



Natural Resource Management at TTU

Mining Education and Rare-Earth Mineral Resource in Kenya Workshop

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Presentation Outline

- Introduction
- Environmental damages of mining
- What TTU is doing
- Structure of TTU's MBA (NRM)

Introduction: Mining & Environment

- Unregulated mining has the potential to release harmful substances into the soil, air, and water.
- The potential dangers may be tackled through:
 - Government regulation on companies
 - Use of cutting-edge technologies to curtail damage
- As more mines open, it is important to have sufficient safeguards in place for environmental protection

Environmental damages of mining

- Open pit mining
 - crushed rocks may expose radioactive elements
 - Metallic dust is produced
 - Residual rock slurries may transmit radioactive materials to the bedrock if handled poorly
- Underground mining
 - Associated with tunnel collapse & land subsidence
 - Large scale movement of waste rock & vegetation
 - Release of toxic compounds into air, water

Environmental damages of mining

- In Situ leach (ISL) mining-ore is dissolved & pumped out
 - Strong acids used to dissolve the ore body commonly dissolve metals in the host rock as well
 - The residual fluids contain elevated concentrations of metals and radioactive isotopes, posing a significant risk to nearby ground and surface water sources
 - The low pH of ISL mining wastewater can result in acidification of the surrounding environment

Environmental damages of mining

- Heap Leaching
 - Process solutions may not be kept within the heap leaching circuit
 - Release of toxic heap leaching fluids into the environment can affect the health of both the surrounding ecosystem and human population
- Brine mining-extracting and evaporating the brine solutions
 - Harmful elements & compounds are released into the environment
 - Leakages can contaminate adjacent water bodies

What TTU is doing

- With increasing discovery of minerals, mining is bound to expand
- If not handled well, the industry will not be sustainable
 - Environment will be degraded
 - Future generations may have their benefits compromised
 - Dutch disease may result
- **NB: it is better to guard against the above**

What TTU is doing...

- TTU has introduced a unique programme, MBA (NRM)
- Goal:
 - To equip learners with economic tools for sustainable management of environment and natural resources
 - To train learners in policy analysis in the area of environment and natural resource management
 - To equip learners with skills to undertake economic valuation of resources for which there are no markets
 - To train environmentally aware mine/mining managers

Structure of MBA (NRM)

Core business management courses:

- Contemporary management
- Statistics for Business
- Marketing management
- Management information systems
- Managerial economics
- Investment and Finance

Structure of MBA (NRM)...

Core business management courses:

- Principles of environmental management
- Human resource management
- Strategic management
- Innovation & change management
- Business research methods
- International Law of resource and environment

Structure of MBA (NRM)...

Specialized NRM Units:

- Sustainability management
- Economics of Resources
- Environmental management systems
- Natural Resource Management Seminar
- 2 elective units
- Research Project (Equivalent to 5 units)—on NRM

End

Thank You for listening