

# "Does Small-Scale Mining Contribute To The Economies Of Developing Countries?" The Case Of Ghana

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**Abstract:**

The impact of small-scale mining in the economic growth and development of many mineral rich countries cannot be over emphasized. However, this has not received the desired attention and focuses over time as most host governments tend to focus more on the large-scale mining companies thereby, neglecting the salient role and contribution of Small-scale miners. This paper focuses on small-scale mining with particular reference to the Ghanaian mining sector which is largely driven by gold and diamonds. Small-scale mining in Ghana has immensely contributed to the GDP of the Ghanaian economy by creating jobs, alleviating poverty and earning foreign exchange revenue for the government. This paper evaluates whether or not small-scale mining contributes to the economy of Ghana.

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## I. Introduction

### Definitions

Just as the name implies, small-scale mining (SSM) or artisanal mining as also referred to, is simply subsistence<sup>1</sup> mining. There is no universally accepted consensus that defines the term small-scale mining. Nonetheless, definitions can be based on two or more of the following criteria which show's different variance as a result of the scale of operation. The table below indicates the criteria for classify mining based on scale of operation into Large-Scale Mining (LSM) and SSM.<sup>2</sup>

**Table 1.1: Criteria for categorizing SSM and LSM**

Criterion	Observed Quality for LSM	Observed Quality for SSM
1. Mine output in TPY	Large	Small
2. No. of persons employed per unit of output	Small	Large
3. Labor productivity	High	Low
4. Size of reserves	Known and large	Unknown and small
5. Capitalization degree	High	Low
6. Gross income of firm (Annual)	High	Low
7. Continuity of operation	Continues	Seldom continues
8. Mining lease size	Large	Small

Source: Noestaller, 1987

Different qualities are observed above for categorizing SSM and LSM. SSM have low mine output in total per year (TPY), which is as a result of low mechanization, a large number of employed persons per unit of output (PUO), which usually consists of rural commuters who are largely uneducated women and children in developing countries. Low labor productivity, low gross annual income of firm unlike the LSM which have high gross income annually, highly capitalized firms and a large output in TPY.

The definition of small-scale mining differs from country to country .Table. 1, below summarizes the definition of small scale mining in some developing countries.

**Table 1.2: Definitions of small-scale in some developing countries**

Ghana	SSM refers to individual or group of organized people usually 4 – 8, or even cooperative of 10 or more which is carried out on full time basis using simple tools and entirely financed by Ghanaian resources.
Chile	Simply mining operation by an individual who works at a mine by himself with or without his family. A maximum of five workers or a society with no more six partners.

<sup>1</sup> Subsistence here means mining to support oneself at a minimal level

<sup>2</sup> Noetstaller, R (1978) Small-Scale Mining: A review of the issues, volume, World Bank Technical Paper No. 75. Page 3

Burkina Faso	Activities conducted on ore deposits with low mechanization levels by legal or natural persons.
Brazil	Collective or individual workers who mine ore using simple techniques, simple machineries and follow criteria set by the National Department of Mineral Production.
Ethiopia	Mining activities designated as such by the minister of which annual run of the mine ore does not exceed a set limit, this usually differs from one mineral to the other.
Suriname	SSM in Suriname simply means the exploitation of mineral deposit that can be economically mined with simple tools due to their size and mode of occurrences.
Mexico	These are mines whose daily capacity of production does not exceed 500 tons per day (for metal and non-metal mines) and the annual production value is less than three million US dollars.

Source: Hilson, 2002

Ghana's biggest mines produced 2.6 million ounces of gold in 2008 and 2.9 million ounces in 2009, according to Mbendi information services report on gold mining in Ghana. The largest gold mine in Ghana is the Tarkwa gold mine and the second largest mine is the Damang mine. Tarkwa has an estimated reserve of 9.9 million ounces and 15.3 million ounces in resource. Damang has 2.1 million reserves and 4.7 million ounces in resource. Obuasi mine produces about 383,000 ounces per year. Iduapriem mine produces 190,000 ounces of gold per year. Sefwi-bibiani belt is said to contain an estimate of 17 million ounces of gold, making it the second most important gold bearing belt after the Ashanti belt. The Ahofa mine produced about 531,470 ounces of gold last year. Pretea and Wassa mine produced million for its operator and recently the Esaase gold deposit with a resource of 2.03 million ounces and 1.45 million ounce was inferred<sup>3</sup>. In 2003, Ghana produced 904,089 carats of diamond, in which small and medium scale miners produced 750,097 carats out of the total.<sup>4</sup>

The objective of this research piece is to evaluate the contribution of small scale mining to the Ghanaian economy. A descriptive and qualitative methodology is employed using charts, figures and tables to aid the analysis. The paper is structured into four chapters; following this chapter is chapter two which overviews small-scale mining in developing countries and Ghana, chapter three reviews issues and challenges of small-scale mining, chapter four looks at the impact of small-scale mining and chapter five concludes the paper.

## II. Small-Scale Mining In Developing Countries

The strength and wealth of many ancient empires was attributed to small-scale mining of precious metals. SSMs, in developing countries mine precious stones and metals like platinum in Ethiopia, diamonds in Lesotho, Ghana, Sierra Leone, Liberia, Tanzania and Central African Republic. Gold in Gabon, Ethiopia, Liberia, Rwanda, Zimbabwe, Tanzania, Nigeria, Ghana, etc. other mineral commodity mined by SSM includes, silver, beryl, gemstones, bismuth, mica and antimony.

In today's developing countries, small scale mining has become an indispensable practice, it is a very well known form of mineral exploitation, even though it is seen as a major contributor to environmental hazard such as land degradation, pollution and noise, it has brought immeasurable economic and social benefits to the economy, it creates employment to millions of people especially rural inhabitants, it is seen as an unsafe practice due to the use of crude tools. Small scale mining contributes to foreign exchange earnings of some countries and to total mineral export earnings (Noestaller, 1987).

### Overview of small-scale mining in Ghana

Ghana is the second biggest producer of gold in Africa after South Africa. Diamond, gold, bauxite, manganese, silver, aluminum, etc. are majorly mined in the country.

Small-scale mining has been a respected tradition amongst families in Ghana and attracted a lot of traders from Portugal, Netherlands and Britain before she was colonized by Britain in 1874<sup>5</sup>. As the world mineral industry has undergone changes in the past 14 years, so has the Ghanaian mining industry, the mineral industry of Ghana is important to the economy because it is one of the biggest contributors to government revenue through tax and royalties paid to the government by large mining industries.

Ghana's small-scale mining constitutes a source of foreign exchange revenue (especially from diamonds and gold) to the government and is a major source of employment in the country. This form of mining is usually made up of children and women who are poor and have no formal education. Gold accounts for two third of mineral production in Ghana.

<sup>3</sup> Mbendi information service. *Gold mining in Ghana*.

(<http://www.mbendi.com/indy/ming/gold/af/gh/p0005.htm>) last visited 17<sup>th</sup> December, 2010.

<sup>4</sup> Mbendi information service. *Diamond mining in Ghana*.

(<http://www.mbendi.com/indy/ming/dmnd/af/gh/p0005.htm>) last visited 17<sup>th</sup> December, 2010.

<sup>5</sup> Ghanaweb, the history of Ghana at <http://www.ghanaweb.com/GhanaHomePage/history/> (last visited on 23<sup>rd</sup> of December, 2010)

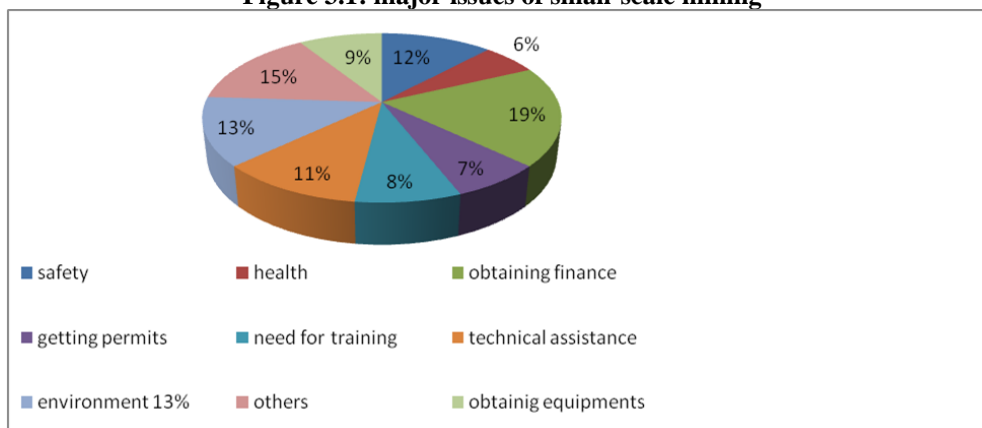
Gold, diamonds and precious stones are generally attractive to the small-scale miners because of their high value per unit weight and are done through surface mining. Due to low capitalization, simple tools and techniques tools like pit forks, shovels, sluice boxes, axes, are used.

There are currently 300 registered small-scale gold miners in Ghana, but majority of them are not registered, making them illegal even if the activity is legalized<sup>6</sup>.

### III. Issues And Challenges Of Small-Scale Mining In Ghana

There are a number of issues concerning small-scale mining, ranging from health issues to environmental issues, obtaining finance, lack of training, to transportation problems, etc. The figure below summarizes the issues of small-scale mining.<sup>7</sup>

Figure 3.1: major issues of small-scale mining



Source: modified from International Labor Organization (ILO) (1999), Sectorial activities program. *Social and labor issues of small-scale mines*.

This estimate was gotten from a survey carried out by the international labor organization in 42 developing countries including Ghana; the first problem with small-scale miners in Ghana starts with obtaining a mining permit from the minerals commission of Ghana as most miners are not educated and may not be able to provide the criteria's.

Obtaining finance which is another bane in the SSM industry has the highest percentage of 19% and poses the biggest issue for miners in Ghana, It is very difficult for these small miners to secure financial loans especially from formal financial institutions such as the commercial banks because they have no collaterals and banks are not willing to give any financial assistance to the miners as there is no guarantee that they will be able to pay back as at when due.

Due to the high concentration of mining activities in the Tarkwa and Damang, regions (two important locations that are rich in gold) the environment in this area is undergoing immense degradation and their economic value is drastically diminishing.

The continued activities of the small-scale miner has immensely contributed to this problem as holes are constantly found everywhere in the regions and this affects the agricultural use of the area, animal farmers cannot freely rear their cows, sheep's goats, etc as they may fall into one of the holes dug up by the miners, or graze on hazardous grasses, also, the use of chemicals which are dangerous to their health, like Mercury and cyanide which are widely known and used by miners in the processing of precious stones. These are toxic and could cause poisoning to the body, tailings dumping in rivers causes river pollution in mining areas, deforestation and erosion damage is also caused by the activities of miners. Most miners are prone to silicosis,<sup>8</sup> malaria, typhoid, etc.

Thus, the aforementioned challenges and shortcomings are viewed by many people as enough reasons to ban small-scale mining in these areas and in many countries as well. The problem is further compounded by the lack of information and knowledge of the long term effect of the activities of small-scale miners on the environment, which makes small-scale mining to be regarded as an unsafe practice.

<sup>6</sup> Mbendi information services. *Mining in Ghana* at <http://www.mbendi.com/indy/ming/af/gh/p0005.htm> (last visited 17<sup>th</sup> December, 2010).

<sup>7</sup> Modified from International Labor Organization, ILO (1999), Sectorial activities program. *Social and labor issues of small-scale mines*. Questionnaires distributed and answered in 42 developing countries.

<sup>8</sup> Silicosis is a form of lung disease cause by the inhalation of dust. This is common with small-scale miners.

Furthermore, in the process of mining, rocks can fall on miners and they can get stuck in the holes, as there are no enough safely measures put in place to forestall such occurrence, the equipment used are old and not sanitized as most of them do not want to invest a share of their income to replace worn out equipments and as earlier noted, they find it hard to secure bank loans.

Mining on any level requires some level of skills, some small-scale miners still lack sufficient training to engage in mining activities this has led to accidents which have caused death, they have been a dozen of reported cases according to the ministry of mines, forestry and mines of Ghana about the misuse of explosives, rock falls on miners and accident with mining equipments.

There is also the issue of transportation, most miners have no means of transportations, if mining is successful transporting the stones may pose a problem. Another major issue is selling arrangement; even if the stones are transported they may face the problem of selling them. There is no job security for small-scale miners due to the uncertain and risky nature of the industry, and this insecurity of jobs even when there is minerals to mine affects the illegal miners that are not registered. The working conditions under which small-scale mining is carried out are unfavorable.

#### SSM VS LSM

For a very long time, the relationship between SSM and LSM has been a strained one. There have been countless cases about clashes between the two. The issue being that small-scale miners keep encroaching on the concessions of the big companies.

Though, some LSM companies have adopted ways to straighten their relationships.

Abosso goldfield limited (which owns Tarkwa and Damang gold fields) is one of these companies that has accommodated some SSMs in there concessions to a certain limit though, in order to promote peace in the communities they operate.<sup>9</sup>

#### IV. Impact Of Small-Scale Mining On The Ghanaian Economy.

Small-scale mining has contributed to the Ghanaian economy dating back from the 4<sup>th</sup> century (Aubynn, 2009). It was a highly regarded traditional activity, the small-scale miners were the only miners of gold and diamonds in Ghana before their activities were thought of as illegal when the British colonized Ghana. It was again legalized by the government in 1989.

Small-scale mining is a source of employment to over one million Ghanaian, majorly in the rural areas especially gold and diamond. It employs 60% of the labor force majority are from the rural areas and is the fifth largest producer of gold and the largest producer of diamonds in Ghana<sup>10</sup>.

**Table. 4.1: small-scale mining production of diamond and gold in Ghana from 1989 to 1998.**

YEAR	DIAMOND(carats)	GOLD(ounces)
1989	151,605	9,272
1990	484,876	17,234
1991	541,897	8,493
1992	479,874	170,866
1993	364,194	33,647
1994	411,303	89,520
1995	333,700	128,534
1996	450,300	112,240
1997	589,900	112,240
1998	400,000	128,335

Source: Aubynn, 2009.

From the table above, it can be seen that small-scale diamond miners produced a total of 4,207,649 carats in ten years and up till today small-scale miners are still the largest producers of diamonds in Ghana. 810,381 ounces of gold was also produced by small-scale miners which makes them the fifth largest producers of gold in Ghana from 1989 to 1998.

According to MMSD project report, 2002 on artisanal and small-scale, 200 thousand Ghanaians were actively engaged in small-scale mining, 67% of these were gold miners, while 30% mined diamonds, and the remaining percentage mined other stones that were considered valuable and marketable.

<sup>9</sup> Aubynn, A. (2009), sustainable solution or a marriage of inconvenience? The coexistence of large-scale mining and artisanal and small-scale mining on the Abosso goldfields in western Ghana. *Recourses policy*. Volume 34, issue 1-2. Accessed via Scopus. (Abstract).

<sup>10</sup> Akabzaa, T and Darimani, A (2001), the impact of mining sector investment in Ghana: a study of the Tarkwa mining region. (A draft report) page 25-27. ([http://www.saprin.org/ghana/research/gha\\_mining.pdf](http://www.saprin.org/ghana/research/gha_mining.pdf)) last visited 18<sup>th</sup> December, 2010.

Despite its abundant mineral resources, Ghana mineral industry was stagnant for over thirty years with just a mere 1.3% contribution to the GDP, prior to the establishment of the Economic Recovery Program (ERP) in 1984 and the mineral and mining law of 1986, the contribution to GDP rose to 5% from 1991 to recent years. Minerals make up about 35% total export, with gold contributing over 90% of the total mineral export<sup>11</sup>.

From the period 1989 through 1994, the small scale sector accrued a total of about 63 million dollars to the government for gold and diamonds also accrued revenue of 75.1 million dollars in the same period (Bermudez-lugo, 2005).

Since its legalization in 1989, small-scale mining sector has produced and sold over 8.0 million carats of diamonds and 1.5 million troy ounces of gold and at the same time employed over a hundred individuals (Amankwa et al 2004).

### **Employment<sup>12</sup>**

This is one of the most important impacts of small-scale mining on the economy. For centuries, even before it was legalized in Ghana, SSM offers both part and full-time employment to individuals especially in communities where they are deposits of precious stones. In most rural areas it is the only means of livelihood, in such communities SSM activities has alleviated poverty and aided economic development.

There is no denying that SSM operations has aided in the development of basic skills, it has turned individuals who were totally unskilled to semi-skilled and SSM operations again is an opportunity for entrepreneurs to emerge locally due to the fact that they are limited in terms of education and finance.

In 2003 small-scale mining created employment for over 100, 000 registered miners. A single registered miner may employ 10 people more or less, to assist him in mining and processing of the stones (Amankwa et al, 2004).

### **Contribution to the economy<sup>13</sup>**

After SSM activities were legalized years ago, the sector has grown drastically and production has increased. 300 small-scale miners were registered after the small-scale mining law was passed. 50 million (40,000 ounces) dollar worth of gold was purchased by PMMC (the official buyers from SSM) s, 3% of this proceedings was contributed to the government land reclamation fund.

In the year 2003, small-scale miners had sold 8 million CZ of diamonds and 1.5 million oz of gold to their major buyers. (Amankwa et al, 2004). As total precious stone production has increased on the national level over the years so has the production by small-scale miners. Table.4.2. summarizes the small-scale mining contribution of diamond and gold to the total national production. As indicated below gold production increase drastically and diamonds also tripled in its production from 1989 to 2003.

**Table 4.2: Total national production of gold and diamond by small-scale miners in Ghana.**

Time	Diamond	National production	Gold	National production
1989	151,606	53.1%	9272	2.2%
1990	484,876	76.2%	17,234	3.2%
1991	541,849	78.8%	15,601	1.8%
1992	442,266	67.4%	17,297	1.7%
1993	376,400	63.7%	35,145	2.8%
1994	405,830	53.5%	89,520	6.3%
1995	337,457	53.4%	127,025	7.4%
1996	443,244	62%	112,349	7%
1997	558,241	67.3%	107,094	6.1%
1998	570,186	70.8%	128,334	5.4%
1999	476,744	69.7%	130,833	5%
2000	686,551	69.4%	145,663	6%
2001	973,033	83.2%	185,596	8.7%
2002	791,908	84.2%	160,879	8.7%
2003	746,925	82.6%	211,414	9.5%

Source: minerals commission through amankwa et al (2004) and IEA.

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<sup>11</sup> Bermudez-Lugo, O. (2005) USGS mineral year book. The mineral industry of Ghana. (<http://minerals.usgs.gov/minerals/pubs/country/2005/ghmyb05.pdf>) last visited 19<sup>th</sup> December, 2010.

<sup>12</sup> Amankwa et al (2004), strategies for sustainable development of the small-scale gold and diamond mining industry of Ghana. *Resource Policy*. Volume 29, issues 3-4, pages 131-138. Accessed through science direct.

<sup>13</sup> Amankwa et al (2004), strategies for sustainable development of the small-scale gold and diamond mining industry of Ghana. *Resource Policy*. Volume 29, issues 3-4, pages 131-138. Accessed through science direct.

Figure. 4.1. Diagram of small-scale production and total production of gold and diamonds (1989 to 2003).



Source: Amankwa et al. 2002.

The sector therefore makes immense monetary contribution to the whole economy.

### Government policies

The minerals and mining law of 1989 which was amended in 1993, contains the legislative framework for mining. It is stated that all minerals and natural resources belongs to the state. Thus a license must be issued by the minister of mines, who power is vested in to do so, he exercises his power with the advice of the minerals commission (MINCOM). MINCOM has the power to regulate and manage the use of mineral resources; it also has the responsibility of registering SSM. The Ghanaian government has a number of policies guiding the activities of SSM. Legalizing their activities many years ago was the first policy regarding them. Even though the policy has proved useful, some amendments are still needed, in terms of health and safety procedure, women and under aged children labor, and environmental problems.

The National association of small-scale miners was set up with the encouragement of the Ghanaian chamber of mines to represent small-scale miners at the chamber level. The aim is to improve laws concerning SSM in order to improve standard of operation to them and also in where they operate. To make available for the SSMs land that may not be accessible to the LSM to operate in and to be able to share in the concessions of the bigger miners without issues. This aims also to encourage the relationship between SSMs and LSMs and then to finally help sustain the SSMs. (Amankwa et al, 2004).

Some other organizations that help sustain the SSM sector includes, the mineral commission, geological survey, Ghanaian chamber of mines, the environmental protection agency, etc. a good working network of this will give good results of the SSM activities.

### Promotion of small-scale mining

Small-scale mining as a significant contributor to the GDP of the Ghanaian economy, the government has welcomed a number of projects to encourage the activities of small-scale;

## V. The PROJEKT-CONSULT.

This is a German sponsored project and the project is executed by the mining commission of Ghana. The project has been in effect since 1996.<sup>14</sup>

The objective is to assist small-scale gold and diamond miners in the following ways:

- Distribution of the appropriate equipments for mining to enable efficiently in mining.
- Lobbying for small-scale miners.
- Encouraging cooperation between miners.
- Improvement of the system of gold selling by the miners.
- Improvement of both institutional and organizational framework for the miners.

<sup>14</sup> Projektconsult, Promotion of small-scale gold and diamond mining in Ghana. (<http://www.projekt-consult.de/pc-ghanamin-en.htm>) last visited 17<sup>th</sup> December, 2010.

### **PMU-MSSP PROJECTS.**

This is an EU (European Union) mining sector support program; it is a financial agreement between the European commission and the republic of Ghana.

Its objective concerning small-scale mining includes:<sup>15</sup>

- Find a substitute for mercury for small-scale miners.
- To train small-scale miners to use safer techniques for mining.
- Poverty alleviation for miners.
- Design policies to help manage environment damaged by small-scale miners.

### **PMMC.**

The Precious Minerals Marketing Company (PMMC) was established in 1963, it was established solely for buying of gold and diamonds from small-scale miners and resell at higher prices to foreigners. Its objective is to increase foreign earning in the Ghanaian economy. Its other functions include:

- Valuation of diamond and gold for the small-scale miners.
- Promotion of the sectors activities.
- Getting licensed buyers to purchase from the small-scale miners.

### **SSMP**

Small-Scale Mining Project (SSMP) established in 1989 and four institutions were responsible for providing support for the scheme, which are, PMMC, mineral commission, geological survey and mines department.

Their responsibilities were:

- The PMMC was to buy gold and diamonds from small-scale miners.
- Mineral commission was to recruit district officers for the project.
- Geological survey was to locate areas that were suitable for the small-scale miners to carry out their activities.
- Mines department had the responsibility of recruiting mine wardens.

## **VI. Conclusion And Recommendation**

The purpose of this study was to evaluate the contributions of small-scale mining to the Ghanaian economy. A descriptive analysis was employed in this study to x-ray holistically, small-scale mining in Ghana and the paper arrives at the conclusion that Small-scale mining has contributed immensely to the Ghanaian economy. However, just as there are contributions made by the small-scale mining industry to the Ghanaian economy, so also are there hazards caused by its activities and limitations, which creates room for improvements and sustainability.

Thus, it is recommended here that the Ghanaian government addresses the following;

License issuing to miners should be made easier to get, so as to increase the number of participants, this will increase output of gold and diamonds and in turn increase both income and government revenue.

Dispute between SSMs and LSM has caused limitations to the operations of the small-scale miner, the government should encourage relationship between SSMs and LSMs. Small-scale miners to form associations similar to the national association of small-scale miners, in order to ensure sustainability with the miners and to enable them participate in the activities of the mining industry as a whole.

It is also recommended that government should make access to bank loans easier for SSMs to get so as to enable them acquire more sophisticated tools and again training programs could be set up to lightly educated them and teach them safety procedures when mining.

Environmental protection laws and policies should be enacted to protect the environment in which these miners operate

Most importantly, creating enabling environment and market for the miners other than PMMC to sell their proceedings quickly and safely is highly recommended.

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