

Mineral Resource Potential and Mining Practices in Pakistan

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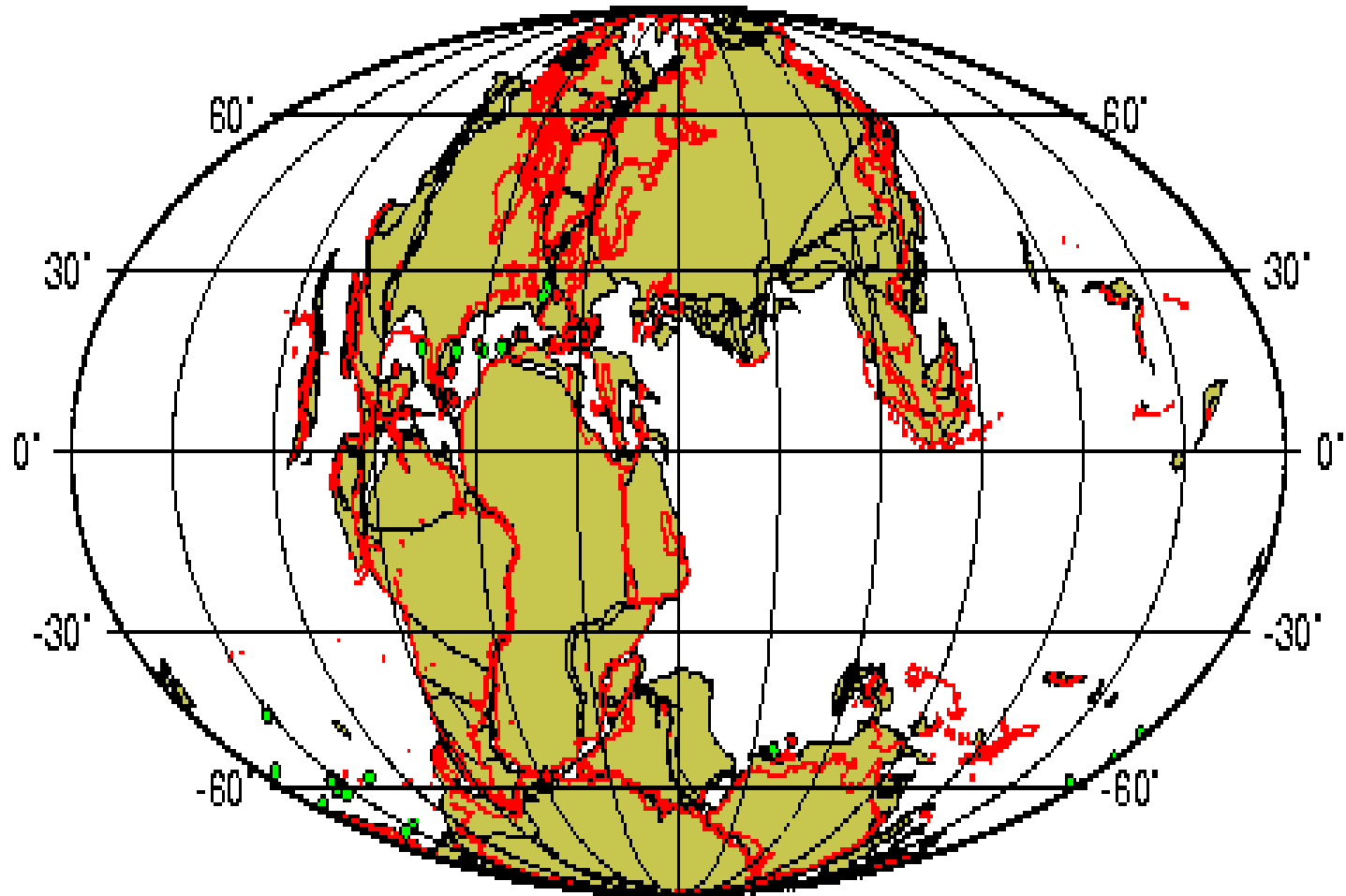
National University of Sciences & Technology (NUST)

Pakistan

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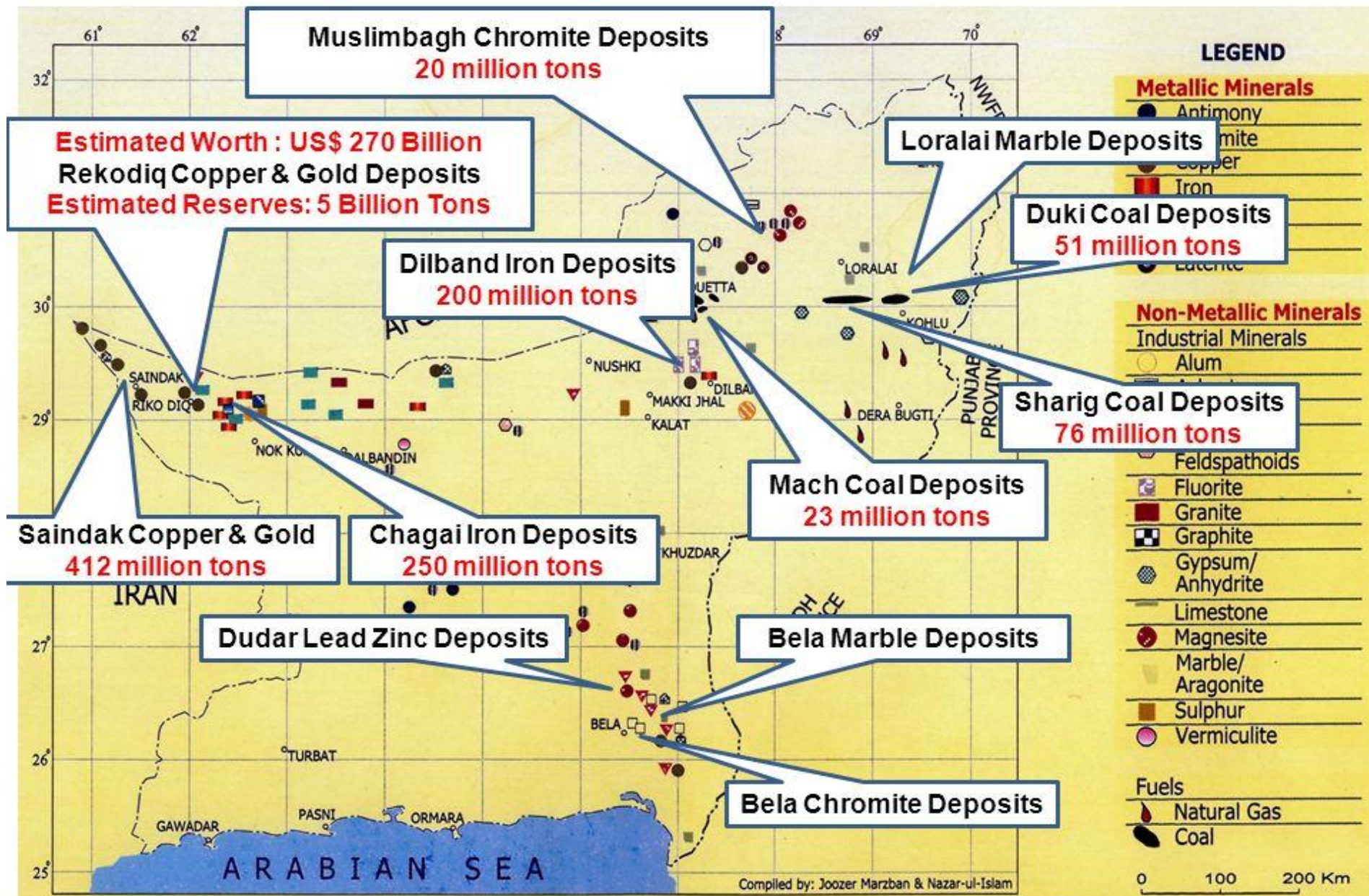
- Mineral Resource Potential
 - Geological Perspective
 - Global Perspective
 - Local Perspective
- Mining Practices
- Challenges
- Opportunities

Our Geological History



150 My Reconstruction

Our Geological History



Mineral Resource Potential

- Geological Perspective



Mineral Resource Potential

- Local Perspective

- * **Reconnaissance mapping on 1:250,000 scale of the entire outcrop region of the country has been completed**
- * **Systematic geological mapping of about 50% of the outcrop region on 1:50,000 scale has been completed apart from the large scale mapping of the priority areas of identified mineral deposits**
- * **Aeromagnetic survey of an area of 112,000 sq. km has been carried out in the Provinces of Balochistan & Sindh**

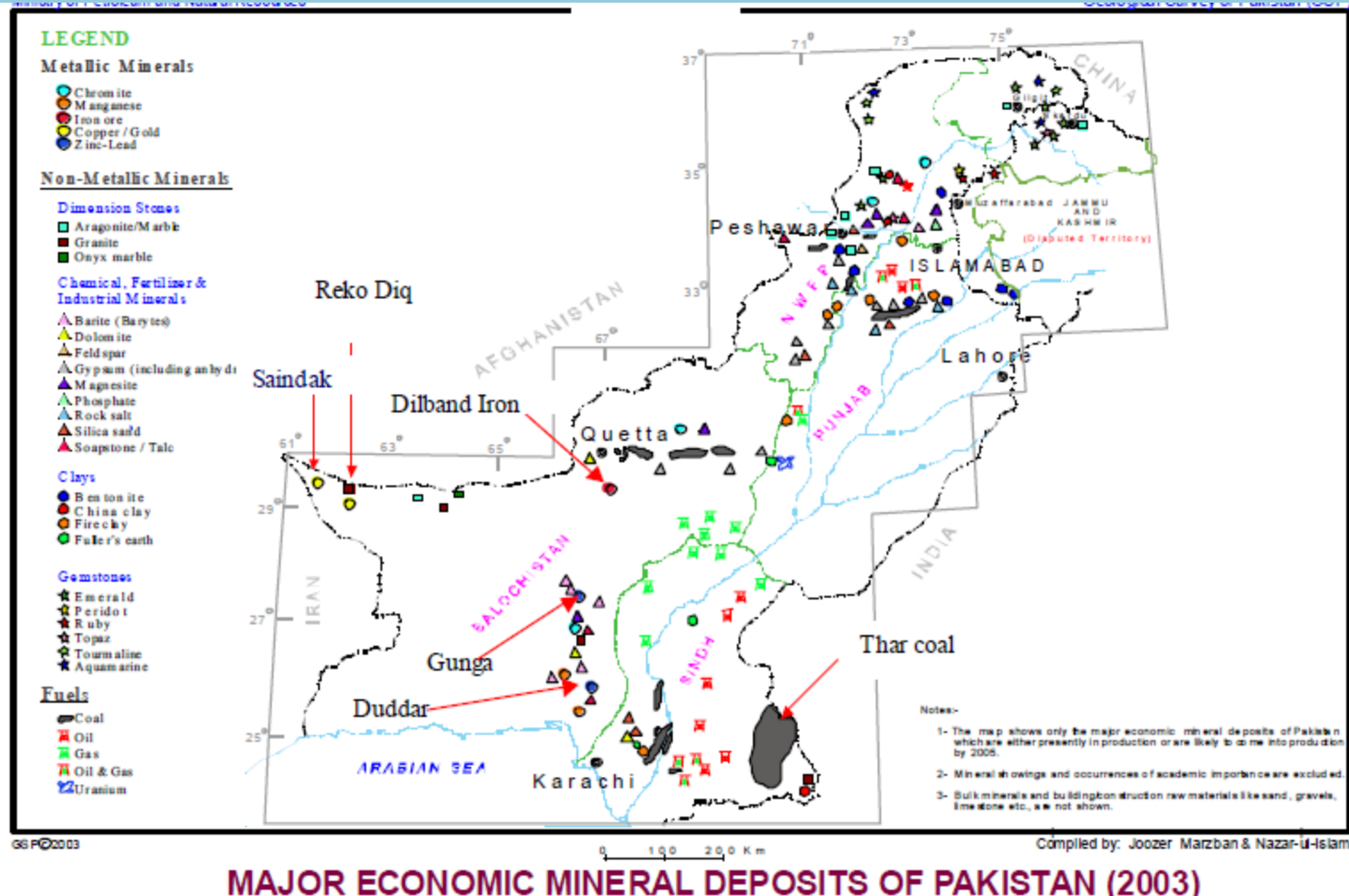
Mineral Resource Potential

- Local Perspective

- * **About a 188,000 sq. km. of an area has been covered by different types of geophysical surveys and 15,000 sq. km. by geochemical surveys**
- * **2,746 bore holes with a cumulative depth of 525,000 metres have been drilled in support of mapping, research, mineral exploration, engineering & hydrogeological investigations**

Mineral Resource Potential

- Local Perspective



Mineral Resource Potential

- Local Perspective

- Saindak & Reko Diq Copper - Gold Deposit**

- Saindak**

Reserves	> 400 million tonnes
Copper	= 0.4 % with 1.7 million tonnes
Gold	= 2.24 million ounces

- Reko Diq Copper – Gold Deposit**

- One of the world's biggest deposit discovered by GSP in 1978-79
Presently M/S TCC is investing 150 million US \$ to develop the deposit
which is expected to start production within 2 years.

Reserves	> 800 millions tonnes
Copper	= 0.64% with 50 million tonnes
Gold	= 9 million ounces

Mineral Resource Potential

- World Bank Perspective

Existing geological anomalies under varying stages of investigation by Geological Survey of Pakistan and the state owned Regional Development Corporations are economically interesting and comprise among others, the Duddar zinc-lead deposit, the Saindak copper-gold deposit, Punfmin iron ore deposit, the AKMIDC poly-metallic deposit and the private sector porphyry copper/gold prospects at Tethan Copper and Reko Diq. Based on the experience of other countries with similar geological endowment, it is estimated, that under reasonable assumptions these could be turned to account and generate significant growth and local economic development. Even if these occurrences represent 25% of the country's potential, the mineral sector with sufficient capital and a favorable investment climate has the capacity to contribute annual revenues and foreign exchange in the range of \$1.5-2.0 billion or 2-3 % of GDP, stimulate secondary and tertiary economic activity, promote growth and provide employment and community development in largely remote regions of the country. The main reasons why this potential has not been developed seems to be the country's traditional focus on manufacturing and agriculture, and an unattractive investment climate.

Mining Practices in Pakistan





SML

means

Saindak Metals Limited

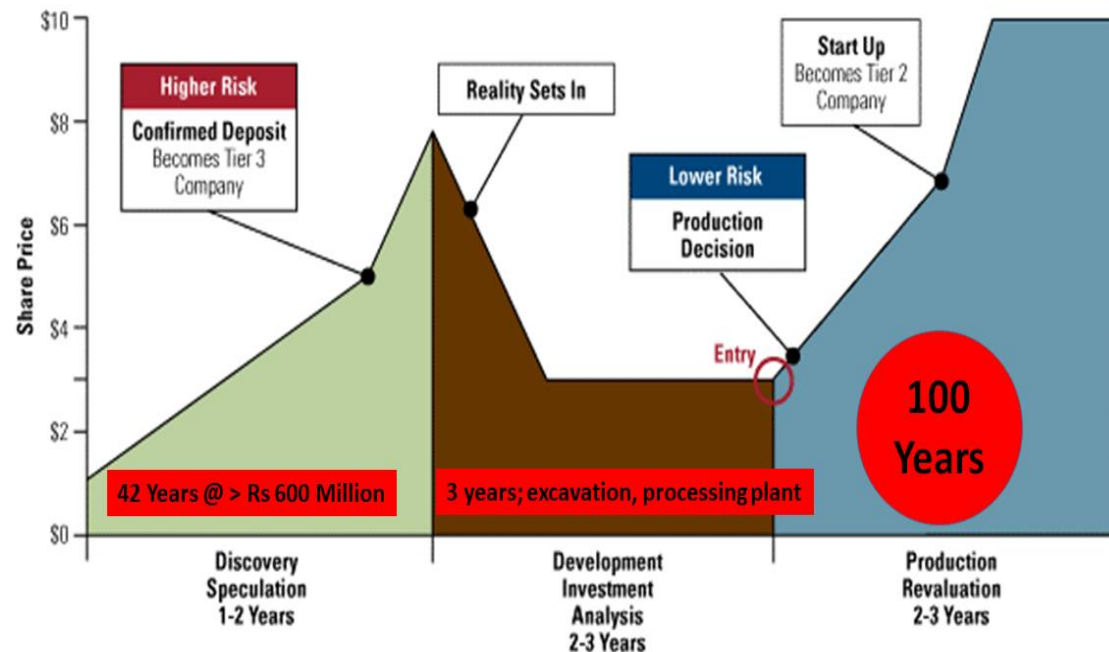
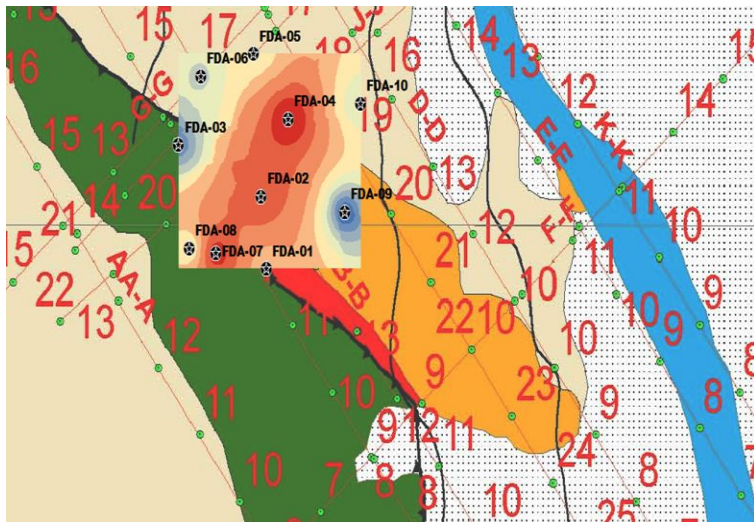
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Mining Cadastre System

Exploration and Estimation Gaps

- **Exploration**

- Prospects or prospect
- Shape, orientation, and extents of the ore body
- Maximum depths and extents
- **Code of practice**
- **Geological data management system**



Challenges

- **Knowledge Gaps**
- **Technology Gaps**
- **Social-Political-Economic Factors**

School of Advanced Geomechanical Engineering (SAGE)

Our Vision

SAGE aspires to provide leadership in geomechanical capacity bldg of the Army and Nation through optimization of existing practices and innovations to deal efficiently with 21st century challenges and opportunities.

Our Mission

Impart Pakistan-specific postgraduate education with cutting edge research to solve complex geomechanical problems with a view to bridge the knowledge gaps and evolve sustainable solutions through national and international collaborations.

School of Advanced Geomechanical Engineering (SAGE)

Department of Mine
Ventilation, Health and
Safety Systems

Department of
Mechanized Mining &
Bulk Material Handling
Systems

Department of
Geomechanics

Department of Mineral
Resource Management,
Policies and Economics

Department of
Earthsciences and
Disaster Management

Geotechnical

Mining

Tunneling

Size, Substance, Style

- Wits, South Africa
- SCME
- IE&SE

MS and PhD

- Rock Engineering
- Geotechnical Engineering
- Environmental Engineering
- Disaster Management

MS and PhD in Earthsciences

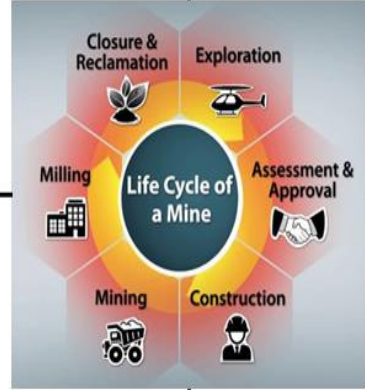
- Wits South Africa
- IGIS (NUST)

- Wits South Africa
- NBS (NUST)
- SNS (NUST)

- Wits, South Africa
- SCME
- College of E&ME
- SMME
- Itasca, USA

MS and PhD

- Mineral Processing
- Bulk Material Handling Systems



MS and PhD

- National Mineral Policy and Cadastral System
- Mineral Resource Management
- Mineral Economics and Policies
- Mineral Laws and Taxation
- Mineral Marketing
- Mine Health and Safety

- Wits, South Africa
- College of E&ME
- SMME
- Itasca, USA
- SWJT, China

MS and PhD

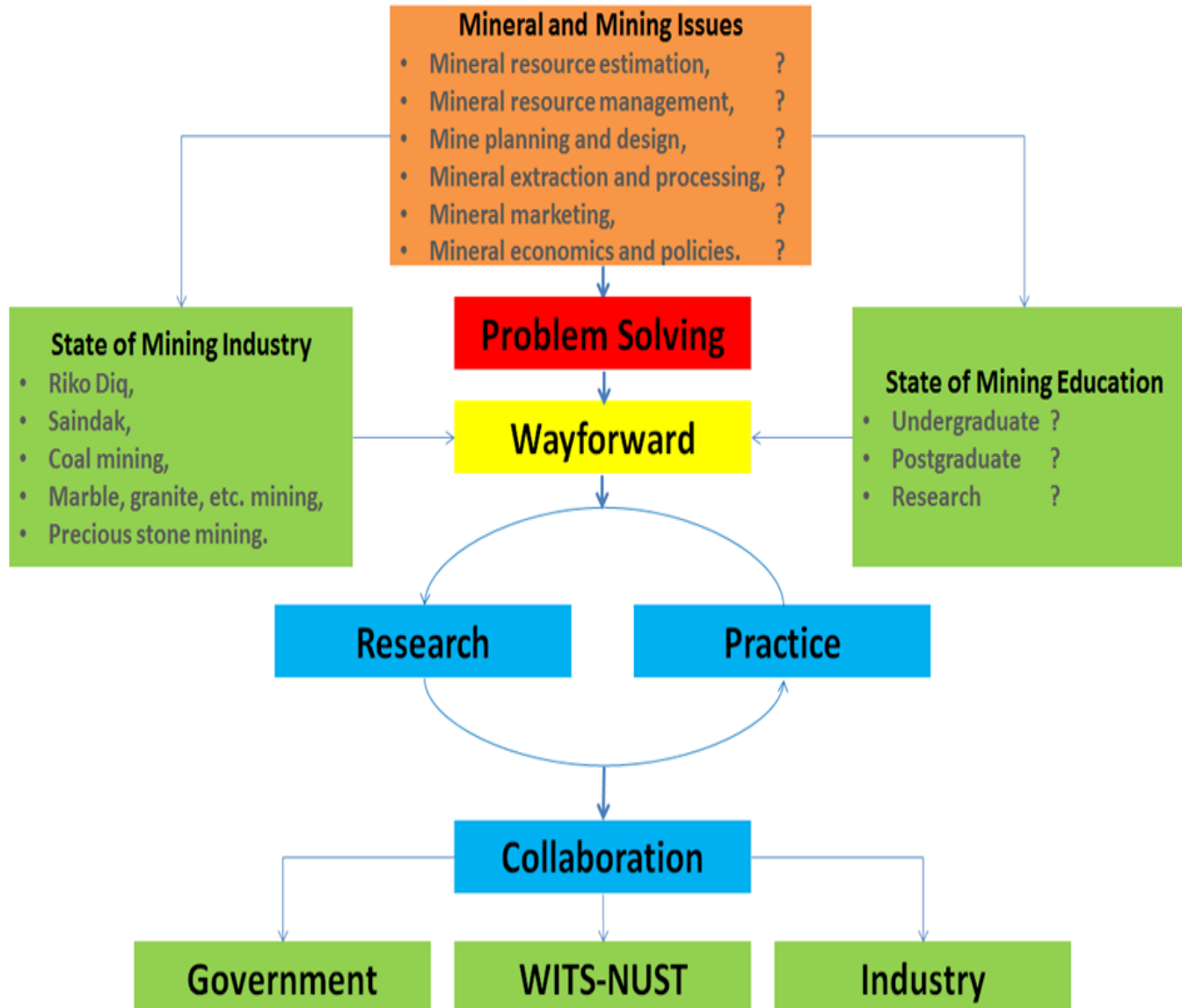
- Mechanized Mining System
- Bulk Material Handling Systems
- Rock Engineering
- Geotechnical Engineering
- Tunneling Engineering
- Mine Blasting
- Mine surveying
- Mine Ventilation, Health and Safety

MS and PhD

- Rock Engineering
- Geotechnical Engineering
- Tunneling Engineering
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- Mine surveying
- Mine Ventilation, Health and Safety

- Wits, South Africa
- Itasca, USA
- SWJT, China

Research Mechanism



Our Collaborators



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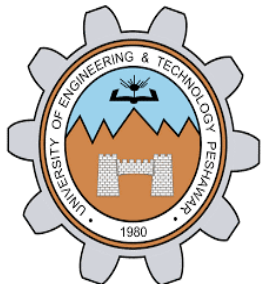
 **srk** consulting




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INSTITUTE OF MOUNTAIN HAZARDS AND ENVIRONMENT, CAS



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What Will it Take to Realize Pakistan's Mineral Potential?

Bridging the Gaps

SAGE

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