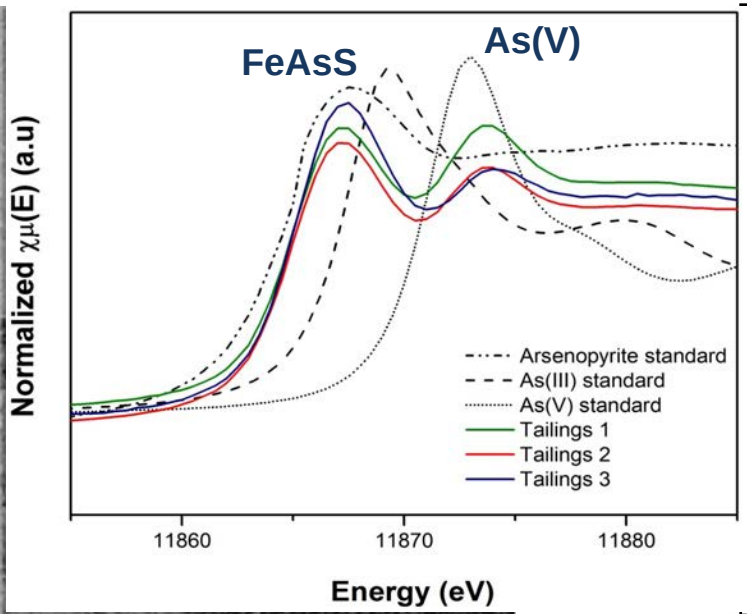
## Soil and Air :

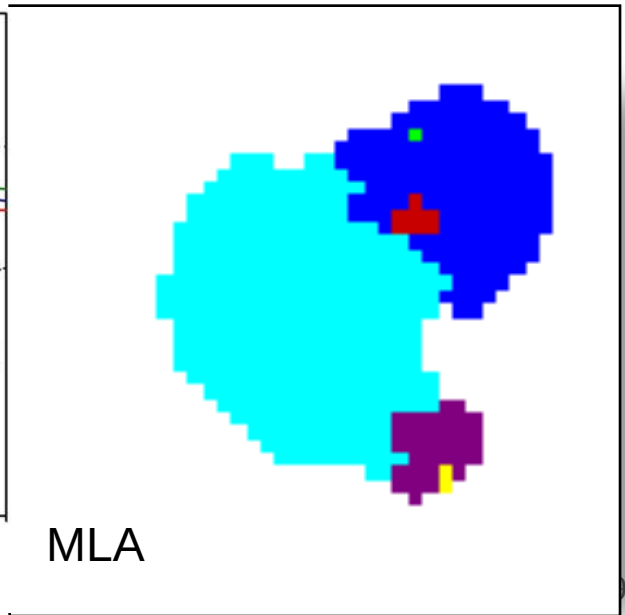
- Total vs. Bioacessible concentration.
- Identification of  the “source”  of particulate matter and Speciation.

Chemical nature, oxidation state, association with other constituents




HRTEM



MLA

# Final Considerations

Access to information has a key role to ensure stakeholders engagement and a mature dialog.

- Education to all levels is needed
- Capacity building - regulators and environmental agencies
- More effective communication.
- Who should play the role of mediator?

Truck Aqua Mundo

Escola da Água de Minas

Oficina Territorial de Educação Ambiental na Agricultura

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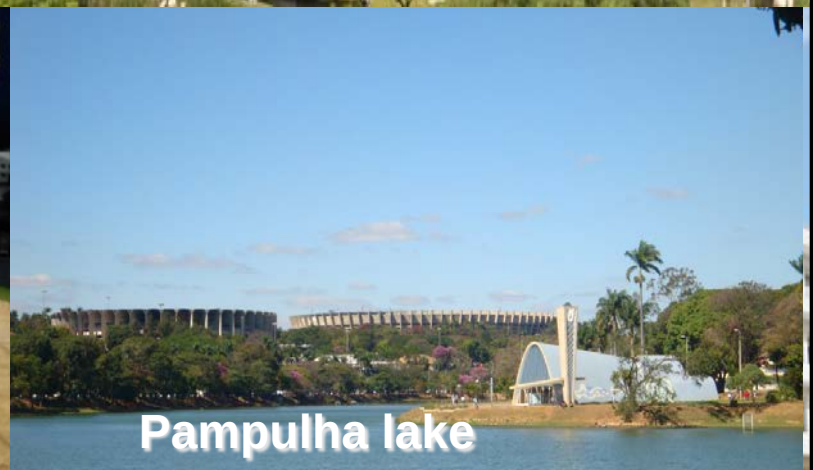
# UFMG – Universidade Federal de Minas Gerais


## School of Engineering



Pampulha lake

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