

Sustainable Development of Minerals Education at the University of Zimbabwe

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Outline

- General Introduction
- Revamping Mineral Education at UZ
 - Establishing UZ-Zimplats Professorial Chair
 - Staff Development
 - Infrastructural Development
 - Research and Services
 - SWOT Analysis
- Concluding Remarks

It all begins with Mining..

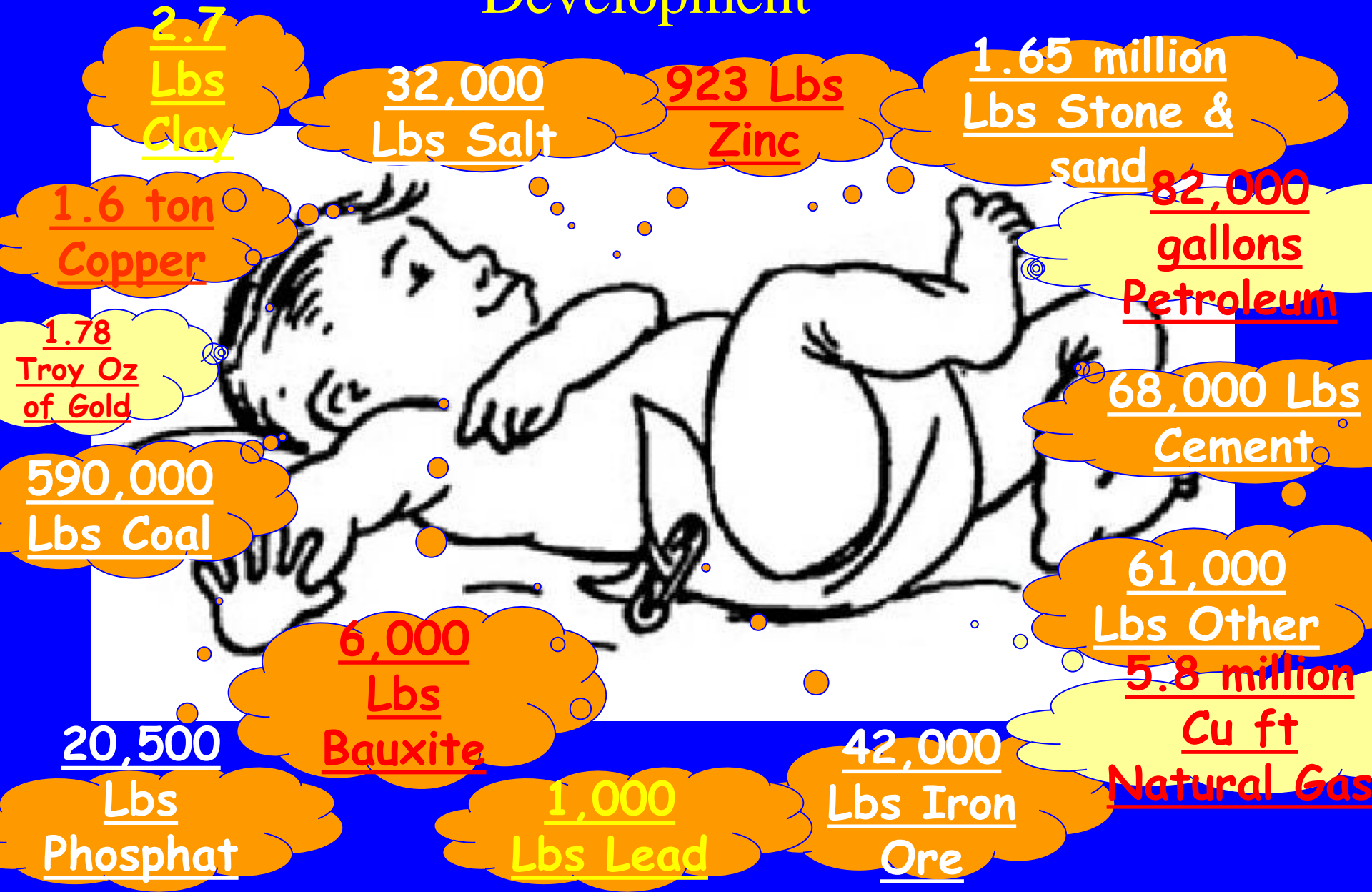
If you cannot **grow** it,
you have to **mine** it.

Geology..

Before you mine,

You have to discover it

Contribution of Mining to Economic Development



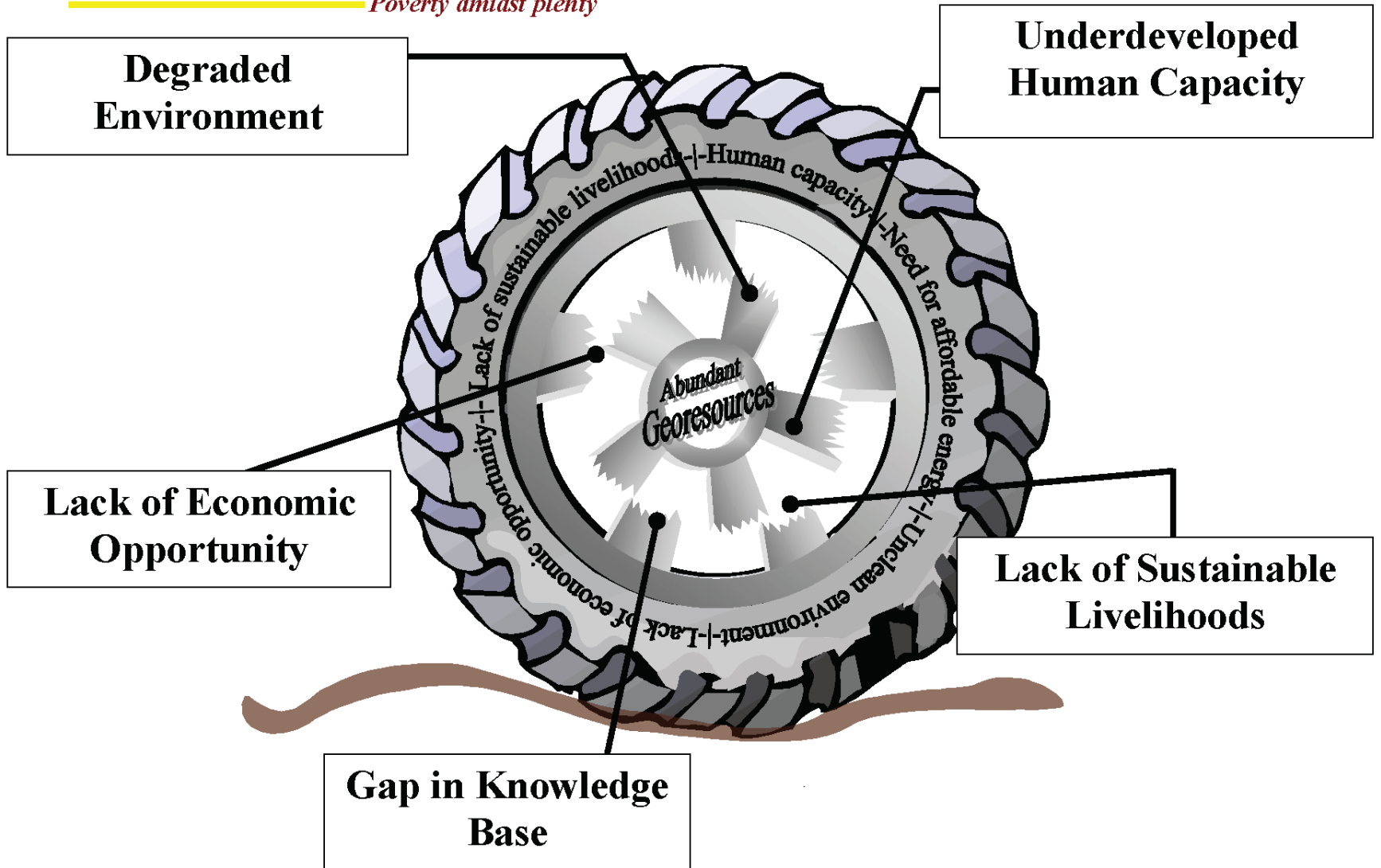
“The **mining sector** will be the centerpiece of our **economic recovery** and **growth**. It should generate growth spurts across sectors, reignite that economic miracle which must now happen... More **mineral deposits remain unknown**, unexplored... Above all we need to move purposefully towards **beneficiation** of our raw minerals.”

President R.G. Mugabe

Inauguration speech August 22, 2013

The Paradox

Poverty amidst plenty



AESEDA Solution

Let's fix it!



Integrated Technical Education

Develop novel Georesources Engineering Management (GEM) curriculum that integrates core physical sciences and engineering principles with social sciences constructs. GEM will produce a socio-environmentally conscious workforce that can enable the *georesources* industry within new environmental paradigm and help develop and support new business ventures.

Entrepreneurship

Integrate entrepreneurship into technical curricula (GEM). GEM products will have the entrepreneurial skills needed for effective participation in business development and economic activities.

Creation of Knowledge

Build infrastructure and capacity for basic research and scientific investigation that will lead to clear identification of the salient causative factors and develop solution strategies.

Institutional Capacity

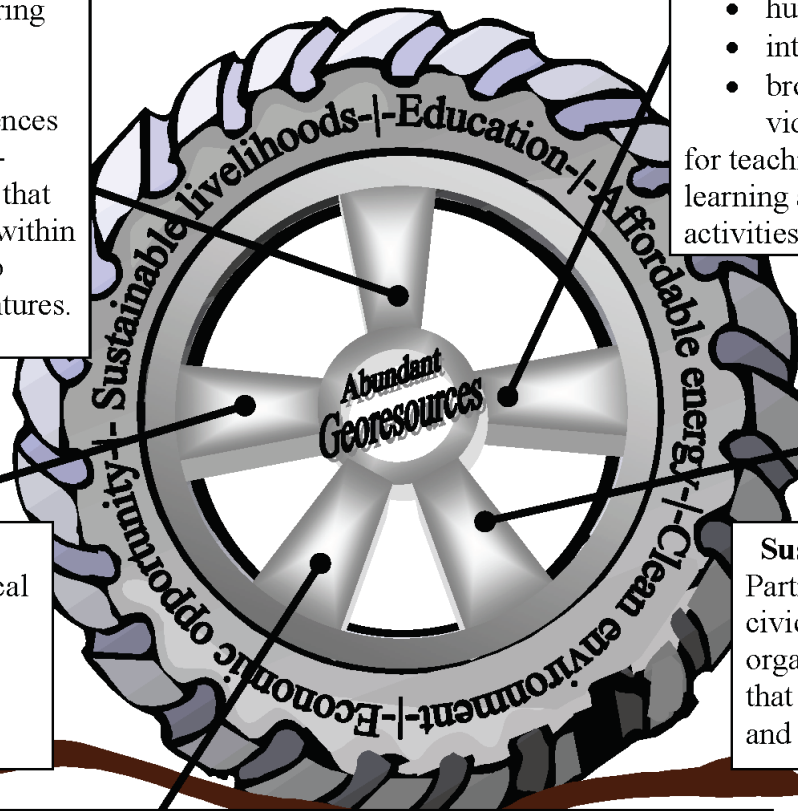
Develop and support:

- human capacity
- integrated laboratory facilities
- broadband connectivity and videoconferencing facilities

for teaching, research, distance learning and community development activities and international

Sustainable Development Policy

Partner with government agencies, civic groups, and international organizations to formulate policies that favor sustainable development and transparent business practices.



Education: Foundation for a Prosperous Society



“Our progress as a nation can be no swifter than our progress in education. The human mind is our fundamental resource.”

John F. Kennedy
(1917 - 1963)

Revamping Mineral Education at UZ

Sustainability

- ‘The ability to meet the needs of the current generation while preserving the ability of future generations to meet their needs.’
- ‘Preserving the things you cannot live without and preserving them forever.’

Anastas, “Meeting the challenges to sustainability through green chemistry”,
Green Chem., 2003, G29-G3

Sustainability...

- "The Stone Age did not end for lack of stone, and the Oil Age will end long before the world runs out of oil"

-- Sheikh Zaki Yamani, a Saudi Arabian who served as his country's oil minister three decades ago

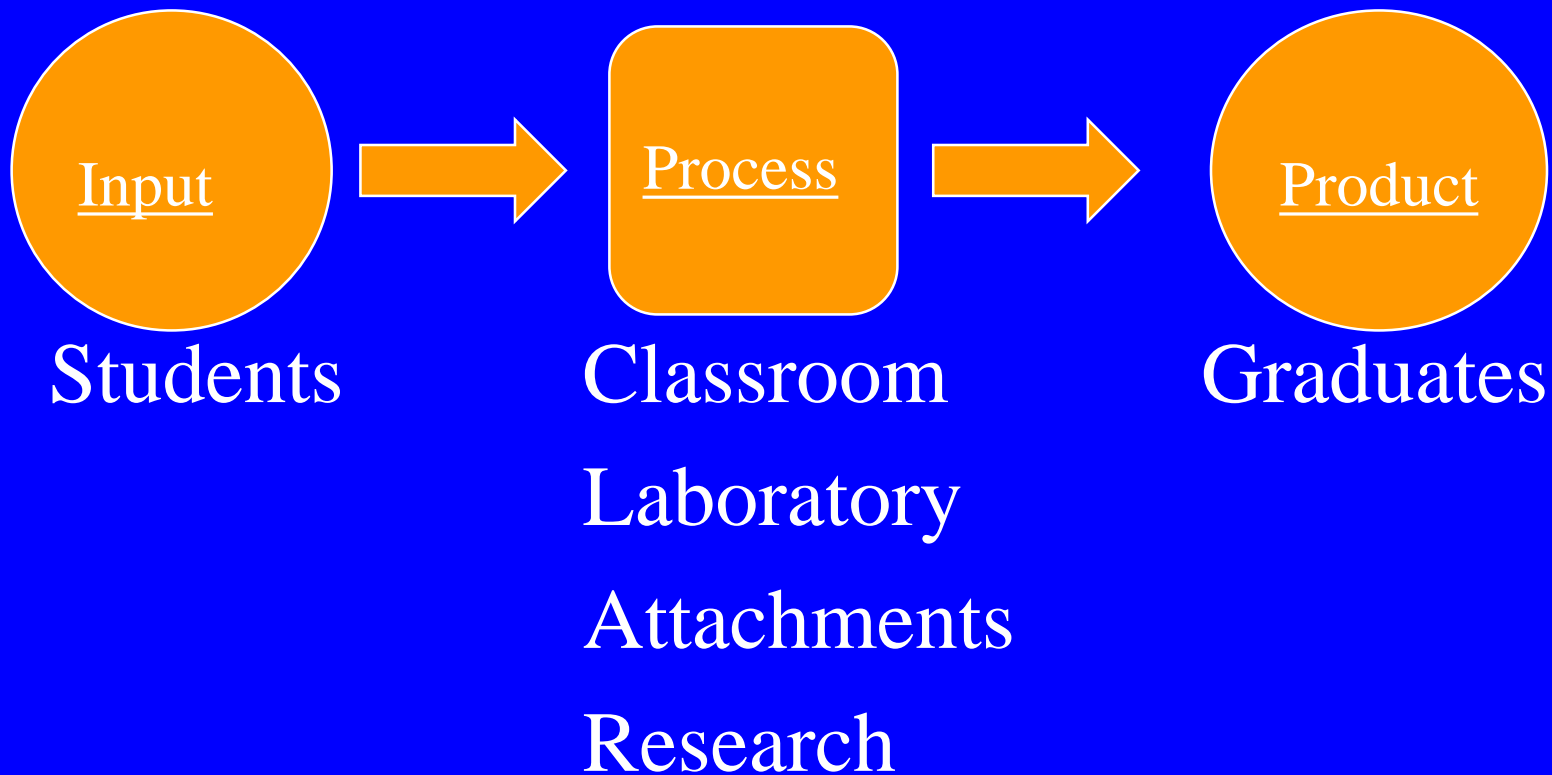
Quoted by the Economist, [The End of the Oil Age](#), 23 Oct 2003

Sustainability...

Sustainability and program ranking depends on the quality of:

- **Students**
- **Academic Staff**
- **Infrastructure**
- **Support technical services**

Training Process



Mineral-Related Programs at UZ

- Geology
- Mining Engineering
- Metallurgical Engineering
- Institute of Mining Research
- Environmental Engineering
- Material Science and Engineering
- Mineral Economics
- Mineral Management Policy

University Strategic Plan 2016-20

Strategic Thrust 1: Postgraduate training - rebrand and develop new PG programs

Strategic Thrust 2: Innovative research - patenting, IP protection & revenue generation

Strategic Thrust 4: Talent management (critical staff training and retention)

Strategic Thrust 8: Infrastructure Development – state-of-the-art infrastructure

Geology, Mining and Metallurgical Engineering

- Teaching, Research and Service
 - Renovation of teaching laboratories and research infrastructure
 - University – Industry Consortium
- Human Capacity Development
 - Academic manpower
 - Industry manpower requirements
- Curriculum Review

Academic Staff (10/5/2017)

Staff	Geology	Mining	Metallurgy
Professor	0	1	1*
Other	2	1 + 5	1 + 3
Staff Development Fellowship			
Ph.D	0	0	2
MS/M.Phil	0	3	3
Vacancy	13	1	0

Academic Staff

- **In-breeding issue:** Staff with with diverse educational background
- **Depth and breadth:** to cover areas of the curriculum, service to industry

Staff Training Strategy for Departments

Staff Development Strategy

- **Geology**: Mixture of external institutions and UZ (6 MSc and 12 D.Phil).
- **Metallurgy**: Mixture of external institutions and UZ (8 D.Phil. –2 underway).
- **Mining**: Mixture of external institutions and UZ (8 D.Phil.)

Infrastructure

Equipment	Category
SEM, ICP-MS, XRD, XRF, AAS, TG-FTIR, etc.	R
Mini Pilot Plant Flotation System	R
Geology Laboratories	UG/R
Metallurgy Laboratories	UG/R
Mining Laboratories	UG/R

UZ-Industry Consortium

- Identifies research and development opportunities of interest to Member companies, and develops research projects that will realize these opportunities
- Six areas: Geosciences, Mining Engineering, Mineral Processing, Extractive Metallurgy, Sustainability, value addition
- Companies provide funding for research to be carried out at IMR

Strength

- **Strong sponsor (Zimplats) support.**
- **Strong UZ buy-in (>\$500K invested in human capital development to date).**
- **Renaissance of Zimbabwe economy tied to fortunes of mining industry.**
- **Supports government policy on industrialization.**

Weakness

- **Staffing issues**
- **Lack of functional teaching and research laboratory facilities.**
- **Poor private sector financial support to UZ.**

Opportunity

- **No research institution supporting developments in the mining industry.**
- **Developing a Centre of Excellence (COE) to service the mining industry in Zimbabwe and sub-region.**
- **Potential for discovery and recovery of new mineral resources.**

Threat

- **Setting up of PAMUST in Zimbabwe**
- **Drop in commodity (base metal) prices.**
- **Lack of buy-in and support of initiative from the other mining houses.**
- **Retention of trained faculty beyond their bonded period.**

Concluding Remarks

- The establishment of closer UZ – Industry partnerships to develop and evaluate new technologies.
- **Building human and institutional capacity to service the mineral industry**
- Modernize laboratory and analytical facilities at UZ to deliver high quality service to mineral industry

Acknowledgment

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Thank you!

