



SEAMIC

SOUTHERN AND EASTERN AFRICAN MINERAL CENTRE
m i n e r a l s f o r d e v e l o p m e n t

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EDITORIAL NOTE

Dear readers, welcome to the Vol. 7 No.1 issue of SEAMIC Newsletter. The contribution of African women in the mineral sector has always been

considerable and contributed to the sector's development to the greater extent. This issue discusses the contribution of women in mining partnership. Despite this huge potential for women to significantly accrue their contribution to mining development, actual rates of participation in Africa remain among the lowest in the world. In terms of representation, African women in mining are present in the industry as full-time professionals, miners, mining company owners, jewellery storeowners, manufacturers and traders. Concerning the specific sectors of intervention, their involvement range from the exploitation of a number of minerals like Gold, Silver, Diamonds, Rubies, Emeralds, Aquamarines, Tin, Malachite, Cobalt, Copper, Industrial Minerals, Talc, Gypsum, Dimension Stones, Granite, Marble, Limestone etc. to broad policy-making, academia, and project finance. The small-scale mining and its problems is also a topic of discussion in this issue. The article on possibilities of improving the technology of extracting minerals for small-scale mining community and available assistance highlights the solutions for the pertaining problems in the sector. Small scale mining sector's problems does not end in the technology only, but the different people involved in the sector with the aim of cheating people has been rampant in lots of places. This issue discusses such problems in the gold mining and trading activities. Spatial data is crucial information in the development of the mineral sector. Development of standardised spatial data infrastructure in Africa is an issue under big debate, and the developments are also discussed in this issue.



INTRODUCTION TO GEOLOGY COURSE AT SEAMIC

AFRICAN WOMEN IN MINING PARTNERSHIPS

BY DR BRIGITTE BOCOUM



Introduction

In a variety of ways, high costs have been found to be associated with the low participation of women in the economic sphere. Yet the traditional paradigm still limits the recognition that women need greater flexibility to play multiple roles - as mothers, wives, workers, and citizens - to maximise family welfare. Meanwhile, few families in Africa for example and most parts of the world are affluent enough to live comfortably on one income, whereas it has become common knowledge that Gender Inequality holds back a country's economic performance. Barriers in whatever form they come, that reduce open competition impede a country's ability to draw on its best talents, ultimately undermine economic growth and productivity. The need has now thus become urgent to look to alternative models of growth and development.

It is worth recalling the importance of the mineral sector for at least 23 out of 53 nations in Africa. Also, the undeniable fact that mining has not yet generated the kind of socio-economic development one would expect is an important consideration. So are the availability of sizeable deposits of great variety, the several revisions of development policies and sizeable investments granted overtime, but most importantly here the fact that mineral exploitation is not new on the continent. It is thus believed that the situation calls for rethinking the development strategy for the sector. It is further suggested that this process urgently puts great emphasis on the need to involve a wider spectrum of stakeholders, to include women, with the aim to better guide policy and perform mining business for development purposes. The paper attempts to highlight the importance for any policy reformulation process to seriously reconsider the existing gender imbalances and prevailing unsuitable approach to women integration in the mining of Africa. Suggestions are also offered to fully integrate both the concept and practice of increased women participation in mining business and related activities with its associated impact in promoting sustainable socio-economic development on a much larger scale on the continent.

Today, the proliferation of new mining partnerships across the globe offers a unique opportunity to mainstream gender equality into the mining sector of Africa. These partnerships through mining networks are seen as a viable channel to create sustainable economic growth and development. Also, they aim at establishing close ties between all constituents with

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a true commitment to the sustainable development of the abundant, diversified, and still mostly untapped mineral resources of the continent. An increasingly significant number of knowledgeable women are involved in all aspects of mining in some countries. However, any increase in female recruiting is generally from a very low base. This, as well as current conditions surrounding women coupled with their low level of involvement in the mining industry of Africa no longer match neither the need and aspirations of women themselves, nor the realities and needs of the region.

It is intended that similar mining networks be created or strengthened among women wishing to contribute substantially to the socio-economic development of Africa. The ultimate aim is to create an enabling environment for the successful integration of women as key partners for mineral development.

There is no doubt, the make up of the mining force is changing and will continue to evolve. Most urgent needs lie in the participation of women in decision-making and in insuring that gender is mainstreamed in the mining industry without discrimination. As time goes by, there will be an even growing need to involve people from non-traditional sources, reconciling the experiences and seeking the most effective approaches that meet the specific needs of women in mining in an efficient and lasting way.

Women's Involvement in Mining

Available statistics point at huge discrepancies in both the degree and levels of involvement between men and women in the mining sector of Africa. Mining and many other industries are traditionally viewed as a male domain and the integration, advancement and retention of women in this sector has been slow to non-existent. In the job market for example, there is ample evidence that employers in the field prefer to hire and work mostly with men. Empirical analysis conducted to explain such phenomena has shed light to the significant detrimental influence caused by the general belief that men's income is more important to their families. Also, the demand for female labour has been found more tied to the level and state of economic growth than the demand for male labour, which does not induce much for Africa. Greater details are available on this topic, which are however discussed elsewhere in the literature. This report mainly focuses on the mining sector's female labour force constraints, to ensure that inefficiencies and distortions that affect much of the increasingly growing and capable work force are better addressed in the future.

Natural resources-endowment is another preferred underlying theory to explain the causes of retardation of women's involvement in the mining sector of Africa. The theory advances that higher levels of unearned income such as natural-resource rents reduce the need for earned income, which in turn is thought to reduce the supply of female labour in general. The resource-poor economies tend to rely more heavily on labour-intensive development and so have depended more on women's economic participation, with rates of female labour force participation closer to their potential. The labour-abundant, resource-rich countries like Nigeria and South Africa (10500 women miners total, i.e. 2.6% of the workforce in 2001) tend to have slightly lower rates of female labour force participation than the labour-abundant, resource-poor economies in Africa. This is valid of most countries, albeit with a few exceptions.

Other analyses have placed greater emphasis on the direct link, which exists between the discouraging support infrastructure¹ and the degree of women's participation in the mining sector. They underline the fact that women are more constrained than men by their immediate physical environment. A woman's horizon could be greatly expanded by investments in standard infrastructure - such as better transport, water, and telecommunications - as well as expansion in market services, acquisition of skills and education for the provision of vocational and life long learning opportunities. Indeed, the matching of competency standards across gender is an essential link between marketable employment requirements and systems. Directly linked to this concept are learning programs, education and training. When isolating specifically the issue of training, the need to maintain a properly skilled workforce has led the mining industry to place strong emphasis on on-the-job training and to develop multi-skilled jobs, formal skill development programs and payment systems based on available skill use. In developed mineral economies like Australia, about 3/4 of work organisation systems in the mining industry reflect these developments. However, in Africa very few such programs include, let alone benefit women.

Based on actual figures concerning employment rates and working conditions, the gaps between men and women in the mining sector of Africa are even more substantial. The proportion of women in the workforce was computed by the International Labour Organisation (ILO) on a sample of 15 countries out of which three (3) were from Africa. In those, female employment stood respectively at 21%, 7% and 2.5% respectively for Kenya, Mauritius and South Africa. Typically female employment in the mining sector is below 10% on the continent. The data made available here further evidences that: (i) in most countries and mining companies the average remuneration of women in mining is below that of men; (ii) the representation of women in senior management positions is less than that of men; (iii) the proportion also declines with the introduction of longer working hours and compressed shifts tending to have a disproportionate effect on women because of their family responsibilities; and (iv) there is no difference between female employment in mining depending on whether developing or developed country. Environment mismanagement also plays a major prohibitive role. The example of South Africa is worth mentioning, where there has been noticeable cases of decline in female employment since 1995, mainly due to substantial decrease in the number of women

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mineworkers working in underground production in poor conditions as far as exposure to dust, heat and noise is concerned.

Indeed, despite the huge potential for women to significantly accrue their contribution to mining development, actual rates of participation in Africa remain among the lowest in the world. Recruitment of women is rendered difficult by the fact that the mining industry is also an employer of predominantly full-time workers, an increasing number of whom are contractors, including in development, production and maintenance. Age, also seems to be a discouraging factor for women since in the average, age of the mining force is considerably above that of the industry as a whole. As regards the type of activities conducted, available statistics reveal no restriction though, apart from the different operational levels, beginners and medium scale included. In terms of representation, African women in mining are present in the industry as full-time professionals, miners, mining company owners, jewellery store owners, manufacturers and traders. Concerning the specific sectors of intervention, their involvement range from the exploitation of a number of minerals like Gold, Silver, Diamonds, Rubies, Emeralds, Aquamarines, Tin, Malachite, Cobalt, Copper, Industrial Minerals, Talc, Gypsum, Dimension Stones, Granite, Marble, Limestone etc. to broad policy-making, academia, and project finance. On the ground, there are concentrating mainly on small-scale mining and have had to experience the unfortunate typical major issues having to do with the sub-sector - including illegal trading (where sales are not transparent and smuggling is rife, benefits are lost to the community and, in most cases, the commodities pass through several hands at discounted prices before reaching the formal market. This often translates into the artisanal miners generally receiving less than half the market value of their production); health and safety; environmental mis-management (pressure on the environment as well as on worker health is particularly strong with respect to gold mining because of the use of mercury); and taxation; in addition to gender discrimination.

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Environmental hazards are worth mentioning since gold and gemstones are the main substances extracted by women small-scale miners in Sub-Saharan Africa. But few women miners have any formal mining skills and many have acquired experience on the ground. Moreover, they are generally not organised. However, both training and organisation into small groups is starting to occur in places. In Africa, they represent only a small proportion of the mining force; but bearing in mind extended families in many countries and a small multiplier effect, their socio-economic impact could be as substantial as that of large-scale mining development. However, any increase in involvement by women in order to be efficient will ultimately depend on the approach taken to restructuring - from the planning stage - which will entail adequate vision and willingness/openness on the part of the people and decision-making body involved in the process.

Further from a socio-economic standpoint, the mining industry remains the main sector, beside agriculture, that can hire large numbers of unskilled workers. The industry is, therefore, in a unique position to contribute substantially, at least in the short to medium-term, to the development of the country's human capital, including women. However, it is imperative that unlighted and committed gender planners be involved in the process. Indeed, gender planning when performed efficiently enables development workers to have the effect they want on women as well as men. Besides, Gender planning is supposed to give content to aspirations to promote gender equity between women and men so that women's roles and benefits are equally supported as those of men and hence suits well in the current context.

In actual practice, a growing number of measures are being taken -either voluntarily, forced by institutional pressure groups or as a result of legislation - to counter these imbalances. But their inefficient implementation accompanied with poor monitoring is still suffering to date and, resulting in mounting dis-satisfaction. In addition, it is expected that all these measures will rely less heavily on equal opportunity and affirmative action policies with time. Rather, the time should come where they are based more on economic and social rationale rather. To that effect, current efforts should concentrate on initiatives aimed at opening the way forward. Hopefully, this would result in the elaboration of more appropriate policy development as well as the establishment/strengthening of all the causal links and partnerships needed to find working solutions to the problem.

Factoring in Women into Global Partnership

Most substantive reforms achieved to date aimed at promoting sustainable development in Africa's mining sector could not have been achieved successfully without the strong implication of a multidisciplinary consortium to ensure that all key aspects were addressed. Using the mining sector as one of the most important channels forward, translates into the need to develop the necessary partnerships to ensure that the minerals and mining sector is identified as a vehicle for poverty eradication in Africa. Today, mining actors everywhere are placing great emphasis on the development of partnerships with all stakeholders having a similar strategic orientation and with whom partnership can lead to constructive division of labour and benefits from synergies. Partnerships are being sought after everywhere and at all levels, with two broad (and sometimes conflicting) purposes in mind: (i) provide stability; and/or (ii) create a better life for all. A snapshot at some of the most recent partnership building efforts in the mining sector offers a better background picture. Outside the continent, the Global Mining Initiative (GMI), a mining project which comprises the chief executives of the ten leading MNC of the world gave a strong signal as to the commitment of mining companies to contribute to sustainable development. GMI was established to develop sustainable development standards to promote global leadership for the mining industry. It led to the Mining, Minerals and Sustainable Development (MMSD) project (early 2002), a USD10 million GMI funded initiative aimed at identifying "how best mining and minerals can contribute to the global transition to sustainable development." Also, the minerals industry corporate world changed the International Council on Metals and the Environment (ICME) into the International Council on Mining and Metals (ICMM) to provide a more effective industry leadership and industry association with a broader mandate to engage with world-wide governments, institutions and organisations of civil society and defined its core mission to be "to help the industry make the transition to sustainable development through scientific research and policy-making." The Committee on Natural Resources and Science and Technology (CNRST) has also since merged with the Committee on Sustainable Development (CSD). Other relevant programs include the Extractive Industries Review (EIR) process and the Collaborative Group on Artisanal and Small Scale Mining (CASM), (Communities and Small-Scale Mining Facility), which were launched by the World Bank. More particularly, CASM was established in 2001 as an umbrella forum to provide a co-ordinated approach to assessing and addressing some of the problems within the small-scale mining sub-sector. More specifically, CASM's mission is "to reduce poverty by supporting integrated sustainable development of communities affected by, or involved in, artisanal and small scale mining in developing countries." The creation of CASM followed a series of international meetings that identified the need for integrated solutions to the problems of the sector, and improved Cupertino between the various institutions. Such initiatives do not go unnoticed on the African continent as they involved bi- and multi-lateral donors, public sector, private companies, academia, NGOs and knowledgeable experts, also, because they were designed to tackle effectively specific problems known in the sector. These global partnership initiatives only but reinforce the conviction of the urgent need for consolidation at all key levels possible in African mining, whose economic importance in the region warrants a similar level of institutional organisation and high-power consultation on the part of all actors and institutions involved in the development of mining activities on the continent. The underlying argument is three-fold: (1) there is a direct link between poverty and the ability to built adequate institutional capabilities and synergies among key regional partners; (2) potential additional negative future development impacts and increased sector vulnerability could result from such global initiative, as past experience has it, in full knowledge of the fact that the countries of Sub-Saharan Africa are highly dependent on the assistance provided by international financial institutions, such as the World Bank - also with a global focus, who tend to use this leverage to promote extractive industries development through the support of capacity building to improve the investment climate for MNC in resources-rich countries on the African continent; and (3) no counterpart body to such global initiatives as GMI, CASM etc. exist to represent the local sector's interests which would have eroded the continent's effectiveness at guiding mineral policy and worsened the quality of operations overtime.

In a similar attempt to share good practices for generating mineral resources based sustainable development in Africa, the MINTEK Institute of South Africa has recently

established partnership with the United Nations Economic Commission for Africa (“ECA”). Other important global mining initiatives with an African focus have recently been established, such as the African Mining Network (AMN) at the Headquarters of ECA in Addis Ababa (February 2003). Meanwhile, the African Millennium Initiative on Science and Technology (AMIST) hosted by UNU/INRA, an initiative of Africa scholars launched by the African Diaspora in 2000 will continue to assist Africa in its development path by integrating mining activities in the near future. In March 2002, the African Mining Partnership (AMP) was launched at the World Mines Ministries Forum in Toronto (WMMF) following recommendations made by the NEPAD Mining Chapter and the Special Conference of African Ministers of Mining and Energy that called for the immediate establishment of a very strong forum for high-level consultations and consensus building, which was held in Ouagadougou in December 2000. The creation of AMP had been supported by the African Mining Ministers who met in Cape Town, South Africa in February 2003 to discuss issues of common interest, particularly those considered strategic in the New Partnership for Africa’s Development (NEPAD). It is seen as a potential vehicle to implement the minerals and mining chapter of NEPAD with a view to harnessing Africa’s mineral wealth to promote socio-economic development.

Notwithstanding the critical role of mining to the well being of so many African economies, the evidence is that women, despite their growing involvement in mining, have not received the same kind of attention as other cross-cutting issues such as environment, to name just one. Today, the mining sector’s overall contribution to the region GDP does not exceed 4% and its net contribution to socio-economic progress is insignificant. Let’s start from the premises/understanding that (i) the economic well-being of a population - including consumption of food, housing, healthcare, and other market-based goods and services - is determined not only by how much each working person earns, but also by what proportion of the population works; (ii) importantly in Africa, each employed person supports more than 2 nonworking dependants, and with women often supporting nearly all their children; (iii) Africa’s achievements in many areas of women well-being compare favourably with those of other regions. Indicators such as female education, fertility, life expectancy, and per capita income show that Africa’s progress over the last decades has been substantial; (iv) Africa falls considerably short on indicators of women’s substantive participation in key economic activity; (v) it is commonly agreed that African economies must look to new models of growth and development relying more heavily on more productive use of human capital. Women remain a largely untapped resource in the region, making up to 53% of the population and in some countries the majority of enrolled university students, but only a small proportion of the active labour force.

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In all situations, individual champions are of course the prerequisite for success and the need to build the necessary appropriate capacity to foster change. This is an important starting point. However, what the societal poverty reduction process mostly entails is multi-faceted partnership, with strong support from all, knowledgeable resource persons including practitioners, public and private institutions as well as supporting services being critical. In this context, research could play a significant supporting role in assessing the evolution of key measurement parameters such as involvement/employment levels, levels of poverty, salary rates and income generation capabilities, social and environmental problems, education and job levels, socio-economic contribution capacity and empowerment for contribution sake.

The first official regional Association of African Women in Mining Business (AFWIMN) was launched in Elmina, Ghana in September 2003. It took off with the initial technical and financial assistance of the United Nations Development Fund (UNIFEM), the SADC Gender Program from CIDA Canada, the Minerals Commission of Ghana, the World Bank Group through the CASM initiative, and knowledgeable experts in the area. This has not been achieved however without difficulties: getting all the member states to sign (SADC, ECOWAS, COMESA, etc.), and refining its overall purpose, as time would evolve. The ultimate aim of AFWIMN as its definition stipulates is “to set a vibrant and transparent sector where gender imbalances do not exist and access and control of resources from the mining industry are equally distributed.” The statement of its purposes outlines that AFWIMN proposes to achieve its

objectives by making visible the participation of women in mining through gender mainstreaming, growth, innovation and increased productivity for the economic empowerment of women, poverty reduction and employment creation of all. Of recently, some momentum was certainly gathered. It is hoped that such momentum will be sustained overtime and that AFWIMN will not only grow in membership, but also in terms of net impact/contribution as it initially set to contribute substantially to the socio-economic advancement of the African region, along side with other partners involved in the sector. It will all depend on the network's ability to adjust on the spot to the ever changing realities of the sector, to rely on clear definitions of targets and objectives based on consensus and enlighten knowledge of the requirements embodied in growth, true commitment on the part of all designated representatives and infallible search for collective gain as well as a dynamic & multidisciplinary approach to resolving the challenge of achieving sustainable development in the mining sector of Africa.

The True Focus Remains Sustainable Development

Mining (small-scale, industrial-scale, trade, etc.) can contribute to poverty reduction in a variety of ways, mostly through generating income as well as creating opportunities for growth for different categories of businesses. As stated previously, discrimination against segments of a population on the basis of gender influences a country's larger social climate and reduces development prospects, good governance, and the effectiveness of society's institutions. Also, this applies to race, ethnicity, and religious background. Studies show that inclusiveness and diversity of perspectives improve decision-making about resource allocation. Women tend to have different perspectives than men about issues of importance in the public domain and decision-making. Women's presence in the key economic and public arenas and their influence on public policy are still limited in Africa.

The 3rd of the Millennium Development Goals agreed between all members of the United Nations aimed at promoting gender equality and empower women. Nowadays, girls are staying longer in school. Across the region, more than one in four girls now enrolls in tertiary education, and women outnumber men in colleges and universities in several countries of the region. Also, girls who stay in school tend to outperform boys. By investing increasingly massively on women's education and training and integrating women in economic activities that are key most for the continent, Africa is increasing women's productive (not reproductive) potential and their capacity to earn incomes and to participate in decisions. Paradoxically, the very low levels of active female participation in the labour force and/or women's representation at the decision-making level mean that the region is not capturing a large enough part of the return on this investment. Add to that the proven higher rates of return in general to empowering women, and it becomes clear that increased female labour force participation and surrounding women with the right enabling environment in the work force would raise the returns to education and training throughout the economy and would improve the living standards of our nations as well as the functioning of our institutions.

The benefits of enhanced women participation have been found to be positive on sustainable development. Besides, low female labour participation has proven to have a high cost to the economy and to the family. Simulations, although not specific to the mining sector -although the latter could yield even higher results-, have shown that increasing female labour force participation from their actual rates to predicted rates could boost average household earnings by as much as 25 percent. For many families, this is a ticket for greater comfort in life. Analyses based on cross-country data have also suggested elsewhere that as countries progress to higher levels of per capita income, increased female labour force participation results in significantly faster income growth. If female participation rates had been at predicted levels, per capita GDP growth rates might have been at least 1.0% higher during the last decade.

MATRIX 1: SELECTED PARAMETERS FOR WOMEN’S CONTRIBUTION TO SUSTAINABLE DEVELOPMENT IN MINING SECTOR & MINING - RELATED ACTIVITIES

Budget & Finance related: Need to agree and obtain a budget and/or Business Plan as well as mobilise funding per target activity
Institutional Matters: Establish specialised agencies, pressure groups or thematic partnerships if needed
Government/Institutional Support: Seek & obtain support at the highest possible levels
Data related: Gather specific quantitative figures to back-up and substantiate the facts
Market related: Assess all specificities and define all requirements in the surrounding environment
Social dialogue: Develop efficient means and strengthen channels to address specific prioritised issues of interest
Education & training: Acquire all necessary sound basic skills to ensure efficient involvement & long-term employment opportunities
Technology related: Value the acquisition of technological know-how and the need to master technical processes
Environment Matters: Support the provision and practice of appropriate standards
Spatial Gender Transgression: Seek the acquisition of power in order to influence decision-making
Communication frontiers: Access all modern means of communication and expand knowledge frontiers
Poverty reduction: Adopt a voluntaristic approach to the issue of contribution for development and encourage involvement in self-generating development promotional activities; make poverty reduction a strategy
Global sustainability: Encourage involvement in activities and forum with global scope
R & D: Develop means to conduct research, further functional capability and improve on existing operational tools

Today, the old “male-breadwinner” model is increasingly becoming out of date, the economic pressures leaving many households without a choice: a growing number of women now need to work outside the home to help support their families. The correct assessment of the surrounding socio-economic realities have created everywhere a generation of young women who are increasingly at par with their male counterparts and expect the same opportunities and rewards. This is also true of the key economic activity, which represents the mining sector. Change, however, will need to be led from the top and supported by the grassroots. The sole responsibility lies in the hands of women, but also with the state and institutions. Gender equality will remain an abstraction unless a substantial number of women believe that they must do something to exercise their rights. Of course, they will have to rely/work on the improvement of institutional frameworks to achieve that purpose. In mining, the challenge for women ultimately lies in how to successfully integrate themselves in light of the prevailing above constraints.

Several key ingredients to ensure the successful integration as well as the sustained involvement of women in mining activities in Africa are highlighted in the Matrix, which is provided. It is clear from the layout, that nearly the totality of these will require the need for strong partnerships, whether at the individual, national, regional or international levels to be built.

Conclusions

Calls for gender equality are often seen as a claim to share power and control or undermine existing systems. Common perception sees it as a threat to social order and an erosion of the established power structure, the latter perhaps with some justification. Yet gender equality has been broadly recognised as important for improving economic growth, creating productive employment, and reducing poverty. Past policies of growth strategies left fewer opportunities for women outside of traditional female jobs. As the region adopts new development models that are more global impact oriented, the demand dynamics for female labour will evolve.

African women in mining still face significant disadvantages today, often working under sub-optimal conditions affording very little potential for growth. Subtle forms of discrimination against women take place through a host of non-wage employment benefits, labour laws themselves not explicitly discriminating against women. In fact, such laws clearly stipulate that women should receive equal compensation for work and skills of equal value while stressing the need to understand that recognition, respect and promotion are natural requirements and are not included in the compensation package. It remains valid to date, however, that the benefits granted by these laws tend to remain unattainable, since they are weakly enforced and the potential beneficiaries lack recourse or information. Significant responsibility hence lies on networks such as AFWIMN and its ability to expand its scope of activities in the future. This should include the promotion among others of large-scale development and the involvement of women in non-traditional activities such as industrial minerals development, the provision of technical assistance, advisory and policy-related work and dissemination of information on best practices in fostering the integration of African women in the mining field. A proposal is also made for the network, once fully operational, to join efforts with key regional institutions and partners such as the NEPAD Secretariat and the ECA in order to insure that significant benefits are now accrued to the local community and the economies of the African countries while factoring in the substantive impact of women in the mining sector.

It has now become evident that great benefits, including income generation, local community development, the mitigation of health, environmental and socio-cultural risks, could be reaped from furthering and most importantly sustaining women's involvement in mining activities. The paper has also highlighted the importance of the need for active participation by all key constituencies and the consolidation of partnerships in order to all jointly successfully achieve sustainable development in the mining sector of Africa. Finally, the promising challenges offered now by NEPAD but also the dynamism embodied in globalisation offers a unique opportunity to mainstream the issue of women in mining on the continent. Greater attention should, however, be given to the ever growing importance of improving family welfare, social and community uplifting, and labour laws in mineral development. The creation of a new paradigm for better integration of women into broader socio-economic development goals at national and regional levels is also paramount. The ultimate challenge remains one of men and women joining forces in order (i) to encourage understanding and strengthen collaboration among all stakeholders that have a similar strategic orientation and with whom partnerships can lead to constructive division of labour and benefits from synergy; (ii) to avoid further wastage of valuable and scarce human resources; and (iii) to finance development projects, design and/or implement carefully selected programs capable of optimising the socio-economic linkages generated by mining-related activities and thus promote sustainable growth and poverty eradication on the continent at any possible scale.

“SUBTLE FORMS OF DISCRIMINATION AGAINST WOMEN TAKE PLACE THROUGH A HOST OF NON-WAGE EMPLOYMENT BENEFITS, LABOUR LAWS THEMSELVES NOT EXPLICITLY DISCRIMINATING AGAINST WOMEN.”

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MINERAL LABORATORY SERVICES AND THE CHALLENGES TO SMALL MINE OPERATORS - TANZANIA'S CASE

BY EDWARD MMOLE



Minerals and their socio-economic importance

“Every house is a mineral home.” So the saying goes. Try to look at all items around you, whether at home or at work place, you may wonder to be informed that all that you have and see are products manufactured from minerals. Starting from kitchenware to toiletry, from agricultural implements to means of communication and transportation, all types of appliances, decorative and raw materials for industries, not mentioning the structures of our buildings, which are all, made from minerals. The minerals had to be mined out from the earth's crust, and later processed in order to obtain value-added products, which would be utilised in the manufacture of different products for human consumption.

It is fairly justified to say that modern civilisation could not have been achieved without the extraction and utilisation of minerals.

“IT IS FAIRLY JUSTIFIED TO SAY THAT MODERN CIVILISATION COULD NOT HAVE BEEN ACHIEVED WITHOUT THE EXTRACTION AND UTILISATION OF MINERALS.”

Distribution of minerals in the earth's crust

Nature has endowed us with minerals in the earth's crust. However, the distribution of different minerals in the earth's crust is very much varied and this depends on geotectonic phenomena, which occurred in different parts of the crust over periods of times. Thus we have areas with high concentrations of gold bearing minerals and others with high concentrations of different metallic minerals. Other locations would host the so called 'industrial minerals' such as limestone commonly needed for cement manufacture, whereas some locations would contain economic quantities of refractory minerals used for moulds and linings in high temperature applications. Diatomaceous minerals are employed in the clarification and deodorisation of oils and beverages, phosphate rock for fertilisers in agriculture, just to mention a few examples.

It is worth mentioning here that the contents of the valuable minerals in the earth's crust is hardly sufficient enough for direct utilisation and as such efforts directed at value addition to the mined product need to be made in order to realise usable products. The process involves mechanical and chemical treatment of the ore after which the obtained product will have a higher content of the valuable mineral and consequently will have a higher market value.

The efforts made towards arriving at the most appropriate technology for the treatment of the raw materials involve investigations aimed at establishing chemical and mineralogical characteristics of the ore which will in turn, facilitate the design of the most economic route for the recovery of the valuable mineral.

Such investigations are conducted in specialised laboratories in which ore samples are analysed and subjected to tests leading to the establishment of the most appropriate technology to recover the minerals.

Gathering necessary mineral information for development involves costs

The collection of necessary technical and economic information required for the evaluation of the feasibility of a business opportunity normally involves financial investment. One should therefore be prepared to allocate sufficient funds for this necessary and very important phase in business development. In the case of mine development this information is generated in conjunction with mineral research laboratories. This is the most relevant source from which proper basic data can be obtained. It is this data that will enable giving direction to future business operations.

It is unfortunate that a large number of business entrepreneurs operating small-scale mines

are still reluctant in investing in research in order to improve their mode of mine operations. They still stick to the trial and error method whereby mining activities are conducted without having an indication of the volume of the ore reserves. Therefore, mineral upgrading methods used are crude and are employed without prior knowledge of neither the expected recoveries nor efforts to get it improved. Mineral processing equipment is often purchased without due regard to mineralisation and characteristics of the ore, as a result of which the business experiences serious operational problems and definite economic losses before closing down.

The following are the advantages, which would be gained from having the ore investigated and tested before embarking on actual mining:

- Estimates of tentative mining and processing capacities and therefore expected life of operations on the basis of the volume of ore reserves (for a particular deposit) can be made,
- Mineralogical characteristics of ore reserves which will facilitate the design of the most appropriate mineral recovery technology will be known,
- The possibility for smooth technological adjustments necessitated by variations of ore characteristics with varying mining levels or depths will be facilitated and
- Planning of future development works would be realistic.

The role of SEAMIC in promoting mineral development

The Southern and Eastern African Mineral Centre (SEAMIC), is an independent regional Centre of knowledge, services, research and development, training, and geo-data management for southern and eastern Africa. It was established in 1977 with the aim of assisting its member states to pool their resources and establish a capacity to accelerate the development of their extensive mineral resources and stimulate economic and social development in the sub-region. This would be achieved through provision of advisory, consultancy, laboratory, training, information and other services to the mining and mineral sector in the Eastern and Southern African countries, through economies of scale. SEAMIC, strategically located in Dar es Salaam, Tanzania, is equipped with mineral and ore testing laboratories serving the eastern and southern Africa sub-region.

The services and products available at SEAMIC include:

- Geo-information services - digitising and GIS applications;
- Ceramic products - tableware, sanitary ware and fire-clay crucibles;
- Bench scale mineral processing - gravity methods of mineral upgrading, flotation, cyanidation and magnetic separation
- Determination of chemical elements - gravimetric, volumetric and UV/VIS methods, XRF analysis, gold fire assay, AAS, graphite furnace and hydride generation;
- Mineralogical and petrological sample preparation and analysis - XRD analysis;
- Gem identification, grading, pricing and certification; and
- Consultancy and customised training courses in ceramic technology, gemmology, chemical methods of analysis, mineral processing operations and geo-information.

Among the multinational companies, worth mentioning that have made use of the services of the Centre are; BHP, Barricks, Volcano Uganda, Anglo-American Corporation of South Africa, Anglo-American Prospecting Services of Kenya, Warthog Resources company from Australia, Goldstream minerals of Australia, PanAfrican Resource (T) Limited. The national public institutions of the member countries including Geological Surveys and Universities are among the users of the services and facilities of SEAMIC.

“THE SOUTHERN AND EASTERN AFRICAN MINERAL CENTRE (SEAMIC), IS AN INDEPENDENT REGIONAL CENTRE OF KNOWLEDGE, SERVICES, RESEARCH AND DEVELOPMENT, TRAINING, AND GEO-DATA MANAGEMENT FOR SOUTHERN AND EASTERN AFRICA. ”

Small-scale mineral developers and mineral laboratory services

Despite the promotional and outreach activities aimed at sensitising artisanal and small-scale miners, many among them have not yet realised the benefits that they can get through use of the services of mineral research laboratories such as SEAMIC's. The reluctance could partly be attributed to not only lack of awareness on the importance of

conducting a systematic evaluations of ore deposits prior to establishment of mining operations but more importantly due to unwillingness and lack of commitment to abandon outmoded approach on mineral development practices in favour of improved methods. As a result, the majority of local claim holders, especially in Tanzania, still operate under very poor and less productive technological conditions with consequent operational inefficiencies and wastage of invested funds. Environmental hazards resulting from such practices are also not seen as a slow killing pill.

Opportunities Available for Small-scale Miners

In view of the risks associated with mining, SEAMIC undertook to incorporate in its training programmes customised courses for small-scale mine entrepreneurs, in order to improve their awareness and knowledge which will later enable them, run their business more professionally and profitably.

SEAMIC has been conducting gemmology courses in which more than 120 participants have learned among others, gemstone identification techniques, grading and value adding techniques, and marketing. Most of the participants, out of whom 83% are Tanzanians, are now operating gemstone business with sufficient competency. Other courses conducted by SEAMIC include: mineral-processing techniques including control and optimisation of process operations, training programmes for small-scale miners, which are targeted at addressing the issue of environmental hazards associated with crude mining activities.

“DO NOT REMAIN IN THE BACKYARD, SCIENCE AND TECHNOLOGY IS NOT GOING TO WAIT FOR YOU!”

Mr. Edward Mmole is Mineral Processing Engineer and the Head of Mineral Processing Section at SEAMIC

call for contributions

**Research articles (including Photos), Tips, Views and Comments
are welcome to the next**

SEAMIC Newsletter Volume 7, Number 2

Deadline for the submission of your manuscript is

1st May 2004

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GEO-SPATIAL DATA INFRASTRUCTURE IN AFRICA - THE ROLE OF REGIONAL ORGANISATIONS

BY MESFIN W. GBREMICHAEL

Introduction

The growing attention from both public and private organisations to aspects concerning Geographic Information (GI) is a logical consequence of the developments society has seen over the last three decades. With the risk of some over-simplification, these developments are characterised by strong individualisation, globalisation, flexibility, the speed of innovation, and the increased care for nature, quality, and safety. These aspects affect directly and indirectly all GI communities, which share the great challenges of the information society, of which GI is an integral part (Annoni and Littlejohn, 2000).

As the number of Geographic Information System (GIS) users is increasing in developing and industrialised countries, the availability of spatial data has become an issue that affects many organisations. They are faced with the cost and effort involved in the generation of spatial data and the need for collaboration and co-operation is gaining attention in some public and the private sector organisations. Spatial data sharing is increasingly being discussed by such public and private sector organisations as a way of overcoming such obstacles. Numerous similar initiatives are under way at the national, regional and global level (de Montalvo, 2000).

Spatial data is data/information relating to the land, sea or air that can be referenced to a position on the earth's surface. It is the key to planning, sustainable management and development of our natural resources at local, national, regional and global levels. Spatial data infrastructure (SDI) describes the fundamental spatial data sets, the standards that enable them to be integrated, the distribution network to provide access to them, the policies and administrative principles that ensure compatibility between jurisdictions and agencies, and the people including user, provider and value adder who are interested at a certain level of area that starts at a local level and proceeds through state, national and regional levels to global level. Spatial data infrastructures are just like other forms of better-known physical and tangible infrastructures, such as roads, power lines and railways (Ezigbalike, 2000). SDI is made up of several components, which include:

- The data: sets of organised spatial data, the databases and metadata;
- Data networks and Technology: the communication channel and the data processing technology used for optimising the transfer of the data from the source to the users;
- Institutional arrangements: the co-ordination of the institutions involved in the SDI development and maintenance;
- Policies and standards: the data communication rules, standards, protocols, and policies addressing social and economic issues of information dissemination; and
- Users: the end users that access the data through the infrastructure.

European SDI

GI concerns all major EU policies, directives and programmes, such as the Common Agricultural Policy (CAP), the European Spatial Development Perspective (ESDP), transport, environmental protection and sustainable development, having an increasing impact on the European territory. Planning and monitoring of these policies intensify the pressure for more timely, dependable and usable GI. At the same time, inappropriate territory management often causes an increase in natural disasters and detrimental consequences to the environment and to people. To reduce the probability and cost of natural disasters and better manage them should they occur, territory management must be monitored and improved.

“SPATIAL DATA SHARING IS INCREASINGLY BEING DISCUSSED BY SUCH PUBLIC AND PRIVATE SECTOR ORGANISATIONS AS A WAY OF OVERCOMING SUCH OBSTACLES. ”

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The European Commission's active involvement in GI policy development has sprung out of the IMPACT (89-94) and INFO2000 (96-99) programmes to support the European information and multimedia industry respectively. As Europe becomes more intertwined economically and administratively more and more companies and (governmental) organisations will be expanding their horizons beyond their own national borders taking a more pan-European view of their activities. As a consequence there is a growing need for pan-European GI for decision support, which is one of the most important uses of GI within the Commission.

To address these problems a communication (GI2000: Towards a European Policy Framework for Geographic Information) from the Commission to the Council and Parliament was drafted to launch a debate at the political level. First it proposed to set up a high level working party composed of Commission services and the actors in industry, government and users to develop consensus and to exert the leadership required to drive development forward. EUROGI, the European Umbrella Organisation for GI, their national members, National Mapping Agencies, and research organisations are all strongly in favour of GI2000 although they have different ideas on concrete actions. It is in this context that the Joint Research Centre (JRC) GI&GIS project has been conceived.

The GI&GIS project aims at helping to pave the way both for private and for public sectors in the EU to overcome the difficulties that hinder the development and application of GI. The specific objectives of the GI&GIS project are:

- 1) To assist the creation of the EGII, playing an active role on the future High Level Working Party mainly focusing (and leading) on technical and scientific aspects;
- 2) To develop a common European position on GI/GIS interoperability
- 3) To inform and educate European users operating as GI/GIS communications facility.
- 4) To conceive, create and harmonise Pan-European databases relevant for EU policies; and
- 5) To develop integrated spatial models and to improve the use of GI in statistics.

National Spatial Data Infrastructure of the USA

A major study released by the National Research Council, in 1993, solidified the concept of the National Spatial Data Infrastructure. This document, combined with the strong interest in federal government reform by the Vice President's National Partnership for Reinventing Government, resulted in the endorsement of formal action to establish a national spatial data infrastructure. This endorsement ultimately led to the issuance of a Presidential Executive Order 12906 in April 1994. The Executive Order called for:

- a. The establishment of a National Spatial Data Infrastructure as a key component of the National Information Infrastructure;
- b. The development and use of a National Geo-spatial Data Clearinghouse.
- c. Use of a national distributed framework of data for registering and referencing other themes of geo-spatial data.
- d. FGDC-endorsed standards for data content, classification and management for use by Federal and available to all other geo-spatial data producers and users.

This Executive Order established the basis for more aggressive federal efforts to advance the NSDI toward full implementation in partnership with state, local and tribal governments, academia, and the private sector where allowed by law.

FGDC (Federal Geographic Data Committee) stakeholders established a core set of essential NSDI components: data content and meta-data standards; a nation-wide set of Framework Data - geographic data maintained by a myriad of different users; meta-data to help inventory, advertise, and intelligently search geographic data sets; a NSDI clearinghouse that allows for catalogue searches across multiple clearinghouse sites; and strong partnerships with federal, state, local, tribal governments, and the private sector.

The implementation of the U.S. NSDI has continued to progress with a growing base of stakeholders, data content and meta-data standards, NSDI clearinghouse sites. The generation of Framework Data is occurring in counties throughout the U.S. Through the FGDC, the

federal government has teamed with stakeholders from local governments, academia, and representatives of the private sector to advance the NSDI. However, a more broadly represented process is needed to accelerate NSDI implementation. A top priority for the advancement of the U.S. NSDI is the creation of a more flexible organisational entity, which will provide NSDI leadership through expanded private and public sector involvement. Additional financing options and incentives will be reviewed as potential avenues for increased funding of NSDI related activities at all levels.

SDI in Africa

There are several initiatives started in many African countries that can be regarded as elements of spatial data infrastructure. However, many of these initiatives have not really been conceptualised as SDIs as described above. Different countries have focussed on different fragments of SDI. Therefore the level of development or introduction of these components varies from country to country.

The largest source of spatial data is the national mapping agencies. Additional spatial data including geological, hydrogeological, soil and river basins maps are produced by national geological surveys, water resources institutes, agricultural institutes and universities. Much of the available data are in the forms of maps and paper records. However, there has been a realisation that the use of computers in spatial data management necessitates availability of such data in digital format. Efforts are therefore underway in many countries to create digital databases through conversion of existing maps into digital format and new production of digital information products.

The most effective data dissemination channels of our time are computer networks and the Internet. These unfortunately are not yet well developed within the African continent. The information infrastructure also depends on other utility infrastructures, such as electricity and telecommunications. In many countries, electricity is only available in the urban centres, leaving large portions of the country without service. These rural areas are also the subjects of the data in the proposed spatial data infrastructure. In fact, much of the environmental and natural resources data would be about these rural areas. Access to the infrastructure should therefore eventually be provided from these centres.

Government departments are the major sources of spatial data. There are two main reasons for this. First is the undeveloped nature of the geo-information industry in particular and the information economy in general. Second are laws and administrative regulations that give exclusive mandates to government departments, even when they lack the capacity to satisfy the needs of the expanding user community.

Regional Organisations and SDI in Africa

The New Partnership for African Development (NEPAD) is the “integrated strategic framework” within which member states of the African Union (AU) are to individually and collectively bring about the holistic socio-economic development of the continent. The intention of NEPAD is to create a common vision and strategic framework within which all existing initiatives can be pursued in an integrated and co-ordinated fashion.

Geo-information will be a critical component because of its ability to integrate data from disparate sources (e.g. censuses, national surveys and resources surveys) and undertake analyses that enable priority areas to be identified for government intervention in the provision of services and infrastructure. This needs to be done within an appropriate framework that takes into the consideration the societal, policy, theoretical, international best practice and strategy spheres present on the African continent to ensure that the necessary connectivity between data sets and components of the information system can be achieved resulting in it being used optimally.

The lack of access to census information and national survey data in African countries, especially in a spatial context, points to the need for the development of appropriate statistical systems for the gathering, analysis and dissemination of this data. This lack of information has been recognised by African states and that is why the United Nations Economic Commission

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for Africa (UNECA) was mandated to implement the African Information Society Initiative (AISI) in 1996 (CODI III, 2003).

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In Africa discussions have been going on for sometime at various levels and fora to set-up such an umbrella organisation to co-ordinate issues related to spatial data infrastructure in the continent. A Pan African Symposium was organised by UNECA to bring together a cross-section of decision makers from geographic information institutions in African to agree on a basic set of concepts, practices, standards and guidelines for establishing spatial data infrastructures that are compatible at national, regional and global levels and to discuss, adopt and sign the charter of a regional body to co-ordinate these activities. The gathering recommended the necessity of establishing a Permanent Committee on SDIs for Africa, whereby the functions of such Committee are incorporated in the terms of reference of CODI-Geo. CODI-Geo is the Geo-information subcommittee in the Committee on Development Information of UNECA.

The committee, co-ordinated by the UNECA is composed of:

- the other subcommittees of CODI, namely Statistics and ICT;
- Rub-regional representations by countries;
- Regional centres in geo-information including;
- African Organisation of Cartography and Remote Sensing (AOCRS);
- Regional Centre for Mapping of Resources for Development (RCMRD);
- Regional Centre for Training in Aerospace Surveys (RECTAS)
- Southern and Eastern African Mineral Centre (SEAMIC)
- Environmental Information System - Africa (EIS-Africa)

A consultative process was initiated among stakeholders, to implement the objectives of the sub-committee of Geo-information of CODI, which include, in particular, the functions of a Permanent Committee on SDIs for Africa. The realisation of these objectives is the responsibility of the Executive Working Group, through the Technical Working Groups. The following working groups were considered for the realisation of these objectives:

- Standards;
- Policy framework;
- Spatial reference framework;
- Geo-spatial data sets;
- Clearinghouse and metadata;
- Institutional arrangements and strengthening;
- Education, training and capacity building;
- Guidelines and best practices;
- Awareness; and
- Recourse mobilisation.

Regional and sub-regional organisations in geo-information play active role in the realisation of the SDI implementation in Africa through the network they have already established. The role of these organisations is magnified specially in the areas of standards, clearinghouse and metadata, capacity building, and guidelines and best practices. The NEPAD programme emphasises the need for co-operation in resource mobilisation effective and efficient use of the depleted resources of the continent.

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TWO KILOGRAMS OF GOLD IN A MATCHBOX

BY JOHN O. BOMANI



You may have enjoyed the article about “Red Mercury” in the previous issue of SEAMIC Newsletter Vol. 6 No. 1. As part of our effort in increasing awareness to the public the different phenomena in the mining sector in Africa with examples more from Tanzania. The mineral commodity in focus for this issue is Gold the most loved and known metal. I will present it as a collection of incidences I came across in relation to gold buying and selling activities. I hope this will also be a learning experience for those who happened to be victimised through similar events or who is planning to have entering in to the business of gold extraction or transaction.

It all started many years back, I cannot remember when exactly, but I was still a small boy before even starting my primary education. Our home was situated several kilometres from the Williamson Diamonds Mine in Shinyanga, northern Tanzania. During those days we could see the big hills created by the mining activities, and the lights glittering vividly during the night.

At times we could even hear the sounds of machinery inside the mines. There were many stories about diamond we could hear coming from the diamond mines. The stories include: “diamond was a very special mineral that could move and hide by itself,” “if you manage to grab it in your hands, it was very slippery,” and “once it drops down then you cannot see it because immediately it moves inside the soil, just like a fish would disappear in water”. There was also a story we were told that diamond was a very glittering material, that it was able to provide light; and we were made to believe that the lights which we saw at the mine during the night were nothing but, diamonds!

Any one can imagine how our childhood mind was prepared to understand diamond during those days. Then it happened one morning. My mother was not in the house. I think she had gone to fetch water, or maybe firewood, I do not remember exactly. I was at home with my young brother and sister. A visitor

came at our home, he was a gentleman I remember from the area. He asked us where our mother was, and we told him that she was not around. My father was living in Mwanza another town in Northern Tanzania because of his work. Then the man opened a plastic bag and showed us some “glittering” materials that he said were diamonds. They were not glittering to the level of the lights that we normally saw during the night at the mine. Although many years have passed, I still remember his “diamonds” were greenish coloured pieces.

The man said “give me money, I will give you the diamonds.” “Our mother is not in, and we have no money.” Being the eldest, I replied.

I remembered the warning from our mother that we should not allow any strange person inside if the elders are not in. “Go and take money inside. Do you know where your parents keep it?” the diamond merchant insisted. Honestly we didn’t know where money was kept inside our home. We had some idea that somehow our money was kept at the railway station, because we had seen mom going there to take some money.

“They keep the money at the railway station.” I told the man. This was all I could say, to the best of my knowledge. It was not possible by then for me to distinguish between the railway station and the post office, where actually our mother was collecting money send to her by our father.

“Go there, at the railway station, you will get the money there.” I insisted. The diamond dealer went away, after failing to get money from us. When we told the story to our mother after she was back she told us that if such a person comes next time, we should shout “thief” to alert the neighbours.

Some twelve or so years ago when I was in Dodoma, central Tanzania, working after I graduated from university, a friend of mine came to my office with a plastic bag, full of pieces he

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called gemstones. Because I was an expert by then in the field, he asked me if I could assist him identifying them. I looked at his samples and they reminded me of the diamond dealer I saw many years ago.

“Do you want to buy these?” I asked my friend. “Buy?” he asked, looked astonished at me. “Yes. Do you want to buy these?” I asked him again. “No. I have already bought them.” He replied.

So, that was that. My friend had already bought the “gemstones” and thereafter he was trying to find a person to identify them. Very strange. I thought he should have consulted me before buying the material. The material, which my friend bought were nothing but glass, which I could identify it immediately without even going through further checking by instruments. You can imagine, buying glass tricked to be precious gemstones. This friend of mine had nearly lost his job, because he used the daily collections of his employer to buy the so-called gemstones, hoping that he was going to be a millionaire the next day. I had to use part of my income to assist my friend out of this mess.

Then years went on. Another friend of mine came one day trembling. He had a test tube full of diamonds. It was sealed expertly and marked “Williamson Diamonds Ltd - Diamonds for Export Value Tanzanian Shillings. 12 million,” at current exchange rate is about US\$ 12,000. I asked him where he got the diamonds and he told me that someone dropped it and he picked it. I asked him if he was not afraid because the sample belonged to a reputable diamond mine, but he told me he would sell it secretly.

“So what do you want me to do with it?” I asked him. “Just check if it is the right material.” I told him “I do not need to do any checking in the laboratory, the material was glass”. So my friend went away. I do not have to tell you the expression on the faces of my friends when I give them every time the negative answers for their “wealthy” materials.

Another one came, a friend too. This time with gold, also in a test tube sealed and labelled “Gold grade A, Value Kenyan Shillings 3 million (more than US\$ 30,000)” I balanced the test tube in my hand, it was astonishingly heavy. I inspected the tube more, the glittering of the golden material inside was appalling.

“The weight of the material is striking.” I said to my friend. He grinned like he had seen heaven. I could see his excitement in his face. “Cool down,” I said. “I haven’t said it is gold, only the weight is striking” I said.

I asked him where he got it and he told me that he bought it from a businessman at a give away price because the businessman was stranded and wanted only fare to go back to Democratic Republic of Congo (then Zaire) to get more consignments. So he bought the material for Tanzanian Shillings 100,000. He borrowed the money from someone.

I could not understand how really foolish my friends could be. How can one give away a 30 million Tshs. consignment for only Tshs. 100,000 without raising suspicion? I told my friend that, if that was the case, then we needed no any analysis to know that someone had stolen his money.

We opened the test tube anyway. At both ends I found carefully concealed steel balls possibly from bearings of car, and those were the source of the unusual weight of the sample. So they had put them to increase the weight, so that any buyer would believe it was gold, because people have been told that gold is very heavy. It is true that gold is heavy, but this is not the only fact. I tested the material by the easiest acid test and it yielded easily. I ended up with a blue-greenish solution, indicating that the so-called gold was some alloy made of copper. So my friend was in for it.

Then I got another friend, this time from abroad, but he fell in the same trap. He bought 9 kilos of bronze believing it was gold. Then he wanted me to test the material. What for? I wondered, because he had already spent a fortune on the consignment, and there was no way I could assist him retrieve the money. Well, I tested it; because this is my duty. A good blue solution of a copper salt.

Finally the day that triggered me to write this article came. I got a phone call from my friend, asking me to meet him at a certain hotel in the city. I asked him what was the matter but he told me that it was something we could not discuss on the phone. I said no, because I

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don't like unclear appointments. Then he insisted that there was nothing wrong, actually it was a business deal, he had some gold he would like me to sell. I told him that, this would be proper to do it at the laboratory where I work. My friend was so persuasive that I finally agreed to meet him the next morning. We met at some place in town and we drove in his car to where he thought it would be ok for his business.

He told me that his sister had 2 kilos of gold, and she wanted to sell the precious material to some Europeans they have agreed to meet at the hotel. So I was called there to assist them to get the right price. We met the sister, three of us ordered some drinks while waiting for the buyers.

"Before they come, It is better if I see the consignment" I said. My friend told her sister that it was OK to show it to me. The lady opened her small handbag, and produced a matchbox, placed it on a small table in front of us.

"It is in here", she said. "What is in here?" I asked. "The material, of course!" They exclaimed in unison. "You mean, two kilos of gold ... in a match box?" I said slowly to them, without hiding my astonishment.

This is how the story went on that morning. I opened to see the inside of the box. There was a blackish powder, one would think it was tealeaves. The weight maybe was a little bit above 100g. This was what was supposed to be 2 kilos of gold. I don't know how the whole business ended, because I thought it was not proper for me to keep my feet in that, so I left.

I kept wondering, why my good friends fall easily for such tricks. Poverty, maybe; or greed or ignorance, or what? So I decided to write this article. I thought it was necessary to put this in writing so that the public should know few facts about precious stones and specially gold, and the risk they are exposed to if they want to buy or sell.

Some people would like to buy gold in the streets, even if it was their first time to see "gold." It is not easy to buy gold or gemstones in the streets. The reason is, you need to know some facts about the items in order to get the right material at the right price. How can you distinguish between a well-prepared piece of glass and diamond, if you have no idea how diamonds look like? One day I nearly died of laughter, because one of my friends told me that the easiest way to identify diamond was to crush it with a hammer. Someone had told him that diamond was the hardest known substance on earth, so the hammer will not affect it.

What is gold? Gold is a pleasure to own and possess, as many people have discovered throughout the ages and around the world. Gold is a very stubborn element when it comes to reacting to or combining with other elements. Keeping this in mind helps to explain many things about gold. There are very few true gold ores, besides native gold, because it forms a major part of only a few rare minerals, it is found as little more than a trace in a few others or it is alloyed to a small extent with other metals such as silver. Gold is almost indestructible and has been used and then reused for centuries to the extent that

all gold of known existence is almost equal to all the gold that has ever been mined.

Gold is a great medium metal for jewellery, as it never tarnishes. Native gold wires emerging from massive white quartz can make for a visually stunning specimen.

A few of the minerals that bear gold in their respective formulas are in a subclass of sulphides called the telluride. The element gold seems to have an affinity for tellurium and this is one of the only elements that gold can bond with easily. In fact only a few rare telluride is found without gold. A few of the tellurides are nagyagite, calaverite, sylvanite and krennerite. These are all minor ores of gold but their contributions to the supply of gold runs next to native gold's own contribution. Occasionally these minerals are associated with native gold.

There are a number of minerals that are aptly named "Fool's Gold" because only a fool could believe they are gold. Actually it is easy for people who see shiny golden coloured flakes sparkling at them from some rock they just picked up to believe that they have struck pay dirt. Gold's ductility, sectility, density and softness are usually sufficient to distinguish it from the much cheaper impostors. The most famous "fool's gold" is the very common sulphide, pyrite, chalcopyrite, marcasite and any other golden coloured sulphide has been also proven to be worthy the "fool's gold". Weathered flakes of biotite which can sport a bright yellow colour and

SOME PEOPLE WOULD LIKE TO BUY GOLD IN THE STREETS, EVEN IF IT WAS THEIR FIRST TIME TO SEE "GOLD." IT IS NOT EASY TO BUY GOLD OR GEMSTONES IN THE STREETS. THE REASON IS, YOU NEED TO KNOW SOME FACTS ABOUT THE ITEMS IN ORDER TO GET THE RIGHT MATERIAL AT THE RIGHT PRICE.

a nice flash of light when viewed just right, have also been mistaken for gold.

Gold specimens are sometimes artistically stunning and a good investment as well. After all, it is gold, which never seems to lose its value. Good natural specimens though are more expensive than their actual weight value. This is to be expected as good gold crystals are somewhat scarce (most are melted down for quick profits) and you really don't want a natural specimen to be worth what a lump of previously smelted and refined gold is worth, do you?.

But most of the gold that you are likely to meet will be smelted and refined gold. Best on the spot indicators are colour, density, hardness, sectility, malleability and ductility. At this juncture, are you still willing to buy gold in the streets?

Other important physical characteristics for gold that may assist in identifying it are: golden "butter" yellow colour when in a mass, but when finely divided it may be black, ruby, or even purple. Gold has a metallic lustre, opaque, no cleavage, hardness 2.5-3, specific gravity 19.3 - which is extremely heavy even for metallic minerals - ductile, malleable and sectile, meaning it can be pounded into other shapes, stretched into a wire and cut into slices. It is actually the most malleable and ductile metal. One ounce (28 g) of gold can be beaten out to 300 square feet. It is a soft metal and is usually alloyed to give it more strength. It is a good conductor of heat and electricity, and is unaffected by air and most reagents.

You can probably understand now why I had to run away from my friend's so-called 2 kg of gold in a matchbox. The density of gold is 19.3 gm/cm³, that means gold is 19.3 times heavier than an equal volume of water. The size of a matchbox is about 20 cubic centimetres. That means we are able to fill in pure gold to that volume amounting to only 19.3 x 20 = 386 g. The 2 kg of gold may required about 104 cubic centimetres to occupy. This is true only if the gold was pure, but for impure gold with lesser density materials, then a larger volume would be required.

So gold transactions require a lot of knowledge. The streets are full of con-men who may take advantage of the ignorance like that of my friends, to dish out some money out of their pockets. These people are plenty, and very aggressive, ready to cheat at any cost. They are usually nice looking guys, well dressed, drive good cars, leave in decent hotels or homes and very polite at their tongues. They normally pretend to possess big consignment of gold up to 200kg. In the actual situation, they can provide very good quality samples of gold to the laboratory for analysis, but they will trade to a counterfeit lot.

Mr. John Bomani is Chief Chemist and the head of Chemical laboratory at SEAMIC.

"SOME OF MY FRIENDS HAVE TAKEN MY ADVICE AND BENEFITED. I ALWAYS TELL WHOM EVER I MET WITH SUCH IDEAS NOT TO BUY ANY MINERAL PRODUCT BEFORE TAKING THE WHOLE CONSIGNMENT TO LABORATORIES LIKE SEAMIC FOR ANALYSIS. "

News

SEAMIC Open Day

On 9th May 2003, the Centre organised an "Open Day" for the general public but with particular emphasis on the Ambassadors and High Commissioners accredited to Tanzania. The open day was organised with a view to exhibiting the services, and products which the Centre is able to provide to the community.

GIS Africa Project

A project called GIS Africa was started in collaboration with the French Geological Survey (BRGM) and the International Centre for Training and Exchanges in the Geo-sciences (CIFEG). The aim of the project is to contribute to the effort of sustainable development throughout the African continent in developing regional policies based on valorisation and diffusion of earth science information. The project involves 10 African Countries and two regional organisations grouped in two regions of the continent namely west and East Africa. The countries involved includes Senegal, Guinea, Burkina Faso, Niger, Mauritania and Mali in west Africa co-ordinated at UEMOA in Ouagadougou, and Angola, Ethiopia, Tanzania and Kenya to be co-ordinated at SEAMIC in Dar es salaam. The project is expected to last until March 2006.

The objectives of the project is to construct a strong geo-science partnership in Africa in order to:

- Reconstitute regional geo-scientific and mineral resources database;
- Organise data preservation, management and accessibility;
- Develop a common African language in the field of earth sciences;
- Help to promote mineral and water resources in attracting potential contributors to economic development;
- Improve local skills, and share knowledge and experience between Africa and Europe as well as between African countries; and
- Propose decision tools to support regional policies related to earth sciences.

TRAINING

Modern Laboratory Management

The Chemical Laboratory section conducted a course on "Modern Laboratory Management" from 4th - 8th August 2003. The course was attended by Mr. Balu Tabarro from Uganda.

Mineral Processing

A training course on testing of ores for process development was organised by the Mineral Processing section between 18 and 22 March 2002 for from Uganda.

Gemmology

The 17th, 18th and 19th "Introduction to Gemmology" courses were conducted by the Mineralogy/Petrology Section during 10-14 February, 7 - 11 April and 23 - 27 June 2003 respectively. Twenty-three participants, including participants from Uganda and Kenya attended the courses.

The Mineralogy/Petrology section also conducted a tailor-made course in "Introduction to Gemmology" from 8th to 12th September 2003 for two participants including one participant from Angola under the Performance Contract.



“Introduction to Gemmology” courses were conducted by the Mineralogy/Petrology Section during 10–14 February 2003



Fire Assaying

A three-week practical training for fire assaying was attended by the Chemical laboratory technician, Mr Gerald Niyukuri, organised by MINTEK South Africa. The training was conducted in October 2003.

Pottery and Ceramic Technology

The Industrial Minerals Application section organised training courses on Pottery for beginners, on 24-28 February 2003, 24-28 March 2003 and 27-30 May 2003.

The Industrial Minerals and Application section continued with provision of short training courses on pottery technology to three groups of school children from Dar es Salaam and to two participants from the embassy of Spain in the United Republic of Tanzania.

ISO 900:2000

ISO 9000:2000 Transition Auditor Training Course was attended by the Chief Chemist, Mr. John Bomani. The training was organised by SGS, Quality Certifying agency in Dar es Salaam, Tanzania during 26-27 February 2003

Attachment

During the month of July and August 2003 eight students from the Department of Chemical and Mineral Processing Engineering of the University of Dar es Salaam were on attachment for eight weeks in the Laboratory Services Department of SEAMIC for practical training. The students were able to gain experience in analytical and ore testing methods.

African Mining Network Workshop

The Director General, Head, Geo-information and Expert geophysicist of Africa GIS project attended the workshop on African Mining Network, organised jointly by UNECA and UNCTAD during 25-27 February 2003 in Addis Ababa, Ethiopia. The workshop was attended by some 40 participants selected from intergovernmental organisations, governments, mining associations, academic and research institutions and civil society from within and outside Africa. Its aim was to review the rationale, proposed structure and operations for an Africa Mining Network as outlined in a Preliminary Proposal which was sent to participants.

The Southern and Eastern African regions have developed some networks and initiatives that address a number of the issues related to mining. West and Central Africa and the Maghreb region seem to have a much lower level of such activities. Some issues relevant to Africa are addressed in institutions situated outside the continent.

A comprehensive, well-organised network with a focus on Africa could provide a vehicle for the collection and dissemination of information and enable the cross-fertilisation of ideas across the continent, across disciplines and across the language divides. Such a network could also:

- serve as a one-stop shop for information linkages of existing networks;
- stimulate the development of local networks and initiatives in sub-regions where they do not yet exist and strengthen already existing ones;
- promote capacity building through training and policy networking;
- work parallel to and in support of the African Mining Partnership (AMP) and other mineral-based initiatives in Africa;
- promote synergies and avoid duplication of efforts and costs;
- help to establish and maintain a database of mining-related information specific to the African region; and
- integrate relevant actors and networks situated outside of Africa

3rd Meeting of the Committee on Development Information (CODI)

The Head, Geo-information Department attended the 3rd meeting on the Committee on Development Information (CODI III) of the UNECA, held in Addis Ababa, Ethiopia during 10-17 May 2003. The meeting was held in three sub-committees namely: Information and Communication Technology (ICT), Statistics and Geo-information. The Geo-information head attended the meeting of Geo-information sub-committee (CODI-Geo).

The meeting of the CODI-Geo sub-committee discussed on issue and deliberated the following:

- CODI should develop a co-ordinated task group to integrate and publish common policies and technical strategies for: library applications, metadata development, geographic and statistical data and services, standards-based information retrieval technologies, and ICT frameworks, portal, and e-government services design in order to optimise access to development information.

- African countries engage in Public Private Partnerships to collect and process the geographic information that is needed for the execution of development projects at local, sub-national and national levels, following the principles of transparency and mutual trust.

- Donor-financed projects should be provided framework data from government, and that all data resulting from a project should be produced, maintained and disseminated according to the principles of the NSDI.

- National agencies producers of Geoinformation should give priority to digitise their analogue spatial data holdings, using published data models, following the principles of SDI.

- Governments should recognise GI production as an investment and as a national asset and,

therefore, should increase the allocation of funds in their national budgets. CODI Geo should facilitate the sourcing of funds in the development of SDI at all levels. Costs for maintaining data can be reduced by sharing them among producers and users, by proper cost-effective methods, and by utilising data produced by other data producers.

- Key players in GI production and management at international, regional, and national levels should take measures in demystifying concept and use, and relate GI to other forms of information, such as statistics and ICT. That all the three CODI sub-committees (ICT, Stat, GEO) at national level should undertake concerted actions and work together, through the establishment of a national committee on development information in order to sensitise and educate policy-makers of the benefits and value of information for development and good governance.
- CODI should convene a multi-disciplinary, multi-national work group to formalise data models and access methods that address both data provider and consumer needs for geographic and statistical information in support of NEPAD.

Radio element Mapping and Status of Global Baseline Map

The head of Geo-information department attended the technical meeting on Radioelement Mapping and Status of Global Baseline Map, organised by International Atomic Energy Agency (IAEA) held during 23-26 June 2003 at Denver School of Mines, Golden, USA. The aim of the meeting was to assess the coverage of radioelement mapping around the world and the status of global baseline for radioelement mapping.

The meeting discussed on reports on radiometric mapping activities and geochemical surveys for radioelements on national, regional and environmental surveys. It also discussed on the possibilities of establishing standards and calibrations for the radioelement maps. The head of the geo-information department made a presentation on SEAMIC's activities in relation to radioelement mapping. The presentation emphasises the accessibility of regional geochemical and geophysical surveys information and the availability of gamma-ray spectrometry surveys calibration facilities at SEAMIC.

Others

The Chief Mineralogist participated in a workshop on Dimension stone organised from 26 May 2003 to 5 June 2003 in Carara, Italy

The Chief Chemist participated in the Conference on Geo-analysis 2003 conducted during 5 - 13 June 2003 in Rovaniemi, Finland

MEETINGS

Board of Directors

The 14th, 15th and 16th meeting of SEAMIC's Board of Directors (BOD) was held on 03-04 March, 23-24 June and 23-24 October 2003 respectively.

The BOD meetings discussed on issues including:

- Review of the performance of the Centre
- Strategic Business Plan 2003/4 - 2007/8
- 6th Standing Committee of Officials and 23rd Governing Council meetings which was held in Addis Ababa, Ethiopia
- SEAMIC's 2002/2003 annual Report;
- SEAMIC's work programme and budget for 2003/2004;
- Auditor's report for 2001/2002; and
- Financial Contributions from the Member States.

Governing Council Meeting

The 23rd meeting of the Governing Council of SEAMIC was held from 27th June 2003 in Addis Ababa, Ethiopia at the premises of UNECA. Angola, Ethiopia, Mozambique Tanzania, Uganda and the UNECA attended the meeting. Rwanda and Kenya were also in attendance as observers. The Governing Council meeting was preceded by the sixth meeting of the Standing Committee of Officials, which was held from 25 to 26 June 2003.

Major decisions made by the 23rd Governing Council meeting included:

- Approval of the Annual Report for 2002/2003;
- Approval of the Auditors Report for 2001/2002;
- Approval of the Work Programme and Budget for 2003/2004; and

SADC Mining Advisory Committee Meeting

The Director General attended the 1st SADC Mining Advisory Committee Meeting, held in Gaborone, Botswana during 19-20 June 2003. The mining advisory committee was established in the place of the previous Mining Sector Co-ordinating Unit (SADC-MCU) which was abolished in the new SADC structure.



VISITS

The Director General visited the Ministry of Minerals and Energy of South Africa and MINTEK in Pretoria and Johannesburg respectively between 29th and 31st July 2003. The objective of the visit was to discuss ways of possible co-operation between SEAMIC and MINTEK and discussing possibility of South Africa to join SEAMIC.

Dr Michel Laval, Director of the International Centre for Training and Exchanges in the Geosciences (CIFEG) visited the centre and held a meeting with the SEAMIC management regarding the GIS-Africa project.

Ms Esther Daniels, Programme Co-ordinator for East Africa of CIM, Centre for International Migration of Germany, visited the Centre during the month of August to discuss the contractual position of the German expert at the Centre.

Hon. Netumbo Nandi Ndaitwash, the Minister of Women Affairs and Child Welfare of the Republic of Namibia, visited SEAMIC on 29 August 2003 and toured the ceramic production unit. The Minister indicated that she would require from the Centre consultancy services for the setting up of a small-scale ceramic production unit in Namibia.

Mr Smith, a consultant from Centre for Development of Entrepreneurs (CDE), visited the Centre and toured the Ceramic Unit on 30 September 2003. Mr Smith was on a mission to review the ceramic sector in the country for CDE. During his visit, he indicated that CDE was looking for projects involving industrial minerals which they could assist in sourcing for funds.

The consultant indicated that there were a number of areas which he thought CDE could provide assistance and that he will include in his report the potential of SEAMIC.

Three experts from the British Geological Survey (BGS) visited the Centre on 16 September 2003. The experts were engaged on implementing an environmental survey project being funded by GEF. The visit was aimed at looking into the possibilities of using SEAMIC facilities for sample preparation and analysis of some of the samples. Unfortunately, BGS did not choose our laboratories possibly because SEAMIC is not ISO certified.

A team from Korea Resources Corporation (KORES) a Korean Government Agency of Resources Development visited the Centre to look for future co-operation regarding in the mining sector of the region.

COMING EVENTS

MEETINGS

Governing Council Meetings

The 24th Governing Council Meeting will be held in May 2003 in Dar es Salaam, Tanzania.

Board of Directors Meeting

The 17th meeting of the Board of Directors of SEAMIC will be held at SEAMIC in May 2003.

TRAINING

Gemmology

The 20th and 21st Gemmology courses will be conducted at SEAMIC from 1 to 5 March and 7 to 11 June 2004 respectively, targeting on mineral technicians, mineral dealers, mineral brokers and anyone interested in gemstones. The course will focus on:

- Diamonds and their grading criteria;
- Classification, varieties, occurrences and identification techniques of gemstones;
- Value factor, trade grades and markets; and
- Synthetic, imitation and treatment of stones.

Chemical Laboratory

The following are training courses planned to be conducted by Chemical laboratory at the Centre:

- Modern Laboratory Management Methods, 26-30 January 2004.
- Gold Assaying 9 - 13 February 2004.
- Environmental Analysis and Technologies, 8 - 19 March 2004.
- Mineral Binders, Cements, Pozzolana, Gypsum and Slag, 19 - 23 April 2004.
- Theory and Practice on Spectrometric Analytical Methods (XRD and XRF), 3 - 14 May 2004.
- Thin Layer Chromatography (TLC), 17 - 21 May 2004.

Mineral Processing

- Testing of ores for process development, 19 - 23 January 2004.
- Control of mineral Processing operations for plant operators, 17 - 21 May 2004.

Pottery and Ceramic Technology

- Pottery course for beginners, 26 - 30 January, 23 - 27 February, 26 - 30 April and 24 - 28 May 2004.
- Advanced pottery course, 29 March - 2 April 2004.
- Clay pottery, porcelain, and ceramics, 28 June - 2 July 2004



SEAMIC

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