Strategies for sustainable development of the small-scale gold and diamond mining industry of Ghana

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Abstract

The small-scale gold and diamonds mining industry is of great importance to Ghana. Since its regularization in 1989 the sector has produced and sold over 1.5 million troy ounces of gold and 8.0 million carats of diamonds. During the same period the sector also provided direct employment to over 100,000 people and improved the socioeconomic life of many individuals and communities. However, these were largely achieved at a cost to the environment in areas where mining is carried out and there is the need to develop the industry in a sustainable manner. This paper looks at the developments in the small-scale gold and diamonds mining industry in Ghana and proposes some strategies on how the concepts of sustainable development could be applied to the industry.

Keywords: Ghana; Small-scale mining; Gold; Diamonds; Sustainable development

Introduction

For many centuries the small-scale mining of precious minerals has made a significant impact on the socioeconomic lives of people and communities involved directly or indirectly in the sector (Kesse, 1985; Hilson, 2002a). In Ghana, the precious minerals mined at the small-scale level are gold and diamonds. Since the regularization of small-scale mining in 1989, over 1.5 million troy ounces of gold and 8.0 million carats of diamonds have been produced by the sector (Ghana Minerals Commission, 2004).

Due to its labor intensity, small-scale mining operations generally generate significant employment avenues, especially in remote rural areas where alternative job opportunities are scarce and low paying. Apart from the direct employment contributions of small-scale mining, it also generates a substantial number of indirect jobs in other sectors of the economy. However, production of these minerals has been at a cost to the environment and there is the need to develop the sector in a sustainable manner.

Sustainable development of minerals and other natural resources has been endorsed as a global management and development strategy and environmental, economic and social developments have been highlighted as the three pillars of sustainable development and their integration is encouraged (WCED, 1987; Anon, 1992). There are, however, several arguments about the applicability of these concepts in the minerals industry, especially the small-scale minerals industry, since minerals are non-renewable resources that are subject to exhaustion in the course of production. The exhaustible nature of mineral resources places a limit on growth of these industries and hence their sustainability (Lele, 1991; Mikesell, 1994; Traore, 1997; Ednie, 2002; Anon, 2002).

In Ghana, there is an ongoing discussion by stakeholders in the mining industry on measures to mitigate the negative effects of small-scale gold and diamond mining and to help the industry to develop in a sustainable manner (Yakubu, 2002; Hilson, 2002b). This paper is a contribution to the debate. It focuses on how the general concepts of sustainable development can be applied specifically to the small-scale...
gold and diamonds mining industry in Ghana. Sustaining the sector is considered in the context of the mineral supply process, environmental and health implications, and the socioeconomic realities of the affected areas.

**Legal framework of small-scale mining**

The legal framework for registration of small-scale gold and diamond mines, mineral production and sales in the sector was established in Ghana in 1989. The Small-scale mining law, PNDCL 218 (Anon, 1989a) led to the establishment of the Small-scale Mining Project within the Ghana Minerals Commission. The Small-scale Mining Project (now Small-scale Mining Department) has the responsibility of providing technical assistance to prospective and registered small-scale miners in Ghana and promoting their activities. The Mercury Law, PNDCL 217 (Anon, 1989b) legalized the purchasing of mercury for gold recovery purposes from authorized dealers and the Precious Minerals Marketing Corporation (PMMC) Law, PNDCL 219 (Anon, 1989c), created an authority to buy and sell gold and diamonds.

The PMMC operates gold and diamond purchasing offices in Accra, Tarkwa and Bolgatanga and has licensed buying agents and sub-agents throughout mining areas in the country who buy gold and diamonds for resale to the corporation. In order to introduce some form of competition into the gold purchasing set up, the Government of Ghana granted buying licenses to private owned companies namely, Miramex and Precious Metal Refinery Limited to purchase gold from small-scale miners.

Since the regularization exercise, two types of small-scale miners have emerged—legal and illegal. Legal small-scale miners comprise those who have acquired mining licenses from the Minerals Commission of Ghana to cover their concessions. Illegal small-scale miners include those mining and/or processing ores without the requisite mining license and they usually operate on concessions held by other companies. Illegal small-scale gold or diamond mining is popularly known in local parlance as *galamsey*, a corruption of the phrase ‘gather them (the gold) and sell’.

By the end of 2001, 420 small-scale mining concessions had been licensed in the country. Of these, nine were diamond licenses and 411 were gold. Together these mines generated employment for over 100,000 miners (Ghana Minerals Commission, 2002). Some small-scale diamond miners recover gold as a by-product or vice-versa

**Technical and financial supports for the sector**

The small-scale mining sector has received governmental and international support since its regularization. The Minerals Commission of Ghana, a governmental body, which is responsible for formulating and managing the sustainable exploration and exploitation of mineral resources in the country and for handling all public agreements relating to mining, is also responsible for making policies governing small-scale mining activities. The Commission manages the sector through its Small-scale Mining Department. The sector has also received assistance from the World Bank for the implementation of the legislation and provision of technical support in areas of health, safety and environment. The German non-profit organization, Gesellschaft für Technische Zusammenarbeit (GTZ) with support from the German government also assisted in setting up a hire-purchase scheme of equipment in 1992 for the sector (Mireku-Gyimah et al., 1996). With assistance from Federal Institute for Geosciences and Natural Resources of Germany and the World Bank, the Minerals Commission successfully tested and introduced hammer mills to the Ghanaian small-scale mining industry in 1999. The first plant was built at Bolgatanga in the Upper-East Region of Ghana (Anim-Sackey, 2001).

A number of companies have been registered as mining support service companies in the sector and these include Peace Small-scale Mining Services, West Africa Gold Mining Company Limited, China Non-Ferrous Metals (Ghana) Limited, Elpusan Company Limited and Triumph Day Company Limited (Anim-Sackey, 2001). They provide technical assistance in prospecting (after acquisition of small-scale mining licence), contract mining and minerals processing. They also give financial and managerial support to companies and groups engaged in the trade. The registration of mining support service companies has contributed significantly to the Minerals Commission’s objective to mechanise the mining and processing operations in the small-scale mining sector. Some large-scale mining companies, that have allowed small-scale miners to work as tributers on their concessions, support the miners through training programmes and provision of equipment. Notable among these companies is Abosso Goldfields Limited, which began this management strategy when it was a subsidiary of Rangers of Australia.

Small-scale miners in Ghana derive most of their technical support base from the staff of the Small-scale Mining Department of the Minerals Commission in the district centers. The district staff visits the miners frequently on their concessions and offer technical advice on good mining practices, health, safety and environmental issues.

**Small-scale mining activities**

The favorable geological setting of Ghana allows small-scale mining of gold and diamonds to thrive. Several small-scale mining areas are dotted throughout the country, specifically within the Tarkwaian and Birimian rock systems of Ghana. Fig. 1 is map of Ghana showing the diamondiferous and gold bearing areas where small-scale activities thrive (Kesse, 1985).
The miners acquire concessions in areas where the deposits are rich, but too small to justify investment in the infrastructure and equipment necessary for large-scale operations. Small-scale miners have very low overheads due to the use of unsophisticated or inexpensive equipment. In addition, production costs per ounce of gold or carat of diamonds in small-scale operations are relatively low and the industry is not very sensitive to fluctuations in the price of the precious minerals on world market (Amankwah and Anim-Sackey, 2003).

Small-scale miners are prohibited from working on mineral concessions held by large-scale mines. Unfortunately, some illegal miners (galamsey) encroach on these concessions leading to conflicts between them on one hand and mine security forces and mine management on the other. However, in recent years some large-scale mining companies have taken proactive management steps to regularize the activities of galamsey miners working on their concessions. It is mainly achieved by ceding portions of the concessions where the total reserves are too small and therefore uneconomic to mine on a large-scale to the Minerals Commission for licensing to the small-scale miners along the lines of statutory laws contained in the Mining and Explosives Regulations (Anon, 1970). The scenario is similar to the peace deal brokered by Placer Dome in Venezuela with small-scale miners working around the Las Cristinas deposit in the early 1990s (Davy, 2001). This development has created a friendly environment and peaceful co-existence between the large-scale mining companies and their small-scale mining counterparts.

By the end of 2003, there were four cases of co-existence between small-scale miners and large-scale mining companies on the concessions held by the latter. The large-scale mining companies involved in this unique situation were Ghana Consolidated Diamonds (GCD) at Akwatia, Goldfields Ghana Limited at Tarkwa, Abosso Goldfields Limited at Damang and Bogoso Gold Limited at Bogoso. Together, these companies had over 4000 tributers working on their concessions (Amankwah and Anim-Sackey, 2004).

In a typical small-scale gold mining operation where hard rock is mined, the ore is excavated manually and size reduction is carried out using a combination of jaw and rocker crushers, hammer, disc and stamp mills. The stamp mills and rockers are manually operated while the others are powered by diesel or electricity. Generally, the milled material is washed in a sluice lined with corduroy, jute material, miner’s moss or astro turf to obstruct the flow of slurry and concentrate gold particles. Alluvial ores do not go through comminution but are scrubbed, screened and concentrated by sluicing. The concentrate in both cases is cleaned in pans and the gold is amalgamated with mercury. The amalgam is then roasted to obtain the gold, which is sold to licensed buyers. Diamond winners dig out the diamonds containing gravel and take it through washing and screening processes to remove clay and coarse gravel. Diamonds in Ghana are usually of size below 8 mm and since those below 1 mm are of no commercial value, the miners screen the gravel to obtain particles between 8 mm and 1 mm and sort them by hand for diamonds.

### Socioeconomic significance of small-scale mining

The small-scale mining of these precious minerals has made significant socioeconomic impact on many individuals and communities since it provides both part- and full-time jobs for the people and in some cases it is the only source of income available to the people. In the rural communities where mining takes place, the activity has reduced rural exodus, promoted local economic development and contributed towards poverty reduction.

In addition, the mining operations are useful in basic skill development and contribute to the transformation of unskilled labor into semi-skilled and skilled workers. More importantly, due to the low barriers to entry in terms of capital needs and formal educational requirements, small-scale mining operations offer excellent opportunities for the evolution of indigenous entrepreneurs. In rural areas where other jobs are low paying or non-existent, small-scale mining appears as a valuable source of employment. The sector also provides raw materials for local industries.

### Contribution towards mineral production and national economy

The sector experienced rapid growth after it was legalized and 3 years after the passage of the Small-scale Mining Law, 300 mining concessions were registered and over 40,000 oz of gold worth $50 million was also
purchased. In addition to these, about $17,000 was contributed to the land reclamation fund set up by the government. The land reclamation fund was funded with 3% retention of the value of the product sold.

By the end of 2003, the small-scale mining sector had sold about 1.5 million ounces of gold and 8.0 million carats of diamonds to PMMC and other licensed precious mineral buying agencies in the country. The contribution of the sector to the gold and diamonds production in the country is significant as shown in Table 1 and Fig. 2 (Ghana Minerals Commission, 2002). It can be deduced from Fig. 2 that total national gold production increased by about five times between 1989 and 2003 while that from small-scale mining increased by about 23 times over the same period. In addition the figure shows the near parity that exists between the diamonds production from small-scale operations and the total diamonds production in the country. There was a three-fold increase in total diamonds production while the diamonds production by small-scale miners increased by five times between 1989 and 2003.

Besides the direct monetary contribution to the economy by small-scale mining, the sector also contributes to greater awareness regarding the country’s gold potential. This was observed in the country in the 1980s where the spread of small-scale mining gave useful leads to large-scale prospecting and exploration companies at the beginning of the fourth gold boom around 1985.

Employment generation

In 2003, the registered small-scale gold and diamond mines employed 100,000 people with almost an equal number working illegally. A licensed operator employs between 5 and 20 groups of tributers consisting of 5–10 workers each that excavate ore and process gold (Appiah, 1998). The level of women directly involved in the activity is estimated around 10%. The constraints to effective women’s participation in the sector have been identified as due to cultural and social taboos.

Apart from the direct employment contributions of small-scale mining, it also generates substantial numbers of indirect jobs in other sectors of the economy due to the demand created for production inputs, transport and other services. If all the people engaged in related service activities—goldsmiths, traders and food vendors are considered the employment figure becomes significantly higher.

Environmental performance of the sector

The environmental destruction caused by the unplanned and sometimes dangerous and irrational methods used by small-scale miners the world over and Ghana in particular has been well documented and continues to be debated. The ad-hoc nature of the operations has resulted in a myriad of primary and secondary problems. Those that are of great concern include atmospheric pollution, water pollution, land degradation and deforestation (Amegbey et al., 1994; Al-Hassan et al., 1997; Amegbey et al., 1997; Tufour, 1997; Amankwah and Buah, 1998; Suglo et al., 1998).

Of the pollutants, mercury deserves special mention due to its toxic nature and because it is the main chemical employed by small-scale gold miners. In a study conducted in a galamsey village to monitor the health effects of mercury on the inhabitants, it was realized that 90% of the people (galamsey and non-galamsey) declared slight metallic taste and salivation problems. Twenty percent claimed to have tremors and 65% had sleep disorders. An examination of mercury levels in biological samples showed that about 86–91% of the population was exposed to mercury (Anon, 1999). This indicates that there is an impact of mercury on public health in this mining community and perhaps other villages where small-scale mining activities take place.

It is therefore a welcome relief that the miners are buying and using retorts promoted by the Ghana Minerals Commission.

Table 1
Production figures for gold and diamonds from 1989 to 2003 for the Ghanaian small-scale mining sector

<table>
<thead>
<tr>
<th>Year</th>
<th>Gold (oz)</th>
<th>Total national production (%)</th>
<th>Diamond (carats)</th>
<th>Total national production (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1989</td>
<td>9272</td>
<td>2.2</td>
<td>151,606</td>
<td>53.1</td>
</tr>
<tr>
<td>1990</td>
<td>17,234</td>
<td>3.2</td>
<td>484,876</td>
<td>76.2</td>
</tr>
<tr>
<td>1991</td>
<td>15,601</td>
<td>1.8</td>
<td>541,849</td>
<td>78.8</td>
</tr>
<tr>
<td>1992</td>
<td>17,297</td>
<td>1.7</td>
<td>442,266</td>
<td>67.4</td>
</tr>
<tr>
<td>1993</td>
<td>35,145</td>
<td>2.8</td>
<td>376,400</td>
<td>63.7</td>
</tr>
<tr>
<td>1994</td>
<td>89,520</td>
<td>6.3</td>
<td>405,830</td>
<td>53.5</td>
</tr>
<tr>
<td>1995</td>
<td>127,025</td>
<td>7.4</td>
<td>337,457</td>
<td>53.4</td>
</tr>
<tr>
<td>1996</td>
<td>112,349</td>
<td>7.0</td>
<td>443,244</td>
<td>62.0</td>
</tr>
<tr>
<td>1997</td>
<td>107,094</td>
<td>6.1</td>
<td>558,241</td>
<td>67.3</td>
</tr>
<tr>
<td>1998</td>
<td>128,334</td>
<td>5.4</td>
<td>570,186</td>
<td>70.8</td>
</tr>
<tr>
<td>1999</td>
<td>130,833</td>
<td>5.0</td>
<td>476,744</td>
<td>69.7</td>
</tr>
<tr>
<td>2000</td>
<td>145,663</td>
<td>6.0</td>
<td>686,551</td>
<td>69.4</td>
</tr>
<tr>
<td>2001</td>
<td>185,596</td>
<td>8.7</td>
<td>973,033</td>
<td>83.2</td>
</tr>
<tr>
<td>2002</td>
<td>160,879</td>
<td>7.2</td>
<td>791,908</td>
<td>84.2</td>
</tr>
<tr>
<td>2003</td>
<td>211,414</td>
<td>9.5</td>
<td>746,925</td>
<td>82.6</td>
</tr>
</tbody>
</table>

Source: Minerals Commission.

Fig. 2. Graph of total national gold and diamonds production and that by small-scale miners from 1989 to 2003.
Commission. With some more education most miners will resort to the use of the retorts and reduce the negative effects of mercury on themselves and others within the immediate vicinity of their workings. Since 2000, the Environmental Protection Agency (EPA), which has traditionally been in charge of monitoring environmental issues in large-scale companies, has been monitoring environmental issues related to small-scale mining operations. Thus, small-scale miners applying for new licenses or renewal of old ones have to go through environmental impact assessment procedures. This is expected to bring environmental sanity into the sector and also prevent the EPA from penalizing large-scale mines for the activities of tenant small-scale miners. Tenant small-scale miners could also be made accountable to their landlords (large-scale mines) on environmental issues.

The mineral supply process

As with every mining company, the mineral supply and general economic environment of the small-scale mining sector has four basic components—an exploration environment, a market environment, a financial environment and a policy environment, that provide both opportunities and constraints.

Exploration environment

There are uncertainties associated with the discovery of economic mineral deposits, and this presents challenges to the fundamental corporate objectives—profitability, survival and growth. Profitability of a mining company is related directly to the anticipated exploration success, development, production and marketing activities (Kesler, 1994). Small-scale mining companies cannot survive on the basis of current reserves only; hence investment in successful exploration is necessary for their survival.

Due to their limited resources, individual miners are not in a position to conduct exploration activities. Thus, if the industry is to be sustained, it is important for the Geological Survey Department of Ghana to continue with exploration and delineation of mineralized deposits and come up with the mineral inventory available for exploitation at the small-scale level. Information already available from the Department’s earlier activities and additional material gathered from abandoned concessions of prospecting and exploration companies that were lodged with the Minerals Commission could be a good starting point for this renewed investigation. The success of the continuing levels of exploration is required to maintain and increase existing levels of production in the industry. It will also allow the miners to work in areas where the minerals are known to be available and hence reduce the investment risks and unnecessary land degradation arising from their frequent wild searches for mineralized areas. Large-scale mines could also be encouraged to release mineralized areas of their concessions that are not suitable for large-scale mining operations for licensing to small-scale miners as already implemented by large-scale mines at Akwatia, Damang, Tarkwa, and Bogoso (Amankwah and Anim-Sackey, 2004).

Market and linkage effects

The small-scale mining sector is the main supplier of gold and diamonds to the local economy. It is responsible for most of the precious minerals used by local smiths, for the production of jewelry and traditional ceremonial artifacts. With the increasing number of local and international jewelry and artifact producing companies there will be an equivalent increase in demand for the precious minerals on the market hence there will be the need for increased production. Any surplus is likely to be absorbed by the international gold and diamonds market.

The industry can produce linkage effects with other sectors of the economy. Backward linkages with some local industries are already in place and it is important for more links to be established for the domestic production of more simple mining and processing machinery, transportation and housing facilities and research into suitable processing techniques. Forward linkages can be strengthened by the expansion of local jewelry and related industries. The decision of the Precious Minerals Marketing Company to extend its operations into gold refining and jewelry production is therefore a step in the right direction. Similarly, it is good for the industry that another buying company with capacity for refining gold has been established in the country.

Financial situation

In 1993, 4 years after the passage of the Small-scale Mining Law, an evaluation of the sector’s performance by Kwame Asante and Associates for the Minerals Commission indicated that lack of working capital and credit facilities, lack of suitable mining equipment and inappropriate wages were the major problems affecting the industry. Others were inadequate prices for produce and insufficient buying centers and agents (Anon, 1993). To a large extent some of the problems such as insufficient buying centers and agents, inadequate prices for produce and inappropriate wages have been solved. Those that still deserve attention are issues of working capital, credit facilities and modern equipment. The problem of acquisition of credit facilities by the miners was tackled to some extent by the Minerals Commission when with assistance from GTZ it put in place a hire-purchase scheme for the miners in 1992. However, this laudable program had to be discontinued when beneficiary miners were not keen at paying back the loans.

Few miners have access to the necessary capital from banks due to the nature of their activities (scattered, informal, rural) and lack of acceptable forms of collateral demanded by banks. This problem could be solved if
the individual miners are encouraged to form co-operatives, enterprises or companies in order to increase their capital base. Such a step, especially between miners in similar localities, would allow maximum utilization of existing equipment and available resources can be channeled into other areas. The groups or enterprises formed could also find it easier to get support from both local and international financial institutions.

**Policy frame work**

Regularization of the activities of small-scale miners was the first policy made towards the sustenance of the industry since it has allowed for intervention and control in their activities (Noetstaller, 1987). The policy in place has worked very well and over the years it has proved to be very useful. These advances notwithstanding, more inputs are needed. For better control and supervision in the sector, the drive to regularize the activities of galamsey miners should be intensified since they have poor records on health, safety, environmental issues and child labor. Given the scattered units and remote areas where the operations take place, legislation and enforcement is unlikely to cause positive changes. Preferably, promotion of educational programs, safer alternatives, and incentives such as tax holidays and access to credit for those who register may encourage galamsey miners to regularize their activities.

The Ghana Chamber of Mines has encouraged small-scale miners to form a federation that could have representation at the Chamber level. Fortunately, the National Association of Small-scale Miners’ Association of Ghana has taken up the challenge and has made presentation to the Chamber of Mines. The Chamber has also called for improvement in the laws governing community-related activities so that the members could contribute more meaningfully towards sustainable development (Addo, 1999; Anaman, 2002). The step taken by the National Small-scale Miners’ Association could be boosted further if the mining companies, as part of the social responsibilities and compensation packages for mining communities could make available some mineralized areas that are not suitable for large-scale mining to small-scale miners for them to operate legally. This would make large tracts of mineral rich land available to the miners and it will go a long way in sustaining the small-scale mining sector.

When the companies making up the Chamber of Mines agree to officially allocate portions of their concessions to small-scale miners, some form of on-site health, environmental and safety training courses for tenant small-scale miners already in business would be necessary. In the future, this kind of training may be made a pre-requisite for acquiring a license as a tenant small-scale miner operating on the concession of a large-scale mine. These would go a long way in establishing trust and co-operation between small-scale miners and large-scale mining companies and increase investor confidence.

Most of the issues that will help sustain the industry call for the networking of all the key organizations in the minerals industry of Ghana. These organizations are the Ghana Chamber of Mines, Minerals Commission and the Environmental Protection Agency (EPA). Others are the Mines Department, Geological Survey Department and the Colleges and Departments in Ghanaian Universities where mining-related courses are studied. A good network and sound financial support are likely to encourage the Geological Survey Department to continue prospecting so that the mineral inventory available for small-scale mining would be enlarged and known. In addition if individual companies that make up the Chamber of Mines willingly cede unused portions of their concessions to the Minerals Commission for licensing to small-scale miners, part of the problem relating to unavailability of mineralized lands for small-scale miners would be solved. The EPA would then help monitor the activities of the miners to ensure that they are using standard techniques comparable to those demanded of large-scale mining companies whilst the Small-scale Mining Department of the Minerals Commission and the Mines Department also tackle the issues related to health and safety. The Universities could also offer services aimed at improving mineral recovery in a cleaner environment and contribute towards the general training of small-scale gold and diamond miners.

Except for the Ghana Chamber of Mines, all the other organizations are government agencies with very limited funding. Thus, funding from other agencies like the GTZ, UNDP and the World Bank, which are interested in the sustenance of the small-scale mining industry of Ghana should be sourced to make this idea a reality. Local organizations that can be tasked in this regard include the Precious Minerals Marketing Corporation and other gold and diamonds buying agencies in the country since they stand to gain from any increases in minerals production from the small-scale mining sector. District Assemblies in areas where the minerals occur may also be encouraged to budget for educational programs with the aim of promoting safe mining practices and creating jobs for the communities in the district. When credit facilities are established, due diligence on the dealings of groups and individuals who apply, should precede disbursement in order to make lending sustainable. Exploration by the Geological Survey Department could be sustained if mineral reserves delineated through the proposed activities are given out as mineral concessions to companies and individuals who are in a position to pay for that extra cost.

**Conclusions**

In the present contribution it has been observed that:

(i) Since the passage of the Small-Scale Mining Law in 1989, the small-scale gold and diamonds mining
The increase in mineral production has been at a cost to Ghana. Canada and Raymond Suglo of Western University College, Mike Doggett and George McIssac of Queen’s University, Acknowledgements

The small-scale gold and diamonds mining industry of activities. Thus, every effort should be made to sustain levels with positive results for individuals, families and social impacts of the industry at the local and national prevailing socioeconomic realities of the affected areas. The results show that there are profound economic and social impacts of the industry at the local and national levels with positive results for individuals, families and communities directly or indirectly involved in these activities. Thus, every effort should be made to sustain the small-scale gold and diamonds mining industry of Ghana.

There are different opinions in literature on the applicability of the concept of sustainability to small-scale mining. This paper discussed the issue in relation to the current situation in the small-scale mining industry of Ghana. A careful analysis of the steps being taken on environmental issues, products and improved human conditions in terms of education, skills and living standards as a result of small-scale mining was made in the context of prevailing socioeconomic realities of the affected areas. The results show that there are profound economic and social impacts of the industry at the local and national partnerships, Natural Resources Cluster, Working paper No. 8 2001.

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industry has received financial and technical support from local and international organizations and some progress has been made in the activities of the miners.

(ii) Production of gold and diamonds by the small-scale mining sector has led to significant socioeconomic impact on individuals and communities involved in the small-scale mining activity and an increase in the overall production of the minerals in the country leading to increased foreign exchange earnings.

(iii) The increase in mineral production has been at a cost to the environment and some communities have had an adverse environmental impact.

(iv) The Minerals Commission of Ghana has embarked on education programs to sensitize the miners on safe mining and tailings disposal practices as well as on other environmental and safety issues, especially on the health hazards associated with the use of mercury and has introduced retorts for treating amalgamated gold.

(v) Small-scale gold and diamond miners may improve their lot technically and could access financial support if they form co-operatives, companies and enterprises and also if they consider more linkage effects with other sectors of the economy.

(vi) A good network and a sound financial support for the key organizations in the minerals sector of Ghana will help in the sustainable development of the small-scale gold and diamonds mining sector.

There are different opinions in literature on the applicability of the concept of sustainability to small-scale mining. This paper discussed the issue in relation to the current situation in the small-scale mining industry of Ghana. A careful analysis of the steps being taken on environmental issues, products and improved human conditions in terms of education, skills and living standards as a result of small-scale mining was made in the context of prevailing socioeconomic realities of the affected areas. The results show that there are profound economic and social impacts of the industry at the local and national levels with positive results for individuals, families and communities directly or indirectly involved in these activities. Thus, every effort should be made to sustain the small-scale gold and diamonds mining industry of Ghana.

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References


Anon., 1993. Review of the marketing function under the small scale mining project. Kwaame Asanti and Associates (Chartered Accountants and Management Consultants), Accra, (Self published).


