Putting Miners First: Understanding the Livelihoods Context of Small-Scale and Artisanal Mining in Ghana

Factors involved in Increasing the Contribution of ASM to Poverty Reduction Targets

SYNTHESIS REPORT
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INTRODUCTION

1.1 Background to the Research

Over the past decade, a multitude of studies (e.g. Hilson 2003; Heemskerk 2003; Seeling 2003) have been carried out on artisanal and small-scale mining (ASM), providing valuable insight on the livelihoods, needs and concerns of the sector's participants. Additional work (e.g. Aryee 2003; Lahiri-Dutt 2003; Hinton et al. 2003) has been undertaken that provides extensive description of the industry's gender and child labour issues. Although there is little denying that these studies have improved our understanding of the social dynamics of the sector, there remains a number of areas in need of further analysis.

Assessment using a Sustainable Livelihoods (SL) research approach is one means of studying the social, cultural, political and environmental aspects of rural populations in developing countries. In the late-1990s, SL became a featured approach in much of fieldwork carried out by the UK Department for International Development (DfID). Analyses using SL frameworks are people-centred, and generally take a holistic view of the factors contributing to poverty, including a lack of assets, poor access to services, institutional inadequacies and group vulnerability (Carney 1998; Seeling 2003). In the context of ASM, the SL approach has gained popularity as an approach for demographic research since the launch of the UNDP's SL pilot study *Focusing on Artisanal Mining Communities* in sub-Saharan Africa in 1999 (Labonne and Gilman, 1999). Fieldwork for this project was carried out in Ethiopia, Ghana, Tanzania and Mali.

Recognising the importance of the livelihood aspects of ASM and building upon the initiatives of the UNDP and allied agencies, a livelihoods/poverty reduction study was commissioned by DFID in two countries: Ghana and Tanzania. The purpose of the project was to examine the economic contribution of ASM at the micro-level in terms of levels and distribution of earnings, to enhance understanding of the challenges

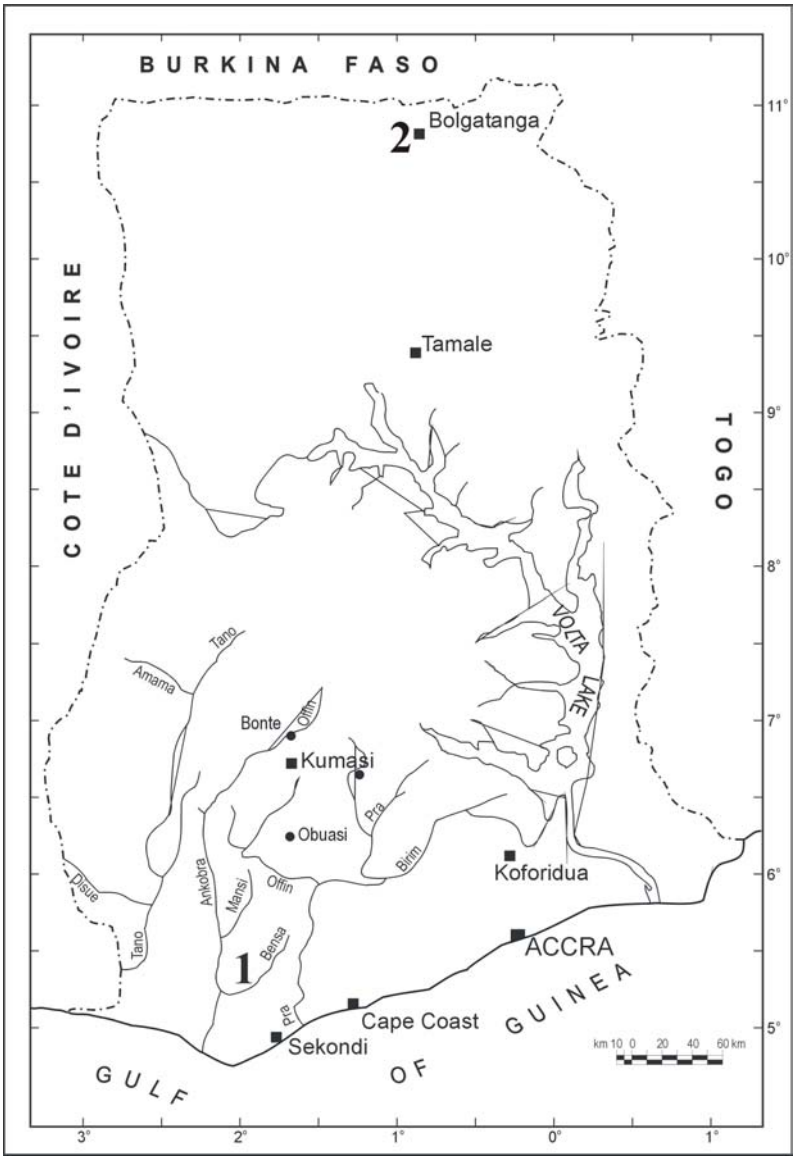
faced by ASM communities in each of the countries, and to devise policy initiatives for improving the security and quality-of life of their people. The research carried out for the project comprised four converging strands of analysis: economic, social, regulatory/institutional and technical.

The present paper reports the findings of the Ghana study. The importance of, and need to undertake, livelihoods analyses of Ghana's ASM communities is underscored in the country's PRSP, which acknowledges the following:

> "Current mining laws tend to disproportionately favour large-scale mining enterprises. To address this apparent imbalance, measures will be put in place to expand the scope and increase the support to the small and medium scale sub-sector with the view to making it the predominant means of exploiting minerals in the long term". [GPRSP, 2003, p. 91]

The research carried out for the Ghana project was conducted in two of the country's major ASM mining centres, Tarkwa/Prestea and Bolgatanga (Figure 1). It is envisaged that findings from this research will enhance knowledge of the indigenous ASM sector and provide valuable lessons for ASM research in other countries.

Figure 1: Location of study sites in Ghana, Prestea/Tarkwa (1), and Bolgatanga (2)



1.2 Objectives of the Study and Research Methodology

The overall project aims and objectives were as follows:

1. To improve understanding of the livelihood challenges facing ASM communities in Ghana
2. To provide evidence capable of informing policy makers and donors about the ASM sector's potential role in poverty alleviation in Ghana, and to contribute to pro-poor policy formulation for resident ASM communities.

3. To put forward recommendations for reducing poverty in the sector – appropriate courses of action for implementation at the district and national levels to.

As previously explained, Tarkwa/Prestea (Western Region) and Gbani (about 10 kilometres away from Bolgatanga, the capital of Upper East Region.) were selected as locations for fieldwork because both sites contain registered (legalised) small-scale mining activity and widespread illegal artisanal mining activity. They are also geographically and culturally different regions of Ghana, which provided access to a wider range of informative perspectives.

The research involved a review of published documents, grey literature and secondary data; visits to mine sites; coordination of focus group discussions/stakeholder meetings; administration of questionnaires; and organisation of validation workshops. The data for the social analysis component of the work was obtained from focus group discussions (which provided opportunities for institutional stakeholder-analysis, power mapping and pair-wise ranking of preferences for alternative livelihood initiatives), semi-structured interviews (based on checklists/instruments drawn from critical issues identified in the literature review); observations and stakeholder meetings (provided opportunities for rapid assessments of key issues, priorities for study and mapping of institutional relationships). For the regulatory/institutional framework component, information was collected from regulatory institutions, with surveys and focus groups conducted with key stakeholders used to obtain complimentary data. For the economic component, a questionnaire was used; moreover, one-on-one interviews were conducted with small-scale miners and heads of financial institutions. For the technical component of the project, fieldwork was conducted within the selected mining regions. Five days were spent in each town, during which time visits were made to individual mine sites; focus group discussions were carried out (one group contained concessionaires, buyers/buying agents and financiers, and another group was comprised of miners/workers); and a validation workshop (with representatives from focus groups and relevant government agencies/departments in attendance).

2. IMPORTANCE OF ASM IN GHANA

In Ghana, artisanal and small scale mining (ASM) is important economically, culturally, socially and spiritually (D'Souza 2002; Hilson 2001; Tsikata 1997; Eshun-Famiyeh 1994). The government also has a vested interest in ASM because of its potential contributions to national mineral exports and foreign exchange: beginning in the late-1980s, initiatives were undertaken to streamline legislative and policy for the sector, and regularise operations. The government also recognises that the sector is an integral source of employment in rural regions of the country (Yakubu, 2002).

Small-scale mining has been carried out in Ghana for centuries, with gold extracted by artisanal means forming the basis of the Ashanti Empire and facilitating the opening of trans-Saharan trade route prior to European contact. Gold was uncovered using rudimentary implements, such as chisels and rock hammers, with recovered rocks crushed and ground into powder. Gold mining – primarily the potential for implementing heavily-profiting large-scale projects – attracted Europeans to Ghana from the fifteenth century onward; the Portuguese, Dutch and English wrestled for control of the West African gold trade for nearly four centuries.

The *Minerals Act of 1962*, passed shortly after country independence in 1957, vested all minerals in the President for the people of Ghana. The *Minerals (Control of Smuggling) Act of 1965* made the purchasing/sale and possession of gold illegal without license, and also branded small-scale mining illegal, although clandestine activities continued unabated up until the 1980s (Botchway 1995; Yakubu 2002; Aryee 2003). As a means of capturing lost revenues from small-scale mining and illicit marketing activity, the Ghanaian government decided to formalize the sector as part of its mining sector reform initiative.

Today, mining is regulated by the *Minerals and Mining Law* (PNDCL Law 153), as amended by the *Minerals and Mining (Amendment Act)*, 1994, Act 475, in which provisions are made for small-scale mining activities. The country's small-scale mining landscape is diverse, as indicated by Aryee (2003). Whilst gold extraction is the sector's featured activity, artisanal and small-scale diamond mining, which is confined mainly to the Akim Oda region, has generated over US$140 million for the

government since 1989 (Amankwah and Anim-Sackey, 2004). Salt winning, terrazzo chipping, and sand mining is also carried out in a number of locations along the Gulf of Guinea coastline, including Ada, Elimina, Saltpond, Keta and Winneba.

The dominant position of gold extraction in the sector precipitated implementation of the *Small-Scale Gold Mining Law* (PNDCL 218) in 1989, which defines "small-scale gold mining" as follows:

> "[The] mining of gold by any method not involving substantial expenditure by an individual or group of persons not exceeding nine in number or by a co-operative society made up of ten or more persons".

By law, small-scale gold mining activities are limited to Ghanaian nationals, are to be conducted in areas designated by the minister, and subject to a licensing arrangement.

The present research focuses on small-scale gold mining. Whilst other minerals mined on a small scale make important contributions to national mineral production and have important community impacts, in terms of production, gold mining is the most important branch of the industry. Moreover, whereas the extraction of minerals such as diamonds and salt are restricted to certain areas of the country, gold mining is ubiquitous because deposits occur in one-sixth of the country; the livelihood implications are therefore more wide-ranging.

2.1 Contribution of ASM to National Economy

Existing work shows that where regularised, ASM contributes significantly to the national economy whilst simultenously generating economic linkages and providing household income. As Iddirisu and Tsikata (1998) explain, at the national level, ASM's contributions may take the form of earnings from exports, which, among other things, help strengthen a country's balance of payments position and make available resources for imports. Where tax administration is visible and efficient, taxes from minerals marketing (such as sales tax) or handling charges at airports) can also add considerably to national coffers. In Ghana, the ASM sector produces some 83% of the country's diamonds and 9.5% of its gold, and since 1989, has produced more than US$330 million in gold and US$140 million in diamonds (Amankwah and Anim-

Sackey, 2004a). Appendix 1 presents production and revenue data for Ghana's ASM sector.

Generally, the economic significance of ASM can be evaluated using three criteria: employment, production and earnings. Due to the largely informal – and in many cases, illegal – nature of ASM, estimates of employment in the sector tend to be varied. The International Labour Organisation (ILO, 1999) estimates that there are 13 million participants in ASM worldwide; in Africa, there are approximately three million people employed directly in the sector (the recent work of UNIDO also provides figures, however the ILO estimate although unrealistic remains unchallenged and is the accepted figure in the literature). These estimates, however, do not take into account the individuals who *indirectly* depend on the sector for sustenance, including dependent family members, gem-cutters/polishers, and suppliers of food and drink. If such groups are taken into account, at least 100 million people worldwide depend upon ASM for their livelihoods (ILO, 1999). There is consensus among industry experts that the sector is poverty-driven, providing employment to rural nomadic groups, redundant labourers and rural inhabitants (UN 1996a, UN 1996b; Labonne 2003).

In Ghana, one of the earliest estimates of national ASM employment was put forward by the World Bank in 1995, which, in its report *Staff Appraisal Report, Republic of Ghana, Mining Sector Development and Environmental Project* (World Bank, 1995), indicated that there were 30,000 small-scale miners operating in Ghana. This figure, however, failed to take into account the burgeoning illegal artisanal mining contingent, giving rise to Appiah's (1998) assertion that the sector provides direct employment to over 200,000 Ghanaians, the majority of whom are rural dwellers, with as many as 600,000 individuals dependent upon its existence for their livelihood. Researchers at UNDP are in general agreement, noting that there are at least 50,000 legal small-scale gold miners and 80,000 *galamsey*[1] operating throughout the country (Labonne et al., 2000). Aryee (2003, p. 395) concedes that the *exact* employment

[1] Highly migratory, unregistered, Ghanaian small-scale miners are referred to locally as *galamsey*, which, according to native people, originated from the English expression "Get them and sell". During the colonial period in Ghana, the Syrians and Lebanese who were engaged in the illicit trade of gold constantly worked to persuade locals to "get and sell" gold, and because the local pronouncing of this phrase was "Gal-am-sey", Ghanaians soon referred to Syrians and Lebanese as "galamsey". Over time, the expression slowly became a label for illegal artisanal mining activity.

figure lies between 50,000 and 300,000, explaining that, "the rather wide range of estimates bears testimony to the lack of readily available accurate and reliable data due to the furtive nature of a large part of such workings in rather remote areas" .

What *is* known, however, is that apart from making important contributions to foreign exchange and national mineral outputs, at least 60% of Ghana's mine labour force is employed within at ASM sites.

2.2 Contribution of ASM to the Local Economy

The findings from the present study confirmed that the ASM sector is important to local socio-economic development in Ghana. In both Tarkwa and Bolgatanga, the various stakeholders within the communities affected by ASM operations (e.g. ASM operators, local administrators, local representatives of relevant national level institutions on the ASM, large-scale miners and private gold buyers) were unanimous in their views that the ASM sector serves as a major source of employment for many people who have few income-earning alternatives. The sector has been helpful in wealth creation and the provision of social/business services to local communities through the re-investment and proceeds. In Prestea, for example, miners argued that about one and a half years ago, there were only three taxis but today they are ubiquitous.

At Prestea and Bolgatanga, the importance of ASM as a source of local employment was evident. It has been estimated that there are about 15,000 people engaged in the sector within Prestea and its environs. Certain miners, particularly well-educated professionals (including mine shift bosses and mine safety officers, among others who were formerly employed by Prestea Gold Resource Ltd), have helped transfer skills for the benefit of others. The involvement of skilled professional miners in ASM at Prestea, in part, quells claims made by the government that the sector is exclusively comprised of illiterate individuals. This corroborates the findings put forward by Hilson and Potter (2003), who report having encountered highly-educated miners within Bibiani, Tarkwa and Asin Fosu,

Appiah (1998) was among the first to put forward estimates on income-earning potential in the Ghanaian ASM sector. The author claimed that a small mine worker in Ghana can earn as much as US$7 each day, which for a five day work week, amounts to US$1820 annually. In terms of the present research, the resulting portrait that emerges from the distribution of labour and earnings is captured in the ASM "diamond" presented in Appendix 2. The significance of the diamond lies in the fact that it captures simultaneously the two main channels through which small-scale mining can contribute to poverty reduction: employment and earnings. Findings revealed that incomes within the ASM study sites vary between and within groups. For example, carriers in the Tarkwa-Prestea areas – mostly women – earned as little as 12,000 *cedis* for a 10-hour work shift, which was further dependent upon whether or not mine owners declared profits. Crushers and washers, on the other hand, reported earnings in the range of 20,000 *cedis* per 10-hour shift, depending on the availability of work. At the other end of the income spectrum lie the buyers/sponsors, who could earn as much as 40 million *cedis* monthly (a lot of these buyers live permanently outside the study areas but do come there regularly to conduct business). Based on collected survey data, the median monthly income were calculated to be ¢1,200,000 and ¢500,000 in Tarkwa/Prestea and Bolgatanga, respectively.

A registered, well-established operation engaged in alluvial mining activity alongside the Ankobra River provided a somewhat more structured view of employment and earnings within the legalised segment of Ghana's ASM sector. At the time of surveying, the company employed about 34 people in for various tasks. Washers were paid ¢30,000 per day or the equivalent of ¢720,000 a month, whilst the site overseer and excavator operator each earned ¢1,000,000 monthly. The on-site electrician earned a monthly salary of ¢800,000. The generally skewed distribution of income in the ASM sector is largely due to an intricate web of financing schemes that almost always guarantee the sponsor-buyers profits, even as their clients, such as miners or cash-strapped ghetto owners, face various losses due to low ore yields.

These gains in employment notwithstanding, the findings revealed a number of employment-related issues that must be addressed so as to make the rise in employment more meaningful to certain key actors, particularly women and children. These included the following:

a. The employment relations within the sector are substantially informal and 'casual'. The sector does not offer any form of social protection for employees. Employers do not comply with statutory obligations relating to social security, taxes, insurance, compensation, hours of work, and the health and safety of employees.
b. Concession owners are also involved with production-sharing, arrangements which results in employees sharing part of the risk inherent with the mine venture. Under such arrangements, employees stand to gain or lose in the same manner as the employer.
c. The exploitation of labour was and issue raised during numerous interviews with female workers, in both Gbane (Bolgatanga) and Tarkwa. The female workers interviewed complained that they were being exploited and worked largely to enrich the predominantly male buyers and/or sponsors, ghetto owners, owners of washing machines, crushers and milling machines. In certain cases, it became clear that female workers were sometimes not paid for their labour and lacked avenues for seeking redress.
d. The bargaining power of workers within the sector is generally weak, largely because they do not have a voice (*i.e*. are not unionised) to engage in negotiations with employers. For example, at one small-scale mining site in Ankobra, which at the time of interviewing, had a workforce of 33, workers complained of a lack of formal union representation, forcing them to negotiate welfare matters with their employer through a single representative.
e. Although mine workers earn more than the minimum wage, the incomes of workers (carriers, crushers and washers) within the sector are low when taking into account the physically taxing, unsanitary and dangerous character of the work they undertake. The low wages in the sector could be linked to inadequacies in the regulatory and institutional framework, which is examined in the next section of the report.

The community members interviewed reported that in Ghana, ASM potentially have economic multiplier effects, an argument also raised by Aryee, (2003). Some miners noted that they are able to save and invest in property, transport, agriculture and commerce. For instance, in Bolgatanga, where it is estimated that ASM employs nearly 20,000 people, the multiplier effects generated by the ASM sector were clearly visible. For example, in the Bolgatanga township, there was evidence of imposing

modernised houses owned by ASM operators. Gbane, a small-scale mine site in Bolgatanga, which hitherto has had a virtually non-existent community, has rapidly expanded and modernized because of incomes and production derived from ASM. A booming market for mainly agricultural produce has been established. However, what remains unclear is the percentage of profits from ASM activity that is reinvested in the community.

2.3 The Relationship between ASM and Large Mines

As publicized in a number of seminal texts (UN 1996b; ILO 1999; MMSD 2002), one of the more contentious problems facing authorities in developing countries is land use conflicts, particularly disputes between artisanal and large-scale miners. Few, if any, mineral-rich countries have managed to avoid such conflicts, which arise because of contrasting perceptions of land resources: whereas large-scale miners maintain they have legal entitlement to concessions, artisanal operators assert that their cultural ties to land overrides any such right. In Ghana, few mining localities have been spared of conflicts between small and large-scale miners, although clashes have been most intense in Prestea/Tarkwa and Dumasi. Several authors (e.g. Hilson 2002; Hilson 2003; Babut et al. 2003; Amankwah and Anim-Sackey 2004b) provide detailed accounts of the major land use disputes that have occurred between Ghana's small and large-scale miners.

In recent years, conflicts have been exacerbated by a shortage of mineralized land – a major reason cited by Hilson and Potter (2003) behind the burgeoning illegal artisanal mining activity in the country. For example, almost all lands in the Tarkwa area are either in the hands of large-scale miners or have been demarcated as forest reserves (see Aubynn, 1997). Consequently, many mining activities are being carried out on the concessions of large-scale mines and in forest reserves. Conflicts of this nature were absent in Bolgatanga, however because the region is devoid of large-scale mining activity; the proliferation of alluvial gold deposits in northern Ghana renders large-scale extraction unfeasible.

According to some unregistered miners, in many cases, large companies are awarded

concessions in areas in which they are already working, thus resulting in their displacement. Unregistered miners admit they sometimes fail to reciprocate the good will of large-scale mining companies in situations where they cede portions of their property to them to operate. These miners sometimes go beyond the designated areas and therefore pose a serious threat to the large-scale mining companies.

The unhealthy relationship between large mines and unregistered miners is well acknowledged and constitutes a source of concern for many stakeholders in the mining sector in Tarkwa. However, among those interviewed, it was noted that there is an overwhelming desire at the community level for improved relationships between small-scale miners and large-scale miners; there is considerable potential for achieving such results. For example, some large-scale miners were said to have launched schemes in which small-scale miners are permitted to mine on portions of demarcated concessions. The danger in such a move is that unless enforced effectively, individuals will comute from the furthest of locations for this security of tenure, which will lead to overcrowding. A case in point was the Abosso Goldfields' concession in the late-1990s, where encroaching illegal miners were relocated to areas deemed unsuitable for large-scale activity and equipped with security cards (see Appiah, 1998). However, the effort was allegedly undermined by an ensuing continuous influx of illegal miners.

2.4 Land Shortage and Poverty

The underlying factor is evidently the unavailability of mineralized land. Land was said to be a critical issue at the Tarkwa area: nearly 70% of the total land surface in the Wassa West district is either in the possession of large-scale mining companies or has been classified as forest reserve (Aubynn, 1997). Apart from the flood plains of the Ankobra River and a few patches of land, which have been demarcated to registered small-scale miners, all remaining ASM activity in the area takes place within the concessions of large-scale mining companies or forest reserves. Research reported by Hilson and Potter (2003) confirms that the unavailability of land plays a major role in discouraging miners from operating illegally; with few options available

for securing parcels of land, prospective small-scale miners see the registration process as a futile exercise.

At Bolgatanga, the situation is different. As previously explained, large-scale mining is not being carried out in northern Ghana largely because the region is comprised of alluvial gold deposits. Although there are plots of land currently under concession to large-scale exploration companies, a large area has already been demarcated by the Minerals Commission for small-scale mining miners; this concession is currently *shared* by both registered and unregistered miners. The small-scale miners interviewed in Bolgatanga, however, did express a desire to have areas delineated specifically for themselves. Many of the miners expressed a willingness to pay prospecting costs, which the state could do by implementing a mutually-agreed repayment scheme.

2.5 Impact of ASM on the Environment

In spite of the numerous benefits derived from small-scale mining, it is beset with environmental problems. The impacts most visible at study sites included the following:

- Destruction of forest cover;
- Destruction of farms (even though the farmers have received compensation);
- Disturbance of the natural habitats of game species (has reportedly scared away such game and affected the returns of hunters in the villages around Gambia;
- Water pollution;
- Air pollution (dust and toxic vapours);
- Noise pollution; and
- Land degradation.

Aryee et al (2003) places the environmental impacts of ASM activities in Ghana into one of three categories. The first encompasses all damage to the lithosphere or land degradation. The authors note how resident operators leave behind "moon-scaped" surfaces, destroy tracts of agricultural land and induce soil erosion. Unplanned prospecting and application of rudimentary mineral extraction and processing

techniques has caused widespread land degradation. Some of these mines are located in or very close to villages, making pits a major health and safety hazard.

The second category of environmental problems encompasses all impacts upon the hydrosphere. Cases of serious river and stream pollution, induced by ASM activities, have been reported by Dankwa et al. (1996), Akabzaa (2000) and others. Specifically, watercourses have been impaired as a result of excessive siltation and discharges of mercury (from gold amalgamation). In fact, a vast proportion of the literature that profiles the environmental pollution induced by ASM activities in Ghana focuses mainly on aquatic-toxicological issues. Examples include NSR (1994), Ntibrey (2001) and Lundberg et al. (2002), Bonzongo et al. (2003), and Bannerman et al. (2003).

The third, and final, group comprises all atmospheric impacts. The primary concern in this context is release of (methyl) mercury vapour. Mitigation measures have been attempted to minimise this pollution by educating miners and introducing mercury retorts at subsidised rates and sold at district centres. Babut et al. (2003), who undertook work in Dumasi, advocates the adoption of the UNIDO TherMex retort, which enables miners to "view" the amalgamation process. Based on experiences in Tarkwa, where miners were observed burning amalgam freely, Hilson (2002b) also called for the adoption of retorts. As part of a grand plan for reducing mercury emissions from small-scale gold mining in Ghana, UNIDO implemented a two-phase mercury abatement project. The first phase involved assessing the environmental and health-related impacts of mercury in small-scale gold mining regions – an undertaking carried out in 1999. The second phase involved the promotion of retort usage – principally, the TherMex model. The Minerals Commission is in the process of making a retort a legal requirement for small-scale gold mining. A portion of the 40 million Euros awarded in May 2002 for mining sector support under the EU-SYSMIN facility will be used to undertake further mercury management research.

According to Al-Hassan et al (1997) as people migrate to villages in search of employment, local populations grow, resting in the importation of varied, and in some cases, conflicting, customs and traditions. There has also been increased prostitution

and sexual promiscuity, and with it, rises in occurrences of communicable diseases such as syphilis, gonorrhoea and AIDS (MIME, 2002; Akabzaa, 1997).

Within the regions where fieldwork was carried out for this study, most small-scale miners used rudimentary operational practices, and had minimal regard for the physical environment, because a lack of awareness. For instance, at one location visited in Tarkwa, intensive mining activity had completely destroyed an entire section of land, which is now filled with potholes, posing a serious safety and health hazard to the villagers of Wangarakrom. Locals are at a constant risk of falling into these pits because the public toilet is located on the site. Moreover, the numerous ponds of water that persist during the raining season serve as fertile breeding grounds for malaria-carrying mosquitoes.

In Ghana, land degradation from small-scale mining activities is a problem that has been examined at length in a number of publications (e.g. Hilson 2002a; Hilson 2002b; ActionAid Ghana 2003; Aryee 2003; Aryee et al. 2003). During the early-1990s, the government made an ambitious attempt to post a reclamation bond for small-scale mining, retaining 3% of proceeds from mineral sales to PMMC for land restoration purposes. Initially, the move was successful, generating some US$17,000 during its first few years of existence. However, as indicated in the GTZ-commissioned study undertaken by Kwame Asante & Associates, 1993, the resulting uncompetitive price led a number of miners to sell gold to illegal gold buyers, thereby forcing the government to abandon the Land Reclamation Bond outright. Generally, the black market for minerals grows when the difference in buying price and market price exceeds 5% (Noetstaller, 1994). With the added cost of the Land Reclamation Bond, miners were receiving payments for gold and diamonds that were nowhere close to the market price; to curb the resulting illegal marketing activity, which saw certain miners smuggling product to neighbouring Togo, Benin and Burkina Faso, the government agreed pay 98% of the market rate for minerals. With the appropriate modifications, the bond could be successfully re-launched but the government has yet to entertain this option.

2.5 An Overview of Sector Support Initiatives Implemented To-Date

Since its legalization, an array of projects have been sponsored and implemented in an attempt to improve living standards in the Ghanaian ASM sector. Shortly after legalising small-scale gold mining in 1989, the Small-Scale Mining Project (SSMP) was inaugurated to handle relevant policy-related matters in the sector. The SSMP is comprised of the following four institutional pillars:

a) The Minerals Commission: carry out priority studies on ASM, issue licenses, and implement relevant industry policies.
b) The Precious Minerals and Marketing Corporation (PMMC): provides purchasing services for small-scale miners.
c) Mines Department: put in charge of the industry's health and safety issues.
d) Geological Survey Department: conducts prospecting and identifies areas suitable for small-scale mining.

As the main administrative body involved with small-scale mining, the Minerals Commission established the Small-Scale Mining Department (SSMD) in 1991 to better address industry policy making and regulatory issues.

As a means of decentralizing the small-scale mining regulatory and licensing process, delivering extension and technical support services to operators, and providing training, the government constructed seven district centres within the following seven localities, which were judged to contain the highest concentration of activities: Tarkwa, Assin Fosu, Akim Oda, Dunkwa, Asankragwa, Bibiani and Bolgatanga (Yakubu, 2001).

The SSMP was established using World Bank monies awarded as part of the *Mining Sector Development and Environmental Project* (World Bank, 1995), the main objects of which were (i) to enhance the capacity of the mining sector institutions to carry out their functions of encouraging and regulating investments in the mining sector in an environmentally sound manner, and (ii) to develop techniques that will improve the small-scale mining operations. The following initiatives were pursued under the scheme for small-scale mining:

- Identification and testing of improved equipment and processing (US$1.25 million allocation): Equipment packages were identified during study tours undertaken by a team of officials from the Minerals Commission and a small-scale miner; various sluices, crushers, pulverisers, pumps and amalgamators were tested.
- Dissemination of equipment and technology (US$1.29 million): A collaborative effort undertaken by the Minerals Commission and the Mines Department. In an attempt to disseminate recently-tested equipment to miners, workshops were held, field demonstrations were conducted, and an assay laboratory was erected at the Tarkwa district centre – the busiest of the seven regional offices.
- Improved geological information (US$1.88 million): A programme to make geological information available to small-scale miners, who generally operate without reliable information regarding the extent of exploitable ores.
- Improved small-scale mining sub-sector framework and set-up (US$0.77 million): Studying the procedure of granting concessions and marketing minerals, with the intention of improving the process overall.
- Land reclamation for small-scale mining degradation (US$2.63 million): A project emphasising the reclamation and rehabilitation of high priority land areas as a pilot exercise, focusing on community involvement.

In 1992, an agreement was reached between the Minerals Commission and the Central Region Development Commission (CEDECOM) to launch a plant-hire purchase scheme for small-scale mining, which involved the implementation of a pilot project in two mining districts, Assin Fosu and Akim Oda. CEDECOM was to design, manage and implement a finance package for concessionaires (Bonsu, 1993). However, it is alleged that, in drawing upon its experiences with small-scale fisheries, and with little knowledge of the target populace, the organization oversaw the purchasing of inappropriate equipment.

In the 1990s, GTZ was hired to provide on-site training to small-scale miners and district officers. The organisation worked in cooperation with the World Bank to

carry out the *Mining Sector Development and Environment Project's* tasks for small-scale mining. In an effort to improve efficiency in the sector, the Minerals Commission has since made numerous attempts, particularly with Chinese and Indian merchants, to establish equipment purchasing/leasing services for small-scale miners. However, merchants' demands for US dollars (which has made it difficult for miners who are forced to purchase US currency with the inflating cedi), and their inability to provide guarantees on equipment, have resulted in the abandonment of these schemes, The Commission should be credited for its efforts in establishing a processing centre in Bolgatanga, a location of widespread alluvial gold deposits. Modeled after the Shamva Centre in Zimbabwe, the unit provides gold processing services for the region's small-scale miners.

Few of the aforementioned, and related, efforts have addressed the crucial livelihoods element, which could explain the limited success of these initiatives. The consensus reached by policy-makers and experts at Yaounde in November 2003 – the *Yaounde Vision Statement* – was the need to "Contribute to sustainably reduce poverty and improve livelihood in African Artisanal and Small-Scale Mining (ASM) communities by the year 2015 in line with the Millennium Development Goals". This research marks an important step towards this aim, building upon the work piloted by the UNDP in 2001.

3. UNDERSTANDING THE CONTEXT: A FRAMEWORK FOR ANALYSIS

3.1 Institutional and Regulatory Framework

In Ghana, as in most developing countries, the motive behind strengthening the regulatory and institutional framework for mining sector is the government's desire to attract foreign investment, maximize returns from mining sector, and provide security

of tenure for incoming large-scale mining companies (Graham 1982; Tsikata 1997). Whilst the government claims the regularization of small-scale mining was driven by a desire to capture lost revenues from the sector, the implementation of an industry framework was to a large degree a manifestation of pressures exerted by large-scale miners, who generally perceive "barefoot" prospectors as a grievance and disrupting. Up until 1989, the regulatory policies in place for mining minimally addressed the welfare and interests of artisanal and small-scale miners. For example, colonial laws such as the *Concessions Ordinance*[2] and the *Gold Mining Protection Ordinance*[3] were designed specifically to protect the rights of large-scale mine concessionaires. In 1989, the government legalized small-scale mining, passing the following pieces of legislation:

1. *Small-Scale Gold Mining Law* (PNDCL 218), which provides for the registration licensing and marketing of gold.
2. *The Mercury Law* (PNDCL 217), which legalized the purchasing of mercury from authorized dealers.
3. *The Precious Minerals Marketing Corporation Law* (PNDCL 219), which transformed the-then Diamond Marketing Corporation to empower it to purchase and deal in gold.

Appendix 4 describes the regulatory and institutional framework in place for ASM in Ghana.

Although numerous studies have been undertaken which sufficiently describe Ghana's ASM regulatory framework and its importance to the state, minimal research has been carried out at the community level, particularly work orientated around sustainable livelihoods. Specifically, there is a need to improve understanding of the industry's labour dynamics, its function as a employment "generator", its income generation potential, and social protection. Key examples of issues in need of examination include the following:

- The specific roles of the industry, its functional relationships with other known institutions, and the effectiveness of these institutions at the local level..

[2] 1890, (CAP 87)
[3] Ordinance No. 3 of 1905

- Analysis of power relations in the mining industry and how these influence the design of the regulatory framework, as well as the attitudes of its institutional actors.
- The degree of "voice" ASM operators have in legislative and policy-making processes, and whether or not it is a lack of community input that has resulted in the implementation of a regulatory and institutional framework which heavily favours large mining concerns.
- The impact of various pieces of legislation on the livelihood of small-scale miners.
- Improved understanding of the contribution of registered and unregistered small-scale miners to the national economy.
- The benefit of having transferable mining rights in the sector.

The present study identified a number of basic limitations with the existing regulatory and institutional framework in place for small-scale mining. These were as follows:

i. The current regulatory regime does not adequately reflect the dynamics of the social and economic relations that have evolved in the ASM sector, making it imperative that relations and policies are redefined to ensure optimal benefits for its participants. For example, at present, the licensing process is extremely centralised, requiring the prospective operator to travel to Accra. There would be merit in empowering district staff, with whom operators are more regularly in contact with, to make key decisions.

ii. The regulatory institutions lack the requisite expertise (in terms of personnel and knowledge) and regulatory coherence (because certain administrative tasks have been abandoned, and regulatory agencies are no longer working together to effectively monitor the activities of artisanal and small-scale miners. They also lack the ability to control and enforce rules and standards because they do not have the statutory authority and the necessary resources to enforce non-compliance. Apart from the EPA having a non-existent role in ASM policy making and enforcement, the Minerals Commission, Geological Survey Department and Mines Department – the three pillars of the SSMP that provide support for ASM – are understaffed, having minimal presence on the ground and/or have abandoned their industry responsibilities altogether. As

identified by miners during focus group discussions, the impact of the relevant institutions on the ASM sector at the local level largely depends on the availability of resources and staff.

iii. Miners noted that apart from Small Scale Mining Centre, which they acknowledged as a useful partner, their relations with other institutions do not extend beyond the licensing process. Certain gang leaders of *galamsey* groups and workers of registered concessions claimed to be unaware of relevant institutions, apart from District Assemblies, local EPA offices and police. They indicated that the police were helpful but that District Assembly staff was not.

iv. There is minimal coordination amongst the institutions regulating small-scale mining. For instance verification of sites for mining purposes is usually carried out by several key institutions, yet there is no well-defined policy framework for joint execution of this task. Miners reported dealing with each institution individually.

The relations ASM operators have with other important groups, including District Assemblies, traditional authorities and landowners are examined in the next the section of the report.

3.2 Linking Regulation to Livelihoods

Employment and incomes can be affected when the law or the operations of regulatory agencies curtail property rights and raise the costs of compliance. In the ASM context, property rights include the rights exercisable pursuant to a mining license, such as entry into and exploiting gold found within a concession. Once a license is granted, the grantee has a property interest in the concession subject to the grant and thus enjoys or ought to enjoy security of tenure over that property. As noted in the description of the *Small-Scale Mining Law* in Appendix V, the nature of the law severely curtails the property rights of ASM operators, and thus affects their security of tenure. Compliance costs may also negatively impact on livelihoods by limiting potential investment in the sector or by curtailing the ability of investors to profitably expand their activities and thus, create jobs and pay living wages.

In Ghana, the current regulatory and institutional framework for ASM does not speak to the issue of social protection, that is, it does not even attempt to address the question of how to reduce or eliminate the vulnerability of economically-weak actors in the sector such as female and youth workers. The glaring absence of social protection mechanisms can also lead to exploitative behaviour on the part of major sectoral actors, with potential adverse implications for wages and livelihoods in the sector. Examples of such exploitation are provided in the ILO's seminal text, *Social and Labour Issues in Small-Scale Mines* (ILO, 1999).

Finally, as explained previously, employment relations within the small-scale mining sector are very exploitative in character. Women and children in particular are often heavily exploited and are thus vulnerable. It has already been pointed out that in some cases, women are not paid for their labour, with many admitting that they do not have any means of redressing such exploitative behavior on the part of their employers. Children also work within the sector, contrary to the requirements of the *Labor Act* regarding the employment of children and young persons. Policy interventions designed to reduce their vulnerability in the employment context are badly needed so as to enhance the potential of artisanal mining as a sustainable source of livelihood. Some of these concerns have already been discussed under the section "Contribution of ASM to National Economy".

The study observed a number of issues pertaining to the operations of small-scale miners that require urgent attention from regulatory authorities. These issues include the relationship between small-scale miners and large mining firms; the issue of land poverty within the sector; the relationship between buyers/sponsors and miners; the role of traditional authorities within the sector; and the issue of forest reserve encroachment. These issues are deeply-rooted in the social and economic circumstances of the small-scale mining sector, and have serious implications for livelihoods. However, as noted earlier, the existing regulatory and institutional framework does not directly address them.

In terms of the relationship between buyers/sponsors and miners, most miners interviewed noted that the terms of financing loans are dictated by the

buyers/sponsors and are sometimes too onerous for miners. Hilson and Potter (2003) were among the first to note that in Ghana, gold buyers have a considerable amount of power, corroborated by findings from the present work. At study sites, buyer/sponsors pre-finance mining activity in expectation of repayment upon discovery of gold by the miner. The study discovered that the default rate as far as such loans are concerned was so high in the Tarkwa area in particular, that it has come to be known locally as "Tarkwa fraud". Cases of default are often reported to the police and are handled as criminal matters instead of civil suits for money due and owing. Where miners are found "guilty" of Tarkwa fraud, court sentences range from two to twenty-five years imprisonment.

Notwithstanding that there probably have been, and will continue to be, real cases of fraud perpetrated on potential investors by charlatans posing as genuine small-scale miners, we take the view that the threat of long prison sentences for genuine cases of loan default could potentially discourage risk-taking by small-scale miners. Therefore, legal intervention may be necessary to decriminalize genuine cases of loan default and to provide for terms of repayment within the context of civil law.

On the issue of land poverty within the sector, the study observed that, unregistered small miners are considered a threat to forest management. This was echoed both in Bolgatanga and Tarkwa. Authorities of the Forestry Commission indicated that they have often spearheaded the eviction of illegal miners from forest reserves. However, their efforts have not been successful in stemming the tide of encroachment. They mentioned that illegal miners are usually "armed to the teeth" and violent. Forestry Commission officers from both Bolgatanga and Tarkwa recounted various incidents of nasty encounters with these encroachers.

Forestry Commission officers said they have no direct role in mining activities, the exception being illegal mining in the reserves, which poses a serious threat to the successful management of a forest. In order to resolve the problem of encroachment in forest reserves, the Commission has instituted a collaborative forestry management arrangement with communities, which obligates residents to report to the Commission any illegal activities of miners in the reserves. No cases of legalized SSM in forest reserves were found.

3.3 Small-scale Miners and Alternative Employment

An analysis of the origins of miners at the study areas (presented in Appendix 3) provides interesting insights and useful information for designing policy responses for specific mining areas. Clearly, the majority of the various categories of workers in the Tarkwa-Prestea area hailed from outside the district. For example as many as 79.5% of miners surveyed within the Tarkwa-Prestea site (Wassa West District) originate from outside of the regions; 1.4% of those surveyed on-site were not Ghanaian but rather residents of surrounding countries. In contrast, the majority of the workers at the Bolgatanga site were from the district. The only notable exception at the Bolgatanga site was the category of buyers, where 53.8% of respondents reported hailing from outside the country, notably Burkina Faso, and 15.4% reported hailing from other parts of the country.

From the preceding discussions, the implications for public policy, in terms of alternative livelihoods, should be clear. Clearly, the lack of employment opportunities in other parts of the country, along with the revival of the gold industry in the Tarkwa-Prestea area, has attracted many jobless people, especially youths, in search of golden fortunes in small- scale mining. However, the finite nature of the mineral and the limited access to land means that there are more people than the government or large mining companies can reasonable accommodate, even in the best of circumstances.

Discussions on alternative livelihood sources of employment and incomes to ASM had mixed reactions. Miners in Tarkwa argued that most people had become used to making quick money from the ASM sector, and therefore, any alternative would have to take that into consideration. The idea of, and efforts towards, alternative livelihood schemes (ALS) was generally described as “interesting” by workers in both sites. Nevertheless, they thought the champions of the idea (the Ghana Chamber of Mines, for instance) needed a better understanding of ASM as a livelihood strategy. Since miners have different motivations for engaging in ASM, their attitudes towards alternative livelihoods – as a total substitute for ASM or as a

complementary/secondary activity – would inevitably be influenced by the extent to which these met those objectives. Miners called for increased attention to be paid to traditional geographical economic activities, and that if the government was pursuing an ALS strategy, it needs to consider where beneficiaries would practice these livelihoods and account for high levels of migration. The effort must be approached holistically, going beyond training to providing meaningful amounts of money that will make the endeavour a viable and attractive alternative to ASM. Some District Assembly officials (particularly in Wassa West) indicated that although the initiatives undertaken by large-scale miners in the area of ASM-ALS are laudable, beneficiaries do not seem to have been extensively catered for, nor have efforts been linked to the Assembly's own poverty reduction schemes.

Certain individuals interview from development organizations identified the need for more publicity on ALS efforts. Too often have large-scale mining companies and governments cited how initiatives have been taken in the area of ALS promotion when, in fact, the options themselves are equally unsustainable. An instance was cited in which one scheme provided five-day old chicks and a quarter of a bag of feed, which could not be realistically considered an alternative to small-scale mining. There was a general indication from the field that the support should be more substantial and should reflect sensitivity towards peoples' traditional activities, as well as build upon existing knowledge. Schemes involving complete re-skilling and/or importation of skills cannot be expected to be assimilated and taken up immediately.

Representatives from development organisations also indicated that the direction being taken by large-scale miners in the area of ALS is noteworthy, but there remains considerable room for improvement, particularly in terms of education. For instance, in the Western Region, it was suggested (by representatives from development organizations) (by who??) that the people have the option of diversifying into oil palm farming yet the GMC introduced mushroom and snail farming, whilsts Bogoso focused on snail farming. The respondents considered that even the orientation of LSM/community relations needed to be changed. They observed that the implementers of the ALS had worked with planners and economists thus clearly reflecting a pre-occupation with the spatial and economic aspects and not sufficient acknowledgement of the social dimensions. They noted that the areas of emphasis

should be ground work and baseline analyses to facilitate groundwork, with accompanying community sensitization.

3.4 Assets and Capabilities involved in ASM

The mining methods adopted by ASM operators depend on the type of deposit being exploited. Surface mining methods are employed to extract alluvial mineral deposits and other deposits that occur close to the surface. In this case, mining involves digging using simple tools such as pick axes and shovels. The extracted gravel is then hauled in head pans by head porters (mainly women) to nearby washing points for sluicing. This type of mining is common along streams, and river courses. Pits are normally no deeper than two metres (Ntibrey, 2001), and in areas with thick overburden, are large and benched to stabilize walls. This type of mining may involve pumping to dewater pits, which can increase processing costs (requires the acquisition of pumps and generators). Thus, such mining is usually carried out during the dry season. According to Amankwa and Anin-Sackey (2001), miners who work along long rivers like Ankobra and Offin usually work in the dry season. The pits dug here can be deeper than two metres. In places where there are weathered outcrops of hard rock orebodies, miners use chisels and hammers to break soft rock. When the orebody is too hard, miners are known to drill holes and insert explosives – although small-scale miners are prohibited from using explosives.

Underground mining usually takes place in abandoned adits and shafts. Access into shafts is facilitated by the insertion of metal structures (for stablility) and moulding of footholes into shaft walls. Miners use torch-lights as a source of illumination whilst inside working chambers. Rock is loosened using hand held hammers and chisels (moils) and shovels. Daring miners use explosives although again, it is illegal. Rock chippings are shoveled into sacks and buckets, and hoisted up shafts to the surface. According to Amankwa and Anin-Sackey (2001), some miners spend days and even weeks underground. Such miners grind their ore and recover their gold before returning to the surface.

Generally, mineral processing methods in Ghanaian ASM fall into one of two categories (Ntibrey, 2001). The first,comprises all traditional and manual techniques, including (manual) the crushing of ore at the mining face using 5lb (2 kg) hammers; fine crushing using steel and pestle in 2-3 cycles after sieving the undersize – 0.5mm; fine milling of the remaining + 0.5mm with corn mills; ore concentration using a single sluice box; panning the concentrate from the sluice box; and amalgamation of the concentrate to recovery gold. Typically, manual methods recover between 20 and 40% of gold from ore (Iddirisu and Tsikata, 1998).

The second category, mechanised mining, features mainly simple portable equipment powered by diesel engines. Notable among these machines are hammer mills (imported from China), which have been certified by miners to be durable, simple and easy to maintain; they are also efficient at milling ore. A number of concentrating units are also used, including sluice boxes with riffles, strake, shaking tables, as well as gold savers and centrifugal concentrators such as the Knelson Concentrator. Mechanised mining is most common in locations containing hard rock deposits, and gold recovery is in the range of 40-75% (Anon, 1996; Amankwa & Anim-Sackey, 2001). The sites visited as part of this study exhibited a notable degree of organization. For example, doorbells are used to communicate between the surface and underground, and improved support structures now exist.

Whilst there is no denying that, through its SSM Department, the Minerals Commission has provided education for registered operators, what cannot be overlooked is the knowledge that has infiltrated into the sector as a result of retrenchment from state mines and private large-scale operations. This has benefited the unregistered (illegal) operators in particular, many of whom now work alongside experienced individuals made redundant at mechanized operations. In Prestea, mining engineers and other skilled workers who still have an employment connection with local large scale mines also engage in semi-legal small-scale mining activities, assuming a sponsorship role or leasing machinery.

There is some use of information communication technology by formal sector actors – through the use of films for public education and for training purposes (such as on mercury) and on environmental and reproductive health. However, there is need to

increase the breadth of such programs. It is important to train Minerals Commission and Mines Department staff on what is available and grant them access to the requisite resources. Presented below is a summary of resources and technology available to the small-scale miners:

1. **Gold occurrence**. The main sources of gold in Ghana are Birimian and Tarkwaian rocks in the forms of reef, vein or lode-type deposits; mine dumps and mill tailings; auriferous quartz-pebble conglomerates; and recent alluvial and eluvial deposits associated with rocks of the above two primary systems

2. **Small-scale mining occurs primarily in areas containing alluvial and eluvial deposits**.

3. **Both surface and underground mining methods are used** to exploit gold deposits in Ghana, and the method used depends on the type and nature of the orebody.

4. **There are both legal and illegal small-scale miners in operation**. Many artisanal miners find that license acquisition to be too expensive and processing is too long and cumbersome.

5. **Geological data is not available to the concessionaires**. The *Small-Scale Gold Mining Law* (PNDCL 218) does not permit small-scale miners to undertake exploration, hence no reserves are demarcated as guidance to prospective miners. Although at the inauguration of the SSMP, the Geological Survey Department was charged with the responsibility of geo-prospecting and demarcating plots suitable for small-scale mining, it has abandoned these tasks on account of alleged finance shortages. Ore identification therefore occurs by trial and error, and in many case, time and money is spent digging pits and shafts several metres deep only to be abandoned due to lack of ore. This frustrates the miners and causes financial losses for them and their families. This also results in minimal time being paid to reclaiming mined-out areas, as miners are in continuous search of sufficiently mineralized land to work in order to feed their families.

6. **Surface mining operations are located in areas with occurrences of weathered orebodies.** Generally, shallows pits, spaced about $1m^2$ apart from one another are dug; chisels and hammers are used to break ore. Surface mining techniques are also used to exploit alluvial deposits.
7. **Underground mining methods are used to exploit rich orebodies with very thick overburden**. Shafts are typically sunk with chisels and hammers, although explosives are widely used by uncertificated blastmen. Drilling is sometimes performed using pneumatic jackhammer on a rental basis. Explosives are also sold and readily available on-site.

8. **Surface mining is used to exploit placer deposits** (mainly, alluvial), weathered outcrops of auriferous reefs and conglomerates with thin overburdens.

9. **Gold recovery has increased with mechanisation** from 20-40% to about 40-60% because of more advanced technology.

10. **Ventilation in underground mines is sometimes very bad**. However, some compatible miners link up their shafts to enhance natural air flows. In some places (Prestea), spraying machines are used.

11. **'Talking' door bells have been** adopted for communication between the surface and underground (typically in Prestea).

12. **Pumps hired at a high cost** (about ¢200,000/day) are used for dewatering underground mines.

13. **Traditional pounding and sieving is giving way to mechanical comminution**. Modified corn mills and hammer mills are now being used for size reduction. Pounding is virtually limited to sampling of the orebody. The corn mills cost about ¢8 million. The hammer mill is acclaimed by miners as suitable for the conditions in Ghana.

14. **Gold recovery through sluicing is low (about 40-70%).** There are no riffles on the board, and washing of the mats is irregular. Recovery can be improved by addressing a number of parameters, including slope, type of matting and frequency of washing. The materials commonly used for matting are jute sacks, carpets, towels and corduroy.

15. **Small-scale mining, especially surface mining, causes tremendous damage to the environment.** In many regions of Ghana, surfaces are scarred with numeorus uncovered pits. Several active and abandoned shafts are neither covered nor fenced. The conditions places such as Gbani, where homes are built arround shafts, are unacceptable and pose a safety hazard to children and women.

16. **Timber is used extensively for support underground**. This has led to excessive local clear-cutting in areas, particularly Tarkwa and Dunkwa.

17. **The processing plant at Gbani is servicing the small-scale miners effectively.** The plant is widely used by particularly women, who gather mineralised rocks from the surface for processing. However, the plant has reported supply, rail and maintenance problems.

18. **Miners use mercury freely to recover gold.** Excess mercury in the amalgam is burned in fire in oval pots, in either kitchens or compounds. This poses a serious health risk to themselves as well as other occupants of their homes.

19. **Miners are reluctant to use the TherMex UNIDO glass retort.** Many believe it is expensive and fragile, and therefore, only a handful of gold buying agents use them.

20. **Non-payment of loans by small-scale miners.** Due to the nomadic nature of the miners, any refundable assistance should be exercised with extreme caution. The CEDECOM experience is a case in point. Its causes for failure include:

- Poor performance of equipment (e.g. water pumps);
- Unwillingness of miners to uptake certain disseminated equipment (e.g. shovels);
- Low operating capital for most of the miners; and
- Inexperience of CEDECOM in handling small-scale miners (the organization drew upon its extensive experience with small-scale fisheries.

21. **Small-scale miners need financial assistance**. Small-scale miners have minimal capital available for startup. When available, financial support is used by small-scale miners to improve production and productivity. However, there are few capital-accruing opportunities available for miners, most of whom are in dire need of the most basic of equipment, including pumps (>5.5HP), compressors and electric generators.

22. **Health hazard**. Most miners continue to burn mercury from the amalgam in the open air, refusing to adopt the glass retorts being promoted by SSMP agencies. Again, cost and fragility are cited by miners as the main reasons behind.their lack of usage.

23. **Land Degradation**. A major cause of the excessive land degradation in small-scale mining regions is the trial and error nature of prospecting. The lack of geological data prevents the Minerals Commission from enacting a viable demarcation policy. Surface mining activity, therefore, is associated with ridges and mounds of overburden, with their underground counterparts leaving behind 'honeycombed' lanscapes.

Dissemination of reproductive health information has had a positive impact at the community level. Notably, the interventions made by CARE International in providing reproductive health education in Tarkwa/Prestea, and the training of peer educators through the SAPIMA (Sexually Transmitted Diseases and AIDs in Mining Areas) and Wassa West Reproductive Health Programs have reportedly had major effects.

At the Bolgatanga study site, skills resident in the actors such as the indigenes who had gained experience in mining is certainly an asset. There have also been communal efforts made to provide social services to supplement what the assembly has made available. The have also been private efforts aimed at providing schools/education at mine sites with community support. One school at Gbane has been in existence for four years, and runs from Stages 1 to 4. It has 103 pupils, of which 60 are girls. It has been registered as a private school and the manager buys the books from the bookshops in town. Tuition is collected on a daily basis or parents pay ¢3,500 weekly. The manager and the chief's representatives have indicated that there are more children in the community who are not in the school but the children are more often in school than not. The manager has asked parents and the Minerals Commission to raise funds; when it started, the MC facilitated the public awareness so that the miners can pay something. The manager/head teacher is not a trained teacher and came from Tongo to the community to visit. NGOs and development agencies do not appear willing to help given the perception of a transient community.

It was suggested that Yale and Tongo should be new sites, and that the MC plans activities in such a way as to separate sites from dwellings. There would be by-laws to regulate behaviour and the co-operation of local chiefs was being sought to execute a code of conduct.

In Bolgatanga, another idea for improving access to technology was presented. The miners are aware of the central ore processing plant that the Minerals Commission and the Assembly have constructed but only a small percentage of the region's operators use it. Many are reluctant to process high grade ore because they have yet to accept the new technology, and/or simply do not wish to disclose information concerning production. Again, some respondents argued that there was a social dimension to this issue: concession owners like the notion of control of large numbers of workers because of the prestige associated with having a large labour force and labour-intensive activities.

3.5 Social Amenities Profile of the Two Communities

There can be no talk of poverty reduction without a meaningful discussion of the social amenities in the communities of interest. Such discussion is important because these amenities, such as pipe-borne water and toilet facilities, can have a significant impact on the residents' health and by extension, the level of productivity in their respective fields. Diseases associated with the absence of such facilities, for example, can translate into high rates of absenteeism and thus lower returns on economic efforts.

In Tarkwa-Prestea, 45.2 percent of respondents reported either having toilet facilities for the exclusive use of their homes (11.2 percent) or for community use (34.0 percent). Just under 53 percent indicated that they had no toilet facilities. In Bolgatanga, 65.6 percent of respondents reported having no toilet facilities, with 12.2 percent having the facilities for their exclusive home use, and another 22.2 percent reported having access to public toilets. The proportion of respondents in Bolgatanga (that is to say, Gbani in the rural savannah) without toilet facilities is almost identical to the figure of 69 percent obtained for the rural savannah in GLSS4, another indication of the intersect of structural and industry-specific problems. The significantly higher proportion of 53 percent of respondents reportedly without toilet facilities in the Tarkwa-Prestea area (which is considered urban) may be due to the fact that the mining areas of interest were improvised slums, comprised of aluminium and galvanized with zinc, shacks that fall beyond the provision of standard social services by the municipal authorities.

Access to potable water supply and the provision of electricity was also addressed by the survey. As noted above, potable water has implications for good health, productivity and poverty reduction. Electricity availability would also be crucial for the use of productivity-enhancing technologies (such as water pumps for the shafts) that are introduced into particular areas.

According to the survey, 58.3 percent of respondents in Tarkwa-Prestea have no access to potable water, whilst 40.2 percent have either shared or exclusive access to such water. Electricity provision, however, was very high among respondents, rating as high as 75.6 percent for those with either shared or exclusive access. Only 22.3 percent said they had no electricity.

In the Bolgatanga survey, 66.1 percent reported having no potable water, with 33.9 percent having either shared or communal access. In the same survey, 84.1 percent said they had no electricity, with 15.8 percent reporting shared or exclusive access. The high percentage of respondents without electricity reflects the fact that the Gbani community surfaced and expanded rapidly – without planning – in response to the gold rush in the area about a decade ago

3.6 Points of Risk and Vulnerability

Small-scale mine concession owners complained that large-scale mining companies would not relinquish their plots; rather, many have sold the rights to their concessions to foreign companies. Upon expiration of their licenses, these large-scale companies pump water to fill the holes they have excavated, which poses are safety risk (drowning) to those residing in close proximity to operations.

In Ghana, the process of obtaining a licence to mine on a small scale is in itself a deterrent to regularization, as described by Hilson (2002a) and Hilson and Potter (2003). A failure to regularize, in turn, deprives prospective small-scale miners of the technical support needed to increase production and efficiency. Miners cited the enormity of the bureaucracy and the expenses associated with securing a license as major disincentives to registering What is seen by miners as high initial capital required for ASM was cited as a deterrent to investment in improved technology, particularly in light of the uncertainty surrounding mineral yields. Generally, the machinery and technology used by operators, by their own admission, is inefficient and ineffective. In the opinion of interviewed miners, the UST School of Mines could assist by developing appropriate machinery for the sector.

The ASM sector had received very negative press coverage throughout Ghana. In particular, demeaning headlines about the *galamsey* are posted regularly in newspapers (Hilson, 2002a). Primary examples include:

1) "Galamsey operators on the rampage" – *Ghanaian Runner* 14/3/1996
2) "Minister launches attack on galamsey, child labour" – *Chronicle* 30/1/2002

3) "Illegal miners invade Teshie" – *GRI Newsreel* 22/4/2002

Respondents noted the sector is also unfairly criticized for some of the accidents that are inevitable,given the lack of support being provided by the government. Moreover, miners explained that from the government's vantage point, small-scale mining is an unrecognized entity in the mining sector, with many pointing to how officers and competing large-scale miners are quick to brand them as thieves and illegal operators.

Miners were aware of the health risks posed by the levels of migration (amongst other things) in the sector. In Tarkwa/Prestea, CARE International has undertaken extensive educational work. Educational programmes – based largely on visual aids – have also been implemented periodically by the Minerals Commission. Participants admitted to understanding the reproductive health and STD/HIV/AIDs messages being conveyed through video, and admitted that they do not protect themselves enough. They also spoke about the "cough" (tuberculosis), making the observation that, "the dust is too much and the 'cough' results". There have been proposals put forward by some mine-site committees for the government to carry out TB tests on miners. Miners, however, will be forced to pay the medical bills, and have therefore demanded the tests at reduced rates. In addition to TB, risks of cyanide and mercury poisoning, contraction of Hepatitis B, and death through suffocation are major health concerns, amongst other illness.

Bannock (2004) identifies a category of risk as "paranormal" – that is, originating from religious or traditional beliefs of local people. These are used to explain trends in productivity, abnormal occurrences such as accidents, amongst others. The sector is fraught with mystery and associated with various taboos and rituals. The most widely known taboos relate to the participation and presence of women on mines – at certain times and in certain activities. Indications are that the aura of supernatural participation could stem from a range of sources, including the following:

- The value that the Ghanaian has placed on gold – spiritual, economic and cultural – and the role of gold in traditional religious and authority activity.
- The sector's long history of illegality.
- The inability of the formal sector to absorb the activity and bring it into the mainstream;

- The laborious nature of non-mechanised artisanal activity.
- The relative size of the rewards –the opportunity cost of the resources *vis-à-vis* alternative ways of making a livelihood
- The competitive nature of the sector – making enormous gains through risks.
- Its "macho" image. For instance, in Bolgatanga, small-scale miners believe that luck plays a major role in the grand scheme of things. The belief system prohibits women from entering pits; generally, men do not want women's menstruation to go near the gold (have tried to put women on one side of the camp not too near operational activities)
- The continued involvement of traditional authorities (chiefs) as players in land allocation and the representatives of the people, as well as key actors in traditional religious rites.
- The belief system – at the Bolgatanga site, it was indicated that mining did not occur on specific days in March, during which traditional festivals are held. No noise-making beliefs and taboos from traditional activities such as hunting transferred to gold mining and combined with taboos from the south. For instance, you must not be "dirty" or desecrated (must have had a bath after having had sex).

4. WHOSE LIVELIHOODS? – PROFILING MINERS AND LIVELIHOOD PATTERNS

4.1 Description /Definition of the ASM Sector and Disaggregating ASM Operators

In Ghana, the ASM sector is far from homogenous. Actors directly involved in mineral production vary, and these differences must be taken into account in any intervention. Types of miners identified in Tarkwa include:

- Alluvial miners scattered along the plains of river valleys (Ankobra);

- Hard rock miners, such as blastsmen; and
- Dig-and-wash miners.

In Tarkwa/Prestea *galamsey* work, two types of concessionaires were identified: 1) those registered with the Minerals Commission, and 2) those who are "owners" with permits awarded by chiefs but who are nevertheless operating illegally. The latter are those who have been given permission to work on the property of Bogusu Goldfields (known locally as 'BGL'). At the Bolgatanga study site, various actors were identified apart from concession owners, including mineworkers, loading boys, chisellers, crushers, and the cooks hired to feed staff. All are paid in ore rather than cash. (Refer to Appendices II and III for the categories of workers in the sector.

Records at the District Mining Office in Tarkwa indicate that the typical mineworker is male and approximately 33 years' old. According the office recods, the age groupings are as following: 18-45 years (75%); 45-60 years (21%); and >60 years (2%). It is hard to generalize about ethnicity, given the wide range of actors in the sector, including non-Ghanaians.

The preponderance of males (88.4 percent in Tarkwa-Prestea and 86.8 percent in Bolgatanga) reflects in part the the physically demanding nature of most phases of small-scale mining. Digging and haulage (to the surface) of mined ore, for example, requires working several hours in dark and watery pits (or ghettos), a situation which likely contributes to the widespread use of hard drugs and alcohol at all of the camps visited, especially in Tarkwa-Prestea. In the case of Tarkwa-Prestea, women are mainly employed to cart/transport (in pans on the head) mined ore to washing stations, whereas in Bolgatanga they carry out pounding tasks or ore washing ore dutites in metal mortars.

The following provides a summary of the demographic profile of the miners interviewed in this study:

a. The average age of miners was remarkably similar at both sites – 31.6 years in Tarkwa-Prestea, and 31.3 years in Bolgatanga. The youngest recorded age was 15 years for Tarkwa-Prestea and 12 years for Bolgatanga. In

Tarkwa/Prestea, the majority of miners interviewed were aged between 22 and 30, and in Bolgatanga, 25 and 30.

b. Just over 65 percent of respondents in Tarkwa-Prestea described themselves as 'married', whilst 70.9 percent in Bolgatanga described themselves as such; the average number of dependents in their households is 1.6 persons and 5.3 persons, respectively. In Tarkwa-Prestea, however, the average number of dependents not residing at the mine site was considerably high (4.5 persons), and even higher (6.2 persons) at Bolgatanga. Both figures reflect the spending patterns of respondents in terms of remittances to these non-resident dependents, and the migratory nature of ASM.

c. In Tarkwa-Prestea, 51.1% of respondents reported having attained a basic education, 23.9% some secondary school education, and another 7.9%, vocational/technical education or higher. Only 17 percent indicated that they had no basic education. By contrast, the figures for Bolgatanga, were 28%, 18.5%, and 6.5%, respectively; 47% of those surveyed reportedly have no basic education. In bringing technological literacy and extension to these areas, policy makers face not only the peculiar needs of small-scale miners but the structural impediments that militate against their ability to absorb and utilize new knowledge

In accordance with general claims put forward by Davidson (1993), the UN (1996a) and others, in Ghana, ASM is a source of 'quick' money – often, considerable amounts at a time. The money earned is sufficiently more than what is lost to retain its attraction. Again, participation in the sector is largely due to the absence of employable skills that would let young people earn monies commensurate to what the ASM activity provides. In spite of the danger and drudgery, ASM workers were perceived to be highly motivated, and overall, the sector is considered far less dangerous than it is perceived to have been a decade ago. Notwithstanding the problems identified, over the past 10-15 years, there has been considerable infusion of technical knowledge (particularly through the network re-trenched workers) into the industry.

The attraction for sponsors to the sector was likened to investment opportunities and speculation (described by one respondent as much like shares on the stock market but without the formality). However, it was also admitted that with a lack of prospecting, most sponsors would be reluctant to invest their money in 'blind deals'. Therefore, if there is going to be increased private sector interest, the element of unknown risk must be reduced.

Respondents stressed the need to distinguish between *galamsey* (unregistered) and registered small-scale mining activities. Some development workers linked the propensity to go into unregistered activity to a lack of economic alternatives and low levels of education. People in this situation "just attack any land at all".

On the other hand, the effects of ASM were assessed in terms of impacts on the development orientation of communities. Development workers defined a "*galamsey* community" as a community fostered by the rush to mine gold. The term "*galamsey*" was descriptive to imply unregulated activity. It is made up mainly of young people, where children's rights to education and shelter are not monitored, or are of minimal concern to anybody. It is heterogeneous community with different value systems, mixed circumstances and desperate for money. This was particularly evident in the Tarkwa study area.

In the Bolgatanga study area, people make their homes around the pit site. Children are seen with their mothers, often assiting with ore haulage. As indicated ealier in this report, here, there is a danger of children falling into pits. However, individuals admitted that pits provide them with a sense of security; therefore, all household/social activities occur in close proximity to mining areas. In 2003, efforts were made by the Assembly, Minerals Commission and landowners to re-locate residents – tasks which proved exceedingly challenging.

4.2 Identifying Stakeholders in ASM

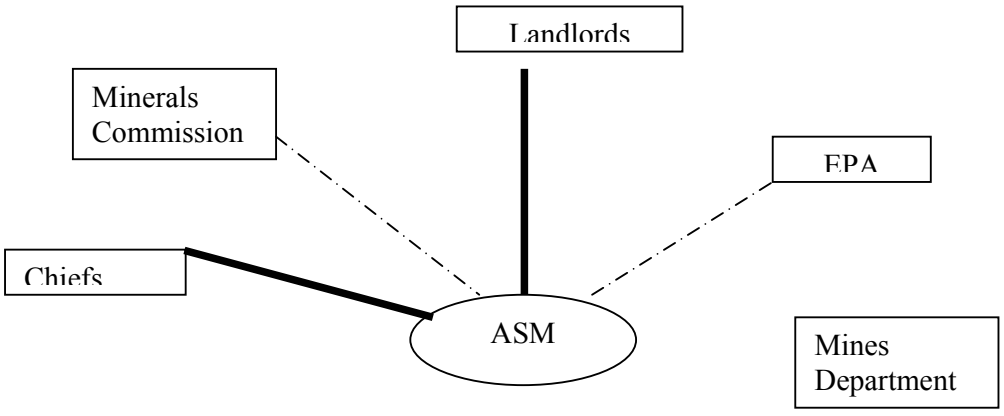
As part of the study, a stakeholder table was compiled on which the interests of each stakeholder were assessed (Appendix V). The major stakeholders identified are the

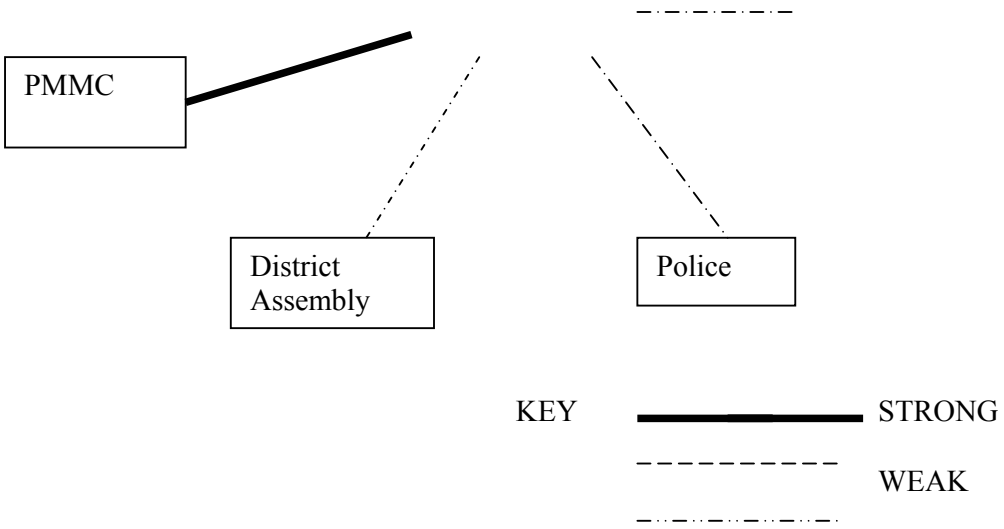
people, groups and institutions affected by, or interested in, ASM. These were further categorized into 'primary stakeholders' (*i.e.* the primary participants or those directly impacted upon by ASM) and 'secondary stakeholders' (*i.e.* those providing input to institutional/regulatory framework surrounding ASM).

The stakeholders identified have a potential interest in intervening to support ASM as a strategy for poverty reduction, and whose endorsement (or otherwise) is needed to move forward in this regard. Levels of interest were assessed based on observation, and ranked accordingly. The assessment also considered the influence of stakeholders (power to change or control decisions) as well as their importance (those stakeholders whose concerns should be priority, such as the intended beneficiaries of potential interventions).

4.3 Different Social Actors linked to ASM: Issues of Power and Support

There were perceptions on the ground that the lack of support or the seeming ambivalence towards the sector by officialdom was somewhat linked to national political issues. To some extent, this perception could be due to insufficient information flow and perhaps, a lack of understanding of the sector by the political authorities. The capacity of large-scale mines to engage political actors' attention and subsequently, their responses to ASM, would be a contributory factor.
During a focus group discussion with eight small-scale miners in Prestea, views on the institutional support for ASM were voiced. Operators indicated that they dealt with the following institutions, and assessed their relationships and the nature of support they received from them as follows:





To support ASM effectively, weak relationships would have to be strengthened, to which respondents recommended that the following:

- That the EPA needs to take steps to increase the processing of EIA applications.
- That District Assemblies should be more pro-active about resolving disputes between large-scale mining companies and ASM operators.
- That the Mines Department and the Minerals Commission be seen as more responsive to the concerns of the ASM sector and address the needs of operators accordingly, in particular, prospecting, the legalization of explosives, and decentralization of the application system.
- That the entities that benefit from the proceeds of miners' activities, such as the PMMC, should recognize them. PMMC regularly provides awards for buyers, who would not have achieved their levels of purchase without the miners.
- That the regularization process, particularly the takss carried out at the District Assembly level, is too lengthy. To encourage miners to regularize their operations, the process must be further decentralized, with district-level staff empowered to make important decisions regarding, *inter alia*, provision of support and an application.

A summary of the key issues raised by interviewed stakeholders concerning relationships with other stakeholder groups is provided below.

a) Regulatory Institutions:

In Tarkwa, unregistered miners indicated that officials who could assist them behaved as though they did not exist. Conversely, officials noted that if they wanted assistance, miners should pursue the appropriate channels to obtain a license. The unregistered miners interviewed in Bolgatanga had different views of the institutions. The Small-Scale Mining Centre was particularly commended by miners for its efforts in helping miners regularize operations but they did indicate that a major problem they faced releated to high processing fees, which they consider a major barrier to legalization. The unavailability of prospective areas for operation was not identified as being a serious problem in Bolgatanga.

b) **District Assemblies**

Institutions' perceptions of small-scale miners varied. Whereas others see their activities as public nuisance, some indicated that their activities were beneficial to communities. Many of the institutions surveyed at Tarkwa perceive miners – especially unregistered miners – as a major problem. The Assembly noted that the existence of ASM, particularly the proliferation of illegal operators, posed a moral dilemma (to the Assembly). On the one hand, it was explained that the sector is an important source of employment for the people who have few income-earning alternatives, and whose farms lands have been lost as part of the land allocation process to large-scale miners. Assembly staff noted that they would like to explore more meaningful ways of engaging with miners. However, the perception outside the Assembly was that the subcommittee on mining was devoted more to the interests of large-scale activity. In contrast, the Bolgatanga District Assembly noted that the ASM sector is worth supporting because it can create employment for youths, reduce social vices and curb southern migration. Thus, it seems to be working more pro-actively with the ASM sector by encouraging operators to form associations, which strengthens their voice and puts it (the Assembly) in a better position to provide assistance; educating them on the need to pay taxes; setting up a business service division to assist miners; providing roads to the mining areas; and providing basic social amenities in the mining communities.

C) **Traditional Authorities**

The role of traditional authorities in the small-scale mining sector has become problematic. Unlike the case with large-scale mining under the *Minerals and Mining Law*, traditional authorities are not entitled to royalties from small-scale mining. In general, traditional authorities do not possess a legally assigned role in regulating the activities of small-scale miners; indeed, they have no such role within the legal regime for mining generally. However, the study found that some traditional rulers were involved in the small-scale mining process, particularly in the allocation of land for mining purposes. It came to light that chiefs were involved in the allocation of land, particularly to unregistered miners, without recourse to the appropriate regulatory institutions such as the Minerals Commission. These allocations, illegal as they are, are made in consideration of the miners paying half of their weekly output to the traditional rulers. For instance, such arrangement existed between unlicensed miners operating within the concession of Bogosu Goldmines Company and certain traditional rulers.

The miners interviewed noted that chiefs have also been valuable as advocates with the large mines in the Tarkwa area but at the same time acknolwedged having sometime been vulnerable to exploitation from traditional authorities. Chiefs also perform customary rituals for these miners to enable them have accident-free operations and discover rich ore zones. At Bolgatanga, the chiefs also settle deputes among miners. Operators also indicated that chiefs benefit from remittances or "tolls" from them. Other contributions to chiefs/ traditional authorities were in kind including iron rods, cement and "drinks" to the palace as appropriate. Other support provided by traditional authorities includes the supplying of equipment and sponsorship.

D) **Landowners:**

Although traditional authorities are often custodians of the land, there are also family lands with custodians in the Ghanaian system of land ownership. At Bolgatanga, landowners allocate lands, resolve conflicts, mobilize the community for the provision of facilities such as schools, and manage inter-tribal tensions. However, landowners indicated that there were very little tangible and material profits. Compensation for land use for mining is quite minimal in relation to levels of investment.

E) **Conflict and Conflict Resolution**

In Ghana, conflicts between small- and large-scale miners persist occur in the Tarkwa area, with the District Assembly assuming a mediation role, with control over the ASM operators exercised by the District Security Committee (DISEC). Traditional authorities appeared to be expected to play a mediation role as well. Occasionally, entire communities have clashed with large-scale miners. On ASM sites themselves, conflict resolution is primarily the responsibility of concession committees. In Bolgatanga, conflict resolution is the responsibility of landowners, the Minerals Commission and the police station. Since the presence of large-scale miningI is negligible in norther Ghana, the District Assembly has not been required to assume a major conflict resolution role as it has in Tarkwa.

4.4 Gender Relations and Women's Participation in the ASM Sector

Focus group discussions held with 30 women involved in ASM at Bondaye and Prestea, and 15 women engaged in ASM at Baako-Ekohu (Teberebe) provided a range of insight.

On-site, women are solely engaged in the carrying of sand/stones/rocks/soil/earth for processing. They also do not have much access to, or control over, the productive resources deployed in the ASM process, with the exception of tools. They explained during the course of discussions that due to physical weakness, they were unable to undertake other mining-related activities that demanded more exertion.

Unlike their counterparts at Bondaye, who perceive men as exploitive, those interviewed from Baako-Ekohu appeared understanding that if male miners expended more energy and resources, they deserved to earn more than women. These women do not earn a specified amount (such as the ¢12,000 a day the Bondaye women made) but rather bargained with their clients over varying quantities of the sand for processing before providing their services. Again, payments are in no way a function of the number of trips made but rather the quantities of sand provided, as prearranged with clients.

Men generally own the shafts (referred to as 'ghettos' in local ASM circles) from which ore- bearing rocks are extracted for processing, confirming the lack of access to, and control of, productive resources on the part of women. The women at Bondaye felt that they contribute to only enrich those who own the ghettos and the processing machines, earning paltry incomes for their work. Women are sometimes appointed as forewomen, but they only exercise their supervisory role over fellow women. Inequality is an issue brought into sharp focus on the ground.

As to whether or not they would prefer alternative sources of employment or remain in the ASM sector, there was overwhelming indication made in the two groups of a preference for alternative sources of employment. Examples of alternative sources of employment identified included tie and dye making, soap making and petty trading.

Based upon feedback from the discussion group, major concerns include a lack of payment for services, falling ill due to physical over-exertion, miscarriages for those who are pregnant, injury and sometimes getting maimed as a result. Once case was cited, involving a lady who became handicapped as a result of falling whilst transporting sand for processing over a very steep hill. Overall, the women interviewed feel that men generally earn more than women in ASM, and therefore face fewer obstacles women. They also noted that there are no legal inhibitions to women acquiring and owning the equipment/machinery – with which they could earn more income from the process – but that a lack of finances prevents such a move. Few have any knowledge of the laws governing the ASM sector.

Their source of water at the mining site is springs situated at the foot of hills from where they carry the sand for processing. However, at home, most of the women indicated they obtained water from pipe borne sources or from the few boreholes located in the town. These women were not an organized group and so there is no formal grievance handling procedure.

4.5 Child Labour and the ASM Sector

Children's participation in the sector varied according to the mine site or area. Within the Tarkwa study area, there is an active involvement of children on-site, despite the fact that it is not permitted. On the issue of child labout, the following points were raised during discussions with education officials:

a. That it is difficult to establish the *real* numbers of children engaged in mining in Ghana – whenever mines officials are around, they do not come out of the pits.
b. Children are become involved in surface mining to earn incomes, and occasionally, because it is seen as an 'adventure'.
c. Although children as young as two years are sent by the mothers to mine, according to the Minerals Commission, the youngest children on-site are typically aged no less than 10. An estimated 2% of Ghana's ASM sector is comprised of people involved aged 18 and under.(Aryee, 2003).(ref)
d. At both illegal and registered operations, children mainly undertake washing and transportation tasks.
e. The child labour force in Ghana's ASM sector is comprised of indigenes, the argument being that children hardly migrate. In some cases, parents are involved in small-scale mining, which makes child participation inevitable.
f. Children are often absorbed in the sector because of financial problems, peer pressure and/or desires to lead an affluent life.
g. Children are likely to be more active at illegal sites because of an absence of a monitoring or regulatory presence. At certain locations visited (Bondaye, Prestea), children were not seen actively participating in mining-related activities. However, at Tebrebe, there were signs of child labour. One female respondent reported that her 14-year old brother, who at the time of surveying was enrolled in Junior Secondary School (JSS), had to go down the shaft at week-ends to pay for his school fees, uniforms and books. Interestingly at the Bolgatanga study site, it was observed that children's involvement was not a formal engagement, as is the case, of course, with salaried workers. The concession owner permits children to chisel for themselves, and may "scavenge" to comb through wastes to search for economic mineral, the selling of which provides finances for school books.
h. A change in attitude is often observed among the youths who have participated in ASM activities. Many return to school, having acquired high-level spending

habits, an addiction to alcohol and drugs, as well as other habits detrimental to learning.

i. The implications for sexual activity are high and compound problems of teenage pregnancy and sexually transmitted diseases, including HIV/AIDs. Early exposure to mining activities is considered to have the potential of hardening children and shortening their childhood, psychologically.
j. Participation in ASM results in irregular school attendance, more so than a complete "dropping out" of the education system. Education Officials argue that children drop out of school for reasons other than pursuance of employment in artisanal mining, including poverty, the school environment, pregnancy and the capacity to absorb what is being taught.
k. When probed about whether the economic benefits of ASM could be linked to better education opportunities, some Education Officials argued that the higher earnings provided by the ASM sector did not guarantee that the children of miners have improved access educational options. The sector is speculative and unreliable, and its numerous layers are far from uniformly profitable. In short, there is no positive correlation between earnings and better family care

4.6 Relationship between Miners and Host Communities

Evidence of migration from various parts of the country as well as beighbouring West African countries such as Burkina Fasso, Liberia was evident at both study sites. It was alleged that in both Tarkwa and Bolgatanga, relationships between the indigenes and immigrant small-scale miners were harmonious.

The tensions that do persist centre around the issue of land-use, with disputes usually occurring between large-scale companies and illegal operators. Outside of the ASM sector, various arguments have been made about the impacts operations have on host communities, including:

- That mining, generally, is extractive and non-renewable and sooner or later, the participants will be required to search for alternatives.
- Mining has had impacts on the land that are far-reaching and even with reclamation, the results are never the same.

- Mining could distort land ownership patterns. Land is initially family-owned with identifiable boundaries. These lands are acquired by mining companies, who engage in surface mining and then cease operation. The lands are then re-allocated to small-scale miners or are taken over by them. When that happens, ownership becomes unclear. Who takes what? Who claims rights to what? This often leads to litigation and clan conflicts.
- The influx of people with different perspectives and priorities has to some extent, brainwashed or changed the orientation of young people.
- The social infrastructure in place was developed by the public sector mainly in the late-1980s and early-1990s. However, there was infrastructure and development ongoing, fueled by private citizens (and quite a lot of it from ASM) which was not always in line with the public interest or public plans – private shops, garages, eating and entertainment places, and educational institutions.
- The use of hard drugs and high levels of alcoholism involved with the activity.
- The health implications for both the actors and others in the communities that they mix with. There appears to be a high correlation between communicable diseases such as STDs and TB.
- The impact of ASM on family life needs to be regulated more effectively, especially when children have the opportunity to engage in ASM (See Section on Child Labour in ASM below). Some of the perceptions of respondents from Tarkwa are presented below.
- Parental control diminishes when children are involved in ASM. It was noted by some respondents that high poverty levels, coupled with the involvement of many children in the sector, has resulted in the inability of parents to exert authority and disciplinary measures.
- Some families live on the incomes children generate – or children complement family incomes to a large extent, even though in some cases, parents are not engaged in the sector.
- Since peer pressure is a major factor propelling youth participation in AS<, there would be increased interest in the standard of living or demonstrated wealth of young people involved in ASM. Therefore, those of school going age

would be attracted, creating a cycle of ill-educated, unskilled labour in the community.

- That the backgrounds of miners, particularly migrants, play a major role in the kinds of families they develop. For instance, it was claimed that those with unstable family backgrounds (presumably from other parts of the country) do not necessarily translate into good home-makers with the accumulation of money.
- ASM activity could disintegrate family life. Once the ore is exhausted and the father (or whoever has been involved in the sector and has been the family 'breadwinner') is temporarily not earning money, there is a transitional period in which life could become unbearable. There have been reports where people have become aggressive, boisterous and lawless.

5. IDENTIFYING CRITICAL LIVELIHOOD CHALLENGES

5.1 The Challenge of Diversity

As identified in the study, the industry is made up of not only miners/diggers but also sponsors who typically finance mining operations and buy back the gold at below-market prices, effectively insulating them from any losses associated with the production of the gold. Other key players include carriers – mostly women – who cart mined ore to processing sites, where crushers and washers grind the rocks into fine sandy pastes for the eventual removal of gold by professional extractors. Whereas most of the small-scale miners in the Tarkwa-Prestea area originate from outside the Wassa West District (where Tarkwa-Prestea is located), the situation is the opposite at the Bolgatanga site of the study.

Significantly, miners-diggers and others involved in the most arduous aspects of small-scale mining are those eager to express interest in alternative employment. This observation means that there is, in fact, room for any alternative livelihood programmes that the government and other actors (such as large-scale mining companies and external donors) may seek to implement to enhance the potential contributions of the small-scale mining sector to poverty reduction.

In areas like Tarkwa-Prestea, where the majority of respondents reported hailing from outside the district, it would be futile to introduce alternative livelihood programmes to the area without first putting in place policy to stanch the flow of migrant workers from other parts of the country. This would mean identifying areas around the country with the greatest number of migrants and providing employment opportunities to discourage their young from gravitating towards Tarkwa-Prestea and other areas like it. This is the only way alternative livelihood programmes for the Tarkwa-Prestea area can prove viable and useful; otherwise, they will always be overwhelmed by the influx of new migrants seeking participation in programmes designed to cater for a fixed number of beneficiaries.

The situation is Bolgatanga is slightly different, where again, most of the small-scale miners interviewed originate from the district. These people are attracted to small-scale mining largely because of the absence of alternative sources of employment with comparable or better returns in their own district. In this case, there would be no need to target migrant miners as such; alternative livelihood programmes may be structured to cater for the needs of the local population.

5.2 The Challenge of Under-Capitalisation

A common complaint from miners-diggers and particularly ghetto owners was the lack of financing from traditional institutions, such as banks. This was the case in both Tarkwa-Prestea and Bolgatanga. Interviews with representatives of various financial institutions revealed an assortment of reasons why they were reluctant to extend financial assistance to ASM operators.

According to one bank manager in the Tarkwa-Prestea area, small-scale mining was associated with *galamsey*, which in turn is associated with lawlessness and thus high business risks, which his bank was not prepared to undertake. Once he was told that there were legitimate small-scale miners with government-authorised concessions to operate upon, he noted that under such circumstances, they would be willing to deal with associations of such legally-authorised miners on the following bases: business potential; feasibility reports on their members' concessions; evidence of legal

authorisation; and a minimum of six months in operations, subject to final approval from headquarters in Accra. Significantly, other financial institutions said they would rather deal with individual miners, with clear and verifiable track records, rather than associations, where the lines of ultimate responsibility are diffuse.

These differences once again attest to the need to avoid devising one-size-fits-all solutions to small-scale miners and try as hard as possible to incorporate the peculiar needs and demands of particular mining areas in any policy responses.

5.3 The Challenge of Miners' Access to Policy and Legislative Processes

The existing regulatory and institutional framework is clearly deficient in terms of its capacity to increase the potential of artisanal mining's contrbution to livelihoods. Regulations heavily impact on property rights and raise the costs of doing business within the sector, thus discouraging long-term investment of financial and technical resources by small-scale miners and/or their financiers. These directly affect job creation and income levels within the sector because investors generally take a short-term perspective of their investment activity. Regulatory institutions also lack mechanisms designed to insulate low-income groups from the "vagaries" of the sector, including the exploitative behavior of employers. As we noted earlier in our introduction, these findings (and arguments and observations) call for a comprehensive reappraisal of the current regulatory and institutional framework, with a view to enhancing its potential to sustainable livelihood. Merely legalizing the activity without adequately capturing its fast evolving and complex social dynamics may forestall the attainment of other social objectives, such as enhancing the potential of the ASM sector to contribute to increased livelihoods. Moreover, the capacity of regulatory institutions to effectively monitor legalized activity and to punish noncompliance is critical to the realization not only of the explicit regulatory objective but also to the attainment of broader social goals, such as wealth generation, job creation and growth in incomes.

6. RESPONDING TO THE CHALLENGES

Our response to the livelihood challenges facing ASM communities reflect the findings of the research, and are based on the following five key principles:

- Existing policies reflect misconceptions and global perceptions of the sector and *not* the specific reality of ASM in Ghana.
- The ASM sector in Ghana is complex, socially diverse and increasingly sophisticated in its technological use.
- There are specific poverty concerns relating to the sector but the challenges with regard to reducing poverty are not significantly different to the broader challenges facing Ghana as a whole.
- Its contribution to poverty reduction within the rural and national economy, although under-acknowledged, is substantial.
- It is, by focusing on people in the sector, their livelihood patterns and the challenges they face to secure individual and household well being that realistic, workable interventions can be identified.

We organize our recommendations around the three main challenges facing the sector:

1) How to integrate miners' interests and demands within broader policy and decision-making processes?
2) How to respond to the diverse contexts and heterogeneity of the sector?
3) What could increase investment and improve access to financial services in the sector and facilitate increased regularization?

6.1 Meeting The Challenge of Miners' Access to Policy and Legislative Processes

The analysis of the legal and institutional framework for artisanal small-scale mining clearly depicts a picture of a deficient regulatory framework with adverse consequences for the realization of increased livelihood for the major actors in the sector. In particular, we have made abundantly clear that the current regulatory and

institutional framework does not even begin to deal directly with the question of livelihoods through addressing issues of employment, incomes and social protection within the sector. We firmly believe that it is time to critically review the existing legal and institutional framework in order to directly address these issues.

In the course of our study, we came upon information regarding government's current attempts, in consultation with large mining companies through the Ghana Chamber of Mines, to comprehensively reform the *Minerals and Mining Law*. We have carefully examined the *Minerals and Mining Bill*, which is currently before Parliament, especially Part XII (on small-scale mining) and take the view that the proposed reforms for the small-scale mining sector are inadequate. The Bill seeks to extend the scope of a license granted to a small-scale miner to cover other minerals besides gold, thus departing from the strictures of the current law regarding the right to mine other minerals. This is, however, made subject to the discretion of the Minister responsible for minerals to specify the mineral to be mined on the license. One positive development is that a license, once granted, is transferable but only to a citizen of Ghana and subject to the consent of the Minister. Further, the Bill seeks to undo the current ban on the use of explosives by small-scale miners by stipulating that they may use explosives upon the recommendation of the Chief Inspector of Mines.

These limited reforms are a welcome development but as stated earlier, they are grossly inadequate in terms of bringing the regulatory and institutional regimes up to stream with the complex social and economic issues within the sector. We propose that the realization of increased livelihood be expressly stipulated in the law as a regulatory end toward which regulatory institutions must work. Therefore, regulatory policies must address issues of employment relations, incomes (wages, emoluments and investment returns) and social protection (social security, health insurance etc).

Finally, reform proposals must be generated using a bottom-up approach as opposed to a top-down approach. Small-scale miners (registered and unregistered), buyers/sponsors, workers, and ghetto owners, among other, must be consulted in a bid to ascertain the nature of the peculiar problems afflicting the sector and hindering the realization of optimal returns for investors, miners and workers. Regulatory responses should then be designed specifically to deal with these peculiar problems.

6.2 The Challenge of Diversity

As has been noted throughout this report, Ghana's ASM sector is heterogeneous in character. The laws and policies in place do not accurately reflect the needs and capabilities of the sector's operators, making increased inputs from district assemblies, the staff of which is more acquainted with the situation on the ground, imperative. We call for District Assemblies to play an expanded role in ensuring that entitlement to public services is met in mining areas, as well as integrating the sector within GLSS5 and other national survey instruments. Most importantly, if the impoverished state of relations between Ghana's large-scale miners and indigenous mining groups is to be improved, District Centres must play a lead role in conflict and dispute resolution.

Empowering District Centres with increased regulatory and administrative responsibilities for ASM could be a part and parcel of a more comprehensive decentralization strategy, in which additional tasks are transferred from Accra to district centres. As the situation stands, the registration process is inherently bureaucratic and has proven to be a major deterrent for miners entertaining the possibility of obtaining a license. By devolving responsibility to the district level, the government would not only eliminate some of the delays associated with securing a license but more importantly, would transfer responsibility into the hands of people with whom miners regularly interact, and are therefore more comfortable dealing with.

6.3 The Challenge of Under-Capitalisation

The task of improving miners' access to finances has long been a quandary in Ghana. Artisanal mining has a reputation nation-wide as being inherently environmentally-degrading, transient, and comprised of unlawful participants. Banks are therefore reluctant to provide financial assistance to even those who have successfully acquired a plot of land from the Minerals Commission. The issue stems from miners having insufficient collateral; rural banks are willing to provide loans to small-scale farmers, who use their crops as collateral.

Can credit schemes be implemented for small-scale miners in Ghana? Hilson and Maponga (2004) identify the absence of geological data as a major factor inhibiting the regularization of small-scale mining; governments' inability to provide detailed assessments of mineralized plots has diminished miners' confidence in registration systems. However, by increasing geo-prospecting activity and determining areas suitable for small-scale mining, governments not only increase miner confidence but make an important step toward establishing a favourable environment for credit schemes. As Bayah et al. (2004) argue, based upon their experiences in neighbouring Burkina Faso, the minerals within the land plot demarcated, provided that their abundance is assessed with a fair degree of accuracy, should be more than adequate as collateral for a miner seeking a loan. Geo-data produced by Minerals Commission should be made available at the district level.

In investigating possibilities for credit provision to ASM, it is also worthwhile in drawing upon some of the experiences in Latin America, where several schemes were launched in the 1990s. Most, if not all, failed but to a large extent because operators were not properly organized, nor did lending institutions have in-depth knowledge as to the locations of operators. If the government finds a way to improve the organization of the sector, it will, in the process, establish a framework for effective credit provision.

Appendix VI presents specific recommendations generated from the national validation workshop and under the various components.

6.4 Next Steps

Phase two has been designed to build on the findings of the livelihoods analysis and test out the applicability of a multi-level livelihoods approach to the complex challenges of the ASM sector. Whilst necessarily modest in scope, phase 2 does offer the opportunity to respond to some of the more immediate challenges of the sector. Specifically, it reflects the importance of testing out transferable institutional mechanisms that can be used throughout the ASM sector in Ghana and elsewhere in sub-Saharan Africa. Three aspects are emphasised:

- An implementation framework which can accommodate social difference and promote livelihood security for all ASM workers including the most vulnerable;
- A multi-level governance mechanism that is transparent, accountable and inclusive of all stakeholders in the sector including ASM miners themselves.
- The piloting of locally-driven specific initiatives aimed at responding to priority demands of ASM workers

We outline below the indicative design and objectives of phase 2, including management arrangements and a draft log frame and indicative budget.

Goal: Improved livelihood security for men, women and children involved in the ASM sector

Purpose: To pilot a multi-level institutional framework linking the ASM to poverty reduction processes in Ghana

Objectives

1. Governance mechanisms for co-ordinating policy dialogue and implementation at all levels in the ASM sector piloted
2. Demand-led development initiatives for ASM miners implemented.
3. Small-scale initiatives for raising public awareness of the contribution of ASM to Ghana supported
4. Participatory M&E System established.

We outline below the aims and indicative activities for each objective in turn.

Output One: Governance mechanisms for co-ordinating policy dialogue and implementation at all levels in the ASM sector piloted

The aim of Output 1 is to pilot multi-stakeholder institutional arrangements for mainstreaming ASM issues within Ghana public policy processes. The mechanism recommended is the establishment of a **National Committee For ASM** (NASM) within the Minerals Commission. The Minerals Commission is clearly the appropriate institutional home for NASM, given it already has responsibility for promotion, monitoring and policy-advice with regard to the sector. **Discussions with the Head of the Minerals Commission strongly indicate a willingness to continue the multi-stakeholder process begun in phase 1 and build on it to establish mechanisms in which actions can be taken that have a positive and sustainable impact on the livelihoods of ASM workers.**

It is envisaged that the committee would comprise of between 15 – 20 members drawn from the following stakeholder groups.

- Minerals Commission (chair)
- Chamber of Mines
- Representatives from ASM
- Representatives of LSM
- Representatives from Local government District Assemblies
- National Board of Small scale Enterprises
- Representatives of NGOs (from the District pilots)
- EPA
- NDPC
- Lands Commission
- Representative from Parliamentary sub-Committee on Mining

Setting up of NASM is in fact a formalisation of the stakeholder process established during phase one and thereby ensures continuity and the continuing good will of all those involved in the livelihoods research process. More importantly, the institutional arrangements envisaged provide a workable mechanism for taking forward the policy recommendations made in phase one and deemed essential for integrating the ASM sector within Ghanaian poverty reduction processes.

Output 2: Demand-led development initiatives to ASM miners implemented

Output 2 responds to three key challenges facing Phase 2:

- The relatively small amount of money available to undertake sustainable initiatives at the local level.
- The lack of capacity within the sector to facilitate social mobilisation of ASM workers.
- The difficulties involved in responding to the diversity in the sector, and therefore the need to test flexible and transferable mechanisms for implementation rather than implement predetermined interventions.

There is possibility that the local level mechanisms will be piloted in the two districts identified in phase one

- Takwa – Wasa West District, Western Region
- Bolgatanga – Bolgatanga District, Upper East District

Through this output, it is envisaged that the majority of phase 2 monies will used support local leverage of existing developmental funds whether from the public of private sector in partnership with District assemblies and local level ASM stakeholders. These district ASM committees will be linked into NASM through mutual representation (i.e. not only are the district committees guaranteed representation on NASM but NASM will also be represented at District level). To ensure ASM workers have an equitable voice in the planning, implementation and monitoring of local initiative it will be essential that a dedicated and experienced social mobilisation CSO is involved as an implementation partner. Preliminary scoping suggests that in Takwa, CARE International, and in Bolgatanga, ActionAid would be willing and appropriate partners.

Indicative activities include:

- Establishing agreement with the District Assembly in terms of institutional arrangements for coordinating ASM local initiatives (this is likely to be building on the existing DA Mining Sub-Committees but will include other relevant stakeholders like representatives from the mining sector, the EAP and traditional authorities) to ensure broader participation and accountability.
- Through participatory diversity assessments conducted by partner NGOs, socially mobilise different groups within the sector and identify priority local demands.
- Through local committees, including mining groups, establish modalities for the disbursement and monitoring of the local initiatives fund. This should include participatory identification of roles, responsibilities and contractual arrangements for administering the fund.
- Establish, from the outset, a participatory monitoring and evaluation process which feeds lessons learnt horizontally back into the District Assembly for strengthening the process and vertically up towards the national commission for enhancing local voice in the policy process (**through output 4**).
- Where appropriate, provide channels for disseminating information to workers within the sector on (a) health and safety (b) potential sources of funds for e.g. FFSMED, BAF, Poverty Alleviation Loans etc. (c) information on relevant laws as well as information related to geology, concessions and leases.
- Identification of most vulnerable groups within the sector and linking them with organisations able to provide them with support.

Whilst it would be premature (not to say inappropriate), to determine what the local initiatives might be, discussions during phase 1 with ASM miners and their representatives suggested a number of possibilities. This list, by no means exhaustive, gives a flavour of the likely demands from different groups within the sector.

- Support for small business development
- Commercial loans for mining start-up costs
- Piloting of health insurance schemes and other sector specific micro-finance services
- Training and capacity building for those (particularly women and the most vulnerable in the sector) seeking livelihood alternatives to ASM work.
- Financial management training
- Technical training

Output 3: Small-scale initiatives for raising public awareness of the contribution of ASM to Ghana supported

Changing public perception of the ASM sector will clearly be a long-term and on-going process. Nevertheless there are opportunities for identifying innovative and ASM-led initiatives for raising awareness of the positive contribution of ASM to

wealth creation and poverty reduction in Ghana. It is important however that these initiatives are embedded within the institutional framework and decision-making mechanisms being tested. We recommend therefore that a small amount of money is earmarked as seed corn funds within an "ASM advocacy fund" that is administered by the minerals commission following modalities identified and agreed by NASM. It may be possible following this route to access funds from other sources e.g. donors and LSMs to match the seed corn fund and increase the potential reach of the fund.

Indicative Activities include:

- Agreeing criteria for disbursement of funds
- Providing funds to disseminate lessons learnt from the pilot project to the Ghana public
- Putting out a call for initiatives from CSOs/private sector for producing advocacy/awareness materials for ASM workers.
- Producing briefing materials for other sectors e.g. education and health on the specific conditions and needs of the ASM sector

Output 4: Participatory Monitoring and Evaluation System Established

Embedding a participatory M&E (PME) system right from the start of phase 2 will be essential for encouraging partnership, reflection and dissemination of lessons learnt. The aim of the PME is to feed lessons learnt horizontally back into the District Assembly for strengthening the process and vertically up towards the national commission for enhancing local voice in the policy process

A PME will enable all stakeholders including ASM miners from the two pilot districts to participate in the process of livelihood change not merely on the basis of benefits obtained but also on everyone understanding what they are trying to achieve, and why. As such it aims to increase stakeholder understanding of, and commitment to a multi-sectoral approach to the livelihood concerns of ASM miners, and allow success measures relevant and appropriate to all stakeholders, to be generated by them. The PME is therefore a critical process output in establishing sustainable governance mechanisms within the ASM sector. The process will therefore require careful nurturing throughout phase 2.

The methods required for establishing a PME build on those used in phase one-plenary meetings and small, interest group discussions, and wherever possible will employed dynamic, visual and participatory activities to facilitate discussion and decision-making. The process will require a high level of facilitation at both the national (NASM) and District level. It is therefore recommended that facilitators employed throughout phase 2 to support the PME process. Preliminary scoping, suggests that ILGS may well be able to undertake this task.

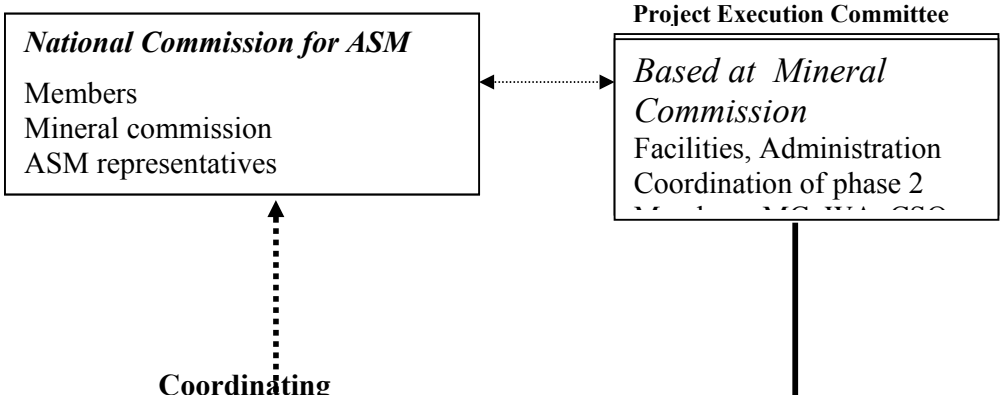
Management Arrangements

The sectoral focus of existing Mining MDAS together with the undoubted difficulties in with co-ordinating across government has undermined the potential for including ASM concerns within the concerted holistic response to poverty and vulnerability being developed in Ghana. Phase 2 has been designed to support responses, which redress the marginalisation of the ASM from poverty reduction processes in Ghana. As such management arrangements need to contribute to the policy and practice shift this will entail both within and without the sector and go beyond merely the administration of phase 2 funds. We envisage the management arrangements as an enabling framework for broader partnerships and working through the Minerals Commission which has a clear mandate and role in the ASM sector. Hence, the importance in Output one of establishing a governance structure. By working through the Minerals commission, but in tandem with other agencies with a role within the ASM sector, phase 2 helps build capacity for the Mineral Commission to carry out its responsibilities while at the same time recognising the boundaries of what it should or should not do (an issue which has been problematic in the past).

It is therefore recommended that Phase 2 be implemented locally through the Minerals Commission overseen by NASM on which all key stakeholder groups (government, private and non-government and donor) will be represented. A small project execution committee consisting of the Minerals Commission, DFID contract managers and the two implementing CSOs will advise NASM. This structure ensures strong government ownership and engagement while giving sufficient voice to other stakeholders. At the same time establishing a smaller Project Execution Committee means that decision-making is manageable and timely. It is envisaged that the DFID managing agent, at the request of NASM, can provide technical support functions.

District level views from the two project areas will be fed to NASM through locally elected ASM representatives who will sit on NASM and also on the locally constituted District committees.

Phase 2 Management and Implementation Structures



Phase 2 Draft Log Frame

	Description	OVI	MoV	Risks & Assumptions
Goal	Improved livelihood security for men, women and children involved in the ASM sector	PME baseline indicators in pilot districts improved by EOP District level poverty indicators	Baseline and PME GLSS 5	
Purpose	A multi-level institutional framework linking the ASM to poverty reduction processes in Ghana piloted	ASM in revised PRSP: End of 2005 ASM indicators included in relevant national and district-level monitoring systems: 2006. Mining and other sector strategies incorporating ASM issues.	Revised GPRS National and District survey instruments e.g. CWIC survey; GLSS5 Sector Strategy documents	Revised GPRS will deal with livelihoods in ASM purely as a mining issue rather than a multi-sectoral issue.
Output 1	Governance mechanisms for co-ordinating policy dialogue and implementation at all levels in the ASM sector piloted	National action Committee for ASM functioning by mid 2005 Funding mechanism for supporting small-scale ASM initiatives in place Active ASM representation from 2 pilot districts on NASM Multi-stakeholder sub-committee of District assembly established and working linking ASM/LSM	Minutes of NASM meetings Request letters from district to NASM NASM membership list and attendance sheets	
Output 2	Demand-led development initiatives to ASM miners tested out.	At least 2 initiatives supported in each pilot district following agreed criteria. ASM miners and their representatives form the majority on	NASM minutes District committee membership lists and minutes Project proposals file PME documents Field visit	Decentralisation processes continue to be implemented in Ghana

		district level committees Increase from baseline of nos of ASM workers accessing existing poverty alleviation/development funds Measurable increase in opportunities for, and regularity of paid employment for poor & vulnerable ASM workers Measurable increase in ASM miner's access to and choice of appropriate financial services in pilot districts		
Output 3	Small –scale Initiatives for raising public awareness of the contribution of ASM to Ghana identified	At least 3 Small-scale initiatives identified and implemented using agreed criteria	Applications file Projects reports and minutes of meetings	
Output 4	Participatory M&E System established.	System linking national and district level processes in place by 1st quarter of phase 2. At start of phase 2 Stakeholders identified desired significant change and work towards it. NASM acts on monitoring data received from pilot districts On-going lessons learnt identified and documented	Baseline document PME reports Significant change matrix Lessons learnt document (s)	

APPENDIX I

Table 1 Gold and Diamond *Production* 1988-2003

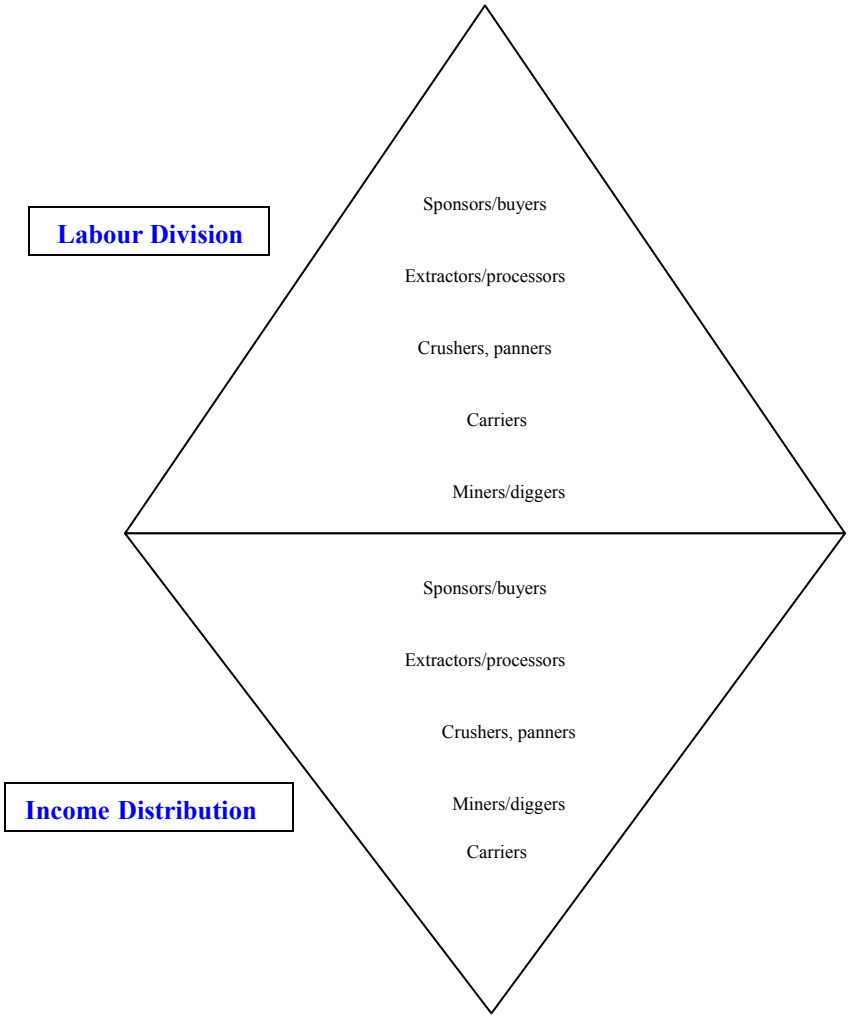
	Gold (oz.)					Diamond (carats)				
	National Total	Percent Growth	ASM	Percent Growth	ASM % of Total	National Total	Percent Growth	ASM	Percent Growth	ASM % of Total
1988	NA		NA			259,358	-	34,158	-	13.2
1989	429,836	-	9,272	-	2.2	285,636	10.1	151,606	343.8	53.1
1990	534,630	24.4	17,234	85.9	3.2	636,503	122.8	484,876	219.8	76.2
1991	847,560	58.5	15,601	-9.5	1.8	687,736	8.0	541,849	11.8	78.8
1992	999,950	18.0	17,297	10.9	1.7	656,421	-4.6	442,266	-18.4	67.4
1993	1,257,489	25.8	35,145	103.2	2.8	590,842	-10.0	375,400	-15.1	63.5
1994	1,428,011	13.6	89,520	154.7	6.3	757,992	28.3	405,830	8.1	53.5
1995	1,717,654	20.3	127,025	41.9	7.4	631,708	-16.7	337,830	-16.8	53.5
1996	1,597,575	-7.0	112,349	-11.6	7.0	714,738	13.1	443,244	31.2	62.0
1997	1,755,240	9.9	107,094	-4.7	6.1	829,524	16.1	558,241	25.9	67.3
1998	2,382,339	35.7	128,334	19.8	5.4	805,742	-2.9	570,186	2.1	70.8
1999	2,557,315	7.3	115,784	-9.8	4.5	681,576	-15.4	476,744	-16.4	69.9
2000	2,447,591	-4.3	145,662	25.8	6.0	989,851	45.2	686,551	44.0	69.4
2001	2,369,909	-3.2	185,596	27.4	7.8	1,169,633	18.2	973,033	41.7	83.2
2002	2,236,838	-5.6	160,879	-13.3	7.2	963,493	-17.6	791,908	-18.6	82.2
2003	2,296,484	2.7	211,414	31.4	9.2	904,089	-6.2	746,925	-5.7	82.6

Table 2. Gold and Diamond *Revenues* 1988-2003

	Gold (US$ mil.)					Diamond (US$ mil.)				
	National Total	Percent Growth	ASM	Percent Growth	ASM % of Total	National Total	Percent Growth	ASM	Percent Growth	ASM % of Total
1988	NA		NA		NA	3.5	-	0.2	-	5.7
1989	159.9	-	3.4	-	2.1	5.2	48.6	2.1	950.0	40.4
1990	201.6	26.1	6.3	85.3	3.1	16.5	217.3	14.3	581.0	86.7
1991	304.4	51.0	5.3	-15.9	1.7	18.6	12.7	17.4	21.7	93.5
1992	343.4	12.8	6.1	15.1	1.8	19.3	3.8	13.0	-25.3	67.4
1993	434.0	26.4	11.5	88.5	2.6	17.3	-10.4	11.6	-10.8	67.1
1994	548.6	26.4	34.7	201.7	6.3	20.4	17.9	11.2	-3.4	54.9
1995	647.3	18.0	48.7	40.3	7.5	14.8	-27.5	8.3	-25.9	56.1
1996	612.4	-5.4	36	-26.1	5.9	13.4	-9.5	8.9	7.2	66.4
1997	579.2	-5.4	28.4	-21.1	4.9	11.3	-15.7	6.2	-30.3	54.9
1998	687.8	18.8	36.6	28.9	5.3	10.6	-6.2	6.1	-1.6	57.5
1999	710.8	3.3	35.2	-3.8	5.0	9.0	-15.1	5.5	-9.8	61.1
2000	702.0	-1.2	40.9	16.2	5.8	11.8	31.1	11.8	114.5	100.0
2001	617.8	-12.0	39.3	-3.9	6.4	20.5	73.7	19.6	66.1	95.6
2002	695.0	12.5	48.9	24.4	7.0	22.2	8.2	16.0	-18.6	72.0
2003	820.0	18.0	79.8	63.2	9.7	20.7	-6.6	17.1	7.4	82.7

Source: Minerals Commission

APPENDIX II


Labour Division
Sponsors/buyers
Extractors/processors
Crushers, panners
Carriers
Miners/diggers
Income Distribution
Sponsors/buyers
Extractors/processors
Crushers, panners
Miners/diggers
Carriers

APPENDIX III

Table 3. Where Do AMS Workers Come From?

Job Category	Response Type	In District		Outside District (In Ghana)		Outside District (Out of Ghana)		Total Respondents	
		Tarkwa	Bolga	Tarkwa	Bolga	Tarkwa	Bolga	Tarkwa	Bolga
Miners	Count/	14	79	58	36	1	0	73	115
	Percent	19.2%	68.7%	79.5%	31.3%	1.4%	0.0%	100%	100%
Owners	Count/	5	12	17	7	1	0	23	19
	Percent	21.7%	63.2%	73.9	36.8%	4.3	0.0%	100%	100%
Washers	Count/	6	6	10	1	0	0	16	7
	Percent	37.5%	85.7%	62.5%	14.3%	0.0%	0.0%	100%	100%
Carriers	Count/	2	18	9	4	0	0	11	22
	Percent	18.2%	81.8%	81.8%	18.3%	0.0%	0.0%	100%	100%
Buyers	Count/	1	4	2	2	0	7	3	13
	Percent	33.3%	30.8%	66.7%	15.4%	0.0%	53.8%	100%	100.%

APPENDIX IV

Local/District Level Stakeholders

Levels of Interest	Primary Stakeholders	Secondary Stakeholders
High	Miners/workers on ASMs ghettos, concessions etc (both registered and non-registered miners) o Men (+) o women (+/-) o children (?) Concession owners (+) Other economic on mine sites/areas (providers of support services, consumer items, other) (+) Sponsors of ASMs (+) Local buyers (who may also be sponsors) • Registered: Licensed Buying Agents (+) • Unregistered including non-Ghanaians (+/-) Other users of land including farmers, shelter purposes, local industry (-)	Representatives of regulatory/official bodies: • District mining centre officers/mine wardens (+/-) • District/municipal chief executives; (+/-) • District/municipal coordinating directors (+/-) • Security agency representatives (Police, CEPS, District Security Committees – DISECs) (-) • District police chiefs (+/-) • District Planning Coordinating Unit (DPCU)/ planning officers (+/-) • District Environmental Protection Agency Officer (+/-) • District Environmental Health Office (Ministry of Local Government and Rural Development) (-) • District Forestry Office (-) • District Office/Representative, Precious Minerals Mining Company (+) • Department of Social Welfare (+/-) • Relevant Assembly Sub-Committees (+/-) • District Education Service Directorate (-) • District Health Service Directorate (-) • Ghana Rubber Estates Ltd (-) • Large scale mining concerns (+/-) • Traditional authorities/custodians of the land (+/-) • Land-owners (+/-)
Medium	• Local goldsmiths/local users of gold (+) • Economic actors (market traders and other service providers in nearby settlements) (+)	• Financial institutions: rural banks, susu groups/credit unions, money lenders (?) • Internal Revenue Service Office (?) • Social Security and National Insurance Trust Office (?) • District Commission for Human Rights and Administrative Justice (CHRAJ) (?) • Non-governmental organizations eg Care International (Tarkwa), Trax, CENSUDI (Bolgatanga) (?) • Community based organizations (Wassa Communities Affected by Mining – WACAM) (+/-)

Levels of Interest	National Level Secondary Stakeholders
High	• Geological Survey Department (+/-) • Minerals Commission (+) • Environmental Protection Agency (+/-) • Forestry Commission (-) • Mines Department (+/-) • Bank of Ghana (-) • Precious Minerals Marketing Company (+/-) • Lands Commission (-) • Water Resources Commission (-) • Ghana Chamber of Mines (+/-) • Office of Administrator of Stool Lands (+/-) • Ministry, Mines (+/-) • Ministry, Environment and Science (+/-) • Ministry of Lands and Forestry (+/-) • Media (Environmental Journalists Association) (-) • Western University Campus of Kwame Nkrumah University of Science and Technology (Tarkwa School of Mines) (+/-) • Private sector precious minerals purchases and jewellery concerns (PMR) (+) • Key international and local: Third World Network, Action Aid Ghana; ISODEC, Care International (-) • Ghana National Commission on Children (?)
Medium	• National Council on Women and Development, MOWAC (?) • Ministry of Finance and Economic Planning (?) • Ghana Education Service (?) • Ghana Health Service (?) • Mine Workers Union (?) • Commission on Human Rights and Administrative Justice (?) • Parliament: Members of the Parliamentary Select Committees on Mines, Environment and Natural Resources (?) • Members of Parliament of the particular mining constituencies (+/-) • National Development Planning Commission (NDPC) (?) • Legal Aid Board (?) • Key departments of the Universities: geology, natural resources, economics, sociology, social work, development studies (University of Ghana, Legon; Kwame Nkrumah University of Science and Technology; University of Cape Coast and University of Development Studies) (?/+/-) • Ghana AIDS Commission (?) • Coalition of NGOs on HIV/AIDs (?)

Stakeholders who had a (+) rating were those perceived to have a keen interest in promoting/ supporting the ASM sector; those with a (+/-) rating were those who had a qualified and cautious interest in the ASM sector. Stakeholders with a (?) rating were those that were seen to be dealing with issues related to, or present, in the ASM sector but had not evinced a clear interest or position on the sector.

APPENDIX V

1. A Description of the Regulatory Framework

In order to engage in the production of gold in the small-scale mining sector, the law requires that a license be obtained from the Ministry of Lands and Natural Resources. Non-citizens and/or Ghanaians under the age of eighteen (18) are not entitled to be issued with a license to mine on a small scale [CS2(a) & (b)]. Moreover, a prospective licensee must be registered with the District Small-Scale Mining Center of an area designated for small-scale mining operations before a license can be issued to him/her. According to the law, a license may be issued to a person or group of persons or a cooperative society. Where it is issued to an individual or a group of unincorporated individuals, then it is valid for a three-year period but may be renewed at the discretion of the Minister for a period he/she deems fit in the circumstances.

The size of a licensee's concession also depends on the number of grantees stipulated on the license. Where the license grants a concession to an individual or a group of individuals not exceeding four (4) in number, the grantee(s) can only be entitled to three acres and five (5) acres in the case of a grant to a group of persons not exceeding nine (9) in number. The biggest concession permitted under the law (twenty-five (25) acres), may be granted only to a cooperative society of ten (10) or more persons.

The Minster has discretionary power under the law to revoke a license on grounds of a) noncompliance with either the terms of a grant or with the law on mining, including the *Minerals and Mining Law* (PNDCL 153); b) conviction of the licensee for smuggling or engaging in the illegal sale or dealing in gold; and c) the public interest.[4]

In terms of Section 7 of the Law, the licensee cannot transfer a license granted. In other words, there is no market for small-scale mining licenses and so grantees who have made a decision to exit from the sector cannot sell their unexpired mining rights to prospective miners.

[4] In terms of Article 295 of the Constitution, the "public interest" includes any right or advantage which enures to or is intended to enure to the benefit of the people of Ghana as a whole.

The law places a number of obligations on licensed small-scale miners. They are to "observe good mining practices," comply with health and safety rules and pay due regard to the protection of the environment (S. 11) but these obligations are not clearly defined under the law. For instance, the broad obligation to observe good mining practices may encompass anything from sector-specific practices to industry-wide practices, including the use of the best technologies employed by mining multinationals. Furthermore, obligations to comply with health and safety rules and to protect the environment can only be understood as a reference to the general practices of the mining industry. Yet, one would have thought that minimum standards tailored to the peculiar needs and circumstances of small-scale miners would have served a more useful purpose. In short, imposing the same obligations on small-scale miners and mining companies may not be fair given the wide disparities in terms of their operations and particularly their technological capabilities. This is a problem reviewed at length in the ILO seminal text, *Social and Labour Issues in Small-Scale Mines* (ILO, 1999).

Small-scale miners are also legally obligated to pay compensation to land owners where a license has been granted. The amount of compensation is determined by the Minister in consultation with the Minerals Commission and the Lands Valuation Board. (S. 12). It is important to note that the obligation to pay compensation for land taking is a constitutional one, and that unlike the *Small-Scale Mining Law*, the Constitution provides that compensation be prompt, adequate and fair. Though the constitutional requirement does not necessarily displace the authority of the Minister and the Minerals Commission and the Land Valuation Board, it means that they are obliged to take account of it in designing a formula for the payment of compensation for land use in the ASM sector.

Section 15 of the Law provides for the exemption of ASM operators from the payment of income tax and royalties in respect of their operations. This exemption is, however, limited to the first three years of the coming into force of the law. In other words, the investment incentive scheme ceased practically to operate after 1992. Therefore, unlike large-scale mining firms, which can apply for exemption from corporate taxes and other financial incentives under PNDC Law 153, small-scale miners cannot continuously apply for exemption. It is not immediately clear why the incentive for investment in the sector was limited by the lawmaker to three years; one can only

guess that the legislative intent was to encourage investment in the sector in the "teething" years of legalization and thereafter, to ensure maximum returns to public revenue from the sector's operations. However, a more enduring incentive structure, such as that under the *Minerals and Mining Law* for large mining concerns, could achieve a similar goal if well designed.

The law also seeks to create a market for the sale and purchase of gold by empowering the Minister and the Minerals Commission to license buyers and sellers of gold (S. 16). Licensed small-scale miners or any person in possession of gold may lawfully sell to licensed buyers only (S.17). This "limited" market for gold transactions is designed, probably, to foster the realization of the key regulatory objective of channeling gold produced by small-scale miners through officially recognized routes and to discourage the smuggling of gold. The concept of a limited market for gold produced by small-scale miners is reinforced by the second piece of legislation enacted as part of the effort to legalize ASM operations – the PMMC law. As noted earlier, this law sets up the PMMC as the apex marketing entity for precious minerals. As far as the ASM sector is concerned, the PMMC is authorized by law to "appoint licensed buying agents for the purchase of precious minerals produced by small-scale miners" [(S. 2 (d)]. It has also got the power to grade, assay, value and process precious minerals (S. 2(b)) and to buy and sell precious minerals [S. 2 (b)]

Though the law creating the PMMC does not expressly or by necessary implication confer either monopolistic or monopsonistic powers on it, the corporation has acquired a huge share of the market for gold and thus possesses substantial *de facto* buying and selling power. Indeed, it was in order to lessen the monopoly of PMMC and thus to introduce competition into the small-scale minerals sector that government licensed Miramex Limited to engage in the buying and selling of minerals. It is generally believed that PMMC's dominance of the market served as a disincentive to artisanal small-scale mining as it paid uncompetitive prices for gold that resulted in a resurgence of smuggling (Anon 1995). Despite these facts regarding the adverse effects of limited liberalization of the marketing of gold products, the current law still penalizes any sale or dealing in gold outside of the framework of the Small-Scale Mining Law and the PMMC Law.

2. A Description of the Institutional Framework

Within the framework of the *Small-scale Mining Law*, a number of institutions or agencies have been granted regulatory authority to oversee the operations of small-scale miners. Some of these institutions, such as the Minerals Commission and the Land Valuation Board existed prior to the enactment of the law; others were created under the law and assigned specific responsibilities. The latter include the District Small-Scale Mining Centers and the small-scale Gold Mining Committees of the District Assemblies. In addition, the Environmental Protection Agency (EPA), Geological Survey Department, the Mines Department, Forestry Commission, Lands Commission and the District Assemblies in mining areas all exercise some form of regulatory authority over small-scale miners.

The study identified the key institutions affecting the ASM sector as the Minerals Commission, the EPA, the Land Valuation Board, and the Small-Scale Gold Mining Centers of the two (2) districts from where data was gathered. These institutions exercise direct regulatory authority over the ASM sector and thus significantly impact its operation. The Minerals Commission is the key licensing agency and therefore exerts enormous power relating to who gets to do small-scale mining and on what conditions. The EPA issues environmental permits to ASM operators and has authority to enforce their compliance with existing environmental rules, regulations and standards. The Land Valuation Board values land for purposes of payment of compensation where applicable whilst the District Centers register miners to operate in the sector. Together, these institutions significantly affect the behaviour of actors within the ASM sector.

Though the other institutions mentioned above have statutory duties the performance of which may have significant implications for the sector, we noted that in actual fact they affect the sector only peripherally. For instance the Forestry Commission does not come into contact with ASM operators except when the latter have encroached upon land within forest reserves. Also, though the Geological Survey Department could directly impact the sector positively by making geological information and data available to its operators, we found no instance where this has happened.

APPENDIX VI

Priorities For Action Emerging From Validation Workshop

1. How to organise small scale miners into groups for purposes of accountability.

2. How the "cake" (earnings/incomes, resources for production) can be shared more equitably amongst participants; related to that, how labour in the ASM sub-sector can be employed more efficiently and sustainably;

3. Using (a) income-earning capacity; and (b) employment efficiency potential as criteria for targeting the actors/activities to be supported;

4. Promoting income-generation activities outside ASM for those participants who are not earning profitable incomes from the sector;

5. Promoting mechanization of activities to make it more attractive as viable, efficient businesses for investment;

6. Securing land use for alternative uses *vis-à-vis* ASM encroachment on LSM property; unregistered ASM activity on registered ASM concessions. Securing legal ASM concessions against vandalisation by illegal actors.

7. Addressing the lack of geological data and the possibilities of some of the proceeds of royalties and mining-related activities being allocated to district assemblies and other [state] beneficiaries to address such problems.

8. Exploring the possibilities of/developing guidelines for large-scale miners investing in geological data generation for ASMs (MC is collating that information on existing concessions, currently).

9. That large-scale miners be encouraged to perceive re-allocation [of unworkable portions of their concessions] to ASM operators through the MC as part of their social responsibilities;

10. Assisting large-scale miners to organise prospective ASMs operators [in their catchment area] into monitored co-operatives on their concessions whose products will be sold to large-scale miners. Specifcally, what provisions must be made for adequate control and remuneration?

11. There must be three thrusts to proposals for Phase II: Enforcement (especially environmental side), Empowerment and Resourcing.

Longer Term – Redistribution-Oriented

1. Using the availability of existing micro-credit schemes to re-align earnings/incomes ratio in the sector.

2. The need to anchor our recommendations in on-going national/efforts at economic empowerment countrywide.

3. Aim at generating proposals to be included in the revised Ghana Poverty Reduction Strategy (GPRS).

4. Aim at including ASM related data for inclusion in Ghana Living Standards Surveys (GLSS)/GLSS + 5.

5. Linking the issues to the larger national unemployment problem.

6. Looking at the dynamics within the sector and the implications for introducing various interventions. For instance, the implications of mechanization: there is the need to anticipate the decline in [labour based/manual] employment opportunities and plan for their broad absorption.

7. Promoting less tolerant/selective attitudes towards illegal activity. (*Instance of the Prestea Small Scale Mining Association cited. They do not have a legal concession yet have an identifiable structure which is recognized by the authorities. This supports the notion that pursuing regularization is just further complicating the process. People are therefore encouraged to work without licenses).*

8. Integrating mining and mining-related concerns into proper land use planning by stakeholders/government at all levels (all areas that are off-limits to mining must be enforced).

9. Targeting LSM assistance in ALS to young people in geographical areas outside the mining area thus stemming the potential migration to ASM.

Recommendations From Research Components

<u>Legislative and Regulatory Actions</u>

The government, with the assistance of regulatory agencies like the Minerals Commission and the Mines Department, should change the appropriate laws to reduce the cost and duration for the granting of license to prospective small-scale miners. As far as possible, decentralisation of the process should be considered.

Unequivocally, small-scale mining has gone beyond soft ground into harder rock and this cannot be easily broken by chipping with chisel and hammer. It is requires blasting. It is therefore recommended that the government through the Mineral Commission and other relevant

authorities should review the small-scale Gold Mining Law (PNDCL 218) to allow blasting under strict control and professional supervision.

Since the legalization process involves the use of money, the group approach to registration of concessions must be strongly encouraged. Legalisation should also be clearly tied to plans by the prospective legal SSM concerns for repairing environmental damage.

The consequences of the lack of geological data are many and can be related to poor reclamation even by legal ASM concerns. It is recommended that the Government should source funds for prospecting of potential areas for ASMs. Such lands should be well delimited into 25-acre plots and give them out to small-scale miners. A portion of the cost should borne by the concessionaires. Such geological data including the special distribution of grade should be properly documented.

Local Economic and Social Development Support

Given the role ASM plays in employment creation and income generation, district assemblies must take responsibility for investing in, optimizing the gains and limiting the impacts of the sector from a local economic and social development (LESD) approach including (a) supporting other institutions to promote availability of specialized services to ASM and ASM support services; (b) creation of an enabling environment for their work particularly financial support, and ensuring safe and decent working conditions.

Both advocacy and policy measures can be adopted to promote more consistent financial support for ASM including

- Funds for Small-Scale and Medium Enterprise Development (FSSMED) and the Business Assistance Funds (BAF). Other financiers who can assist them include National Board for Small-Scale Industries (NBSSI) and Action for Employment Generation (AFEG) which focuses on employment generation.
- various district level credit schemes including the district assemblies common fund, HIPC and similar facilities under the community based rural development programme and the social investment fund.

LSM/ASM Relations

Whilst large-scale miners can be encouraged to allocate "unworkable' portions of their concessions to ASM, standard procedures for these allocations should be arrived at and circulated by the Minerals Commission (with Chamber of Mines and Mines Department). For instance, standardizing the "letters of consent" – formats, modes of supervision and monitoring should be arrived at.

As far as possible, workable areas within the large-scale mining concessions should be allocated to only groups in good standing or co-operatives to ensure collective ownership and responsibility.

Where large-scale miners meet active and extensive galamsey activity on the concession prior to their arrival, extensive dialogue between large-scale miners, all sections of the community as well as the ASMs must be encouraged and facilitated from a social analysis perspective (beyond the current economic and planning –oriented approaches) prior to any arrangements.

A dialogue with landowners and traditional authorities on the regulations for allocation of concessions and their obligations to large-scale miners and legal miners must be initiated.

Alternative Livelihood Schemes

Large-scale miners (through the Ghana Chamber of Mines) have supported various alternative livelihood schemes (ALS) but appear to have so far demonstrated limited capacity for responsiveness to the perspectives and needs of small scale miners in this regard. As far as possible, stake-holding institutions should stick to their original mandates in providing a co-ordinated, responsive approach to ALS. For instance, the Minerals Commission should stick to policy advice, advocacy and co-ordination of priority insights and promotion of best/good practices.

Assemblies should more actively promote alternative employment activities alongside support for ASMs as legitimate small business ventures.

Involvement of Minors

Interventions to limit children's participation would require a broader, multi-sectoral approach: including parents, the assemblies, relevant decentralized agencies and civil society actors.

The interventions must be tailored to address the reasons why children engage in ASM; including prohibitive by-laws by the assembly; across the board support for incentives to remain in education; education and motivation of parents and the cooperation (and sanctions) for mine-site committees on which children are found.

Women's Participation

Women's participation in the ASM sector has been mixed; whilst they have gained employment as carriers and in support services of provision of food, consumer items etc, they are also amongst the lowest earners. In particular, the District Assemblies Common Fund poverty reduction/income generation credit should be made accessible as an option for women engaged in ASM-related activities to go into alternative undertakings.

Image of ASM

Negative images about ASM still persist. These affect its development. The distinction between legal small scale mining and unregistered (galamsey) must be emphasized and championed by government. Legal ASM activity must be promoted in the media and by mining-related institutions as contributors to economic development.

Non-enforcement of the existing legislation is a disincentive to registration. With the simplification of the process, the penalties for illegal operation should be enforced. Legal concession owners should be encouraged to expose illegal operators.

Voice and Policy Influence

There are different levels of voice of actors in the ASM sector depending on their regularization status (when they can depend on the District Mining Centre); their income levels and access to information amongst others. There are on-site miners organizations but national level representation and voice is fragile.

As a way of ensuring the viability of the sector, the Minerals Commission should take pro-active steps to strengthen the ASSM – association of small scale miners (especially through financial and logistic support including making available to it viable operations to work). The relationship between the ASSM, the Ghana Chamber of Mines and other identifiable collectives should be clarified. The Association should be re-organised with a membership of financiers, diggers and miners.

Technical and Environmental

Small-Scale Mining Project Officers are unable to assist illegal miners even though their locations are known because they do not want to be seen to be condoning illegal mining. It is recommended that the officers should be given the permission to reach-out to the (illegal) miners with extension service including counselling to regularise their operations.

Wet grinding should be encouraged. However, where dry milling is practiced the mills should be sited away from populated settlements and protective nose guards should be provided to the millers.

In the short term miners should be educated to add riffles to their sluice boxes and also wash their mats regularly.

In cases where they still pound and sieve, the miners should protect their noses and ears with pieces of clean clothes and earplugs respectively.

Education of small scale miners should be intensified to promote the use of mercury retorts to prevent damages to the health of miners and relations.

For the long term, more research is required to determine the appropriate parameters of sluicing to be adopted in the various mining areas.

The miners should be provided with technical assistance in good mining practice. The waste water discharged from the sluices should be recycled in a similar way that is adopted at processing plant at Gbani in the Bolgatanga area.

Land degradation by SSM can be minimised by adopting the following measures:

- Provide detailed geo-data to inform and restrict miners to only viable areas which can pay for eventual reclamation.
- Provide incentive packages to miners to encourage them to reclaim/ rehabilitate mined-out lands.
- Institute national/District award schemes for the best miner for those who exhibit sound mining practices (including simultaneous reclamation).

More efforts in encouraging technology development and research institutions to promote appropriate technology for the ASM sector in Ghana.

More consistent, conscious programme of farming out relevant ASM-related research to mining students as a way of linking the theory to applied research.