THE MINERAL RESOURCES UNIT

United Nations University, Institute for Natural Resources in Africa, Mineral Resources Unit (UNU/INRA-MRU)
School of Mines, University of Zambia

Introduction

From the on-set it was envisaged that the creation of UNU/INRA will require in its first phases a capital or endowment fund of same US$50 million which was then expected to be yielding US$6 to 7 million per annum in interests. It was expected that this capital fund will at least 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 generous pledge of US$2.0 million towards the Institute'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. 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. An MoU signed between GRZ and UNU in 1985 gave effect to the establishment and locating of the Mineral Resources Unit (MRU) at the School of Mines, University of Zambia where it started operations in April 1991 as the first "Cell of Excellence" or "Operating Unit" of UNU-INRA.

Raison d'être

As noted in the Lagos Plan of Action, African governments were rightly concerned about formidable obstacles that undermined the ability of the African countries to benefit fully from their vast mineral resource endowment. The contribution of the mining industry to the economies of many African countries has been minimal. Africa at the moment depends on the industrialized countries for technical expertise, finance, and markets for the development of its minerals and mineral products.

Clearly, there is need in 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. In particular, there is a need to formulate different **mineral resources policy options**, especially in the fields of **mineral exploration**, **mining development**, **mineral processing, taxation** and **value addition** for internal or multi-country use and industrialization in Africa which are of crucial importance for self-reliant development. Therefore, there is an urgent need for African countries to ensure that enough trained manpower is available in technological, managerial and policy areas. UNU-INRA will make a contribution to these efforts through professional manpower training programs, related R & D work, policy studies, and information dissemination. It was envisaged that the offer by the Government of Zambia to host the Mineral Resources Unit will enable UNU-INRA to undertake such project activities without delay, by building on the work and facilities of the School of Mines of the University of Zambia where the Unit is located. The work of INRA would benefit from the well-established mining sector in Zambia and neighboring countries where field work could be carried out.

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, 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 stake holders such as members of the College of Research Associates (CRA) of UNU-INRA and industry.

Some Achievements

Under a scenario of severe constraints in resources inflow, research and training has been going on at the MRU at a very low level mostly with support in form of small grants from UNU and INRA. To date work at MRU has been doing research which is directed at contributing to the improvement of household food security. The areas of priority for the MRU currently 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 improvement 'fertilizers' for use by resource-poor rural farmers.

Some of the activities carried out so far by the MRU in collaboration with various stakeholders include the following:

First Training Course: "Mineral Resources in Africa and their Management for Sustainable Development". 18th-31st August, 1991, Lusaka, Zambia.

This course brought together participants from various parts of Africa in various disciplines related to natural resources management.

Second Training Course: "Economic and Legal Issues in the Management of Mineral Resources in Africa". 26th-31st October, 1992, Lusaka, Zambia.

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

International Conference on Phosphate Resources and Food Security in Africa. 3rd-6th Nov, 1997, Lusaka, Zambia.

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. (Proceedings available)

Workshop on Constraints Faced by Women in Mining Sector. 27-29th October, 1998. Lusaka, Zambia

Field Excursion for Participants

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.

Agronomic effectiveness of locally produced Partially Acidulated Phosphate Rock (PAPR) project. 2001 – 2003

A Demo Field

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.

PhD Studies on the Optimization of Production Parameters of Partially Acidulated Phosphate Rock (PAPR). 2001 - 2003

PhD Student Optimizing PAPR production at School of Mines Pilot Plant.

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.

Gemology Course. May – July, 2003. Lusaka. Zambia
Gemology Course. March – May, 2005. Lusaka. Zambia
Gemology Course. August – October, 2006. Lusaka, Zambia.
Gemology Course. May – July, 2008. Lusaka, Zambia.

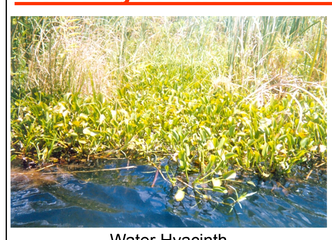
The program aimed at equipping small-scale miners, individuals and/or organizations involved in mining and trading of gemstones with basic knowledge and skills in gemstone identification, valuation and faceting (value addition). This is one way of ensuring that the gemstone industry contributes significantly 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:

1.Identify the major gemstone types;
2.Conduct best mining practice of gemstone;
3.Carry out a valuation of gemstones;
4.Add value to gemstones by faceting;
5.Conduct their own marketing of gemstones.

Stakeholders' workshop on promotion of the use of Agricultural Lime. 20th 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.

Water Hyacinth value addition Project. Jan 2003- 2005.



Water Hyacinth

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). The utilisation of these weeds adds value to them and presents a sustainable method for controlling the weeds population, whose excessive biomass is currently conceived as a serious environmental problem.

Field workshop

Demo orchard

A field workshop to review the project's progress and demonstrate some aspects of the Water Hyacinth Value addition project was held at River Motel in Kafue, on 11th March 2005.

A Study of Phosphates and Lime Material from Nkombwa Hill and Matanda. 2007

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 Test for Phosphates

Field Soil Acidity Test

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.

Comparative advantage

MRU is a model of the concept of "Cells of Excellency" or "Operating Units" of UNU-INRA with established office space, collaborative research staff and basic facilities provided by the University of Zambia.

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 .

Conclusion

Consultations on payment by GRZ of its balance to INRA's endowment fund has been going on with various government's official including the Secretary to the Treasury. Clearing this balance will make a little bit more resources available for MRU's work.