UNU-INRA MINERAL RESOURCES UNIT (MRU) 
LUSAKA, ZAMBIA.

SUMMARY REPORT OF ACTIVITIES 1991- 2011

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UNU-INRA 25th Anniversary - International Conference on Sustainable Development of Natural Resources in Africa, December 5-7, 2011 
ACCRA, GHANA
Historical Background

Noted

• African governments were concerned about obstacles that undermined the ability of many African countries to benefit fully from their vast mineral resource endowment.

• Africa’s dependency on industrialized countries for technical expertise, finance, and markets for the development of its minerals and mineral products.

Agreed

• There was need for Africa to solve these problems effectively and to take bold action in order that the various countries can benefit properly from their mineral resources endowment (Lagos Plan Of Action).
Realized

• Need to formulate different **mineral resources policy options** particularly in:

  - mineral exploration,
  - mine development,
  - mineral processing and
  - value addition,

For internal or multi-country use and industrialization of Africa
Strategy

• For an urgent need for African countries to ensure that enough trained manpower was available in technological, managerial and policy areas of mineral resources utilisation.

Expectation

• UNU-INRA would make a contribution to these efforts through professional manpower training programs, related R & D work, policy studies, and information dissemination.
MINERAL RESOURCES UNIT  
(UNU/INRA-MRU)

Genesis

- UNU-INRA required in its first phases a capital or endowment fund of same US$50M expected to yield US$6 to 7M/a in interests to guarantee a minimum annual income for effective, creative work on a continuing and assured basis.

- The Government of the Republic of Zambia (GRZ) made a pledge of US$2.0 million towards UNU-INRA’s endowment fund and, because of its vast mineral resources and long history of mining, offered to host the Institute’s Mineral Resources Unit (MRU) at the School of Mines of the University of Zambia as the first “Cell of excellence” or Operating Unit of UNU-INRA.
• In 1985 an MoU signed between GRZ and UNU, gave effect to the establishment and location of the MRU at the School of Mines, where it started operations in April 1991 as the first “Operating Unit” of UNU-INRA.

• By 1990 GRZ had made a total down payment of US$1,241,387.34 to the UNU towards the endowment fund of UNU-INRA, leaving a balance of US$758,612.66.
It was envisaged that the offer by the GRZ to host the MRU will enable UNU-INRA to undertake capacity building project activities without delay, by building on the work and facilities of the School of Mines. These activities would benefit from the well-established mining sector in Zambia and neighboring countries where field work could be carried out.
Mandate

MRU would concentrate its work in the priority areas of mineral resource endowment, technology and management, and mineral policy options through:

- Undertaking research and development work
- Provide advanced training for scientists, technologists, managers and engineers
- Participate in scientific and technological information activities
- Host conferences, seminars, workshops and panels
- Provide consultancy services
- Facilitate the work of networking with other stakeholders such as members of the CRA of UNU-INRA and industry.
Achievements

• Research and training has been going on at MRU at a very low level mostly with support in form of small grants from UNU and INRA and others organisations.

• Work at MRU has been restricted to research directed at contributing to the improvement of household food security.

• Areas of priority include the restoration and maintenance of soil fertility including the use of indigenous agro-minerals such as phosphate rock, agriculture lime, gypsum etc. as affordable soil improvements for use by resource-poor rural farmers.

• Manned by a Coordinator, a Special Professional Assistant and a Bilingual Secretary.
  – Coordinate Multidisciplinary Research
Accomplishments

1. **First Training Course**: “Mineral Resources in Africa and their Management for Sustainable Development”.  
   This course brought together participants from various parts of Africa in various discipline related to Mineral resources management.

   Legal experts from all over Africa considered and exchanged views on legal issues crucial to mineral resources management in Africa.

Topics covered during the conference included phosphate resources, characterization of the phosphates, agronomic evaluation of phosphate and experiences gained on the use of phosphate by farmers.

Topics covered included, Finance, Marketing and operational and processing constraints faced by women, mostly gemstone and precious metals small-scale miners. Issues of environmental impact of mining were also covered.
A collaborative research project between the School of Mines and School of Agricultural Sciences conducted to study the effectiveness of PAPR on various field crops on various soil types in Zambia.
6. **PhD Studies on the Optimization of Production Parameters of Partially Acidulated Phosphate Rock (PAPR).** 2001 - 2003

- The only PhD study programme carried out at MRU since inception was designed to streamline all parameters required for efficient and cost effective production of PAPR for easy affordability by resource-poor rural farmers.

PhD Student Optimizing PAPR production at School of Mines’ Pilot Plant.
The program aimed at equipping small-scale miners, individuals and/or organizations involved in mining and trading of gemstones with basic knowledge and skills in gemstone identification, valuation and faceting (value addition). This is one way of ensuring that the gemstone industry contributes significantly to the growth of the Zambian economy in general and to poverty alleviation particularly in rural areas where these gemstones are located. On completion students should be able to:

- Identify the major gemstone types;
- Conduct best mining practice of gemstone;
- Carry out a valuation of gemstones;
- Add value to gemstones by faceting;
- Conduct their own marketing of gemstones.
11. **Stakeholders’ workshop on promotion of the use of Agricultural Lime**. 20\textsuperscript{th} October, 2006.

The workshop brought together stakeholders including producers, researchers, farmers, donors, private and public institutions to deliberate on the use of Agricultural lime in mitigating soil acidity for improved crop yields.

- This project aimed at answering to the challenge of increased food production and improved human livelihoods in Zambia using locally available inputs of aquatic weeds such as water hyacinth (*Eichhornia crassipes*) and *Salvinia (Salvinia molesta)* together with local phosphates (PAPR).
13. **A Study of Phosphates and Lime Material from Nkombwa Hill and Matanda.** 2007 - to date

- A collaborative research between UNZA and MRU to study phosphates and Agric lime materials from Nkombwa Hill in Northern Province and the potential use of carbonate rocks from Matanda in Luapula Province for liming and soil improvement.

*Field work at Nkombwa hill*
Future plans and Challenges

Outlook

• Under the general directions of UNU-INRA and within the framework of the Institute’s strategy the MRU would concentrate its work in the priority areas of mineral resource endowment studies, environmental aspects, technology and management, and mineral policy options.

Challenges

• The objective of MRU is to carry out research and development work and provide post graduate or advanced training for scientists, technologists and engineers in the priority area of mineral resources exploitation for sustainable development of Africa. This has been greatly impeded by constraints in financial resources inflow to MRU to carry out its mandate.
Advantage/Strengths

- Clearly defined mandate and objectives
- Well-established office/work space with basic equipment.
- Basic facilities provided by the School of Mines, University of Zambia.
- Readily available collaborative research staff from various disciplines.
- MRU is a model of the concept of “Cells of Excellency” or “Operating Units” of UNU-INRA.
Endowment Fund

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Let us put our heads together to create a Sustainable Africa