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Small-Scale Gold Mining: An Evolving Success Story in Ghana

Background

The rural labour force engaged in the illegal mining of gold in Ghana, popularly known as "galamsey" (meaning gather and sell), was recently estimated as being approximately 30 000 with undocumented annual revenues of about US\$ 30 million. Gold was produced from surface or near surface workings using mainly artisanal technology. The non-existence of a framework within which operators could be licensed and sell their gold through official channels led to illegal operations where outputs and profits were smuggled out of the country. Illegal small-scale gold mining activities led to the establishment of a well-organized black market system. As a result the Government of Ghana not only lost a valuable source of revenue to its economy but failing to regularize small-scale mining led to unsafe working conditions, environmental damage, and high policing costs.

Study on the Regularisation of Small-Scale Gold and Diamond Mining

In November 1986, in an attempt to redress the situation, the Government of Ghana commissioned Mackay & Schnellmann Ltd, a mining and geological consulting group based in the UK, to undertake a study on ways to regularize the activity, provide support for it and put in place appropriate

legislation and monitoring to ensure the proper contribution from small-scale gold and diamond mining to Ghana's economy.

Recommendations

The final report of the study was submitted to the Government of Ghana in May 1987 and included the following recommendations:

- The creation of a system for licensing and registration enabling the Minerals Commission, Mines Department and the Geological Survey Department to support and monitor the activities in the small-scale mining sector;
- Provision of technical assistance to the miners in the form of advice, simple mining and concentration equipment and demonstration of correct mining and processing methods;
- Establishment of a central buying agency to purchase gold from the miners for at least 90% of the world market price;
- Amendments of previous government policies prohibiting the sale of mercury to miners.

Ghana's Minerals Commission accepted the recommendations and presented a memorandum for the creation of a **Small-Scale Mining Project** to the government which was approved

in early 1989.

SMALL-SCALE MINING PROJECT

Definition of small-scale mining

Under the proposed Project small-scale mining would affect the following operators hereafter deemed "small-scale miners" :

- Individual casual workers who from time to time pan streams for gold;
- Small organized groups of four to eight individuals carrying out their operation on a full time basis using simple equipment and tools;
- Cooperative of ten or more individuals.

The activities of these operators would be defined as to size of concession area, mining methods, size of capital and duration of mining lease as follows :

- Small-scale operators must be Ghanaians and must be financed entirely from Ghanaian sources;
- The concession area licensed shall not be more than one acre in the case of a small group of up to four individuals and two acres for a group up to ten individuals, with cooperatives given up to

twenty-five acres;

- The licence shall be granted for one year for a small group renewable if all legal requirements are met and production is adequate, and in the case of cooperatives the licence shall be granted for a minimum of three years;
- No workings shall exceed ten meters in depth without prior permission in the case of small groups and twenty meters in the case of cooperatives;
- The use of explosives and chemicals shall not be permitted unless under supervision;
- Capital expenditure shall be limited to the cedi equivalent (Ghana's currency) of US\$ 200 000.

Structure and Monitoring

The scheme involves the identification and demarcation of areas suitable for small-scale mining to ensure that there is no interference with areas best suited for large-scale mining activity. District centres would be set up in eight areas covering the southern part of Ghana where precious minerals occur and intense small-scale mining takes place. The centres would be responsible for registration, licensing, training and monitoring. Small scale miners applying for licences would submit their applications, indicating the area to be mined, to the appropriate district centre to be processed. The Mines Department would appoint Mines Wardens to each district centre to monitor and advise miners on the use of correct mining methods. It would also institute regular training programs for miners.

Purchasing

A purchasing system aiming to eliminate the black market and reduce the incidence of policing is expected to include

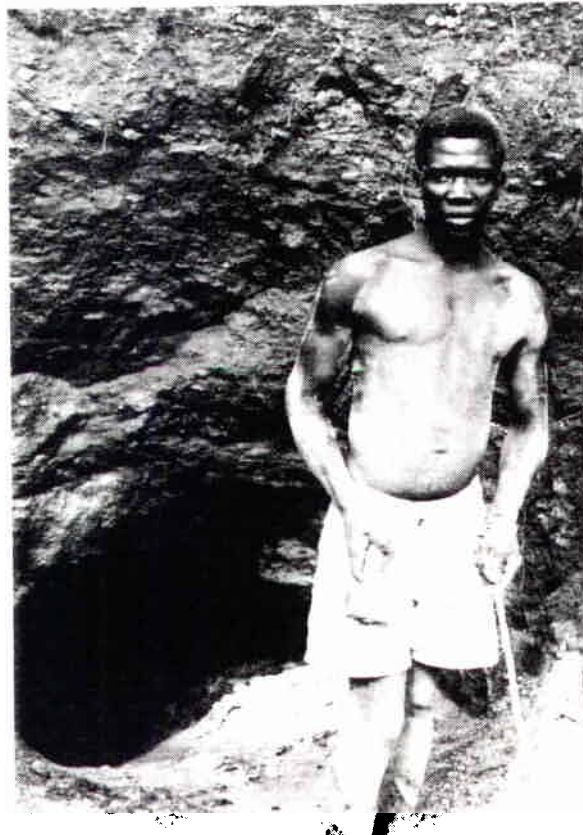
in the long term: setting up buying facilities in all district centres; field purchase of gold; providing essential inputs to operators e.g. mercury, pumps, sluice boxes, etc; and a pricing arrangement enabling payment of at least 90% of the world market price. The purchasing wing of the Project, state-owned Precious Minerals Marketing Corporation (PMCC), would purchase all diamonds and gold produced by small-scale miners. Buying agents licensed by the Corporation could also purchase gold from the miners to be re-sold only to the PMMC. Given the existence of two legal rates for foreign exchange, one determined by weekly auction and the other determined by the market, the Corporation would allow the purchase of gold and diamonds at prices determined by the highest of the two rates, i.e. the market rate. Since PMCC began purchasing gold, the Corporation's quoted prices have been higher than those paid by the smugglers.

Environment

As environmental considerations form an important feature of the programme, the equivalent of 3% of the value of gold purchased would be paid by the buyer into a central government fund, the Land Reclamation Fund) for the reclamation of land, particularly for agricultural purposes.

Implementation

The project is being implemented in two phases, a structural development phase and an operational phase, over a two-year period. The structural phase involved the establishment of the district centres for registration and licensing purposes. During this phase purchasing and marketing of gold was started. The operational phase will emphasize improvement of mining and processing methods, introducing the processing of concentrates at treatment centres, expansion of training schemes and the opening of new offices.



Galamsey miner in front of mine adit, Tarkwa Concession area, Ghana.

Initial Assessment

The first phase in the regularisation of Ghana's small-scale gold and diamond mining took off in earnest in May 1989 and as of January 1990 considerable results had been attained. The number of licences granted (84 to individuals, 72 to groups, 25 to cooperatives, and 21 to Ghanaian companies) represent an estimated 11 000 small-scale mining jobs which were previously illegal and have now been regularized. Production has also increased now that the sector has been formalized and miners need not fear police harassment.

The Precious Minerals Marketing Corporation (PMMC), has purchased 9 272 ounces of gold valued at US\$ 3,4 million for the 1989 period and 151 606 carats of diamond valued at US\$ 3,1 million. The Land Reclamation Fund has so far accumulated the equivalent of approximately US\$ 102 000 which represents 3% of the value of the gold purchased.

Since small-scale mining is a community-based activity, District Mining Committees have been set up to play an advisory role in the smooth implementation of the Project. The Committees comprise all parties within the community with a vested interest in the Project.

Anticipated results

Anticipated results and benefits of the application of the program are many-fold. Principally, it will represent a large-scale employer of unskilled rural labour and a major foreign exchange earner. Also of major significance will be the contributions to rural development and social change.

* From reports submitted by Joseph Yaw Aboagye and Amponsah Tawiah. Additional information can be obtained through the Minerals Commission, Small-Scale Mining Project, P.O. Box M.248, Accra, GHANA.

1989 – 1990: Mixed Year for Small-Scale Mining

Commentary by J. Davidson

Events and developments which have occurred during the past year have given cause for both hope and anxiety with respect to the future of small-scale mining internationally. Some of the more positive developments have included the implementation of the first phase of the small-scale mining regularization program in Ghana and the apparent success of the Brazilian government in striking a deal between Paranapanema, the country's largest mining corporation, and cooperatives representing the garimpeiros mining at Bom Futuro, the largest tin mining operation in the world.

In the case of Ghana, the Minerals Commission has begun to create the infrastructure necessary to support the regularization effort, including the establishment of purchasing and technical support centres; it has been able to free up concession areas for exploitation by newly licensed miners, and has stationed training officers in the mining areas to work with the miners to improve their mining and recovery methods (see article above).

In Brazil, the Bom Futuro tin mine (Rondonia state) was officially closed this past January until such time as adequate tailings dams and containment systems could be installed to minimize the pollution of nearby rivers. At peak operation, the mine was worked by over 20,000 garimpeiros; in spite of the shut-down, the mine continues to operate at 60% of last year's level. Much of the mine's production has been exported illegally from the country. In support of Association of Tin Producing Countries' efforts to bolster tin prices, Brazil made an unspecified pledge to cut back on tin exports. The deal between Paranapanema and the garimpeiros aims not only to curb tin smuggling (i.e.

unregistered exports), but also result in a reorganization of the mining operations, which will promote cooperation between company and garimpeiros and reduce environmental damage. The cutting of such a deal in a country where small-scale mining is so important and at the same time so controversial would appear to be a major step forward (see article and interview below).

In the Phillipines, the federal government, as part of its anti-poverty agenda, has been supporting the development of a model for small-scale mining and the expansion of small-scale mining operations in Davao province of Mindanao. If efforts succeed here, the potential exists to encourage small-scale mineral development in other parts of the country, giving small miners the opportunity to mine in virgin prospect areas in advance of large operators. Foreign investors and established local companies have thus far adopted a wait-and-see attitude.

In Papua New Guinea, Bougainville's Panguna copper mine has been shut down since May 1989, in response to attacks on both personnel and property by local Bougainvillean rebels. In March 1990, continuing rebel activity forced the closure of the mine (its removal from care and maintenance status) and withdrawal of CRA's remaining personnel from the minesite. 2000 plus jobs were lost at a mine which in its last full year of operation (1988) contributed US\$180 m in direct government receipts (15% of the government's revenue) and accounted for about 40% of the country's export income (the country's single largest foreign exchange earner), and 20% of the Gross Domestic Product. To make up the shortfall, the P.N.G. government has been forced to turn to international lending institutions, including the IMF

and World Bank. To make matters worse in January, the malaise seemed to spread to the Highlands, as local landowners blockaded the road to Ok Tedi, temporarily shutting down the mine - P.N.G.'s most important mining operation after Bougainville. While these are extremely large-scale mines, the issues which underlay the rebel actions are unquestionably small-scale.

At Panguna, the original development of the mine involved the forced removal and compensation of many local landowners. The affected communities, never entirely convinced of the generosity of the compensation package in the first place, became more and more disturbed by the environmental damage resulting from the mining operations. In November 1988, almost 20 years later, landowners were demanding an additional Kina 10 billion in compensation. Their protest, originally motivated by environmental objections, compensation and revenue sharing demands, ultimately became enmeshed with secessionist demands as well, and provided the fire for the Bougainville Revolutionary Army (BRA) to bring the mine to a standstill. At Ok Tedi, the protest was sparked by the P.N.G. government's decision to allow the mining company to continue to discharge all of its tailings and waste rock to the Fly River system. The local communities were already hard pressed to cope with the mine's environmental impacts - the destruction of the river's fish and turtle populations, the sedimentation of river bank garden land and the river with mine detritus which have resulted in the loss of agricultural land and clogging of the critical navigation channels connecting local communities to downstream markets and trading centres - not to speak of its social-cultural impacts on tribal myth, religion and social life. Government inaction was the straw that broke the camel's back.

While these ore bodies are world class deposits, whose amenability to rational small-scale exploitation may be

questionable, the failures of the government and mining companies to address and resolve obviously critical issues of local concern over the twenty year life of the Bougainville mine, highlight all the potentially negative aspects of large-scale mineral development in small-scale autochthonous societies. The closing of Bougainville forces us to re-examine assumptions regarding the scale and development effects of mining enterprise in southern countries.

Events in Brazil, particularly in Roraima, Rondonia and Para states, relating to environmental damage, disruption of native communities, and even the difficult social and economic legacy of small-scale mining upon deposit payout (e.g. Serra Pelada) (see article below) raise serious questions about the conduct and legitimacy of small-scale mining activity in places where technical and operational supports are not available or only occasionally provided.

In Canada, the revision of Ontario's Mining Act (Bill 71) has opened a new can of worms from the point of view of

small-scale prospectors and developers. The most heated criticisms revolve around the so-called "use it or lose it" concept embodied in the proposed legislation. This approach to mineral land management considerably increases the costs of holding land under leasehold. Under the old law, virtually all the assessment work requirements occurred in the mining claim stage. Now a leaseholder would also be obliged to undertake annual assessment work. Given the block size necessary for mining development, typically 50 to 100 claims, the additional costs of maintaining a block of leases would be a considerable burden for small prospectors, and might well jeopardize their ability to maintain leasehold during lean years, when low commodity prices make venture capital difficult to obtain. There are other aspects of the proposed legislation which appear to compromise the rights of small prospectors and juniors. Bill 71 is still being discussed and debated.

In retrospect, then, the last twelve months have held a mixed bag of developments for small-scale mining advocates.



Garimpo Serra Pelada today, Brazil
(Photo courtesy of J.A. Pinto, Belem-Para)

SMI NEWS

- o A modest operating grant was solicited and received from the International NGO Division of the Canadian International Development Agency in November 1989.
- o A revised project proposal entitled "International Small Scale Mining Information System" was submitted to the International Development Research Centre (Ottawa) in February 1990. It is now in the final stages of the IDRC review process. If approved, the project will allow SMI to begin serious data gathering activities, to construct a computerized information system, to expand its ability to analyze, publish and disseminate information, to finance partial staffing of the National Institute of Small Mines's office in Calcutta, India, to conduct data gathering and field tests in a pilot study area (West Bengal State).
- o SMI has organized a one-day workshop, "International Information Systems for Small-Scale Mining" to be held in conjunction with the 4th International Conference on Geoscience Information (Geoinfo IV) in Ottawa on June 29, 1990.
- o SMI is supporting the Mining, Geological and Metallurgical Institute of India, in its efforts to organize an international conference on small-scale mining scheduled for February 2-4, 1991, in Calcutta. Papers are now being requested on such topics as the economic and environmental aspects of small-scale mining, high-tech applications, policy developments as well as country reviews. There is also interest in some papers describing the North American experience. For further information, please contact the Organizing Secretary, ICSSM, c/o MGMI, 29 Chowringhee Road, Calcutta-700016, India. Fax: 91-33-286604.
- o A membership structure for SMI has been finalized. All individuals, institutions, and corporations interested in supporting SMI's efforts to promote small-scale mining entrepreneurship internationally are invited to join. The membership structure and application form are available from the SMI secretariat in Montreal.
- o Please note that SMI Bulletin has switched from volume/number designations to numerical sequencing.

United Nations Revolving Fund in the Philippines

During Phase I of the United Nations Revolving Fund project PHI/86/N^o 1 in the Philippines, a major chromite deposit was discovered. The activities under this project had been concentrated on the ultrabasic massifs of two islands : Palawan and Dinagat. It is in the northern part of the latter island (located north-east of Mindanao and south of Samar), already recognized for its numerous smaller chromite deposits, that the discovery was made in the spring of 1989.

As early as June, first hundreds, then thousands of individuals flooded Dinagat from Mindanao, Leyte and Samar in an attempt to make their fortune in what quickly became a "Chromite Rush". A village of about 12 000 inhabitants mushroomed on the east coast of the island and production from two open pit sites, Bel and Kong King, began immediately.

In October, 6 000 workers were involved in the exploitation of this massive deposit. Although exploitation of the mineral in this manner is illegal, it is exceedingly difficult to control. Recall similar events in Brazil with the gold at Sierra Pelada a few years back. By the end of September to early October 1989 daily production was 120 to 150 tons of a 60% Cr₂O₃ ore!

Detailed studies of the deposit and estimated reserves are presently being carried out by geologists within the framework of the UN project but initial estimates evaluate reserves to be over 1 million tons and more likely to be in the vicinity of 5 million tons.

(J.-F. Sauvage, Géochronique N^o 33, February 1990. Translated by C. Patenaude.)

Gold Mining and Garimpeiros

by J. Davidson

While Brazil's first gold rush occurred in the 18th century, the discovery of Serra Pelada in 1980 marked the beginning of the country's second and current gold boom. Brazil is now the world's 6th largest gold producer, after South Africa, the Soviet Union, the United States, Australia, and Canada. However, Brazil's total reported output has only been a best estimate over the last eight years, given that at least one-half of the country's gold production during each of these years, was not declared.

Brazil's Department of National Mineral Production (DNPM) has estimated 1989's total output to be close to 120 tonnes of which 55.6 tonnes were registered. In 1988, the story was similar, with an estimated total production of 140 tonnes of which only 56.4 tonnes were recorded.

Since 1980, the vast majority of gold production, registered and undeclared, has been removed from small-scale workings (garimpos) or from large mines (e.g. Serra Pelada) worked by small-scale artisanal miners (garimpeiros). Only recently have mechanized and larger-scale operations become significant - companies such as Morro Velho, Rio Paracuta, Val de Rio Doce and others. In 1983 such companies only accounted for 16% of the registered gold production. By 1988, their share had risen to 39%, and in 1989, they accounted for about 54%. But as almost all undeclared production originates from the garimpos, mechanized mines still only accounted for 25% of the country's total estimated production in 1989.

Another characteristic of Brazil's current gold rush is that most of the gold has been extracted from sedimentary, lode and alluvial sand deposits located in Brazil's Amazon rain

forest states, including Amazonas, Rondonia, Mato Grosso, Roraima, Para, Amapa, Maranhao and Tocantin. Within this region, there are, by one estimate, approximately one million garimpeiros, working more than 2000 prospects, serviced by over 900 airstrips, whose economic activities support close to 4.5 million people.

In the Amazon area alone, there are 16 major gold mining districts which have been identified and another 20 smaller areas, which are also being exploited.

The vast majority of both legal and illegal garimpeiro activity is located in Para, Mato Grosso, Rondonia and Roraima states (see Map below).

Most garimpeiro gold comes from surface or riverine workings, with minor amounts from underground mines and reworked mine tailings. Last year approximately 47% of the production was realized using hydraulic mining methods. Dredging accounted for 19%; pick and shovel methods and riffle box, another 17%. The more complex ores require more complicated beneficiation techniques. Milled material comprised 15% of the total. Underwater suction (2%) and tailings reprocessing (1%) at Serra Pelada accounted for the rest.

Today, activity at Serra Pelada is limited to the rehandling of mine tailings, with close to 15,000 people employed in retreatment and concentrating work. What remains of Serra Pelada, which at its peak involved over 80,000 miners, and during its short life, yielded 80 tonnes of gold, is a flooded, abandoned pit of questionable safety, and a "bidonville", where 25,000 men, women and children exist in a generalized state of poverty. During the past year,

Mitsubishi Corporation has been negotiating a "joint-venture" with the miner's cooperative of Serra Pelada to upgrade recovery facilities and extend mining activity underground.

Garimpeiro activity, at times encouraged by the government, but only minimally supported in terms of technical and infrastructural assistance, has also turned the Amazon into the "largest laboratory of gravimetric concentration" in the world - employing a range of technologies with little understanding of or regard for their effectiveness in gold recovery and/or their environmental impacts. As a result, gold recoveries have run 60% at best, with most workings averaging considerably less, while pollution of the Amazon river system with solid effluents and metallic mercury has become a major cause for international concern. The lack of technical support and knowledge has also meant that garimpeiro mining activity has focussed mainly on surficial stocks and small and medium "alluviones", leaving undeveloped the larger and deeper veins and alluvial deposits.

Most recently, in Roraima state, the expansion of garimpeiro activities into Indian reserve areas has led to confrontation and conflict locally and nationally. In early January of this year, Brazil's Justice Minister moving to protect the endangered Yanomami tribe, (about 1500 of the group's remaining 10-11,000 have died from disease introduced via the gold rush which reached their lands in 1987) finally ordered the eviction of thousands of miners illegally operating on Yanomami Indian lands. A week later, the government revised its approach, suggesting instead an exchange of land for a promise on the part of the garimpeiros to leave the Indian

settlement areas and limit their use of mercury and the carrying of firearms. This relocation of mining activity was to be completed by the end of April. There was some skepticism on the part of environmental and church groups that this plan would work. In mid-March, the new President of Brazil, Fernando Collor de Mello, visited the territory to find 30,000 garimpeiros still active in the restricted areas. He ordered the dynamiting of airstrips being used by the illegal garimpos still operating in these areas. The

destruction of 73 known air strips commenced on May 2.

Against the backdrop of increasing conflict with the garimpeiros, a further series of decisions by the new government - to increase the tax on gold sales, and to reduce the official gold price to Cr200/g (about \$113 US/oz) - have resulted in yet more difficulties - these of an economic nature - for garimpeiros. Garimpeiro production is expected to decline in 1990 in the face of

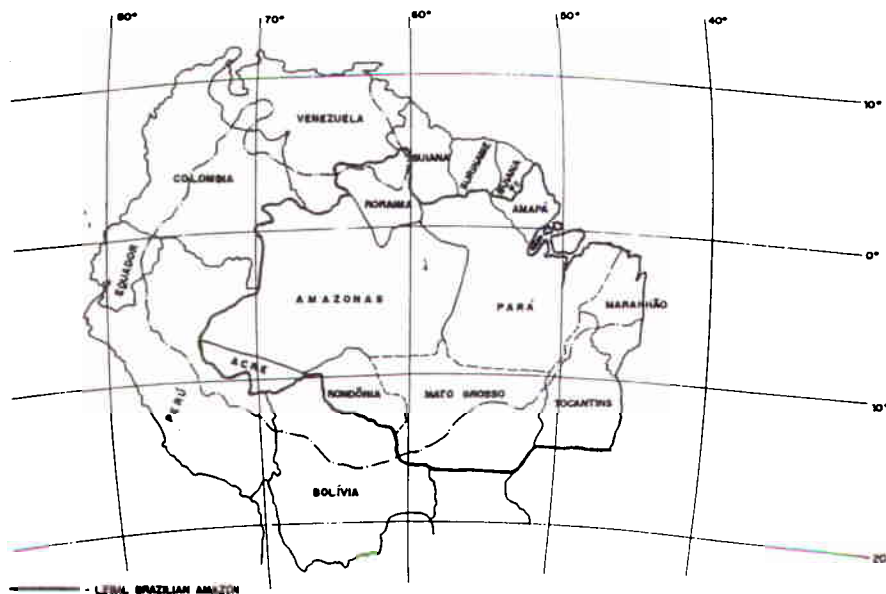
these latest economic measures and increasing pressures to curtail garimpeiro activities in the Amazon.

Acknowledgement

The Editors wish to thank Srs. A.J. Feijao and J.A. Pinto for making available a copy of their paper, "Garimpeiros Activities in South America - The Amazon Gold Rush", (March 1990), for SMI's use. It proved to be an invaluable source of current information for this report.



Serra Pelada 'Bidonville' 1989
(Photo courtesy of J.A. Pinto, Para-Belem)



The States of the Brazilian Amazon.

Garimpeiros in Brazil – An Insider's View An Interview with Sr. Antonio da Justa Feijao

Antonio da Justa Feijao is a geologist and a special adviser to USAGAL (Uniao dos Sindicatos e Associacoes de Garimpeiros da Amazonia Legal), the union of Amazonian garimpeiros founded in 1985. USAGAL regroups syndicates, associations and cooperatives of garimpeiros. Each group is represented within USAGAL by two members, usually the president and a second representative.

Sr. da Justa Feijao was the director of a mining company in the Tapajo mining province in 1984. In 1985 he formed a garimpeiros syndicate in the Tapajo and helped form USAGAL in at the end of that same year. He lived in the jungle as a garimpeiro (gold prospector) himself for three years, between 1987-1989, until malaria fever forced him to return to the city.

Sr. da Justa Feijao was interviewed by J. Davidson,

SMI's Director General, on March 12 during the Prospectors and Developers Association of Canada 1990 Annual Convention. He had been invited to speak at the convention on garimpeiros activities in the South American Amazon.

J. Davidson : Why did you decide to form a garimpeiros syndicate in 1985?

da Justa Feijao : In all of Brazil's gold history, dating back to the 18th century, there has never been organized groups, associations, syndicates, or a government agency to offer support to the garimpeiros. It was my idea to create such a support group.

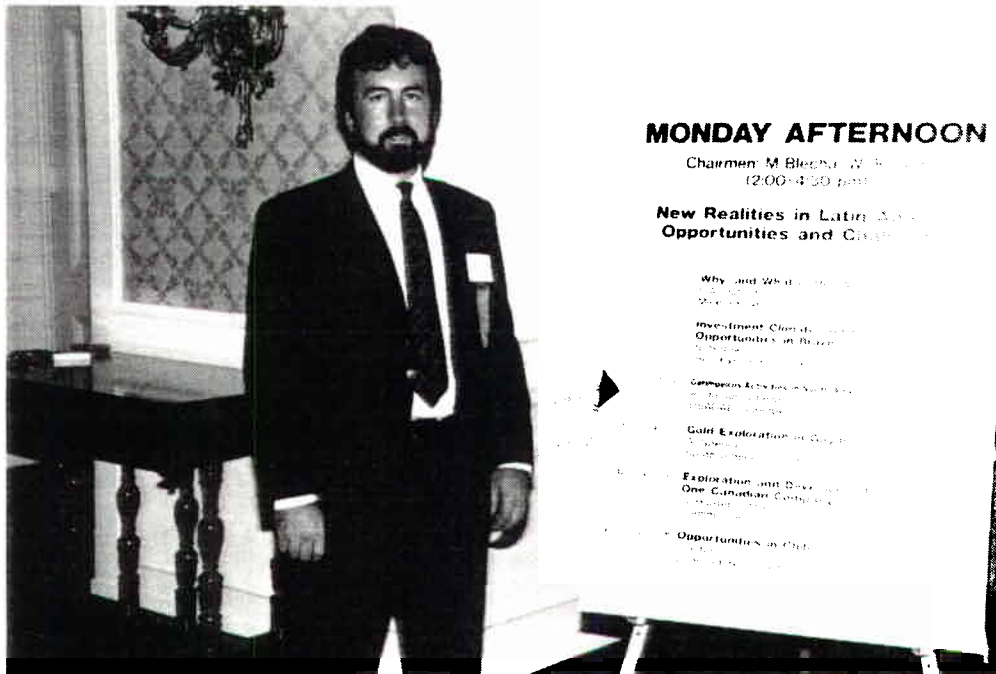
J. Davidson : What type of problems did the syndicate, and later, USAGAL, try to address?

da Justa Feijao : The first problem is that of mercury (gas and solid) pollution. USAGAL

believes the garimpeiros should be taught the proper usage of mercury. We try to advertise such an educational program on television, in papers and journals. The second problem we wish to address is that of an alternative production sector, such as agriculture and fishing, in order to provide garimpeiros with job options when they leave the mining sector after 5 to 10 years. USAGAL is developing a program in this regard.

J. Davidson : Why do garimpeiros spend such a relatively short time-span working gold deposits?

da Justa Feijao : Garimpos (the actual gold working) is a place for young men. The work is very difficult and malaria and other tropical illnesses are exhausting. Forty to forty-five years old garimpeiros who cannot work under these



A.J. Feijao at the PDA Annual Convention, Toronto.

conditions anymore migrate back to the slums and outskirts of large cities since no other options are available to them in the jungle. We must create alternatives for garimpeiros to remain in place and continue earning a living.

J. Davidson : What is the "alternative work" project that USAGAL is presently developing?

da Justa Feijao : The project is called Amazon 2/1. Actually, in 1979 and 1980 people left traditional occupations such as fishing and agriculture for the garimpos enticed by the "rags-to-riches" stories linked with the Serra Pelada gold rush. The government encouraged this migration because it needed the gold to procure the foreign exchange necessary to buy petroleum.

J. Davidson : The government encouraged the exploitation of the garimpos at Serra Pelada. Did it also provide the necessary infrastructural support for the ensuing settlements?

da Justa Feijao : Of all the garimpos only Serra Pelada received nominal support in terms of schools, hospitals, technical assistance and that only for three years, until 1983, the time it took for Brazil to regain its international credit standing. Then the government withdrew its assistance in Serra Pelada which is now a large slum.

It is also interesting to note that the government encourages the settling of garimpos for political reasons. There presently exists a strong international movement led by environmentalists promoting the creation of an independent homeland for Brazil's Yanomami Indians. Since this homeland would presumably be carved out of the existing Brazilian territory, garimpeiros are made to occupy all the border areas so that no land appears unoccupied.

The final result is that the problems raised by poverty are moved out of the cities into the jungle and quite often forgotten by the government

authorities. The standard of living in the cities than appear to increase but the predicaments faced by the poor, now isolated in the jungle, are still not being addressed.

J. Davidson : You touched on this topic during your presentation earlier. Could you please elaborate on the reasons why garimpeiros are not able to make a decent living from gold mining?

da Justa Feijao : This is the heart of the garimpeiros problem. Normally, the garimpeiros spend between one to two months recovering the gold from hard rock or alluvium. This gold then takes two days to travel south to the gold market at the Central Bank. The money the garimpeiros receive in payment for the gold is then used to buy food, machinery, diesel fuel, etc. Since none of these necessities are available locally, the money is returned to the commercial centres of the south which are supplying all of the above. The garimpos export gold, create misery and poverty and import only food.

J. Davidson : Do the garimpeiros take the gold themselves to the gold market or is it sold to a "middleman" at the mine site?

da Justa Feijao : Normally there is a small town or city which provides support services to the garimpeiros and offer a primary market for the gold. There are also "middlemen" and they are very rich.

J. Davidson : What price do the garimpeiros get for their gold from the "middlemen"?

da Justa Feijao : Normally, the price paid varies between 80 and 85% of the government-set gold price. (Ed. Note: There was some confusion during the interview over this point. Hopefully this is the correct interpretation of what was meant.)

The middleman sell 50% of the gold bought through official channels, i.e. the Central Bank, and 50% through the black market. In that regard it is

ironic that Brazil's Bureau of Mines keeps two separate records for gold production, one for official production and one for production estimated to be lost to the black market.

J. Davidson : How can the garimpeiros improve their living conditions. Why is the money paid to them insufficient to earn them a decent living?

da Justa Feijao : The problem is that each garimpeiro fits within a certain social structure which comprises multiple levels. Usually, one or two men will stake a portion of a river or outcrop. The machinery used to extract the gold is positioned along the stream bed or deposit and operated by four or five garimpeiros hired by the owner of the lease. Of the gold produced and sold 70% of the returns will go to this boss and 30% to his hired help. However, this 70% share must be used to buy fuel, airplanes, food, machinery, etc. Furthermore, the garimpeiros can only work seven months of the year since they are hindered by the five-month rainy season.

J. Davidson : Where does USAGAL go from here? What do you see for the future?

da Justa Feijao : USAGAL must become a strong confederation representing the miners interests. It must become a strong political force in order to lobby the government agencies responsible for all the mineral sector policies and laws.

For more information please contact Sr. Antonio da Justa Feijao, Director, Tecmina, Av. 1 de Dezembro, 562/101, CEP 66 240, Belem-Para, BRAZIL.

The Federation of Mining Coops — La Paz

FEDECOMIN-LP (Federación Departamental de Cooperativas Mineras La Paz) was created in November 1978 as a regional subsidiary of FENCOMIN (Federación Nacional de Cooperativas Mineras de Bolivia). FEDECOMIN's principal objectives are : 1) to represent the interests of its affiliated cooperatives, and 2) to provide support services, including administrative, technical, and financial assistance. These objectives are realized through the efforts of a team of multidisciplinary professionals, technicians and specialists aided by representatives from member cooperatives : CODECOMIN (Consultora de Cooperativas Mineras). Credits provided to FEDECOMIN-LP by banking institutions and other funding agencies are administered by FADES (Fundación para Alternativas Desarrollo) which also administers FEDECOMIN's Revolving Fund. FEDECOMIN is responsible for evaluating the financial requirements of projects presented to it by member coops and providing the necessary financial assistance.

Since 1989 FEDECOMIN-LP has created two departments providing technical support : DEAT (Departamento de Educación y Asistencia Técnica) and PTF (Programa Turbinas de FEDECOMIN-LP). DEAT promotes education and training and provides mine assessment (prospecting, production, reserve), as well as providing feasibility studies for other activities. PTF aims at implementing micro hydro-plants to harness small streams for powering mine equipment (processing plants, aircompressors for drilling work, etc).

Programa Turbinas de FEDECOMIN-LP initially got financial support from Bread of the World, a funding agency of the Protestant Church in Germany and technical assistance from FAKT (Association for Context Appropriate Technology), a consulting group of Bread of the World specializing in small-scale water power technology.

Hydropower at 'La Suerte' Coop

Bolivia is a mining country where silver, gold, tin, and tungsten are produced. Sales of these commodities are highly dependent on fluctuating world market prices, which often translates into cyclic crises and the unemployment of thousands. In reaction to this situation, small-scale miners organized themselves into cooperatives demanding land claims from the government. The history of these mining cooperatives in Bolivia goes back as far as 1929 with 340 coops presently registered.

As one of five countries situated in the high Andes with an east-west extension of 900 km, a mean annual precipitation of roughly 1 500 mm and altitudes of 250 to 6 550 meters above sea-level, Bolivia became an ideal site for the testing of micro hydro-power plants. FEDECOMIN, a federation of mining coops started the Programa Turbinas de Fedecomín (PTF) which offers planning and implementing capacity for the harnessing of small streams to power the equipment of the mines. Since credits present some difficulty, PTF is equipped with a rotating fund. Instead of using this fund to finance only one or two plants, PTF builds plants only after a thorough feasibility study of a site gives a positive result. The coop can then take up a loan to be repaid with the savings generated from the use of the hydro-power plant as opposed to the Diesel generator.

The coop "La Suerte" (meaning "luck") was founded in 1970 and is a nine-hour jeep ride from the capital La Paz. "La Suerte" presently numbers 99 "socios", or members. They started out by exploiting their gold veins manually, using the "quimbaleta" to grind the ore and a "chua", or wooden pan, to separate the gold from the sand. Production by this method is inefficient, the human effort involved tremendous, not to mention the exhausting working conditions.

With contributions from the savings of each "socio", the coop was able to acquire mining equipment as well as a Diesel generator (130 kW) to power it. The production increased but so did the costs. The generator required up to 6 000 liters of fuel per month. To transport it to the mine took two days over difficult roads. Subsequent repairs on the vehicle were frequent and made up a large part of the expenses.

Even before PTF had started operating, the coop approached FEDECOMIN to assist in harnessing the river passing by the mine. After a period of planning and preparation, including continuous measurements of the river's waterflow and determination of the power at different site alternatives, construction in May 1987. In order to lower the overall investment, the coop decided to provide its own manpower rather than contract a firm to install the equipment. Although the high amount of local participation was not always easy for either the coop or PTF, requiring additional coordination and supervision, in the end it resulted in an enhanced degree of identification and satisfaction by coop members with "their plant". The turbine of the micro hydro-power plant at "La Suerte" was ceremonially put into service on May 18, 1988.

(HYDROWET, Vol.1 (88), N^o 1 (FAKT, Gansheidestrasse 43, D-7000 Stuttgart 1). For more information contact Carlos Malgarejo, Director, Programa Turbinas de Fedecomín, Casilla 11 394, La Paz, BOLIVIA).

Small-Scale Gold Mining in Harare District

Introduction

This article reviews the growth of the small-scale gold mining sector in the Harare Mining District between 1980-1988, the problems associated with this expansion, and the available government assistance. Small-scale gold mines presently make up more than 70% of the small-scale mining sector in this district, the other 30% involving the mining of clay deposits, iron oxides and pegmatite minerals (i.e. mica, tin, tantalite, tourmaline, beryl) and the associated precious and semi-precious stones.

Definition of Small-Scale Mining

The classification scheme adopted by Zimbabwe's Ministry of Mines recognizes six categories of mines based on individual annual gold production in kilograms (Table 1). The last category, which is the focus of this report, includes all operations (mines, sand and tailings reworking) that produce less than 15 kilograms per annum and accounts for 80% of gold-producing mines and 3 to 5% of the total annual gold production.

Within the Zimbabwean context a small-scale miner is recognized as falling within any of the following groups: 1) an individual employed elsewhere but engaged in mining in his spare time, 2) a farmer-miner engaged in mining on a seasonal or part-time basis, 3) a full-time miner exploring and exploiting new deposits, 3) cooperatives of inexperienced miners short of capital and equipment.

The noticeable growth in small-scale mining activity in Zimbabwe, immediately following independence in 1980 (Fig. 2), has been accompanied by a number of problems which

government agencies have sought to address with the help of policies directed specifically at the small-scale mining sector. Among the most difficult situations are insufficient financial resources and inadequate experience and training.

Financial Resources

The lack of sufficient capital has affected the small miners at all stages of production from exploration to processing. The hiring of reasonably skilled personnel to ensure that the deposit will be exploited in a systematic and safe manner and to ensure maximum recovery has been beyond the reach of most small miners. Inadequate funding has also resulted in the inability to acquire the necessary exploration and mining equipment and to install adequate processing facilities on-site. This has led to prohibitive transport costs between the mines and processing or custom milling plants.

Experience and Training

Lack of proper experience and training at the exploration and exploitation stages have often meant haphazard mining strategies leading to extensive loss of ore. At the processing stage it has translated into poor sampling practice and inefficient recovery of the minerals.

Custom Milling

A result of both insufficient financial resources and lack of appropriate training is that small-scale miners often have to use the services of custom milling plant owners. Custom milling is contract milling where a miner or small company with a mill processes ore from other miners for a fee. Unfortunately, poor recoveries (often as a result of

negligence on the part of the milling plant owner when treating ore other than his own) result in disputes between the producing miner and the plant owner.

POLICY OF GOVERNMENT ASSISTANCE FOR THE SMALL-SCALE MINING SECTOR

Small-scale mining activities are governed by Zimbabwe's Mines and Minerals Act, which is administered by the Ministry of Mines through its four District Mining Commissions. Geologists, mine engineers, inspectors, surveyors and metallurgists complement each other in an attempt to help the small-scale miners with support and technical advice on exploration, mining and processing problems.

Financial Assistance

A number of loan types are available to small-scale miners under the government funded Mining Industry Loan Fund. For instance, upon recommendation by geologists, engineers, and metallurgists financial assistance is available to the small miners in the form of a prospecting grant, maximum Z\$ 2 000 (approximately US\$ 860), to meet the initial exploratory costs. Other types of loans of varying amounts are available to purchase and/or develop mines, establish infrastructures and for emergencies. All the above loan programmes are administered by regional technical staff and regularly appraised by the Chief Government Mining Engineer. Central control is the responsibility of the Ministry of Mines.

Technical Assistance

The rapid growth experienced by the small-scale mining sector has led to a shortage of adequate mining equipment. Tools used range from hammer,

chisel and pinchbar for extraction; wheelbarrows, windlasses and buckets, to bring ore to the surface. Crushing equipment can be as simple as pestle and mortar or hand operated stamp mills. The government's Plant Hire Scheme allows the small-scale mining community to have access to more modern equipment including pneumatic hoists, drills, compressors, mills and flotation cells. The programme is operated on a 'hire-to-purchase' basis and is administered by the Chief Government Engineer. Field technical staff supervise the installation of the equipment and carry out the maintenance.

Marketing

In order to curb illicit trade, government has guaranteed the gold price at Z\$ 600 (approximately US\$ 245) per ounce.

THE SMALL-SCALE MINER'S ASSOCIATION OF ZIMBABWE (SSMAZ)

The formation of the Small-Scale Miners's Association of Zimbabwe (SSMAZ) in 1982 was a great boost to the small-scale mining sector in this country. At the beginning of 1987, the SSMAZ received the support of the Intermediate Technology Development Group in the UK (see SMI Bulletin Vol 1., No.1). As a result, a pilot co-operative milling and processing centre, the Shamva

Gold Mining Centre, was commissioned in mid-1989. The numerous small-scale gold miners in the Shamva area bring their ore for custom milling to this central facility. Having realized that the majority of its members lack proper technical knowledge, the SSMAZ together with the staff from the Ministry of Mines and ITDG have organised regional training workshops to teach basic mining methods and other techniques.

The formation of the SSMAZ has helped organize the small-scale miners both at the regional and national level. Small-scale miners face similar problems regardless of the mining region in which they operate. The training workshops disseminate basic information on mining principles as well as information on locally available technical, mechanical and financial assistance. This together with the government's assistance programmes such as the Mining Industry Loan Fund and Plant Hire Schemes have played a crucial role in enabling the small worker industry to survive and in many cases prosper.

Discussion

Without a doubt Zimbabwe's small-scale mining tradition, which goes back many centuries, has endured and even profited since the country's independence in 1980. With the government of Zimbabwe

acknowledging the contribution of small-scale mining to the national economy, enterprising individuals have been encouraged to develop new deposits and rework abandoned mines and tailings. Despite the numerous advantages of small-scale mining operations in term of rural development, large-scale employment opportunities, and generation of foreign currency, more work remains to be done before this vital sector attains its full potential. Although any citizen can undertake prospecting, exploration and exploration activities for any mineral at any organisational level providing the necessary licensing and registration formalities are complied with, the very number and seasonal nature of some small-scale mining operations makes these requirements difficult to meet. Without the necessary technical supervision this situation leads to inefficient and wasteful mining and processing methods. Ancillary effects of unsupervised operations include inadequate health and safety conditions and environmental problems including farmland destruction, river bank erosion and silting. Finally, illegal activities by unlicensed small miners trading gold on the black market result in the loss of essential foreign exchange.

Based on an article submitted by K.G. Chenjerai, Regional Geologist, P.O. Box 8039, Causeway, Harare, ZIMBABWE.

Table 1. ZIMBABWE'S MINES CLASSIFICATION SCHEME BASED ON ANNUAL GOLD PRODUCTION

PRODUCTION (kg)	% OF GOLD PRODUCING MINES	% OF TOTAL ANNUAL GOLD PRODUCTION
>300	2-7	61-83
150-300	.07-4	5-25
60-150	.04-5	2-14
30-60	0-2	0-4
15-30	0-2	0-2
<15	85-95	3-4

Employment Creation and Economic Development in the Small-Scale Mining Sector

A seminar on potential for employment creation and economic development from small-scale mining in Zambia was held 15-16 February, 1990, in Lusaka. The meeting was sponsored by the International Labour Organization (ILO) under the auspices of the Southern African Team for Employment Promotion (SATEP).

A 147-page document tabled by Dr. M. M. Mpande, Dean of the School of Mines, University of Zambia, formed the basis for discussion. The document addressed the small-scale mining of gemstones (emeralds, amethyst and aquamarine) and to a lesser extent small-scale mining of industrial minerals.

The seminar was divided in two parts, the first being devoted to discussion on "Available Resources" and the second addressing the question of "Available Assistance". In total five papers were presented dealing with the above topics. Under the second topic in particular, subjects such as availability of technical, financial and infrastructural support services were considered. Problems arising from policing and/or licencing, lack of promotion of the gemstone sector to the tourists and the present marketing arrangement were considered by at least one speaker to be detrimental to the industry. The last item in particular is one of general dissatisfaction among the small-scale miners.

Before the seminar came to a close three committees were formed. They were given the mandate to draft resolutions, which would then be forwarded as recommendations emerging from the seminar, to government authorities through the Ministry of Mines, under the following headings: "Legal Framework", "Marketing Arrangement", "Technical and Financial Assistance".

As reported by Sandfor Mambwe, Geological Society of Zambia, P.O. Box 30090, Lusaka, ZAMBIA. For further details, please contact Dr. M.M. Mpande, School of Mines, University of Zambia, P.O. Box 32379, Lusaka, ZAMBIA.

The Gemstone Mining Situation

*by West Sikombe**

Known principally for its huge copper mines, Zambia has witnessed an upsurge in gemstone mining over the last three years. The mining of emerald, aquamarine, and amethyst now account for the largest proportion of small-scale mining activity in the country.

For these three major gemstones, 200 prospecting licences have been issued for emeralds, while 48 mining licences are currently operational on the Copperbelt; for aquamarine, 50 prospecting licences have been issued and a total of 25 mining licences are operational; 38 prospecting licences have been issued for amethyst and a total of 25 mining licences are fully productive.

Gemstone mining has thus become a vital part of the Zambian small-scale mining sector owing mainly to three important factors. Firstly, gemstone mining is simple and technically uncomplicated. Secondly, the government's liberal policy of issuing licences has encouraged an increase in small-scale mining ventures by Zambians. Thirdly, the government's "equipment-for-hire" program allows small-scale miners easy access to mining equipment through Zambia Consolidated Copper Mines. The equipment and workshop for servicing are based in the field and charges are very reasonable. Although this program is available only in the emerald mining areas, it is hoped to be extended to other gemstone mining areas as well.

Despite the encouraging trend being observed in the field of small-scale gemstone mining, two major constraints remain major drawbacks to further expansion. In the first case, the small-scale miners being issued prospecting licences typically do not concern themselves with any "scientific" exploration effort or evaluation of mineral prospects. Instead they go into the field, hire expensive equipment, and start mining, whether or not there is any proven economically mineable material. As a result, much activity ends in failure and bankruptcy. Professional geological services are rarely sought unless reports are required by government agencies or when geological problems are encountered. In the second instance, the marketing arrangement is far from being efficient and is a cause of major dissatisfactions among small-scale miners. Currently all emerald rough stones are bought by the parastatal company, Zambia Emerald Industry Limited (ZEIL). The stones which are not used by ZEIL are turned over to another parastatal company, Reserved Minerals Corporation, which is expected to process the material through its subsidiary Mindeco Small Mines. Aquamarines are also marketed through the Reserved Minerals Corporation. The sole marketing agency for amethysts is Kariba Marketing which represent a Lonhro and government shared holding company. Lonhro is currently the major amethyst producing company in Zambia under its subsidiary, Northern Minerals.

Not surprisingly, Zambia has been losing a substantial share of gemstones through illegal mining and illegal trading. It is estimated that at the existing level of production, the government loss is approximately US\$ 50 millions every year. With the levels of production expected to rise as a result of the "equipment-for-hire" program, the threat of increased losses becomes evident.

In order to see Zambia regain its share of much needed foreign exchange from the sale of gemstones on the international market, urgent steps must be taken. Foremost is the creation of a proper marketing system with a more liberal approach necessary to satisfy the small-scale miners. Also, small-scale miners need to be educated and encouraged through seminars, workshops and field demonstrations to utilize proper prospecting and mining methods.

* Kankule Mining Co., P.O. box 50549, Lusaka, ZAMBIA.

CALENDAR OF EVENTS

June 24-29, 1990. The 4th International Conference on Geoscience Information (GeoInfo IV) will take place in Ottawa, Ontario, Canada. The conference will include plenary sessions and concurrent workshops, seminars, posters and discussion sessions, formal and informal. SMI will host a workshop on international information systems for small-scale mining. For more information contact : David Reade, GeoInfo IV Secretary, GEOSCAN Centre, 601 Booth Street, Ottawa, CANADA, K1A 0E8. Tel.: 613-992-9550. Telex : 0533117 EMAR-OTT. Telefax: 613-996-9990.

September 10-14, 1990. The Chamber of Mines and Energy of Western Australia is sponsoring an international conference on occupational health and safety in the minerals industry to be held in Perth. For information contact : Mr. P.B. Gilroy, Secretary, Minesafe International 1990, The Chamber of Mines and Energy of W.A. Inc., 7th floor, 12 St-George's Terrace, Perth, Western Australia 6000. Telefax : (09) 221 3701.

October 2-5, 1990. The North West Queensland Branch of the Australasian Institute of Mining and Metallurgy is to conduct a conference at Mount Isa, Queensland, designed specifically for mine geologists. It is the first of its kind to be held in Australia. The conference will provide the venue for the representation and discussion of practical aspects of mining geology, with particular emphasis on recent development, innovative ideas and cost reduction methods. For information please contact : Mike Brook, Secretary, Organizing Committee, Mine Geologist's Conference, North West Queensland Branch, The AusIMM, P.O. Box 567, Mount Isa, Queensland 4825, Australia. Tel. : (077) 44 2417 Mount Isa. Telex : AA 49562. Telefax : (077) 43 9858.

January 23-25, 1991. The International Conference of Rare Earth Minerals and Minerals for Electronic Uses will be convened at Prince of Songkla University, Hat Yai, Thailand to explore such topics as supply and demand, extraction technology, and new applications. For information please contact : Prof. Dr. Boonsom Siribumrungsukha, Dept. of Mining and Metallurgical Engineering, Prince of Songkla University, PO Box 2, Khohong, Hat Yai 90112, Thailand.

February 2-4, 1991. The Mining, Geological and Metallurgical Institute of India in collaboration with SMI, the Intermediate Technology Development Group, and the National Institute of Small Mines will be hosting an International Conference on Small-Scale Mining. For more information, please contact : Organising Secretary, ICSSM, c/o MGM, 29, Chowringhee Road, Calcutta-700016, INDIA. Telefax : 91-33-286604

CURRENT OPPORTUNITIES

Investment and Technical Assistance Opportunities

China. Ore exploitation company seeks financial assistance to exploit potash syenite and nepheline syenite deposits, and know-how to manufacture potassium fertilizers from potash syenite. Duan Wei-xin, Senior Engineer, The Non-ferrous Metals Geological Research Institute of Eastern China, 58-1 Yu Dao St., Nanjing.

Ghana. Small-scale mineral processing company seeks know-how, flow-diagram information technology, technical assistance, etc. to process raw bauxite into aluminium sulphate and other salts. High grade bauxite available on company's licenced concession. K. Kwakye Ankoma, Managing Director, Primary Ore Products Co., Ltd., P.O. Box 3191, Accra.

Ghana. Financial assistance sought, possibly on a joint-venture basis, to manufacture 10 to 15 tonnes per day of dry kaolin for the building industry, using locally available kaolin in lumps. Feasibility study available. Aitso Kofi Akpalu, Managing Director, Maskee Ltd., P.O. Box 0416, Osu-Accra.

Ghana. Prospectors and traders in gold seek investor for the exploitation of gold on a concession of 36.24 square miles. Life of the reserves estimated at over 40 years. All necessary documents have been acquired. Kweku Asamoah Boateng, Managing Director, Eagle Life Star Ltd., P.O. Box 1777, Kumasi.

India. Salt works with a capacity of 150 000 tonnes per year seek proven technology and process know-how to manufacture salt and bitterns based chemicals. Illustrative projects include bromine (1.5 tonnes per day) and bromine salts, mini caustic soda plant (25 to 40 tonnes per day), and magnesium oxide from sea water for magnesia refractory bricks. Land, infrastructure, raw materials, manpower and financing available. B.K.S. Jain and Associates, Marketing, Management & Agro Consultants, 7 Neel Tarang, 208 Savarkar Marg, Bombay 400 016.

Morocco. Know-how, process technology and equipment sought to manufacture 150 to 250 tonnes per day of plaster of Paris from calcinated gypsum, with low energy consumption. Sabri Frères S.A., 53, rue Abdellah Elmediouni, Casablanca 01. Telex : 24832. Telefax : 31 77 11.

Nigeria. Entrepreneurs seek technical know-how and joint-venture to cut and polish granite blocks and manufacture floor tiles for export and local market. Infrastructure, large quarry and labour available. B.A. Momodu, Manager, Jidaire Scientific Co. Ltd., P.O. Box 333, Benin City.

Nigeria. Mineral processing company seeks calcining technology on joint venture basis to exploit diatomite deposit. Feasibility study is available. Other opportunities include talc and marble. Al. U. Sanda Kano, Minerals Industry Ltd., 78 Club Road, Kano.

Sri Lanka. Pioneer exporters of silica quartz, phlogopite mica scrap and sea salt seeking partners for joint venture in silicon carbide, ferro-silicon, graphite crucibles and table salt production. K.A. Dalpatadu, Krishna Mining Co, (Ceylon) Ltd., 54-2/3, Australia Building, York Street, Colombo 1, Sri Lanka. Telex : 21494 GLOBAL CE. Cable : "PORTIMEX" Colombo.

United Republic of Tanzania. Precious and semi-precious gemstone mining and exporting company seeks investor with know-how, technical, marketing assistance and machinery, to set up mining concerns for gemstones, tombstones, granite blocks and building stones on a joint-venture basis. Mines, mining concessions, grants, land and labour available. E.N.K. Loomu-Ojare, Managing Director, Melau Gemstones (T) Ltd., P.O. Box 2604, Arusha. Telex: 42004 IMPALA TZ.

United Republic of Tanzania. State-backed co-operative seeks technology, financial assistance and equipment to undertake small-scale mining for gold deposits. Project write-up and background documentation on deposits available. B.B. Mayao, Chairman, Juhudi Multipurpose Co-operative Society Ltd., P.O. Box 1188, Mbeya.

United Republic of Tanzania. State-backed co-operative seeks know-how, technical assistance, equipment and training on a joint-venture basis, to cast jewellery of all kinds especially from gold, tanzanite, ruby, tourmaline, etc. B.B. Mayao, Chairman, Juhudi Multipurpose Co-operative Society Ltd., P.O. Box 1188, Mbeya.

Yugoslavia. Company seeks joint-venture partner to acquire and operate an automatic grinding machine for refractory tiles made from diatomaceous earth. Yugoslav Chamber of Economy, reference 2540/4117, Bureau for the Employment of Spare Production Capacities, Knez Mihailova 10/11, 1100 Belgrade. Telex : 11431 yupub yu. Telefax : (11) 31 928.

Employment Opportunities

Bolivia. CUSO is currently seeking a Canadian mining specialist to undertake technical and economic evaluation studies of state owned, private sector, and cooperative mining operations, as well as to provide assistance to local NGOs, church and trade union organizations on the development of alternative mining strategies in the Potosi region. A working knowledge of large and small-scale mining, as well as mining economics is desirable. Contact : Ms. Claire Bedard, CUSO, 180 St-Catherine Street East, Suite 610, Montreal, CANADA, H2X 1K9. Tel: (514) 393-9133.

A Special Note of Thanks

On behalf of the Board of Directors, the Executive Committee and Managing Director of Small Mining International wish to express their appreciation to Ms. Chantale Patenaude for the dedication, thoughtfulness, organizational abilities and good spirits she brought to her work during the first year and one-half of SMI's existence. Without her assistance and generosity, SMI would never have gotten as far as it has, in such a short period of time. Her invaluable contributions, as office manager, researcher, writer, editor, and co-worker, are gratefully acknowledged. We wish her only the best in all her future endeavours.

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SMI is a non-profit organization dedicated to strengthening and supporting the small mining sector as an aide to rural development, social and economic, especially, but not exclusively, in developing countries.

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Contributions in English, French, and Spanish on all aspects relating to small-scale mining, including upcoming events and new publications, as well as, comments and suggestions are welcome.

Requests for information on membership and subscription requirements can be addressed to SMI's Managing Director at the above address.
