IMPACT OF MINING SECTOR INVESTMENT IN GHANA:

A STUDY OF THE TARKWA MINING REGION

(A DRAFT REPORT) PREPARED BY

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1.0: INTRODUCTION

1.1 Background:

The resurgence in the mining industry in Ghana since 1989 cannot be considered an isolated phenomenon. It is driven by the global paradigm which emphasises private sector-led development as the engine of economic recovery in developing countries. This is indeed the thrust of the structural adjustment programmes (SAP) prescribed for such developing countries by the World Bank and allied institutions since the early 1980s. In these economic programmes, African countries with important mining sectors were obliged to shift their policy emphasis towards a primary objective of maximising tax revenue from mining over the long term (which remains largely a mirage), rather than pursuing other economic or political objectives such as control of resources or enhancement of employment. According to the World Bank, this primary objective could only be achieved by a new division of labour whereby governments focus on industry regulation and promotion while private companies take the lead in operating, managing and owning mineral enterprises.[1]

Many of the 16 countries identified by the Bank to be given priority for exploration and private mining investment were from sub-Saharan Africa, obviously because the region is an important supplier of a variety of minerals to the world. It accounts for about 8 % of world mine production. It holds more than 10 % market share in six minerals -- bauxite, cobalt, manganese, rutile and uranium -- and a 37 % share of world diamond production. By the close of 1999, nearly all African countries, some of them without known mineral resources, had either modified their minerals codes or introduced them where they did not exist before.

Ghana, long regarded as the African trailblazer, was an obvious laboratory for these reforms. After all, a comparative geological ranking of African countries placed Ghana third after South Africa and Zimbabwe[2]. Ghana was, therefore, among the first sub-Saharan countries to embark on these prescribed reforms and its mining sector received priority attention in the country's Economic Recovery Programme launched in 1983.

Between 1984 and 1995, there were significant institutional development and policy changes to reflect the new paradigm, from the establishment of the Minerals Commission in 1984 and the promulgation of the Minerals and Mining Code in 1986 to the promulgation of the Small-Scale Mining Law in 1989 and the establishment of the Environmental Protection Agency in 1994.

The historical importance of mining in the economic development of Ghana is considerable and well documented, with the country's colonial name -- Gold Coast -- reflecting the importance of the mining sector. Gold dominates the mining sector and

[1] THE WORLD BANK. 1992, *Strategy for African Mining*. World Bank Technical Paper No.181, African Technical Department series.
[2] Laura Irvine, 1991, *Euromoney*, September.

Ghana is Africa's second most important producer of gold after South Africa, the third largest producer of manganese and aluminium and a significant producer of bauxite and diamonds[3]. In addition, inventories of iron, limestone, kaolin, salt and other industrial mineral resources exist but ae not exploited on a large scale.

From the inception of Ghana's economic policy changes in 1983 to date, the mining sector has witnessed a considerable investment boom and increased production, particularly in the gold sector. There has been considerable growth in the number of new mines and exploration companies. The sector has also attracted a significant number of sector support companies such as catering and transport companies, explosive manufacturers, mineral assay laboratories, etc. The sector has increased its contribution to gross foreign exchange earnings and appears to have attracted substantial foreign direct investment funds over the years.

By the end of 1999, the sector had attracted over US$3 billion worth of foreign direct investment. Ghana now has 19 operating mines and over 128 local and foreign companies with exploration licences, mainly in the domain of gold. The sector now accounts for more than 30% of gross foreign exchange earnings. In 1997, officially reported output of newly mined gold was 54.4 metric tons with a market value of about $545 million.

Despite this boom, there is growing unease with regard to the real benefits accruing to the ordinary Ghanaian in the mining communities and to the country as a whole, in the light of the extremely generous fiscal and other incentives given to mining companies under the mining sector reforms. As observed by Patricia Feeney, the World Bank strategy is surprisingly silent on measures that might be required to protect the rights of vulnerable segments of the society during the economic transition[4]. Ghana's structural adjustment programme generally generated considerable social costs and had considerable negative impact especially on the most vulnerable segments of the society (the rural poor, women and children).

It has been suggested that a thorough cost/benefit analysis of the resurgent mining sector would probably return a negative figure. This is because of such factors as the high level of fiscal incentives enjoyed by mining companies and the high level of foreign exchange earnings they are allowed to retain in offshore accounts. Other relevant factors include the negative environmental impact of mining and the growing redundancies associated with the privatisation of state-owned mining companies. Thus, the growing incidence of conflict between mining communities and their chiefs on one hand and mining companies on the other hand echoes the growing disquiet about the effects of the mining sector-led structural adjustment programme on the population.

[3] GEORGE J. COAKLEY, 1999, *The minerals industry of Ghana*, in the US Department of the Interior, US Geological Survey, Minerals Yearbook. Area Reports: International 1997, Africa and the Middle East Volume III.

[4] Patricia Feeney, 1998, *The Human Rights Implications of Zambia's Privatisation Programme.*

1.2 Objective Of Study:

The principal objective of this work is to assess the socio-economic and environmental effects of the mining sector reforms implemented under the structural adjustment programme, with particular reference to affected mining communities in the Tarkwa mining area. The specific aims are reflected in the terms of reference for this project, which include:

1. A concise account of the growth and development dynamics of the mining industry in Ghana from the colonial period through to the 1970s and 1980s, from colonial and post-independence government control to the era of structural adjustment and after.
2. A critical investigation and evaluation of the major elements of mining sector adjustment, including all policy and institutional reforms implemented in the sector under SAP.
3. A cost-benefit analysis of mining investments, taking the following into consideration: level of foreign direct investment inflows to the sector since the reforms, level of employment, net foreign exchange earned, extent of linkages with other sectors, as well as the environmental and social impact of mining sector investment.
4. Evaluation of adequacy of mechanisms for decision making, negotiation and conflict resolution between various parties in the sector; the role of state agencies and issues of good governance
5. A concise enquiry into issues of competition between large- and small-scale miners and issues of ownership

1.3 Methodology

The study was undertaken on community basis (micro-level) but scaled up with secondary information from the district, regional and national levels to address the micro- and macro- aspects of the assessment. It consisted of desk study and primary data collection. The desk study consisted of a literature review of existing reports and works -- i.e. previous studies relating to the subject matter, at the community, district, regional and national level in other African countries and elsewhere in the world.

The primary data collection involved visits to selected communities in the Wassa West District to assess the social structure of the communities. The aim was to pave the way for active involvement of the communities and to ensure that this participatory approach also factored in the gender dimension. The field visits also included the identification of stakeholders -- communities impacted by mining, mining companies, government support agencies for the sector, non-governmental organisations and community-based organisations to solicit their effective participation. The participatory methodology was achieved through focus group discussions along with informal, structured and semi-structured interviews with institutions, chiefs, opinion leaders and individuals.

1.4 Structure Of Report

The report has seven sections with each section addressing a main heading. Section One introduces the subject matter, outlining the background to the study, the objective of the study and the methodology used to conduct the exercise.

Section Two gives an overview of the dynamics of the Ghanaian minerals industry from the colonial era to the present. It reviews the policy changes pursued at various stages of the country's mineral development and the impact of such changes on production and general performance of the sector. In fact, it is an analysis of the political economy of mining industry dynamics throughout the period.

Section Three reviews the various policy changes in the mining sector made under the auspices of the economic recovery programme (ERP) and the structural adjustment programme (SAP) and the resulting performance of the mining sector =. It also presents the general structure of the industry in terms of ownership and major players

Section Four makes a brief presentation of the demographic, geographic, socio-economic and cultural characteristics of the study area and assigns reasons for the choice of the site for the study.

Section Five analyses the impact of mining sector reforms in the study area. It includes a brief cost/benefit analysis of the economic, social and environmental factor impact of mining sector investments on local communities. s. This section also considers the level of foreign direct investment inflows to the sector since the reforms, the level of employment, net foreign exchange earned, extent of linkages with other sectors, along with the negative environmental, health, cultural and social impact of mining sector investment in the district.

Section Six briefly surveys the impact of mining investment on women in the area. It takes stock of the level of women's involvement in mining, marketing and peripheral, related activities.and considers the health and other social consequences of mining activities on women in the area.

Section Seven draws conclusions from the research , makes recommendations and outlines areas for possible intervention measures.

2.0: DEVELOPMENTS IN GHANA'S MINERAL INDUSTRY

2.1 Introduction

Ghana's mining tradition, particularly regarding gold, dates back to the fifteenth century, but has since had a rather ragged history. British and a few other foreign investors controlled the industry during the colonial period. Developments in the mining industry at this stage were responses to economic and political developments in Britain and Europe in general rather than to market conditions???. The industry was very vibrant during the pre-independence period. Ghana accounted for 36 % of total world gold output (8,153,426 fine ounces) between 1493 and 1600[1], but its share of world mineral output dwindled over subsequent years.

The post-independence period was marked by state ownership of mineral resources. The period up to 1986 was generally characterised by stagnation of the industry, except for a few spikes recorded immediately after independence and in the early 1970s. The sluggish production, particularly in the gold sector, could be attributed to market conditions, investor uncertainty about the safety of their investment under Ghanaian self-rule and the effects of state intervention in the industry.

As part of the country's economic recovery programme (ERP) launched in 1983, the mining sector underwent significant reforms beginning in 1986. This section looks at the dynamics and performance of the mineral industry in Ghana from the colonial era to date, exploring the local and global factors responsible for the evolution of the industry throughout the period.

2.2 Pre-Independence Period

While gold mining by indigenous people is said to pre-date Christian times and Ghana's modern mining history spans over six centuries, private Ghanaian gold miners were banned after 1933 from operating mines due to the promulgation of the Mercury Law. Large-scale mining by British and other foreign investors began in the late 19th century. British mining interests were a significant source of influence on the Colonial Office in London and its representatives in the territory and shaped the formulation and implementation of mineral policy in the colony[5]. The thrust of policy in the sector was aimed, first at establishing a legal and administrative framework that would facilitate mining operations and secondly, ensuring the self-sufficiency of the British Empire. For instance, the development of minerals such as bauxite and manganese in Ghana was a function of the needs of Britain and carried out with the active participation of British state. Although a concession for mining bauxite in the Awaso area was obtained in 1926, production only started in 1940-41. This was when other sources of bauxite were cut off

[5]. Tsikata, F.S (1997). *The Vicissitudes of Mineral Policy in Ghana*. Resources Policy Vol. 23 No.1/2 pp9-14.

from the Allied forces in the early part of World War II. British Aluminium Company Limited, acting as agents for the British Ministry of Aircraft Production, started exploitation of the Ayawaso deposit. Similarly, exploitation of manganese in Ghana started in 1916 at the request of the Wartime Ministry of Munitions, as manganese was in high demand for war purposes[6].

Mineral production during this period had its ups and downs. The period from 1480 to 1954 was characterised by two major periods of peak production referred to as the " Jungle Booms" and three periods of depressed production, attributed to various reasons including the influence of the two World Wars. Ghana accounted for 36% of total world gold output (8,153,424 fine ounces) between 1493 and 1600, but this share dwindled over the years as a result of new producers. Total production up to 1934 was about 30 million fine ounces of gold representing 2.7 % of worldwide production[7].

The First and Second World War periods were characterised by low production[2]. Rapid closure of small and medium mines that were starved of supplies because of the war affected output. In addition, the drafting of men and miners who could handle explosives to the warfront and the internment of German concessionaires by the British were some of the reasons accounting for the low production during the period. The depressed gold production in 1918 –1929 was attributed to labour scarcity. The booming cocoa and construction industries and the emergence of the manganese and diamond mines affected the labour supply. But the growing number of Ghanaians who preferred to work their small mines also affected the labour availability.

In fact the preference of Ghanaians to work in their own mines rather than work for the Europeans encouraged the Colonial Office to pass the Mercury Ordinance of 1932, making it illegal for Ghanaians to use mercury for mining. This marked the beginning of the criminalisation of indigenous, small-scale gold mining and the edging out of Ghanaian gold producers, until 1989 when the Small-scale Mining Law was enacted to give legal status to the sector again.

The banning of indigenous gold mining did boost large-scale mining as more labour was freed for the latter and the period 1933 to 1942 saw increased mine output. The emergence of major new producing countries and the growing struggle for independence creating political risk and investor disquiet were responsible for the territory's dwindling share of world production from 1943 to 1954. State intervention immediately after independence was to ensure that mines with considerable labour force threatening closure did not do so for obvious reasons.

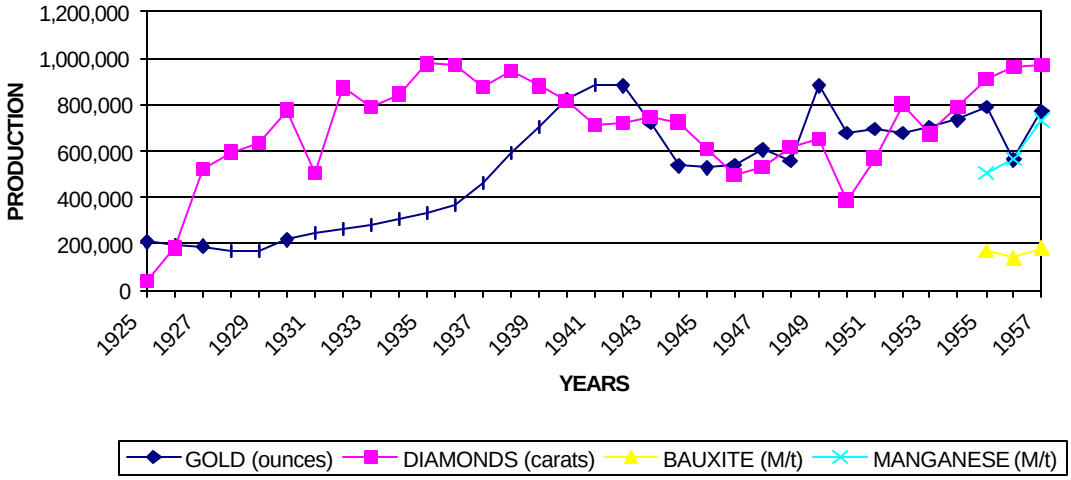
[6] Graham, R. (1982). *The Aluminium Industry and the third World: Multinational Cprporations and Underdevelopment.* Zed press London.
[7] David Bird, 1994, *Gold in Ghana.* Mining Journal , January.

Table 2.1: Ghana's mineral industry performance up to independence

Year	Gold (ounces)	Diamond (carats)	Bauxite (M/t)	Manganese (M/t)
1925	1925[8]	210 301	40 296	
1926	1926	198 083	185 116	
1927	1927	189 117	521 774	
1928	1928	168 933	594 022	
1929	1929	167 115	636 779	
1930	1930	218 494	777 080	
1931	1931	246 075	503 743	
1932	1932	264 422	872 706	
1933	1933	284 841	788 704	
1934	1934	308 960	844 332	
1936	1935	337 065	975 151	
1937	1936	367 819	971 617	
1938	1937	461 621	875 248	
1940	1938	590 026	944 071	
1941	1939	701 417	881 373	
1942	1940	818 911	814 139	
1943	1941	882 241	712 576	
1944	1942	880 000	719 379	
1945	1943	721 315	747 712	
1946	1944	536 727	722 558	
1947	1945	527 628	611 080	
1948	1946	540 906	495 061	
1949	1947	604 250	530 319	
1950	1948	557 185	620 614	
1951	1949	882 014	651 067	
1952	1950	679 173	386 796	
1953	1951	694 886	569 392	
1954	1952	678 831	800 967	
1955	1953	700 139	674 743	
1956	1954	734 630	789 550	
1957	1955	787 922	911 973	167 966

[8] Statistics for 1925–83 are from G. O. Kesse (1985), *The Mineral and Rock Resources of Ghana.*

Fig 2.1 MINERAL PRODUCTION FROM 1925 to 1957



2.3 The Post-Independence Period up to 1986

Generally, the vicissitudes in Ghana's mineral industry mirror trends in the global industry. The period between 1965 and 1980 was characterised by the declaration of permanent sovereignty over natural resources by developing countries, primarily through large-scale nationalisation of mineral extractive facilities, the renegotiation of existing arrangements and the creation of state enterprises and numerous commodity producer associations[9].

Ghana's mining industry was state controlled from 1957 to 1986. After independence, the government set up the State Gold Mining Corporation (SGMC) and the Ghana National Manganese Marketing Corporation (GNMC). SGMC was established in 1961 to acquire five gold mines (Bibiani, Tarkwa, Prestea, Konongo and Dunkwa mines) from British companies. In 1972, the government took majority shares (55%) in Ashanti Goldfields Corporation (AGC), Ghana Bauxite Company (BAC) and Ghana Consolidated Diamonds Company [3]. The Ghana National Manganese Corporation (GNMC) took over manganese operations at Nsuta from the African Manganese Group (AMG), a British subsidiary of Union Carbide.

The government's cardinal objectives in the acquisition of these mines has been summarised as the protection of employment and the access to foreign currency generated by the mines[10]. The policy at the time was, therefore, aimed at maximising government revenue, control of resources and employment generation. Thus, state mines were subject to government intervention for purposes often unrelated to efficiency or

[9] . Thomas Walde, 1983, *Permanent sovereignty over natural resources, recent developments in the mineral sector*. Natural Resources Forum, published by the United Nations, New York, July.
[10] Tsikata, F.S (1997). *The Vicissitudes of Mineral Policy in Ghana*. Resources Policy Vol. 23 No.1/2, pp 9-14.

economic probity. The mining sector was, therefore, constrained by lack of investment and exploration. The state-owned mining enterprises were under-capitalised and became increasingly obsolescent. Lack of investment, maintenance and modernisation left these state-run mines uncompetitive. Apart from AGC and GNMC, which were operating profitably, the SGMC and BAC were operating at a loss and SGMC had closed the Bibiani and Konongo mines, which were making serious losses.

From 1960 to 1980, various modifications were made to the mining sector code aimed at attracting private participation, but they failed to attract significant foreign private investment. The changes were characterised by high taxes and other duties along with significant state control of the industry. The mining industry stagnated and up to 1985, there were no significant new investments in Ghana's mining sectorOutput in almost all the mines declined and the sector contributed relatively little to gross national earnings.

Table 2.2: Comparison of earlier fiscal regimes and PNDCL 153 (1986)

ITEM	SMCD 5 1975	ACT 437 INVESTMENT CODE, 1981	PNDCL 153 REGIME	AMENDEMNT
Corporate Income Tax	50 - 55%	45%	45%	35%
Allowances				
Initial Capital Allowance	20%	20%	75%	
Subsequent Annual Capital Allowance	15%	N.A	50%	
Investment Allowance	5%	N.A	5%	
R & D Allowance	N.A	25%	N.A	
Royalty	6%	2-6%	3-12%	
Min. Turnover Tax	2.5%	2.5%	N.A	
Mineral Duty	5-10%	5-10%	N.A	
Import Duty	5-35%	5-35%	N.A	
Foreign Exchange Tax	33-75%	33-35%	N.A	
Import License Tax or Import Levy	10%	10%	N.A	
Government shareholding	55%	55%	10% (min)	
Gold Export Levy	C 3/oz for every oz 100,000 oz.	C 3/ oz for every oz 100,000 oz	N.A	
A.P.T			25%	

The mining sector accounted for about 15% of export earnings from the mid-1970s to 1982, of which the gold subsector contributed over 80%.

From production peaks in the 1960s, gold output fell to 5.97 million oz in the 1970s and even further in the 1980s to only 3 million oz. Other minerals suffered a similar decline. This was one of the main reasons for the declining availability of foreign exchange during the latter period (Table 2.3)

The main reasons assigned for the decline in the mining sector during the period, as outlined in a World Bank report on the structural adjustment programme in 1984, include the "lack of foreign exchange to maintain and rehabilitate the mines; lack of capital

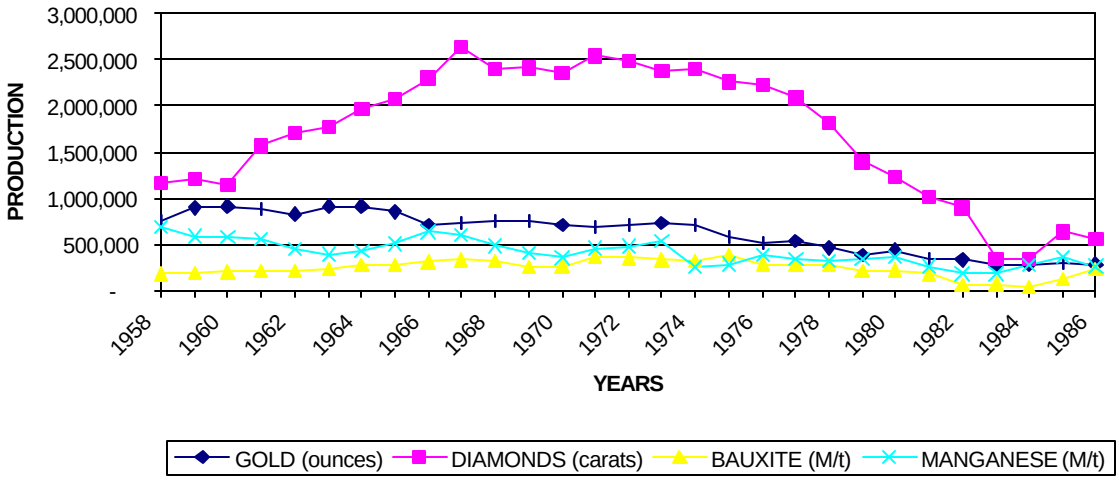
investment for mining skills; infrastructure deterioration, particularly shortages of rail capacity for manganese and bauxite; mining company financial problems due to the greatly over-valued currency and spiralling inflation; a declining grade of gold ore; the exhaustion of high grade manganese ore; the depletion of the more lucrative diamond mines in many areas; high absenteeism and low worker discipline; and pilfering, illegal panning and smuggling of gold and diamonds"[11].

Table 2.3: Post-Independence Performance of Ghana's Mineral Industry (1958-86)

Year	Gold (ounces)	Diamond (carats)	Bauxite (M/t)	Manganese (M/t)
1958	747 493	1 165 577	180 480	686 676
1959	892 113	1 213 474	186 879	587 483
1960	915 317	1 138 665	197 938	577 648
1961	878 459	1 567 039	213 767	559 760
1962	823 115	1 713 286	207 929	443 391
1963	911 663	1 765 461	225 955	394 080
1964	912 592	1 968 176	271 025	424 657
1965	851 090	2 070 142	278 589	509 166
1966	708 906	2 301 659	312 508	638 000
1967	724 134	2 633 527	333 458	596 572
1968	757 346	2 398 631	317 171	484 696
1969	750 435	2 413 415	247 999	400 363
1970	714 442	2 355 797	259 993	354 726
1971	693 770	2 542 100	361 038	455 253
1972	710 013	2 482 822	356 479	476 690
1973	731 711	2 375 582	330 351	533 789
1974	709 550	2 406 860	327 627	255 393
1975	583 103	2 255 227	383 087	282 291
1976	515 654	2 231 791	282 084	384 162
1977	531 084	2 085 511	271 090	343 228
1978	465 651	1 817 818	271 448	321 443
1979	387 730	1 391 058	213 679	342 051
1980	437 669	1 227 071	224 501	368 593
1981	349 870	1 016 580	179 598	260 409
1982	335 724	893 016	63 530	176 871
1983	276 659	336 612	70 235	179 987
1984	282 299	341 978	44 169	267 996
1985	299 615	636 127	124 453	357 270
1986	287 124	560 538	226 461	262 900

[11] J. Songsore, P.W.K Yankson and G.K. Tsikata, (1994). *Mining and the Environmental: Towards a Win-Win Strategy (A study of the Tarkwa – Aboso – Nsuta Mining Complex in Ghana)*. June

Fig. 2.2 MINERAL PRODUCTION FROM 1958 to 1986



2.4 The Post-1986 Mineral Industry

The dynamics in Ghana's mining sector are in direct consonance with worldwide trends in the sector. The global mining industry has undergone vigorous changes in the last 15 years. Improved exploration, mining and processing technology have revolutionized the entire mining industry worldwide, particularly in the domain of gold.
The development of processes such as cyanide heap-leach and bio-oxidation have made viable the processing of low-grade material which hitherto was considered waste. The revolution in processing technology also gave impetus to an evolution of mining and exploration methods. These have made possible more efficient processing of more complex ores such as sulphides and oxides. It has also resulted in an upsurge in exploration and mining activity worldwide. In the area of gold, traditional underground mining is being abandoned in favour of surface mining. These developments have had negative dimensions in terms of environmental impact.

Apart from these technological innovations, which account for the upsurge in mining activities globally, the most fundamental development in the industry from the early 1980s to date has been in the area of the mineral policies of mineral-rich countries, particularly in the developing world.

The global technological movement and the policy dynamics in the industry have resulted in the widening of the axis of mining investment opportunities and a re-orientation of focus of international mining and mining-related companies. The increasing lead role played by international junior companies and African mining is well noted.

During the late 1980s, the mineral industry worldwide experienced major changes. State ownership of mines was de-emphasised. Many mineral-rich developing countries were encouraged to put in place a policy framework that would encourage private

participation. International private investor demands for participation in the mining sector were well articulated by various groups including the World Bank[4] and the International Monetary Fund (IMF). For a country to attract private investment, therefore, it must offer, in addition to a promising geological environment, a conducive policy, legislative and administrative framework more conducive to business, and a thorough privatization programme.

The main purposes of the privatisation programme have been: to reduce the role of the state in the economy and to improve business competitiveness and efficiency; to reduce the fiscal deficit by using the proceeds from the sales to retire external and domestic debt, and to generate new cash flows through investment and tax revenues.

In response to this global demand for policy changes to attract international mining investment, Ghana shifted its focus from direct state investment in the mining sector to promotion and regulation of private companies. Within the framework of the country's economic recovery programmeof 1983, and more specifically under its structural adjustment programme, the mining sector was a major target for reforms to address the concerns of investors and financiers, to arrest and reverse the fall in the industry and to ensure growth.

The policy changes have achieved the desired results with respect to investor perception of the investment environment and the volume and value of mineral output. The country fast became a citadel of commerce and mining in West Africa. Internationally, Ghana is known now to be among a few selected African countries with the most attractive geological and investment environment.

Comparative geological ranking of African countries placed Ghana third after South Africa and Zimbabwe. For the most attractive African countries from the general perspective of mining investment, Ghana is ranked third after Botswana and Zimbabwe respectively[5]. In a political and commercial risk assessment of African countries, Ghana was categorized good enough to risk investment alongside Zimbabwe and Morocco[6]. A survey by International Investment Conference Inc. indicated that the country moved from 7th position in 1992 to 6th in 1994 on the list of emerging markets. The explosion of local and foreign mining and exploration companies in Ghana confirms these findings.

The renewed investor confidence in Ghana's minerals industry is reflecting in the ballooning volume and value of minerals produced. Gold production, which dwindled from a peak of 915,317 ounces in 1960 to 282,299 ounces in 1984, rebounded to 998,195 ounces in 1992, exceeding the 1960 peak value. Output reached an all time-record high of 1,706,229 ounces in 1995 and has since exceed that figure. Bauxite production similarly has been on the increase. Production showered from 44,169 tonnes in 1984 to 530,267.2 tonnes in 1995. (Fig. 2.2 and 2.3).

The production of manganese and diamond has rather been in general decline. Ghana Consolidated Diamonds produced only 293,882 carats in 1995 compared with 1,148,678 carats in 1980. However, one significant development in the diamond sector has been the

role of small-scale diamond winners. Their share of total diamond output increased from 4,328 carats to 337,457 in 1995. The manganese corporation, 100% state-owned until the end of 1995, produced just 179,359 tonnes in 1995 as against 267,996 tonnes in 1984.

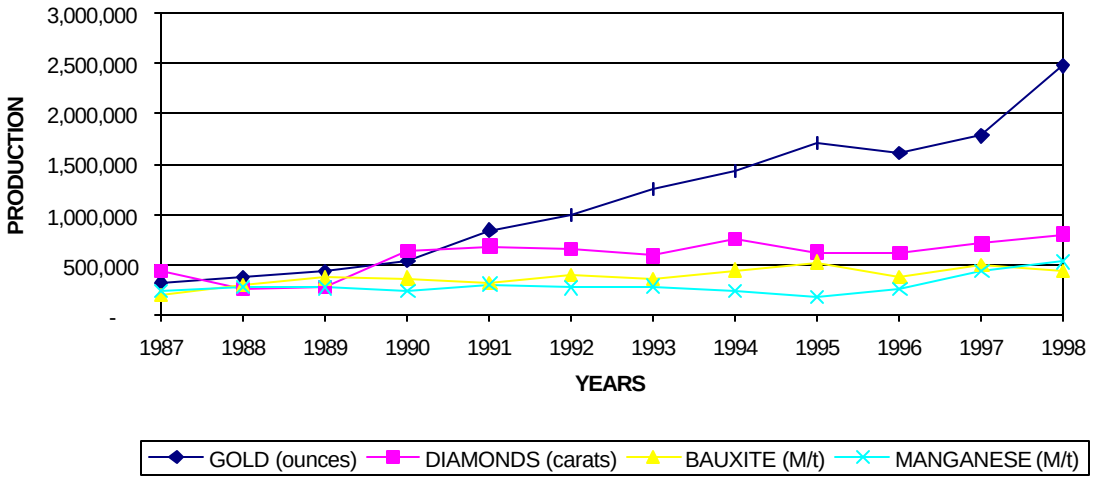
Gold in particular has assumed a leading role in foreign exchange earnings. In 1994, gold exports amounted to $549 million, representing 45% of total export revenue ($1,215 million), beating cocoa (25% of total exports) downto second place for the third year running.

Employment in the minerals sector also surged, at least up to the close of 1995. The total labour force of the sector rose from 15,069 in 1987 to 22,500 in 1995[7] (Fig.). This figure represents full-time employees of mining companies alone and excludes exploration companies and mining support service companies.

Table 2.4: Performance of Ghana's Mineral Industry under SAP (1987-1998)

Year	Gold (ounces)	Diamond (carats)	Bauxite (Mt)	Manganese (Mt)
1987	328 926	440 681	201 483	242 410
1988	373 937	259 358	299 939	284 911
1989	429 476	285 636	374 646	273 993
1990	541 400	636 503	368 659	246 869
1991	845 908	687 736	324 313	311 824
1992	998 195	656 421	399 155	276 019
1993	1 261 424	590 842	364 641	295 296
1994	1 430 845	757 991	451 802	238 429
1995	1 708 531	631 708	530 389	186 901
1996	1 606 880	271 493	383 370	300 000
1997	1 788 961	714 341	504 401	436 903
1998	2 481 635	808 967	442 514	536 871

Fig. 2.3 MINERAL PRODUCTION IN GHANA (1987 - 1998)



3.0: POLICY CHANGES IN THE MINING SECTOR UNDER SAP

3.1 Introduction:

The mining sector reforms that started in 1986 formed part of the macro- economic policy reforms of the economic recovery programme (ERP) initiated in 1983. Sectors that had the potential to generate export revenue were the priority targets of these reforms. The mining and cocoa sectors, the biggest gross foreign exchange earners, received prompt attention in order to boost investor interest.

3.2 Overview of the ERP/SAP

In broad terms, the ERP aimed to reform prices and restore production incentives, arrest inflation, realign interest rates, reduce budget deficits, rehabilitate social and economic infrastructure and establish proper priorities for the allocation of scarce foreign exchange, improving government finances, eliminating black marketing and smuggling and realigning the currency with the major currencies of the world[12].

The major components of the ERP included

- A flexible exchange rate policy.
- Intensive policies for the export sector, especially cocoa and mining.
- The gradual removal of price and distribution controls.
- Prompt adjustment of administered prices to reflect changes in the exchange rates and other costs, including energy prices.
- Reducing or eliminating budget subsidies.
- Initiation of sector specific rehabilitation and infrastructure programmes to improve management and restore the potential for growth.

The country's structural adjustment programme aimed to address problems including deteriorating exports, a weak financial system that hindered private investment and savings mobilization, a stagnant industry, weak public administration, etc.

The broad objectives of the structural adjustment programme were to:

- Establish an incentive framework to stimulate growth, encourage savings and investment and strengthen the balance of payments.
- Improve resource use, particularly in the public sector, and
- Ensure fiscal monetary stability.

World Bank policy recommendations for restructuring the key export sectors, especially mining, under the structural adjustment programme included the need for a coordinated programme of rehabilitation of state-owned mines, a satisfactory degree of management autonomy, gradual divestiture of such mines to private investors, together with financial assistance in order to reverse the downward trend of production.

[12] V.K Nyanteng (ed) (1997). *Policies and Options for Ghanaian Economic Development*. Published by ISSER, Legon.

- Realignment of the price and incentives system in favour of the production sectors, particularly the export sector,
- Reduction in government intervention in the economy and gradual liberalization of the economy.
- Restoration of monetary and fiscal discipline
- Encouragement of private sector development; and
- Rehabilitation of the country's economic and social infrastructure.

The measures adopted under the ERP towards achieving these objectives were under three broad headings:

- Policy reforms in such areas as public sector management, import trade, external distribution, the foreign exchange regime, the external value of the cedi, and budgetary policy on deficit financing.
- Sectoral/institutional restructuring, such as the financial sector reforms, divestiture of state-owned enterprises;
- Programs of physical rehabilitation and development of the economic and social infrastructure, such as roads, schools and public buildings.

3.3 Mining Sector Reforms

The mining sector as a potential major contributor to gross foreign exchange received priority attention under SAP with the aim of ensuring increased production and productivity. According to Jacob Songsore et al, 1994, two types of policy actions positively impacted on the mining sector:

a) Macroeconomic policy reforms; and
b) Sector specific policy reforms.

In more specific terms, the mining sector policy reforms included:

- Changes in mining sector legislation to make the sector attractive to foreign investment.
- Increasing fiscal liberation of the mining sector.
- Strengthening and reorientation of government support institutions for the mining sector.
- Privatisation of state mining assets.
- Enactment of environmental laws and other mining sector legislative changes

At the macro level, the policy framework focused on trade liberalisation policies, public expenditure policies, state-owned enterprises reform and public sector management. Liberalisation of imports and export promotion policies were crucial in turning the mining sector around. The reform exercise facilitated access to foreign financing for buying the equipment and spare parts for the rehabilitation and expansion of existing mines and for the development of Greenfield ?? mines.

The adjustment programme was implemented progressively over the years. During the first years of the programme, mining sector polices aimed to increase the worth of existing mines through rehabilitation. Some mines enjoyed loans from multilateral and bilateral financial agencies facilitated and guaranteed by the government for expansion and rehabilitation while others were put on management contracts to improve their efficiency. Ashanti Goldfields had substantial funds during the period for expansion and rehabilitation while former state entities such as the Tarkwa gold mine, Prestea Mine and the diamond mine were given out to various groups of investors under management contract agreements

The second stage entailed the privatisation exercise, which was carried in a variety of ways including the following.

i) The government systematically disengaged itself by selling its shares in these mines to the private sector. In the case of Ashanti Goldfields Corporation, the government progressively reduced its stake to 19% in 1998, from its original 55% through the sale of its shares initiated in 1993, while in the case of Ghana Bauxite Company, the government reduced its shareholding from 55% to 20% in 1998.

ii) Complete divesture of hitherto state-owned mines to the private sector with government maintaining a statutory 10% free equity in those mines. Initially, foreign companies were invited to participate in management contract agreements and eventually bought them where they found them viable. For instance, Goldfields South Africa ran the Tarkwa mine on management contract from 1993 and 1994 and eventually purchased it in 1995. Johannesburg Consolidated Investments (JCI), another South African company, ran the Prestea mine on contract from 1995 to 1996 and purchased it in 1997. Dunkwa Goldfields and Ghana National Manganese Corporation were sold outright while Ghana Consolidated Diamonds, which was run by De Beers on contract, has failed to attract buyers and De Beers refused to exercise its option to purchase it. It has since remained on the divestiture list.

3.3.1 Mining Sector Legislation Reforms and Fiscal Liberalisation

From 1983 to date, various pieces of legislation have either been promulgated or revised in order to facilitate mining sector reforms. The most fundamental changes included:

- Promulgation of the Minerals and Mining Law, 1986, PNDCL 153
- Establishment of the Minerals Commission, 1986, PNDCL 154
- The Minerals and Royalty Regulations L.I. 1349, 1987
- Additional in l Profit Tax Law PNDCL 122 in 1985??
- Promulgation of Small-Scale Mining Law in 1989, PDCL 218
- The Precious Marketing Corporation Law, 1989 (PNDCL 219)
- Establishment of Precious Minerals Marketing Corporation, 1989

- Establishment of Environmental Protection Agency in 1994
- Drawing up of mining environmental guidelines in 1994
- The Minerals and Mining (Amendment) Act 1994
- Review of mining environmental guidelines in 1999.
- Divestiture of state-owned mines from 1992 to 1999

3.3.1.1 Concessions granted to Investors under the Minerals and Mining Law

One significant aspect of the reforms is the fiscal liberalisation of the mining sector through various provisions of PNDCL 153 and its amendments, PNDCL 122 and L.I. 349. The Minerals and Mining Law provided a wide range of concessions to investors. For example, a holder of mineral rights should be granted the following benefits[13]:

- Exemption from payment of customs import duties in respect of plant, machinery, equipment and accessories imported specifically and exclusively for the mineral operations and may after establishment receive additional relief from payment of customs and excise duties as provided in the Mining List;
- Exemption of staff from payment of income tax relating to furnished accommodation at the mine site;
- Personal remittance quota for expatriate personnel free from any tax imposed by any enactment for the transfer of any external currency out of the country;
- Exemption from selective alien employment tax under the Selective Alien Employment Tax Decree, 1973 (N.R.C.D. 201);
- Deferment of the payment of registration and stamp duties for a period not exceeding five years, to be granted by the Minister for Finance in consultation with the Minister for Mines and Energy, where they are satisfied that the circumstances prevailing at the time of the application for the benefit, justify such deferment.

One most significant feature of the Minerals and Mining Law is the scaling down of corporate income tax liability and the provision of more specific fiscal allowances that aim to reduce the general tax liability of mining sector operators. For example, corporate income tax, which stood at 50-55% in 1975, was reduced to 45% in 1986 and further scaled down to 35% in 1994. Initial capital allowance to enable investors to recoup their capital expenditure was increased from 20% in the first year of production and 15% for subsequent annual allowances in 1975 to 75% in first year of operation and 50% for subsequent annual allowances in 1986. The royalty rate, which stood at 6% of the total value of minerals won in 1975, was reduced to 3% in 1987[11]. Other duties such as mineral duty (5%), import duty (5-35%) and foreign exchange tax (33-75%) that prevailed and contributed significantly to government revenue from the sector until the reforms were all scrapped. (Table)

Apart from these, a holder of a mining lease may be permitted by the Bank of Ghana to retain a minimum of 25% of the operators foreign exchange earnings in an external account for the purpose of procuring equipment, spare parts, raw materials and for

[13] Kwesi Biney, 1998. *The Mining Sector- Too Much Concession?* Business Watch, Vol.2 No.1. June. P28

dividend payment and remittance in respect of goods for expatriate personnel, among others. Each company negotiates directly with the government the exact percentage that can be retained outside Ghana. The balance of revenues is returned to an account with the Central Bank of Ghana to cover operating costs, further capital expenditure and taxes etc. In addition to the law, the Bank of Ghana also guarantees the holder of a mining lease the ability to convert cedis to US dollars for the following purposes of distribution of either dividends or net profit resulting from investment made in Ghana with a convertible currency. Remittance of funds resulting from the sale or liquidation of assets, operations or interest associated with investment???. (Table5).

Typically, gold is sold directly to refiners in Switzerland and the revenue is held in an account there. Thus, although mineral exports form a significant part of Ghana's exports, their contribution to GDP is less than 2% (Table 3.1)

Table 3.1: Percentage of export value permitted to be retained offshore

Company	Minimum	Maximum
Ghana Australia Goldfields	55%	80%
Abosso Goldfields Ltd	55%	80%
Associated Goldfields	25%	45%
Takoradi Goldfields	25%	45%
Goldfields (Gh.) Ltd.	60%	95%
Ghana Gold Mines Ltd	60%	69%

Source: Thomas Akabzaa, 2000. *Boom and Dislocation: Environmental Impacts of Mining in the Wassa West District of Ghana*. Published by Third World Network, June.

3.3.2 Restructuring of Governmental Mining Sector Support Institutions

According to the World Bank, the overall objective of the programme to develop governmental agencies in the mining sector is to support sustainable development of Ghana's mining sector on an environmentally sound basis through the application of improved technology and strengthened mining institutions. The specific objectives are: (i) to enhance the capacity of 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 the techniques and mechanisms that will improve the productivity, financial viability and environmental impact of small-scale mining operations[14].

The general terms of the mining sector reforms necessitated the establishment of a national mechanism responsible for the administration of the mining and investment laws. Investors had decried the fact that mineral investment is regulated by several pieces

[14] Minerals Commission. 1995. Ghana – Project Implementation Plan: Mining Sector Development and Environment Project, (unpublished)

of legislation involving many departments such that the potential investor must approach various ministries to have a project screened and approved. Therefore, under the mining sector reforms, the Minerals Commission was set up in 1986, to ensure a one-stop service for investors and to minimise bureaucracy. It is responsible for formulating regulations, amending and modifying existing legislation as necessary to set up a sound regulatory framework for the sector. It develops guidelines and standards for monitoring of the environmental aspects of mining activities. The Commission also makes recommendations on minerals policy, advises the government on mineral matters, and reviews, promotes and develops mining sector activity.

Through its Small-Scale Mining Department, which was established in 1989, the Commission is responsible for enhancing small-scale mining operations, including by formulating and modifying the regulatory framework and improving the marketing of small-scale mineral production..

Similarly, the reforms aimed to support the Geological Survey Department, which conducts large-scale geological studies in the country. It prepares maps and reports and maintains a geological library.

In addition to policy changes, the evolution of mining technology has made it possible for low-grade material to be processed as ore. Comparatively lo- cost processing methods such as heap and bio-leaching made the processing of near-surface oxides and sulphides feasible through surface mining, a less costly method of intensive mining. All major new mines that came on stream are open-pit (Table 3.2).

Table 3.2: New mines coming on stream after 1986

NAME OF COMPANY	LOCATION	DATE OF START	MINING METHOD
Southern Cross Mining Ltd.	Konongo/Odumasi/A/R	1988	Open cast/heap leaching
Teberebie Goldfields Ltd.	Teberebie (Tarkwa W/R)	1990	Open cast/heap leaching
Ghana Australian Goldfields	Iduapriem (Tarkwa W/R)	1992	Open cast/CIL
Billiton Bogosu Gold Ltd.	Bogosu (W/R)	1990	Open cast/CIL
Goldenrae Mining Co. Ltd.	Kwaben (E/R)	1990	Alluvial/floating wash plant
Bonte Gold Mines Ltd.	Essase (A/R)	1991	Alluvial mining
Goldfields (GH) Ltd.	Tarkwa (W/R)	1994	Open cast/heap leach
Cluff Resources (GH) Ltd.	Anyanfuri (C/R)	1994	Open cast/heap leaching
Obenemasi Gold Mines Ltd.	Konongo/Odumase (A/R)	1995	Open cast/CIL
Prestea Sankofa Gold Ltd.	Prestea (W/R)	1995	Tailing/dump excavation/CIL
AGC (Bibiani) Ltd	Bibiani (A/R)	1997	Open cast/heap leaching
Abosso Goldfield Ltd	Damang (W/R)	1997	Open cast/CIL
Satellite Goldfields Ltd	Subri (W/R)	1999	Open cast/heap leach

4.0 STRUCTURE OF THE MINING INDUSTRY IN GHANA

4.1 Introduction

Ghana has the potential to produce a variety of minerals including limestone, silica sand, kaolin, stone, salt., The main minerals produced by large-scale companies are gold, diamond, bauxite and manganese, while industrial minerals such as kaolin, limestone and silica sand are mainly produced by small-scale operators.

While foreigners are the main owners of the large mining companies -- the government and private Ghanaian investors account for less than 15 per cent of the shares in these mines -- small-scale mining activity is statutorily restricted to Ghanaians.

Gold contributes more than 90% of the total value of minerals won in the country and has attracted the largest number of large and small-scale operators. Statistics from the Mines Department indicate that there are 16 large to medium-scale gold mines with seven other gold projects at mine-development stage that are likely to come on stream by the close of the year 2001.

Both foreign and local companies are actively involved in explorationof. By October 2000, 224 local and foreign companies held mineral rights for gold exploration and exploitation, while over 600 registered small-scale miners, along with an estimated 200,000 informal miners, popularly called "galamsey operators", were scattered on prospecting grounds throughout the country.

Of the $612.9 million in total mineral export earnings in 1997, gold accounted for $579.2 million, or 94.5%, while the remaining 5.4% came from diamonds, bauxite and manganese[15]. (Table).

4.2 Large-scale Mining

4.2.1 Major Mining Companies

There are 19 large mining companies in Ghana operating 16 gold mines, and one bauxite, one diamond and one manganese mine. Currently, with the exception of Ashanti Goldfields Company's Obuasi mine and the Prestea Gold Resources Limited, all the other mines are surface operations (Table 4.1)

The Obuasi mine of Ashanti Goldfields Corporation (AGC), which started in 1890, is by far the largest and oldest operation in the country. The mine accounts for more than 50% of Ghana's total annual gold production and AGC itself is the largest company in the country. It has gone multinational, with mines in Guinea, Mali, Tanzania and Zimbabwe, and exploration projects in about 15 African countries.

The company has undertaken an ambitious expansion programme since 1995 through acquisition of and merger with other companies. Other mines operated by the company in

[15] The Institute of Statistical, Social and Economic Research, (ISSER), 1998. *The State of the Ghanaian Economy*, ISSER, University of Ghana, Legon, June (p67-68)

Ghana through its expansion programme include the Bibiani, Anyanfuri and Iduapriem mines.

Diamonds are mined from alluvial sources mainly from the Birim Diamond field at Akwatia and the Bonsa diamond field in the Eastern and Western regions respectively. Ghana Consolidated Diamonds Limited (GCD) undertakes large-scale diamond mining. However, this company has been on the divestiture list since 1993. Its share of the nation's diamond output has been dwindling and it currently accounts for less than half of total annual diamond output.

Manganese is mined at Nsuta in the Western region by the Ghana Manganese Company Limited (GMC)[16] while bauxite is mined at Awaso by the Ghana Bauxite Company Limited (GBC).

Table 4.1 Large-scale mining companies in Ghana (2000)

Company	Commodity mined	Mines	Type of mine
AGC	Gold	Obuasi Anyanfuri[a] Bibiani[b] Iduapriem[c] Prestea Sankofa[d] Asikam	UG& OP OP OP OP Tailings Alluvial
Abosso Goldfields Ltd.	Gold	Damang (near Tarkwa)	OP
Goldfields (Gh) Ltd.	Gold	Tarkwa	OP
Teberebie Goldfields Ltd	Gold	Teberebie	OP
GAG	Gold	Iduapriem	OP
Prestea Gold Resources	Gold	Prestea	UG
Billinton Bogoso	Gold	Bogoso	OP
Bonte Gold Mines Ltd.	Gold	Akrokerri	Alluvial
Dunkwa Continental Goldfields Ltd.	Gold	Dunkwa	Alluvial

[16] This mine was formerly state-owned. It was divested to its present owners in 1994. Alk Elkem Norway is the majority share holder.
[a] Acquired in a purchase of Cluff Resources
[b] Acquired from International Gold Resources (IGR) of Canada (As an advance prospect)
[c] Acquired in merger with Golden Shamrock in 1996
[d] Acquired in purchase of SAMAX Gold Inc. in 1998

Company	Commodity mined	Mines	Type of mine
Obenemase Gold Mines	Gold	Obenemase	OP
Amansie Resources	Gold	????????	OP
Ghana Consolidated Diamonds	Diamonds	Akwatia	Alluvial
Ghana Bauxite Company	Bauxite	Awaso	OP
Ghana Manganese Company	Manganese	Nsuta	OP

4.2.2 OWNERSHIP STRUCTURE OF LARGE-SCALE MINING COMPANIES

The government of Ghana controlled at least 55% shares in all large mining operations before the era of structural adjustment. However, the ownership structure of the industry has radically changed with private investors now playing a leading role. Foreign companies control an average of about 70% of shares in these mines. The government has 10% free share in each mine, with the option to acquire an additional 20% at the prevailing market price. The dominant players in exploration are mainly junior companies from Canada, Australia and South Africa, with lesser investors from United States, United Kingdom, Norway, China etc.

4.3 Small-Scale Mining Sector

Small-scale mining has traditionally played an important role in the economy of Ghana. Mining by indigenous people goes back to the 4th century. They were the only miners of gold and diamond in the traditional economy until 1905 when the colonial authorities through legislation made their operations illegal.

Their operations remained illegal until 1989, when the government legalised them. During the period that the sector was outlawed, the miners still carried out their operations amidst harassment by the security agencies. Small-scale mining is estimated to provide direct and indirect employment to over one million people.

The sector, if properly managed, could provide employment to many rural communities and generate significant revenue for the government. In fact, between 1989 and 1994, small-scale mining earned the government $63 million. The government has regularised small-scale mining activities through the Small-scale Mining Law

A dangerous development is the growing antagonism between small-scale miners and large-scale companies. The proliferation of large-scale exploration and mining companies

in some cases limits the ground on which small-scale indigenous miners can operate. It is for this reason that in recent times there has been upsurge of reported clashes between large-scale companies and small-scale miners, resulting in considerable damage to both sides. This serious problem needs to be addressed as it has the potential to undermine international investor confidence.

The government aims to allocate to small-scale miners areas too remote for large scale mining through the small scale mining programme is welcomed. Such a move would, apart from its social benefits ensure more efficient extraction of resources. It would also curtail the haphazard operations of these mines and the attendant environmental degradation attributed to it.

In 1989, as part of the minerals sector restructuring, the small-scale mining sector was formalised through the enactment of PNDC Law 218; the Small Scale Gold Mining Law. Under this law, the Small Scale Mining Project, a Department of the Minerals Commission is responsible for registering and supervising small-scale miners in the country. The project has so far registered over 600 co-operative and individual small-scale miners.

The government has also established the Precious Minerals Marketing Corporation. This was the sole governmental agency for the purchase of the produce of small-scale miners. The government has since opened up the marketing to private licensed buyers.

Despite the legalisation of their operations, some still operate illegally. The small-scale mining law requires them to register with the Minerals Commission who would assign them specific areas to operate. But because of the several frustrations they meet in the process, many of them opt to operate illegally. This has given rise to two groups of small-scale miners, those registered and licensed and those operating illegally (galamseys).

The small-scale mining sector as a whole is an important player in the country's mining sector. It is the largest producer of diamonds and fifth largest producer of gold (Table 4.2).

Table 4.2: Mineral Production from the Small Scale Mining Sector (1989 to 1998)

YEAR	GOLD (ounces)	DIAMOND (carats)
1989	9,272	151,605
1990	17,234	484,876
1991	8,493	541,879
1992	170,866	479,874
1993	33,647	368,194
1994	89,520	411,303

1995	128,534	333,700
1996	112,240	450,300
1997	112,240	589,900
1998	128,335	400,000

4.4 Public Sector Mining Industry Support Organizations

The long tradition in the extractive sector has enabled Ghana to build an institutional framework of organizations to support the industry. These are: the Ministry of Mines and Energy, the Minerals Commission, the Geological Survey Department, the Chamber of Mines, the Mines Department, the Environmental Protection Agency, Lands Commission, Land Valuation Board and the Forestry Commission. These organizations are required to provide support to ensure optimal exploitation of the country's natural resources.

The Minister for Mines and Energy is responsible for all aspects of the minerals sector in the Ghanaian economy and is the grantor of mineral exploration and mining licences and leases. Within the Ministry, the Minerals Commission has the responsibility for recommending mineral policy, promoting mineral development, advising government on mineral matters and serving as a liaison between the government and the industry. The Ghana Geological Survey Department conducts geological studies and prepares geological maps for government. The Mines Department is responsible for safety in the mines. The Ghana Chamber of Mines is a private association of operating mines. It seeks to promote mining interests and communicates and exchanges information on mining matters with government and other public and private bodies. It also engages in discussion of proposals for legislative bodies and also negotiates miners' compensation and benefits with the National Union of Mine workers.

The Lands Commission maintains legal records of exploration licences and mining leases and participates in the examination of new licence applications. The Commission also seeks to initiate policies relating to stool and state lands. The Valuation Board provides rates for valuation of property affected by mining operations. The Environmental Protection Agency tries to strike a balance between the demands of the rapid economic growth and the need to protect the country's natural resources and protect the health and welfare of the people, ensuring environmentally sound resource extraction. It conducts and promotes studies, investigations, surveys, research and analysis relating to the improvement of the country's environment and to maintain sound ecological system. The Forestry Commission is responsible for the management of the country's forest. The department is supposed to work with the Minerals Commission on the granting of exploration licences and mining leases to ensure a balance between mineral extraction and sustainable forest resources. This collaboration became particularly necessary when the Chamber of Mines started lobbying for mining concessions within forest reserves

The defined roles of the various institutions are the statutory roles. There are, however, no effective cross-sectoral linkages among these institutions. This lack of effective collaboration among the sector institutions contributes to some of the environmental problems resulting from mining. A number of exploration companies are currently operating in forest reserves because local forestry authorities are not always aware of the grant of licences to companies to operate within forest reserves until these companies commerce exploration activities in such areas. The growing encroachment of forest reserve and the growing conflicts among communities displaced by mining and mining companies over payment of compensations reflects lack of harmony among mining sector institution.

5.0 THE STUDY AREA

5.1 Introduction

The study area is Tarkwa and its environs in the Wassa West District of the Western Region of Ghana. Tarkwa is the administrative capital of the Wassa West District. This chapter presents a brief discussion of the geographic, demographic, and socio-economic characteristics of the study area and assigns reasons for the choice of Tarkwa as the site for the study. The Western region is shown in figure 5.1 in national context.

Tarkwa has nearly a century of gold mining history and has the largest concentration of mines in a single district on the continent of Africa, with virtually all the six new gold mines operating surface mines. Many of the multinational mining companies in the area have gold mining concessions in other West African countries with similar rock units. These rocks occupy about 60% of Ghana and nearly the entire study area. (figure 5.2)

The area contains a significant proportion of the last vestiges of the country's tropical rain forest, which declined from 8.2 million hectares in 1992 to 750,000 hectares by 1997.

It is characterised by an undulating terrain with a magnificent drainage system. It experiences the heaviest and most frequent rains in the country.

The heavy concentration of mining activities has generated environmental and social issues in the area. The issues centre on resettlement and relocation, negotiation and compensation and environmental damage. The persistence of these socio-environmental problems accounts for the occasional and frequent resistance from the affected communities as well as clashes between them and the mining companies. The destruction of sources of livelihood and the spate of resistance and clashes have given rise to an environmentally conscious population from which local social movements are emerging.

5.2 Location

The Wassa West District lies between latitudes 4^0 N and 5^0 40" N and longitudes 1^0 45" W and 2^0 10" W. The District covers a total land area of 9235km^2, representing % of the total land area of the country. It is bordered to the north by the Wassa Amenfi District, to the south by the Mpohor-Wassa East and Ahanta West, to the east by the Mpohor-Wassa East and to the west by the Nzema East District. Figure 5.3 shows the location of the district in regional context.

5.3 Climate

The area falls within the equatorial climatic zone, primarily the tropical rain forest zone of Ghana. The District has a mean annual rainfall in the range of 1500mm and 1933mm with most of the rains occurring from April-June and October-November giving it a bi-modal rainfall regime.

Relative humidity for the area ranges from 70% to 90%. The daily temperature ranges between 20^0 C and 40^0 C while the mean monthly temperature ranges from24^0 C to 30^0 C.

5.4 Topography

Tarkwa and its environs lie generally within mountain ranges covered by thick forest with a variety of fauna and flora. In some cases, the ranges are interspersed by undulating valley bottoms. Tarkwa township and its surrounding settlements are wedged between two long ranges of hills considered the two limbs of a gold mountain. These mountain ranges rise to an average of 300 metres above sea level but can reach 335 metres. These evergreen mountain ranges are rich in biodiversity. at least, before the unset of mining.and with the numerous settlements in-between them present appealing aesthetic scenery. Unfortunately, these ridges are the main areas where gold is found, and they are targets for open pit mines.

5.5 Drainage

Tarkwa presents a unique drainage system. The mountain ranges constitute the source of water for many of the rivers and streams in the area. The Tarkwa region is also part of an extensive drainage basin known as the Ankobra Basin comprising the Ankobra River and its tributaries. Locally, the Bonsa Sub-Basin comprising the Bonsa River and its tributaries such as Essumang, Angonabeng and Ahumabru covers the area. Almost all tributaries of the Bonsa in the Tarkwa region take their sources from the ridges within the mining concessions of large-scale mining companies operating open pit mines in the area. These major rivers and their tributaries facilitate mining activities in the area -- particularly for galamsey operators -- by providing the water required for the processing of gold.

5.6 Vegetation

The vegetation of the area consists of tropical rain forest characterized by rich undergrowth of climbers and shrubs of varying heights. The trees, which generally reach heights of between 15 and 45 metres -- are distributed mostly at the summit of hills where mining has not yet reached. There has been a rapid reduction in the density of trees in areas affected by mining activities. Lack of protection from mining and lumber activities is primarily responsible for the poor vegetation in the area. Where the area has been mined out, the vegetation consists of ferns and other shrubs which grow profusely on the hilly slopes.

5.7 Demographics

According to the 1994 census, the population of the Wassa West District is 260,000 with an estimated growth rate of 3.0%. The spatial distribution of the population is skewed, with a heavy concentration in the mining areas. About 70% of the total population resides in the Tarkwa mining region, where population growth is also said to be above the national average of 3.1%. This is due mainly to migration of people to the area in search of jobs in the mining sector.

The indigenous ethnic group is the Wassa people but the ethnic mix is highly varied due to mining activities. The growing influx of people in search of jobs in the mines and the drift of unemployed youth from other regions in the country to the area for galamsey mining are major contributory factors to the growing population.

The total population distribution by sex is higher for females than males and the economically active age group constitutes the largest portion of the population of the area. The male-female ratio for the area is estimated at 1:9 while 70% of the population is of working age (15-64 years) . Children up to 10 years old constitute 24.8% of the population, compared to a national average of 45%, and old people (65 years and above) make up 4.6% of the population. This unusual population structure is due to the generally high rate of labour migration in search of jobs in the mining sector and various trades around the mines.

5.8 Economic Activity

The Wassa West District is said to contain 44% of Ghana's closed forest, accounts for 30% of the country's gold production, about 39% of cocoa, 50% of the country's standing commercial timber and 100% of manganese and bauxite production[1].
This natural resource potential provides the basis for varied economic activities in the area. Outside Tarkwa township and in the rural settlements, subsistence and commercial farming have been the main economic activity among the people. Currently, however, mining has overtaken farming as the single largest economic activity in the area (Table 5.1).

Table 5.1: Employment Statistics for Mines in Study Area (1995)[22]

Company	Total Labour	Expatriate	Expt/total
TGL	941	29	0.0308
GAG	536	26	0.491
BBG	1058	32	0.0302
GGL	1459	21	0.0121

Barnex	1580		
Sankofa	143	3	0;0163
GMC	732	4	0.0066
AGL	xxxxxx	560	NA
Small-scale and galamsey	6000		

Source: Data from Minerals Commission

The only large-scale industry apart from mining is a glass factory located at Abosso with a workforce of 300[2]. There is also a tyre factory at Bonsa, which was out of production for some time but resumed production around mid-1998.
Other economic activities in the area include wood processing, textile manufacture and metal processing. There are also small-scale industries in areas like milling, gari processing, carving, craft, carpentry, black-smithing, tailoring and petty trade.

5.9 The Mining Industry

Tarkwa has the highest concentration of mining companies in the country and the West African sub-region and possibly the Africa. Out of the 16 large-scale mines in Ghana eight of them are located in the Tarkwa area, producing a significant proportion of the country's gold output. The only manganese mine in the country is also located in this area. In addition, there are over 100 registered, small-scale gold and diamond mining companies in the area together with more than 600 unregistered miners popularly known as galamsey operators. There are also about 30 local and foreign companies exploring for gold and diamonds in the area.

Table (5.2): Mining Companies Operating in Tarkwa Mining District

COMPANY	LOCATION	START	PROCESSING METHOD
GFL	Tarkwa	1993	Underground/open cast/heap leach
TGL	Teberebie (Tarkwa)	1990	Open cast/heap leach
BGL	Tarkwa	1990	Open cast/CIL
GAG	Iduapriem (Tarkwa)	1992	Open cast/CIL/heap leach
Barnex (Prestea) Ltd	Prestea	1997	Underground/Open pit/CIL
Sankofa Gold Ltd	Prestea	1995	Tailings treatment/CIL
Abosso Goldfields	Abosso	1997	Open pit/CIL
SGL	Tarkwa	1999	Open pit/CIL

***Source**: Boom and Dislocation*

All eight companies employ the open-pit method of mining. Also, all the companies use cyanide heap leach operations as shown by the table. These methods have far-reaching consequences for human health and environmental safety. The use of heavy machinery to exploit low-grade ore has a destructive effect on the vegetation of the area and generates both dust and noise pollution.

Table 5.3: Mineral production in the Tarkwa Region (1991-1996)
(Gold is in ounces)

Company	1991	1992	1993	1994	1995	1996
Gold fields (Gh) Ltd	27595	26550	39265	39394	44442	
Teberebie Goldfields	79111	128594	164885	177290	235471	
GAG		37893	123302	118602	124279	
Abosso Goldfields						
Barnex Ltd	22773	16878	21024	19673	22033	
Sankofa					5255	
Billinton Bogosu	61678	78076	94536	109050	107677	
GMC (in tonnes)	311824	276019	295296	138420	179359	
Small-scale Gold Miners	463.6		503.88	791.27	805.99	537.34

Source: Minerals Commission.

6.0 IMPACT OF MINING ON THE AREA

6.1 INTRODUCTION

Since mining projects are usually located in remote sites, mining companies have had to invest in considerable physical and social infrastructure such as roads, schools, hospitals, electricity and water supplies. Communities within mine locations have generally been beneficiaries of some of these facilities. At the same time, these communities have been victims of air and water pollution as well as other forms of environmental degradation resulting from mining operations. Mining also often requires a considerable degree of land alienation. Thus, while mining projects generally have weak links with the rest of a host national economy, they can have a decisive impact on the communities in which or near which the mines are located. (Kwesi Anyemedu, 1992)[1].

The structural adjustment policy pursued by the government of Ghana had a significant influence on the mining boom in Ghana and within the Tarkwa area especially. The boom in fact induced the flight of resources and the livelihood of the people into the hands of transnational mining companies operating in Tarkwa and its environs. And in the face of the boom, national environmental policies have not been able to adequately guard and protect local communities from the adverse impact of mining operations. This has led to a deepening of poverty levels of the people.

This section contains a brief discussion of the evolution of Ghana's environmental policies for the pre-SAP (1972-1982) and post-SAP (1983-1999) periods. It then assesses the environmental impact of mining on the livelihood of the people of Tarkwa area.

6.1.1 The Evolution of Environmental Policies in Ghana --1972 to 1982

In 1972, the United Nations General Assembly held a conference on the Human Environment in Stockholm, Sweden. Ghana participated in the conference, which agreed to give a human face to all type of development. As a commitment to the global efforts towards environmental protection and to give meaning to national efforts at environmental management, the Environmental Protection Council (EPC) was created in 1974 by NRCD 239. This was the beginning of national recognition of the need to bring environmental issues into the development main stream. However, this recognition and the creation of the EPC were propelled more by changes in the international scene towards environmental stewardship than by decisive national action to regulate its environmental resources especially mining activities. Decree 239 was primarily aimed at controlling the use of chemicals in the country. This is evidenced by the conspicuous absence from an 18-member Toxic Chemicals Committee appointed by the EPC to advise on such matters, of any of the institutions that deal with mineral exploration[2]. Even though the EPC was created in 1974, it remained an advisory body until 1994 when it became an agency with regulatory powers. It took a considerable period of time to place

the Council under the appropriate ministry. The EPC began as a department under the Ministry of Finance and at one time, it was moved to the Ministry of Health and then to the Ministry of Food and Agriculture. The reshuffling continued until a full Ministry of the Environment was created in 1992.This was later turned into the new Ministry of Environment, Science and Technology.

These changes did not reflect on the strength and capacity of the Environmental Protection Council to protect the country's environmental resources from destruction by the mining industry in particular. There were also no provisions in the existing mineral laws to protect the environment from mining operations.

6.1.2 The Evolution of Environmental Regulations --1983 to 1999

The ERP/SAP was launched in 1983 with the main objective of restructuring sectors of the economy to achieve an accelerated annual growth rate of at least 5%. This led to a number of economic and mineral policy reformsHowever, while the mining sector reforms were going on, very little was done to reform existing environmental laws to accommodate the destruction that would arise from accelerated growth in the mining sector. In 1988, an attempt was made to quantify annual losses to the economy through environmental degradation. Conservative estimates amounted to 41.7 billion cedis, the equivalent of 4 per cent of total GDP[3]. The following year, the EPC began to apply the environmental impact assessment (EIA) as an environmental management tool and a pre-requisite to all development projects, especially of an industrial kind. However, the Council lacked the necessary legal backing to effectively enforce this requirement on industry, including mining.

This process was given impetus by the preparation and adoption in 1991 of a National Environmental Action Plan (NEAP) and a National Environmental Policy (NEP). The NEP, which provided the broad framework for the implementation of the NEAP, sought to assess all undertakings including mining that might have a potentially adverse impact on the environment and to set and implement appropriate quality standards and guidelines for acceptable levels of public health and environmental safety. As observed by Thomas Akabzaa, one major product of the NEP that addresses the environmental impact of the mining sector is the Mining and Environmental Guidelines, published in 1994 with the objective of assisting the mining industry to operate in an environmentally sustainable manner[4]. The NEAP and NEP were given legal backing in December 1994 when the EPC was transformed into the Environmental Protection Agency (EPA) by an Act of Parliament (EPA Act, 1994 (Act 490). Act 490 made EIA a mandatory requirement for all development projects and programmes, including mining. With the passage of Act 490, it became mandatory for all new mining projects to prepare EIA, while existing mines were required to prepare and submit Environmental Management Plans (EMP).

Procedures for the application of EIA to development projects and mining have been well developed and documented. Once in operation, the mines are obliged to prepare and submit their environmental action plans, annual environmental reports and environmental audit reports to EPA. This is to ensure periodic assessment of environmental performance

by all existing mines and to issue such directives as may be necessary for the timely intervention by the mines to address any environmental problems that might result from their operations.

Act 490 also gave rise to the passage of an Executive Instrument 9, 1999 and regulations to support issue specific areas under the Act and the NEP. One of the regulations is Legislative Instrument 1652, Environmental Assessment Regulations, 1999. The Executive Instrument 9, 1999 made provision for the appointment of certain categories of staff of EPA as public prosecutors in respect of offences committed under Act 490 and the Pesticides Control and Management Act 528, 1996 while the legislative instrument provided standards for granting permits and licenses.

The evolution of these policies was intended to redefine the functions of EPA as a regulatory institution with the legal powers to ensure compliance and enforcement of environmental quality standards. Unfortunately, this has not been practicable for most mining operations for a very long time due to the inadequate institutional capacity of the Agency, the lack of coordination among mining sector institutions and the weaknesses of the EIA process.

6.1.3 Inadequate Capacity of EPA

The Environmental Protection Agency lacks the required capacity in terms of personnel and finance to ensure compliance and enforcement of environmental quality standards. The operational environment defined by the law is quite extensive, applying to all types of industry including mining and agriculture. Unfortunately, the appropriate staffing levels, especially of professional staff, are woefully inadequate to meet the extensive demand imposed by Act 490. By the close of 1999, the total staff of the Agency was around 200. Between late 1999 and the first half of 2000, the Agency had only one Legal Officer. The Tarkwa District office, the only district in the country to host an EPA office, has only one officer to cover a total of nine mining companies. Inadequate funding compounds the staffing situation of the Agency.

The penalties provided for under Act 490 and its legislative instruments are so low as to have little if any deterrent effect on mining companies. For instance, the public prosecutors provided for under Executive Instrument 9, 1999, are limited to the lower courts where the maximum fine for an offence does not exceed 200,000 cedis. Therefore, the only effective tool available to the Agency is the threat of mining license forfeiture or cancellation.

6.1.4 Lack of Coordination among Mining Sector Institutions

Mining activities affect the multiple use of the environment, especially land and water. It does require cross-sectoral efforts from all mining sector regulatory institutions to promote the ecological and social objectives of mining. This has not been the case in Ghana, particularly for the mining industry in Tarkwa. A number of the mining sector public institutions take unilateral action regarding mining investment. For instance, until

recently, the Minerals Commission could grant a license to a mining company without reference to the Forestry Service, the EPA or the Land Commission.

The chiefs, who by tradition are the custodians of land, have little input in the granting of mining concessions. The chiefs are used by the state as the local clearinghouse for the establishment of mining projects in their respective communities. One of the chiefs at Iduaprem lamented that in most cases, the mining companies call on them when all investment decisions have been reached with the state. The companies come to announce these decisions to the chief. In fact, most of the mining and environmental laws at the inception of SAP were passed at a time when the primary concern of the state was to grant investors mining title, offering them technical rules and security to facilitate accelerated investment and growth. To tie up mining investment to strict environmental compliance could cause delays in establishing mining projects and thus serve as a disincentive to the rapid growth of investment.

6.1.5 Weaknesses of the Environmental Impact Assessment (EIA)

The guidelines developed to protect the mining environment through the application of EIA are well laid out. The EIA procedure is properly documented as an environmental management tool. Nonetheless, the guidelines are associated with practical weaknesses which deny some stakeholders of mining investment, especially affected local communities, the opportunity to participate fully in the EIA process.

A major principle of the EIA process is that the proponent is required to give notice and advertise the proposal in the national press to enable the public to express its interest or concerns or to comment on the project. On receipt of a draft EIA report, EPA publishes it for people with specific interest or concerns to study the report and raise such concerns within a period of 21 days from the first day of publication[5]. The channel for notifying and soliciting information from interested and affected people does not provide a level playing field for the communities who are directly impacted by such mining projects. First, the sources of information, which are primarily the national press or the premises of District Assemblies, are inaccessible for these communities. Worse still, EIA reports are presented in technical language and these communities do not have the capacity to study and understand the issues raised in the reports. The input of the affected communities is thus lost in the process.

Related to this is the confidentiality clause for Environmental Audit Reports which limits public access to the information required for promoting and ensuring environmental compliance by mining companies. Generally, Environmental Audit Reports are treated as confidential documents and therefore are out of the reach of the public.
The confidentiality issue is complicated by the fact that a company is not obliged to accept recommendations made by an audit report. When an audit has made recommendations to minimise the negative impact of mining activities on the environment, a company can refuse to accept these recommendations. This is possible because there is a proviso in the guidelines that a company is not obliged to accept all the recommendations of an audit, especially if it considers some of them impractical, too

costly or that the recommendations do not fit in the operating or management structure of the company[6]. This makes EIA appears to be restricted to the submission of a report.

Another problem is that effective community participation is not guaranteed in the EIA process. This is the case because the proponent or their consultant conducts the study and by so doing, establishes the desirable content of the report after consultation with selected individuals, particularly chiefs who might not be directly impacted by the project but enjoy the benefits of the project in the form of royalty payments as a result of the existing, complex land tenure system.

Mining companies and their sympathisers argue that community concerns are addressed adequately during environmental impact hearings, which are usually organised to hear the concerns of the community regarding the project. However, experience has shown that such public hearings are nothing more than public relations forums where companies largely dwell on the expected positive economic benefits of the project to both the state and the local population while downplaying the negative impacts of the project[7].

Also there is no follow up in Ghana where such hearings have raised serious objections to an EIA. For example, in one mining community Mempeasem, when the C4 Mining Company presented its EIA, it could not convince the inhabitants about how it was going to deal with the expected environmental and social impact of the project. Despite this, the Minerals Commission went ahead and issued it with a mining lease. Again, while the Kyekyewere community was still waiting for some feedback on a public hearing held in September 2000, the Abosso Goldfields began to take action to resettle the community. Another shortcoming of the EIA is that they do not adequately deal with the social impact of mining projects. Generally, when social issues have been addressed, they tended to cover payments of compensation and royalties. So far only two projects, Goldfields (GH) Ltd and Abosso Goldfields Ltd, have carried out social impact studies[8].

These weaknesses prevent the regulations from supporting the population of the affected communities in Tarkwa. The weaknesses have providedthe leeway for mining operations to have a severe impact on the environment, deepening the plight and poverty of the people and affecting their overall livelihood.

6.2 ECONOMIC AND SOCIAL IMPACT

6.2.1 Introduction

It would be extremely difficult to perform a thorough cost–benefit analysis of mining in view of time constraints and the weak culture of information disclosure in the country in general and in the mining sector in particular. What this chapter seeks to do is to discuss the perceived benefits of mining investment on local communities, as ascertained through the participatory study and to see why some of these perceptions do not conform to reality on the ground. Thus, these cursory cost-benefit analyses of the impact of mining sector investment on local communities have been done looking at economic and social effects. the environmental and health impact will be considered in the next chapter. The

analysis compares the level of foreign direct investment inflows to the sector since the reforms to the level of employment, net foreign exchange earned, extent of linkages with other sectors, and the negative social and cultural impact of mining investment in the area.

6.2 2. Economic Impact

6.2.2.1 Perceived Economic Benefits

The mining sector has been the leading recipient of foreign direct investment capital. Between 1986 and 1997, the sector attracted about US$3 billion of foreign direct investment, representing more than 60% of all such investment in the country. Most of these funds went into mine rehabilitation and expansion of existing mines, new exploration projects, development of new mines and establishment of mining support companies such as equipment supply companies, assay laboratories etc.

The most publicised benefits of the increased mining sector investments resulting from Ghana's economic reforms include the following:

- Mining is the leading earner of foreign exchange in the country
- Provides substantial government revenue
- Provides capital and social infrastructure to the public
- Generates direct and indirect employment
- Develops communities in mining areas

6.2.2.1.1 Foreign Exchange Generation

Increased investment in the mining sector as a response to economic reforms has resulted in monumental increase in output in all major minerals, with gold enjoying the most phenomenal growth (Table). Total value of minerals produced has equally been ballooning. The sector has become the leading gross foreign exchange earner since 1992. The sector's contribution to the nation's gross foreign exchange earnings grew progressively from 15.60% in 19986 to 27% in 1990, 45.5% in 1995 and to 46% in 1998. In absolute terms, the sector generated US$ 124.4 million in 1986, US$242.3 million in 1990, US$682.2 million in 1995 and US$793 million in 1998 (Table 6.1). Gold export earnings increased from 14.5% of total exports in 1986 to 43.3%, in 1995 but decreased to 37.6% in 1998 due to depressed gold prices.

TABLE 6.1: SHARE OF MINERALS IN TOTAL EXPORTS (1983-1995)

EXPORTS	UNITS	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	199
Gold	Mil. $	114.1	103.3	90.6	106.4	142.5	168.5	159.9	201.6	304.4	343.4	415.7	548.7	651.1	612
Diamonds	Mil. $	2.8	2.8	5.5	4.8	4.0	3.5	5.2	16.5	19.2	19.3	14.0	20.4	13.8	13
Manganese	Mil. $	3.1	8.3	9.1	8.2	7.8	8.9	11.7	14.2	20.2	16.4	13.5	9.6	6.8	7
Bauxite	Mil. $	1.7	0.9	2.7	5.0	5.2	6.9	9.1	10.0	8.6	9.5	10.4	9.6	10.5	8
Total Minerals Exports	Mil. $	121.7	115.3	107.9	124.4	159.5	187.8	185.9	242.3	352.4	388.6	453.6	588.3	682.2	641
Total Merchandise Exports	Mil. $	439.0	567.0	632.0	749.0	874.0	880.7	808.2	896.7	997.6	986.3	1020.3	1214.8	1500.0	
(Minerals/All Merchandise Exports)	%	27.72	20.34	17.07	16.61	18.25	21.32	23.00	27.02	35.32	39.40	44.46	48.43	45.48	
Gold/Minerals	%	93.76	89.59	83.97	85.53	89.34	89.72	86.01	83.20	86.38	88.37	91.64	93.27	95.44	95.4
Diamonds/Minerals	%	2.30	2.43	5.10	3.86	2.51	1.86	2.80	6.81	5.45	4.97	3.09	3.47	2.02	2.0
Manganese/Minerals	%	2.55	7.20	8.43	6.59	4.89	4.74	6.29	5.86	5.73	4.22	2.98	1.63	1.00	1.1
Bauxite/Minerals	%	1.40	0.78	2.50	4.02	3.26	3.67	4.90	4.13	2.44	2.44	2.29	1.63	1.54	1.3

Sources: Minerals Commission and Ghana's annual Budget Statements

6.2.2.1.2 GENERATION OF GOVERNMENT REVENUES

The industry generates revenue for the internal economy through the following sources:

- Salaries, wages and other payments made to employees and contractors
- Corporate income taxes, royalties, concession rents, services, customs and harbour duties
- Taxes on salaries of employees, and social security contributions from employees and their employers
- Dividends to shareholders
- Equipment and consumables purchased locally
- Import duty and purchase tax on vehicles
- Electricity and water charges
- Divestiture of state mining companies and sale of government shares

Table 6.2: Contribution of the Mining Sector to Government Revenue.

Year	Income Tax (Mining)	Mineral Royalties	Total Revenue (Mining)	Total Revenue (IRS)	% from Mining
1990	2,825,941,158	1,893,436,000	4,719,377,158	52,818,068,300	8.94
1991	821,844,979	3,021,277,000	3,843,121,979	61,485,625,496	6.25
1992	4,555,051,883	4,545,804,000	9,100,855,883	74,731,531,366	12.18

1993	4,310,958,293	7,485,121,000	11,796,079,293	113,236,997,000	10.42
1994	6,942,264,873	12,783,689,000	19,725,953, 873	166,595,941,000	11.84
1995	19,713,191.185	20,911,926,000	40,625,117,185	275,513,201,000	14.75

Source: Adadey 1997: The role of the mining industry in the economy of Ghana.

Table 6.3: Divestiture proceeds from mines in Study Area (in millions of US dollars)

Company	Purchase price	Amount paid	Balance	Investors
Tarkwa Goldfields	3.0	3.0	Nil	Goldfields (SA)& SSNIT
Prestea Goldfields	2.0	2.0	Nil	JCI
Ghana National Manganese Corp.	4.0	2.0	2.0	Elkem

Source: Divesture Implementation Committee.

6.2.2.1.3 GENERATION OF EMPLOYMENT

The mining sector is said to be a significant contributor to formal and informal employment in the country. Up to 1995, the sector accounted for an estimated 20% of formal sector employment, with large-scale mining companies employing about 20,000 people, (Table 5.5) and the small-scale and artisanal mining sectors accounted for more than twice that number. In addition, mining sector support companies such as assay laboratories, equipment leasing and sales agencies, security and catering agencies also contribute to formal sector employment.

Table 5.5 Employment Statistics for Mines in Study Area

Company	1985	1990	1995	1996	1999
TGL			941	1194	1413
GAG			536	586	680
BBG			1058	1025	
GGL			1459		1138
Barnex			1580		1496
Sankofa			143	227	
AGL			-	-	309
SGL			-	-	523
GMC			732	920	693

Source: Minerals Commission

6.2.2.2 REALITIES ON THE GROUND

6.2.2.2.1 FOREIGN EXCHANGE AND GOVERNMENT REVENUE GENERATION

While in gross terms, mining is the leading foreign exchange earner, its net foreign exchange contribution to the national economy has been minimal. Generous incentives and tax breaks given to investors and the fact that mining companies retain on the average about 75% of their export earnings in off-shore accounts for various purposes helps explain the sector's minimal contribution to net foreign exchange receipts.

Similarly, the sector's contribution to government revenue has been minimal in light of the fact that mining attracted over 70 per cent of total FDI during the ERP. The mining sector contribution to revenue mobilised by the Internal Revenue Service (IRS) increased from 8.4% in 1990 to 14.4% in 1995. The bulk of mining sector revenue emanates from royalties and income taxes of local employees. Most of the companies in the country and the study area in particular do not pay corporate income taxes due to the virtual tax holiday enjoyed by these companies as a result of the generous capital allowances that they enjoy.

6.2.2.2.2 GENERATION OF EMPLOYMENT

The sector has a relatively limited capacity to generate employment. This is because surface mining operations are capital-intensive with relatively low labour requirements. All post-SAP mining ventures have being surface operations. Goldfields (Gh.) Limited was one of just three mines operating labour-intensive underground mines but it closed its underground operations in 1999, sending home about 1,000 workers.
The divestiture of formerly state-owned mines resulted in significant restructuring and cost-cutting by their new owners to ensure efficiency. In addition, the persistent decline in commodity prices -- especially gold -- has resulted in radical restructuring to reduce costs. Many mines have reduced their labour force substantially, in the last three years especially.

Similarly, increased unemployment due to massive lay offs at some mines has widened the income gap. Between 1992 and 1998, there was a net loss of more than 1,000 mine jobs in the area. The first round of job reduction came when the Tarkwa, Prestea and Nsuta mines were privatised. Then second came in 1998 and 1999, in the wake of sliding gold prices and a major reduction of the workforce at the Nsuta manganese mine.

Table 6.6: Percentage Contribution of Mining and Quarrying to total GDP

YEAR	% CONTRIBUTION	YEAR	% CONTRIBUTION
1970	2.4	1983	1.1
1971	2.4	1984	1.1
1972	2.5	1985	1.2
1973	2.3	1986	1.1
1974	1.8	1987	1.1
1975	2.0	1988	1.2
1976	2.0	1989	1.3
1977		1990	1.3
1978	1.7	1991	1.3
1979	1.5	1992	1.4
1980	1.3	1993	1.5
1981	1.0	1994	1.5
1982	1.2	1995	1.5
		1996	1.5

6.2.3 SOCIAL IMPACT

6.2.3.1 Introduction

The social organisation of every community is guided and directed by certain principles. The concentration of mining operations in Tarkwa has had a seriously adverse impact on the social organisation and cultural values of the people. Concerns have been expressed about inadequate housing, youth unemployment, family disorganisation, school drop out rates, prostitution and drug abuse. If these problems are not new to the Tarkwa area, they have risen to a level that the population perceives to be threatening and the main cause has been the concentration of mining activities in the area. According to the Wassa West District Planning Officer, the concentration of mining activities has triggered massive migration of all kinds of people to the area. The population growth rate is above the national average and might even be double it.

He added that apart from the mining and exploration companies, there has been a recent influx of other mining support companies such as contract miners, security organisations, catering and restaurant services, transport, explosives, equipment leasing groups, and road and building contractors(See Table 5.7).

Table 5.7: Mining Support Companies in Tarkwa

COMPANY	ACTIVITY
Base Water	Contract mining
Continental Security	Security
KI	Explosives
Kingdom Transport	Transportation

MINPROC	Plant Construction and others
SGS	Assay Laboratory
SSI	Catering and Restaurant
Tallywoodro	Contract Mining and Road construction
Transworld	Assay Laboratory
UEE	Explosives
WAMS	Equipment Leasing and Contract Mining

6.2.3.2 Inadequate Housing

Between 1990 and 1998, mining investment in Tarkwa has led to the displacement of a total of 14 communities with a population of over 30,000. Some people had to migrate in search of farmland while others were relocated or resettled by the mining companies., The EIAs of four mining companies operating in the study area gave the total number of people to be displaced as 22, 267 from 20 communities (see Table 5.8 for a breakdown of the population displaced and the company responsible.

Table 5.8:

COMPANY	NO. OF COMMUNITIES RESETTLED	NO. OF COMMUNITIES RELOCATED	TOTAL POPULATION DISPLACED
TGL	3	1	522
GAG	0	1	45
GFG	6	7	20,000
AGF	1	1	3,700

The growing displacement of communities and people has resulted in increased migration of the youth —who were not considered for compensation -- to the towns, especially Tarkwa, in search of jobs. The sudden flow of people into the township has created a major problem of housing. Rents have risen so much that the migrant unemployed youth cannot afford available rooms in the townships and Tarkwa residents in rented houses have also been affected. Besides those forced to live in severely overcrowded conditions, many of the migrant youth turned the Tarkwa Railway station and lorry parks into places of abode. A majority of those interviewed reported having lived in make-shift structures in the forest or in hired rooms in villages such as Atuabo, Teberebie, Old Damang, Mandekrom, Old Iduaprem, settlements that have been displaced by large-scale mining activities. A situation of this nature also has the potential of generating other social problems.

6.2.3.3 Prostitution

One of the major social issues that have emerged from the concentration of mining activities in Tarkwa is prostitution. Over 70% of the communities contacted complained of the increase in prostitution and cited it as one of the factors responsible for the erosion of social values in the area. This has been validated by a study conducted by CARE International, an NGO working in the area.

According to CARE there are both mobile and resident sex workers in the area. The mobile sex workers -- who come mainly from Takoradi, Cape Coast, Kumasi, Accra and Obuasi -- target expatriate staff of the mining companies and some prosperous galamsey operators. The resident sex workers service mostly local workers of the large mines and the galamsey communities.

It was observed that some of these sex workers had migrated into Tarkwa with the intention of trading or getting other jobs. Failure to attain their stated objectives compels them to resort to prostitution as the last option for survival. The trend for reported cases of HIV in the Wassa West has been on the increase since
1992. Table 5.7 shows the trend for the period 1992 to 1996.

Table 6.9: Reported Cases of HIV in the Wassa West District, 1992-1996

YEAR	1992	1993	1994	1995	1996
REPORTED HIV CASES	6	25	37	68	100

It is believed that the growing incidence of HIV cases in the Wassa West District, the highest in the Western Region, is due to the increased incidence of sex trade in the area.

6.2.3.4 Family Disorganisation

The relocation and compensation measures implemented by various mining companies in the Tarkwa area have had serious consequences for the family as a close-knit social unit. New housing arrangements for resettled communities have also disrupted long-established family networks in the area. In many instances, the housing units provided by the mining companies have not conformed to the size of households . For instance, a family that had a house with five rooms and large space was resettled in a house with three rooms in a crowded space. Many of the residents of the resettled communities complained of inadequate internal space (number of rooms, size of rooms) and open external space for other domestic activities.

Also, the compensation scheme has helped disorganise some families. In the Tarkwa area, irresponsible, male family heads opted for relocation instead of resettlement. This enabled them to collect cash compensation and they subsequently abandoned their families. This deepened the plight of affected rural women and children.

6.2.3.5 Unemployment

in direct and indirect ways, mining accounts for the high rate of unemployment in the study area. Large-scale surface mining has taken up large tracts of land, from farmers at the same time as mining activities do not provide enough jobs to match the total number of people laid off from agriculture because of the impact of mining. In most of the communities contacted, people expressed concern that the influx and concentration of

mining in the area initially promised alternative and more rewarding jobs for the youth. The chief of Abekoase near Tarkwa, one of the scattered communities in the concession of Goldfields Ghana Limited (GGL), lamented the refusal of GGL in particular to offer jobs to residents of Abekoase despite a promise by the company. The chief recounted that in an attempt to secure jobs in GGL, residents of Abekoase decided to help apprehend thieves who used the village as a route to steal from company. The community was successful on a number of occasions yet GGL failed to offer any job to the residents. The frustrations associated with unemployment have pushed some of the youth towards drug abuse.

6.2.3.6 Drug Abuse

An addictive drug sub-culture is taking root in Tarkwa Township. According to the District Planning Officer, it is particularly common among clusters of galamsey operators and prostitutes who are mainly migrant youth. The drugs -- marijuana and other addictive drugs like cocaine -- are consumed in the belief that they stimulate the miners to work very hard. .

6.2.3.6 High Cost of Living

One of the known, negative effects of mining is the high cost of living within communities near mine locations. All the indices -- food, accommodation, health, water, etc -- that make a decent life have a price tag beyond the reach of the average person. At the same time, the traditional sources of recreation and livelihood of the people are seriously impaired by mining activities, a situation that sparks off or aggravates other social problems.

Two main factors are responsible for the high cost of living in Tarkwa. First, there is the disparity in incomes in favour of mining company staff. For example, the salaries of the Ghanaian staff in the mines are indexed to the US dollar, which raises their income far above their counterparts in the public sector. In addition, the expatriate staff of the mines is paid internationally competitive salaries, which further widens the income disparities in Tarkwa. This group of high-income earners has thus influenced the pricing of goods and services such as housing, food and other amenities.

Secondly, the mining industry has withdrawn a significant percentage of the labour force from agriculture and other income-generating activities by taking farmland away and holding out the false promise of employment. The fall in food production in an area that is already densely populated, with high unemployment, accounts for high food prices. The average price for a plate of food is 10,000 cedis. As of October 2000, a bag of rice that was selling 215,000 cedis in Accra, was being sold for 260,000 cedis in Tarkwa.

The harsh economic conditions have also pushed children of school-going age into menial jobs at the expense of their education. Child labour and high, school dropout rates is notable in communities in the study area. During the latter part of 2000, the Wassa

Association of Communities Affected by Mining (WACAM) proposed to assist a number of such children to go back to school.

6.3 ENVIRONMENTAL AND HEALTH IMPACT

6.3.1 Introduction

In most parts of Tarkwa, the environment is undergoing rapid degradation and its immense economic value is diminishing from year to year, due mainly to the heavy concentration of mining activities in the area. Agricultural lands are not only generally degraded, but the decrease in land for agricultural production has also led to a shortening of the fallow period from 10-15 years to 2-3 years.. The traditional bush fallow system, which adequately recycled substantial amounts of nutrients and made the next cycle productive, can no longer be practiced due to inadequacy of land. Large-scale mining activities generally continue to reduce the vegetation of the area to levels that are destructive to biological diversity.

The principal elements of the environment land, water and air have been severely impacted by mining operations. The continued viability of these elements to support the well-being and development of the rural populations in the Tarkwa area is currently in doubt. The next section considers the impact of mining on the physical environment -- land and vegetation, air and water pollution -- as well as the health situation of Tarkwa and its environs.

6.3.2 Degradation of Land and Vegetation

Considerable areas of land and vegetation in Tarkwa have been cleared to accommodate surface mining activities. Currently, surface mining concessions have taken over 70% of the total land area of Tarkwa. It is estimated that at the close of mining a company would use 40-60% of its total concession space for activities such as siting of mines, heap leach facilities, tailings dump and open pits, mine camps, roads, and resettlement for displaced communities. This has significant adverse impact on the land and vegetation, the main sources of livelihood of the people. There is already a scramble for farmlands in Atuabo and Dumasi.

The tailings dam of one mine has taken a total of 6.3ha of land. Given an estimated per acre yield of cassava of 108,000 bags, This means the tailings dam has denied the farmer a minimum of 275,351 bags of cassava per annum. The tailings dam, plant site and feed stockpile of Ghana Australia Goldfields Ltd. alone will affect a total of about 315 farmers currently cultivating around the area. This has significant implications for the farmers' income and food security of the family.

The deforestation that has resulted from surface mining has long-term effects even when the soil is replaced and trees are planted after mine decommissioning. The new species

that might be introduced have the potential to influence the composition of the topsoil and subsequently determine soil fertility and fallow duration for certain crops. In addition to erosion when surface vegetation is destroyed, there is deterioration in the viability of the land for agricultural purposes and loss of habitat for birds and other animals. This has culminated in the destruction of the luxuriant vegetation, biodiversity, cultural sites and water bodies.

Some large- and small-scale miners and illegal chainsaw operators are already threatening the three major forest reserves -- Bonsa, Ekumfi and Neung -- in the Tarkwa area. These reserves occupy a total area of 435.15km^2. The breakdown for each of the reserves is as follows: Bonsa Reserve 209.79km^2, Ekumfi Reserve 72.52km^2 and Neung Reserve 157.84km^2.

It is expected that by the time the four mines -- GAG, TGL, GGL, and AGL -- would have mined out all their concessions, a total of 16 ridges ranging between 120m and 340m high would have been turned into huge craters.

GGL is expected to mine out three ridges at Rape, Akontase East and Akontase West during the estimated, 25-year lifetime of an open pit mine. TGL would mine out three ridges and GAG five ridges. AGL also has three ridges on its concession. The companies have admitted in their EIAs that such pits cannot be rehabilitated.

6.3.3 Water Pollution

Many mines have an active programme to lower the water table or divert major watercourses away from the mines. This exercise has disruptive consequences for the quality and availability of surface and ground water. The concentration of mining operations in Tarkwa has been a major source of both surface and groundwater pollution. Four main problems of water pollution have been noticed in Tarkwa mining areas. These are chemical pollution of ground water and streams, siltation through increased sediment load, increased faecal matter and dewatering effects.

6.3.3.1 Chemical Pollution

Various chemicals such as cyanide and mercury are used during ore processing. These chemicals constitute the major pollutants of surface and ground water. Chemical pollution could also occur through the misuse, mishandling and poor storage of explosives. Sulphur dioxide fumes from mining companies could also generate extensive chemical pollution. In addition to chemical pollution, heavy metals from mining operations contribute to water pollution. The presence of such heavy metals above a certain threshold can be injurious to human health and the environment, particularly aquatic life.

The main concern of the communities has been potential cyanide pollution of surface and ground water resources by large-scale surface mining operations and mercury contamination from small-scale and illegal (galamsay) mining activities.

Samples taken from a stream in the Teberebie village resettled by TGL confirmed the community's concern about water pollution. The stream draws its water within the concessions of TGL. Analysis of the sample showed augmented levels of faecal matter (126 counts/100ml), suspended solids (16mg/l), and low pH (5.11).

Water samples obtained from boreholes, wells and streams within Tarkwa area produced startling results of very high abnormal content of faecal chloroform, suspended solids, chloride, colour and manganese content, particularly in the Angbenabe River at Nkwantakrom.

Table 6.1 shows the results of
Table 6.1: Water samples obtained from selected communities around Tarkwa.

PARAMETER	Guide Value for Maximum Allowable Concentration in Drinking Water			SAMPLING STATIONS			
	EU	WHO	USA	NKWANTAKROM (STREAM)	DAMANG NKRAKRA (STREAM)	DAMANG TAMANG (STREAM)	DAMANG (BOREHOLE)
PH	6.5-8.5	6.5-8.5	6.5-8.5	6.46	6.70	6.52	6.33
Colour (Hu)	20	15	15	700	150	150	<5
Suspended solids (Ss)	4	5	1-5	138	17	37	19
Zinc (Zn)	0.1	3.0	5.0	0.05	0.04	0.02	0.05
Lead (Pb)	0.05	0.01	0.05	0.04	0.2	0.13	0.05
Cadmium (Cd)	0.005	0.005	0.005	<0.01	<0.01	0.02	0.01
Manganese (Mn)	0.02	0.5	0.05	8.89	0.05	2.4	0.1
Iron (Fe)	0.05	0.3	0.3	0.4	1.8	2.4	0.1
Chloride (Cl)	25	250		7.4	7.8	6.1	8.1
Sulphate (SO^4)	25	250	250	34.1	0.1	0.6	0.2
Chromium (Cr)	0.005	0.05	0.05	0.08	0.09	0.12	0.11
Nickel (Ni)	0.05	0.02		0.04	<0.01	0.11	0.04
Cobalt (Co)				0.11	0.08	0.16	0.09
Faecal Coliforms (Counts/100m)	0	0-3	1	146	64	68	1
Silica (Si02)				10.1	15.1	15.7	68.1

Results are in mg/l except pH and where otherwise stated.
Samples analysed by the Environmental Chemistry Division of the Water Research Institute of the Council for Scientific and Industrial Research (CSIR), December 1998.)

Table 6.1 continued

PARAMETER	Guide Value for Maximum Allowable Concentration in Drinking Water			SAMPLING STATIONS			
	EU	WHO	USA	MILE 7 (Well)	MILE 8 (Borehole)	YAW MANUKROM (Well)	ATEKYENSU TECHIMANVILL (Stream)
PH	6.5-8.5	6.5-8.5	6.5-8.5	6.38	5.79	6.67	5.94
Colour (Hu)	20	15	15	5.0	5.0	350	250
Suspended solids (Ss)	4	5	1-5	12.0	10.0	36.0	22.0
Zinc (Zn)	0.1	3.0	5.0	0.03	0.09	0.07	0.06
Lead (Pb)	0.05	0.01	0.05	<0.01	0.01	<0.01	0.03
Cadmium (Cd)	0.005	0.005	0.005	<0.01	<0.01	<0.01	<0.01
Manganese (Mn)	0.02	0.5	0.05	0.05	0.25	0.87	0.01
Iron (Fe)	0.05	0.3	0.3	0.2	0.1	2.6	1.4
Chloride (Cl)	25	250		17.4	9.0	7.4	7.0
Sulphate (SO^4)	25	250	250	6.5	<0.01	5.0	3.0
Chromium (Cr)	0.005	0.05	0.05	0.07	0.06	0.05	0.08
Nickel (Ni)	0.05	0.02		0.04	0.05	0.09	0.03
Cobalt (Co)				0.14	0.06	0.07	0.05
Faecal Coliforms (Counts/100m)	0	0-3	1	108	Nil	89	186
Silica (Si02)				35.1	17.5	20.2	15.9

Results are in mg/l except pH and where otherwise stated.

Table 6.1 continued

PARAMETER	Guide Value for Maximum Allowable Concentration in Drinking Water			SAMPLING STATIONS			
	EU	WHO	USA	DISTRICT ASSEMBLY HALL (Borehole)	BONSANO (Stream)	TEBEREBE (Borehole)	TEBEREBE (Stream)
pH	6.5-8.5	6.5-8.5	6.5-8.5	5.62	6.75	5.37	5.11
Colour (Hu)	20	15	15	<5.0	150.0	<5.0	<5.0
Suspended Solids (Ss)	4	5	1-5	176.0	26.0	14	16.0
Zinc (Zn)	0.1	3.0	5.0	0.07	0.04	0.08	0.09
Lead (Pb)	0.05	0.01	0.05	0.10	0.11	<0.01	0.06
Cadmium (Cd)	0.005	0.005	0.005	0.01	<0.1	0.02	0.01
Manganese (Mn)	0.02	0.5	0.05	0.15	0.06	0.08	0.11

Iron (Fe)	0.05	0.3	0.3	<0.03	1.2	<0.01	<0.01
Chloride (Cl)	25	250		18.9	7.9	8.0	14.8
Sulphate (SO^4)	25	250	250	0.1	3.0	<0.1	0.6
Chromium (Cr)	0.005	0.05	0.05	0.13	0.09	0.13	0.13
Nickel (Ni)	0.05	0.02		0.01	<0.01	0.07	0.15
Cobalt (Co)				0.10	0.04	0.11	0.13
Faecal Coliforms (Counts/100m)	0	0-3	1	15	142	28	126
Silica (Si02)				11.4	20.7	26.5	13.3

Results are in mg/l except pH and where otherwise stated.

Table 6.1 continued

PARAMETER	**Guide Value for Maximum Allowable Concentration in Drinking Water**			**SAMPLING STATIONS**
	EU	**WHO**	USA	**TAMSO (Stream)**
PH	6.5-8.5	6.5-8.5	6.5-8.5	6.81
Colour (Hu)	20	15	15	175.0
Suspended Solids (Ss)	4	5	1-5	24.0
Zinc (Zn)	0.1	3.0	5.0	0.09
Lead (Pb)	0.05	0.01	0.05	0.09
Cadmium (Cd)	0.005	0.005	0.005	0.01
Manganese (Mn)	0.02	0.5	0.05	0.80
Iron (Fe)	0.05	0.3	0.3	2.8
Chloride (Cl)	25	250		2800.0
Sulphate (SO^4)	25	250	250	2.0
Chromium (Cr)	0.005	0.05	0.05	0.17
Nickel (Ni)	0.05	0.02		0.12
Cobalt (Co)				0.12
Faecal Coliforms (Counts/100m)	0	0-3	1	264
Silica (Si02)				13.4

The results are in mg/l except pH and where otherwise stated.

The Angbenabe stream is the main source of drinking water for the communities living along it. At one time, this river was polluted by effluent believed to be an overflow of water closet cesspits and other domestic wastewater from the mine camp of Ghana Australia Goldfields (GAG). The communities made a complaint about the pollution to the mines and the District Environmental Management Committee.

The company responded to the complaints of the communities by providing them with hand-dug wells. Sadly, however most of the wells are in deplorable condition and are as heavily polluted as the stream. For instance, none of the six wells at Mile-8 and Mile-5 are in satisfactory condition. Similarly, wells at Nyame Bekyere and New Iduaprem are sited closed to pollutant sources-- a polluted stream at Nyame Bekyere and a KVIP at New Iduaprem. Another well provided by GAG at Diwobrekrom (Mile-5) is considered too close to the blasting site. Frightened by the potential dangers of blasting and the noise, the community does not patronise the well.

Communities without alternative sources of drinking water continue to depend on the polluted Angbenabe stream. One such community is Nkwantakrom. Analysis of water samples from the stream around the community gave very high pollutant levels as follows; faecal content 146 counts/100ml, manganese 8.89mg/l, suspended solids 138Ss and colour 700Hu. The communities believe strongly that GAG and galamsey operators upstream cause the pollution.

The levels of pollution and the poor water yield from the new water sources, coupled with the complaints from the communities, are ample demonstration that the affected communities had marginal input in the decisions on where to site these water facilities. It also suggests that the concentration of mining activities in the area has worsened the living conditions of the people. The pollution also weakens the ability of the stream to support aquatic life and has denied the people access to clean water. The situation has become unbearable to the extent that many of the communities within the concession area of GAG are reluctantly requesting relocation or resettlement.

Similar cases of pollution and complaints are reported within the operational area of Ashanti Goldfields Limited (AGL). The people of New Damang and Kyekyewere complained of pollution of the Nkrakra stream at Damang and the Tamang stream at Kyekyewere. Water samples taken from these streams indicated a level of pollution to high for domestic use. The study discovered that the level of pollution of these streams was so serious at one time that AGL had to place security personnel along the banks of these streams to prevent the communities from using them.

The activities of galamsey in the affected mining communities also contribute immensely to pollution in the streams by increasing the mercury content. Although no test was conducted on mercury content, levels are expected to be quite high because galamsey operators combine significant volumes of water from these streams with mercury for gold processing.

Another water pollutant noted in the Tarkwa mining area is cyanide. Cyanide tests were not conducted for two main reasons. First, cyanide is easily degraded by sunlight. Secondly, all the samples were collected during a period of high rainfall in the area. These two factors would mar the results due to heavy dilution. Nonetheless, cyanide levels are expected to be high because the Nkrakra and Tamang streams are fed by smaller streams with catchment areas that include the cyanide contaminant facilities of GAG and TGL.

Communities have reported sporadic cyanide contamination of streams. For instance, the Kyekyewere community within the concession of AGL complained of occasional cyanide leakage from pipes close to the community.

The singular event that best illustrates cyanide pollution in the area is the 1996 cyanide spillage at TGL cyanide contaminant pond. This is what Thomas Akabzaa has named "the Teberebie Cyanide Spillage Saga"[9].

On Tuesday, June 18th, 1996, between 2 and 3:00 pm, there was a cyanide spillage into the Angonaben stream, a main tributary of the Bonsa River. Following a heavy downpour, an enormous amount (36,000m^3) of gold pregnant cyanide solution with a cyanide concentration of 8-100 ppm was accidentally discharged from the contaminant facility within the premises of the TGL's operation. The spillage is reported to have affected up to nine villages along the banks of the river.

The reaction of the company to the spillage was seen as an attempt to clear the physical mess and evidence of the pollution rather than to protect the communities from using the contaminated water. It concentrated on detoxification of the river but failed to warn the communities or make a report to the Assembly. The company alerted the communities only the next day (June 19th, 1996) during which time people and their livestock would have already used water from the stream. The company again failed to report the spillage to the Wassa West District Assembly even weeks after the incident.
The spillage caused considerable losses of trees, crops and animals, especially in Teberebie and the health impact on human beings was enormous.

There were conflicting reports of the spillage, one simply doing public relations for the company and the other confirming the adverse impact of the spillage.

The report of SGS -- the firm that prepared TGL's EIA for its expansion work -- claimed there was no visible damage due to the spillage[10]. SGS outrageously praised TGL for its quick response to the spillage and argued that the spillage was caused by an excessive floodstorm never experienced in the last 100 years and not as a result of any design deficiency.

There are three significant dimensions to the SGS report. The first dimension confirms the company's commitment to clearing the physical evidence of the spillage. The second is an attempt to exonerate SGS from criticism of design deficiency since they prepared the EIA for the company. The third dimension is a clear demonstration of the kind of partnership that exists between the mining companies and the consulting firms/intellectual communities. This partnership largely and further deepens the already vulnerable position of the affected mining communities in their attempt to resist problems engendered by mining.

In contrast, the report of the District Environmental Management Team (DEMT), following a visit to the affected communities,[11] confirms that there was considerable damage to fish, crops and farms due to the spillage. The report recommended that TGL should compensate the affected people for loss of fish stocks in fishponds and crops on farms. According to the DEMT report, all fishponds in the affected area lost their fish stocksand cocoa farms were also severely. Cocoa pods submerged in the floodwater became rotten and young trees were scorched. Other crops affected by the spillage included cassava, maize, plantain, cocoyam, pineapples, pepper, tomato, okro, beans, cowpea, banana trees and yam. .

The health of local people was adversely affected by the spillage. During a visit to the affected communities, the study team observed that a lot of people were suffering from skin rashes. Local people attributed the skin condition to cyanide pollution. Although there was no medical evidence to support their claim, the communities were not far from the truth. An informal discussion with a member of a team of researchers commissioned by the company to assess the extent of damage admitted that the confidential report submitted to the company linked the rashes to the pollution.

Following the insistence of the DEMT, the company agreed to compensate affected farmers with 46,000 cedis each as a goodwill gesture rather than the salvage value of damage. This was because the company asserted that no visible damage was caused to farms. Many of the farmers rejected the offer as unfair. These farmers, together with those who were not considered at all for the so-called "goodwill gesture," have been in a legal battle with the company since 1997 demanding fair compensation for the loss of crops, fish and the damage suffered in terms of health.

Ironically, national mining policies have not been helpful to the communities in this disaster. Also, the incident did not receive significant media coverage. This is an indication of the powerful, mining sector lobby and the extent to which the concentration of mining operations in the Tarkwa area has deepened the plight of the people.

6.3.3.2 Dewatering Effects

Mining has active dewatering effects. Apart from consuming a huge amount of water, extensive excavation of large tracts of land and the piling of large mounds of earth along watercourses remove the source of water recharge for groundwater sources and ultimately reverse the direction of flow of ground water, causing active dewatering. A number of boreholes, hand-dug wells and streams in the area have either become unproductive or now provide less water.

It was observed during the survey that many of the boreholes and hand-dug wells in the area -- including those provided by some of the mining companies for resettled communities -- have problems relating to yield. They were either not producing at all or produced very little water.

At the resettled community of Teberebie, one of the two boreholes provided by TGL was out of production while the second one gave an extremely low yield. For instance, it took the team over 10 minutes of pumping to fill a litre sample container with water from the borehole.

The same dewatering process reduces recharge to streams, especially during the dry season. Mining activities draw a huge amount of water from the Bonsa River, resulting in lower water flow levels in the Bonsa and the lower reaches of the Angonabeng River and lengthening patches of dryness during the dry season,
The concentration of mining operations in Tarkwa area has considerable, adverse impact on the accessibility and availability of both ground water and surface water resources.

Table 6.2: Water Availability Survey for Selected Communities

Community	Water Source	Provider	status
Mile-7	One hand-dug well without pump One hand-dug well with pump	GAG	Not productive Broke down a month after construction. (Constructed 4/11/97, Team visit:20/12/97)
Mile-8	Hand-dug well with pump Well without pump	GAG	Very low yield Out of production
Yaw Manu	Hand-dug well without pump	GAG	Well water is direct seepage from nearby polluted stream.
Kumsono	3 Boreholes	BGL	Not functioning
Bekoase	3 Boreholes 1 Dam	GFL	Not functioning. Dried-up.

Source: *Field survey*

6.3.4 Air and Noise Pollution

Mining activities and mining support companies release particulate matter into the ambient air. The concerns of the affected communities on air quality have been the airborne particulate matter, emissions of black smoke, noise and vibration.

6.3.4.1 Airborne Particulate Matter

Airborne particulates of major concern within the Tarkwa area include respirable dust, sulphur dioxide (SO^2), nitrogen dioxide (NO^2), carbon monoxide (CO) and black smoke.

The activities that generate this particulate matter include site clearance and road building, open-pit drilling and blasting, loading and haulage, vehicular movement, ore and waste rock handling as well as heap leach crushing by companies doing heap leach

processing. Others include fumes from the roasting of sulphide ores by assay laboratories and in refining processes.

The release of airborne particulate matter into the environment -- particularly minute dust particles of less than 10 microns -- poses health threats to the people of the Tarkwa area. All fine dust at a high level of exposure has the potential to cause respiratory diseases and disorders and can worsen the condition of people with asthma and arthritis. Dust arising from gold mining operations has a high silica content which has been responsible for silicosis and silico-tuberculosis in the area.

Results of air quality monitoring for dust showed values far above acceptable, detectable limits for health safety. The EC, WHO and EPA levels for the pollutant are 50 gm^{-3}, 70 gm-3 and 70 gm^{-3} respectively. On the contrary values obtained from the EPA monitoring station at the Tarkwa Government Hospital are as high as 199 gm^{-3}. Table 6.3 shows the results of a 12-day monitoring exercise.

Table 6.3: Air Quality Monitoring at Tarkwa General Hospital

DATE	**PM10:gm-3**
16-11-97	77.3
21-11-97	15.6
26-11-97	38.9
3-12-97	37.4
12-12-97	48.1
24-12-97	36.4
31-12-97	52.9
7-1-98	19.9
14-1-98	68
17-1-98	57
24-1-98	54.4
28-1-98	48.5

Source: Environmental Protection Agency

The table shows that during the 12-day monitoring exercise, there were five days on which the level of pollutants exceeded the EC-approved limit. It must also be pointed out that the monitoring station is located about 6km from the nearest surface mining operations. This means that the level of pollutants would be much higher for communities around the fringes of the mines.

The same dust is deposited on the vegetation, making it unpalatable for both human and livestock consumption. The consumption of green leaves popularly called ‘kontomire’ has fallen significantly among households that have become conscious of the deleterious effects of the dust. This also has adverse consequences for the diet of the people.

Unfortunately, the mining companies have not put in place adequate measures to prevent harmful emissions of dust into the ambient air. Measures to reduce dust are limited to occasional spraying of roads within the premises of the mining concessions. This appears to be a misplaced effort because road dust does not appear to be the main source of dust pollution. Furthermore, the EPA admitted that dust suppression on the haulage roads is ineffective and the frequency of spraying inadequate, particularly in the case of TGL[12].

Black smoke from fuel burning, fumes from the assay laboratories and ore roasting at Prestea constitute additional sources of airborne pollutants in the Tarkwa mining district. There were cases where the values recorded for smoke exceeded the tolerable levels of the EC, WHO and EPA. The highest value recorded was 207 gm^{-3} as against the tolerable levels of 100 gm^{-3} for the EC, 85 gm^{-3} for the WHO and 40 gm^{-3} for EPA-Ghana.

The other particulate matter of concern in the area is sulphur dioxide (SO^2). This comes from the roasting of sulphide ore by Prestea mine and assay laboratories, vehicular emission and domestic energy sources of fuel such as liquefied petroleum gas (LPG) and kerosene. The high concentration of sulphur dioxide gives rise to acid, which subsequently produces sulphuric acid (H^2 SO^4). Sulphuric acid can cause breathing difficulties and discomfort. According to Park (1987)[13,] at toxicity limits of –0.5-1:g/l, there are no visible effects on health, but toxicity greater than 1.5:g/l can result in breathing difficulties and from 200:g/l and above can cause great discomfort. Some of the harmful effects of sulphuric acid include heart disorders, asthmatitis, bronchitis, lung problems andother respiratory disorders.. Indications are that an extensive amount of SO^2 and black smoke is being released into the air. This is a health threat to the people.

Table 6.4: Daily Average Measurement of SO_2 and Black Smoke Concentration at a Station near the General Hospital, Tarkwa

DATE	SO_2 gm^{-3}	Smoke gm^{-3}	DATE	SO_2 gm^{-3}	Smoke gm^{-3}
16-12-97	26	30	1-1-98	26	80
17-12-97	26	25	2-1-98	26	14
18-12-97	26	46	3-1-98	32	18
19-12-97	40	49	4-1-98	26	18
20-12-97	33	31	5-1-98	32	22
21-12-97	33	28	6-1-98	26	69
22-12-97	40	51	7-1-98	39	134
23-12-97	32	60	8-1-98	32	155
24-12-97	32	32	9-1-98	39	207
25-12-97	26	45	10-1-98	26	171
26-12-97	32	48	11-1-98	26	110
27-12-97	19	39	12-1-98	19	90
28-12-97	39	39	13-1-98	26	118
29-12-97	39	35	14-1-98	26	118
30-12-97	32	61	15-1-98	33	101
31-12-97	32	48	16-1-98	33	118

Source: Report of EPA Mines Monitoring Team, 1997

SGS laboratory, which is one of the sources of fumes, is located close to residential areas. This laboratory provides a range of services to the mining companies in Tarkwa and other parts of the country. The laboratory has a roaster that processes sulphide ore samples and therefore emits fumes.

The communities complain about smog, which occurs frequently arising from the activities of the laboratory. They also complain of a foul odour from sulphur dioxide and other sulphide fumes. The communities say they have complained to the Wassa West District Assembly Sub-Committee on Environment on a number of occasions.

The toxic emissions from the laboratory have been blamed for the scorching of cocoa trees and other crops in the vicinity of the laboratory. Personnel of the Department of Agricultural Extension Services confirmed this allegation.

Interestingly, while SGS was labeled as polluter of the ambient air quality, the company until recently was responsible for analysing all particulate matter for all the mining companies in the study area. How can a polluter prescribe environmental quality standards acceptable for health and environmental safety? At best, the standards would be at par with SGS effluents, which were already above tolerable limits. The communities had no option but to continue to live with the situation.

6.3.4.2 Noise and Vibration

The sources of noise and vibration in the area include mobile equipment, air blasts and vibration from blasting and other machinery. The effect of high-pitched and other noises is known to include damage to the auditory system, cracks in buildings, stress and discomfort. These noises can also frighten animals, interfere with their mating processes and also cause abortions, therefore adversely affecting the animal population.

There is widespread and deafening noise from operations of all the surface mines in the area. The peak period for noise in Tarkwa is from around 2:00 pm to late evening.

Communities within the concessions of GAG and TGL have lodged a number of complaints with the Wassa West District Assembly Environmental Management Committee on the noise nuisance.

In a discussion with the Environmental Officer of GAG, the Officer said that the mining companies are not oblivious to the plight of the people and that they are taking a number of measures to reduce the adverse impact. He said the measures include the introduction of several delays during blasting in order to reduce the vibration effects, the reduction in the frequency of major blasts and of blasting in the daytime. This is to reduce the noise level and vibration impact since most people would be busy outdoors.

These measures have not adequately addressed the problem of noise pollution in the area. Blast-related noise remains high. In fact, blasting noise levels measured at one of the

mines suggest that all the values obtained far exceed the EPA's highest permissible noise level for heavy industry for both day and night (see Table 6.5)

Table 6.5: Blasting Noise Levels Measured at 10:00 hrs GMT

DATE OF BLAST	BEFORE BLAST (dB)	BLAST UNITS
4-9-97	70 dB	72
12-9-97	70 dB	86.2
15-9-97	70 dB	76
20-9-97	70 dB	87

All the values recorded in Table 6.5 are above the highest permissible noise level for a heavy industrial area, making these levels totally unacceptable for communities close to the mines. One community located six miles away from GAG operations has complained of noise, blast and ground vibrations. This community has requested relocation or resettlement but GAG has turned down their request, arguing that there is insufficient evidence to support the community's claim.

The refusal of GAG to meet the request of the community is a clear case of companies taking advantage of the weak capacities of local communities to deny them fair treatment. However, the 1996 Environmental Audit Report on the mine acknowledged that significant levels of noise are generated in the mine site. Noise levels at the crusher, according to the report, are above 85db and protective devices were recommended for the workers.

Frequent blasting in the mines and the resulting ground vibrations have caused considerable cracks in buildings in communities in the Tarkwa area. The greatest blasts come from GAG and TGL due to their proximity to the township and the fact that they operate at much higher elevations.

One of the worst affected buildings is the Fiaseman Secondary School, situated less than a kilometre away from TGL surface mines. Many of the buildings of this school have very serious cracks. The dining hall, in particular, can best be described as death trap.

Four communities in the area -- Atuabo, Akuntasi, Nkontakrom and Dumasi -- all complained of cracks in their buildings resulting from the activities of Aboso Goldfields Limited (AGL). They said the period of intensive blasting and vibration was between 12:00pm and 5:30pm.

Table 6.6: Period of extensive blasting and vibration by Aboso Goldfields Limited in four communities.

NAME OF COMMUNITY	**TIME/PERIOD**
Atuabo	12:15 & 5:15pm
Akuntasi	12:15 & 5:15pm
Nkontakrom	2:30-3:00pm
Dumasi	12:15 & 5:15pm

Source: Field interviews

These communities alleged that the company addresses the problem of cracks in buildings by giving out 200,000 cedis or, in lieu, a quantity of cement to the victims of the cracked buildings.

At GMC, while the company does not monitor the effects of its blasting on the nearby communities, it was quick to reject as baseless the complaints by the Akyem community about the noise nuisance and the effects of blasting on their buildings.

6.4 HEALTH IMPACT

Part of the major adverse environmental impact of mining is the generation of diseases due to pollutants and accidents at mines. The effects of some of these pollutants manifest themselves immediately (cyanide, for example) but others (such as mercury) take a long time to show.
In Tarkwa, the extraction and processing of gold has given rise to various environmental related diseases and accidents. According to the District Medical Officer of Health Dr. Avorti, the common, mining-related diseases observed in the area over the years include, but are not limited to:

a) Vector-borne diseases such as malaria, schistomiasis and onchocerciasis.
b) Respiratory tract diseases, especially pulmonary tuberculosis and silicosis.
c) Skin diseases.
d) Eye diseases, especially acute conjunctivitis.
e) Accidents resulting from galamsey activities, and
f) Mental cases.

Data obtained from the District Medical Office, Tarkwa, suggest that mining impact-related diseases such as malaria, diarrhea, upper respiratory diseases, skin diseases, acute conjunctivitis and accidents form the top ten diseases in the area.

Respiratory Diseases
There is an increasing trend for respiratory diseases in the area. The incidence of upper respiratory tract infections (URTI) is relatively high in the area, with an annual average of 840 reported cases. Pneumonia and pulmonary iuberculosis follow, with annual reported cases of 199 and 109 respectively.

Table 6.7: Annual Reported Cases of Respiratory Diseases at Tarkwa Government Hospital, 1992-98

YEAR	UPPER RESPIRATORY TRACT INFECTIONS (URTI)	PNEUMONIA	TUBERCULOSIS (TB)	TOTAL
1992	356	101	83	540
1993	594	78	76	748
1994	1227	35	72	1334
1995	692	27	73	792
1996	881	93	111	1085

1997	1244	145	146	1535
1998	924	724	151	1799

Source: Tarkwa Government Hospital

The table shows that with the exception of the decline in1995, reported cases of the three major respiratory diseases has been on the increase from 1992 to 1998.

According to the District Medical Officer of Health, TB has a strong history in the area. The rock formation in which gold is found in the Tarkwa area has very high silica content. Therefore, the dust generated by mining activities contains silica, which causes the silicosis, tuberculosis and silico-tuberculosis diseases. The miners and residents who inhale this dust are thus exposed to these diseases. This explains why there is a high level of silico-tuberculosis among miners in the area. A 1989 study of one mine in the area recorded a 1.2/1000 incidence of silico-tuberculosis while the incidence of pure silicosis was 1.9/1000. The average incidence of tuberculosis in the District is 0.5/1000 against the national average of 0.003/1000.

Again data from the District Medical Office, Tarkwa, showed a considerable increase in reported cases of acute conjunctivitis. The data indicated the incidence of conjunctivitis as 2.4/1000 in 1995 and this is blamed on the high incidence of particulate matter in the area. The communities complain of high dust content and accused the mining companies of inadequate dust-suppressing measures. The 1996 monitoring report of TGL described dust-suppressing measures by the company as ineffective, which confirms the concerns of the communities on dust pollution.

6.4.1 Malaria

Malaria is a major public health problem in Tarkwa. A report by the District Medical Officer revealed that the Wassa West District has the highest incidence of malaria in the Western Region. Malaria is the primary cause of child mortality in the country and the Wassa West District is the worst affected area with an infant mortality rate as high as 85/1000 compared with the national average of 80/1000. The District also records the highest incidence of malaria in the country with an annual incidence of about 185/1000 against the national average of about 40/1000. In 1994, for example, 75% of miners surveyed at the mines were carrying the malaria parasite. Between 400 and 500 shift losses were recorded in the peak of the rainy season.

Most of the communities contacted complained that the concentration of mining operations is responsible for the high incidence of malaria in the area. The mining activities in the area promote environmental modifications that favour malaria vector development. The activities create open pits, divert watercourses and subsequently result in bodies of stagnant waterthat have been instrumental in furthering the spread of malarial vectors, notablythe anopheles mosquito egg development.

The concentration of mining companies in Tarkwa has gathered a large army of migrant workers, some of who may have been carrying the parasite before their arrival in Tarkwa.

Not only do such people suffer themselves, but they also increase the risk of malarial epidemics.

6.4.2 Skin Diseases

Cases of skin diseases were observed to be prevalent in communities that were contacted. The worst affected areas include communities along the Bonsa River and its tributaries within the concession of TGL and GAG, particularly Mile 8, a community relocated by GAG. At Mile 8, skin rashes were very common among the population and children were hard hit by this condition. The community alleged that the rash was an allergic reaction affecting users of one of the hand-dug wells provided by GAG, which they claim is highly polluted.

This is believed to be the result of cyanide and mercury pollution from gold processing. Mercury in particular is widely used by small-scale miners in the area for the processing of gold. It is proved that mercury can cause skin cancer.

All the communities contacted blamed the high incidence of skin rashes on the activities of the mining companies, particularly TGL and GAG. They alleged that occasional increases in levels of cyanide reaching downstream from mine-run-off and leakage from cyanide ponds within the two mines upstream pollute the water of the stream that they use for bathing and drinking.

There were also documented reports that confirmed abnormal mercury levels in hairs taken from some small-scale miners and their families.

6.4.3 Other Diseases

Other mining and environment related diseases are reported to be on the increase in the area. These include diarrhea and sexually transmitted diseases (STDs).

Reported cases of environment-related diarrhea are on the increase. In 1998, the monthly diarrhea incidence of 3.4/1000 in the District rose to 6.6/1000 in July, which is the peak of the rainy season, but fell to 4.8/1000 after the rains. This scenario suggests that surface water run-off could have been responsible for the wide spread of various, mining-related toxicants in the area resulting in the high incidence during the rainy season. Also, even though the incidence fell after the rains, it was still higher than the district monthly incidence of 3.4/1000.

Sexually transmitted diseases (STD) have also assumed an increasing trend in the Wassa West District. Reported cases of syphilis and HIV have been on the increase in the area since 1992. For instance, reported cases of HIV rose from six in 1992 to 100 in 1996.

Two main factors are responsible for the increasing incidence of STDs. The first is attributed to the high influx of people into the area of expatriate employees and of Ghanaians looking for jobs and trade outlets.

The second factor is blamed on the concentration of galamsey operators in the area. According to the District Medical Officer of Health, Tarkwa, the screening of one galamsey community produced 10 cases of syphilis and one case of HIV[18].

7.0 IMPACT OF MINING SECTOR INVESTMENT ON WOMEN

7.1 Introduction.

The Terms of Reference of this study were particular about the impact of mining investment on women in the Tarkwa area. The environmental, social and health dimensions of the impact of mining have already been discussed. The concern here is to look at the involvement of women in mining and related activities and the impact of such activities on women.

The nature of the involvement of women and the nature of the impact of mining activities on them vary between large-scale and small-scale operations.

In the case of small-scale mining and quarrying, women are directly involved in some aspects of actual mining, processing, marketing and other activities.

The discussion regarding large-scale mining looks at the specific impact on women of recent relocation and resettlement schemes undertaken by some large companies. The study also looks at some of the roles women perform at small-scale mining sites and the problems they encounter in performing such tasks.

7.2 Large-Scale Mining and Women.

The survey looked at the number of women directly employed in the mines, other economic activity undertaken by women as a result of the mining boom, as well as the negative impact on women of increased mining activity in the area. Particularly, the impact of resettlement and relocation programmes of such recently established large mines on women in the affected communities are considered.

7.2.1 Employment and other mining-relatedeconomic activity of women

It was established that the mining industry in general has comparatively fewer women in direct employment than other industries. Traditionally, women have had very little involvement in exploration, mining and mineral processing activities. The direct involvement of women in formal, large-scale mining is generally limited to support activities such as management, clerical, security, catering and related jobs. It was observed that in Ghana, there are about five geologists who are women out of about 120 geologists working with large-scale exploration and mining companies.

While the mining boom brought an increase in trading activities and women formed a significant part of traders in markets in the Tarkwa area, the recent spate of redundancies in nearly all the mines in the area has slowed economic activity and some women traders have gone out of business.

7.2.2 Women, Relocation, Resettlement and Compensation Policies

In the last 10 years, four large mining companies undertook to resettle and relocate some communities in their concession areas in order to make room for surface mining operations. The two biggest and most recent such exercises were studied to assess their impact on women in the affected communities.

It came to light that in the case of two companies, women were among the members of various committees from the communities that discussed the relocation scheme and the amount of compensation for affected people.

Women complained of unfair treatment when it came to compensation for people to be resettled or relocated. Traditionally, family heads are men and most compensation went to them. Some males who receive such compensation abandon their families and take to irresponsible live in the township, some only return after the money is finished.

Women in the area who mainly sell from tabletops or use wattle structures as shops were never – or were hardly -- considered in the compensation packages. In addition, many of the new settlements are quite far removed from the clientele of these women traders such that they have found it difficult to make sales substantial enough to support themselves and their families.

It was acknowledged that although Goldfields (Gh.) and Abosso Goldfields Limited have provided relatively modern market places (in terms of structures) the women traders are not getting the level of patronage they had in their former communities. “Goldfields is providing us with concessional loans, which is laudable, but people are not paying the loan back as expected, because the patronage is just not there, remarked one market queen at the new Atuabo market built for the community by Goldfields (Gh.) Limited.

Compensation policy also did not consider the tenant status of many local people. Several women who got displaced without compensation are now living in makeshift wattle

structures on the fringes of Tarkwa. In interviews, many of them said they could not afford the rents in town. They make their living mainly by selling firewood from the forest or performing various jobs at galamsey sites. Those selling firewood complain that because most of the land in the area is under mineral concession, they have difficulty getting wood from this private property.

7.3 Women and Small-Scale Mining

The effects of small-scale mining on women were studied using two, small gold mines registered as cooperatives, one illegal, gold mining (galamsey) camp and one stone quarry. In addition, an analysis was made of people engaged in gold marketing to establish the level of women's participation.

The registered small gold mines are the Akoon cooperative, situated on fringes of Tarkwa Township, and the Kedadwen Cooperative, located 12 kilometres down the Tarkwa-Takoradi road. The galamsey camp is 5 kilometres south west of the Abosso mine, while the stone quarry is 1 kilometre from Tarkwa Township on the Tarkwa-Takoradi road. The assessment looked at the type of jobs performed by women and the impact of all mining activity on them.

Most of the women in the survey sites use hand-held sieves to sieve the ground ore for processing. Others provide water for washing, drinking and processing of gold, some pound the work for milling while others are employed to carry the rock and ore material from remote locations to the processing centres.

There were other women not directly engaged in mining activities. These women sell cooked food, while others sell assorted goods.

Out of the three mining groups surveyed, 3.6% of the workforce is female, while there were two females among the 24 cooperative members of the two mines.

Table7.1: Female workforce of selected small mines and galamsey camps

Mine	Total workforce	Women in the workforce	Cooperative Membership	Women cooperative membership
Akoon Cooperative	85	9	14	1
Kedadwen Cooperative	45	2	10	1
Cocoase Camp	420	49	not applicable	not applicable

At the Akoon cooperative, women are only engaged as bookkeepers and security guards. The mine has a total of 14 cooperative members including only one woman. Their concession is part of the underground mine of Goldfields (Gh.) Limited which was shut down in 1999. It employs 159 workers who perform various functions including mining and processing, security and book keeping. Mining takes place underground and appears very risky and this, according to local people, is the reason why women are not involved in the mining process.

The Kedadwen Cooperative also had no women in mining activity although this is an alluvial operation. The two women working there only cook for their male counterparts.

At the Cocoase (galamsey) Camp, although the women carried out the most tiring tasks such as pounding rock and carrying water and rocky material for long distances, they made an average of 60,000 cedis a month. Their male counterparts who dig out the ore material and washi the ore receive on the average about 150,000 cedis a month.

Both young men and women at this camp saw their jobs as a last resort. They were apparently full of hope that the New Patriotic Party (NPP) government would create jobs to relieve them of their suffering.

8.0 CONCLUSION AND RECOMMENDATIONS

The report concludes that mineral policy reforms in Ghana have contributed to an enormous increase in mining investment but there has not been a corresponding review of environmental policies to take account of the damage caused to the environment and to sources of livelihood. Similarly, the increase in mining investment has resulted in a significant increase in gold production and the generation of external earnings. However, the wealth generated does not benefit either the national economy or communities located near the mines. The consequences have been a deepened crisis of health and environmental sustainability, social upheavals and economic deprivation.
Our recommendations are as follows:

8.1 Policy Issues

Policy reforms in Ghana's mining sector have introduced generous incentive packages for mining investors but have failed to provide solutions to community concerns. Difficulties have been encountered in harmonising mining and environmental laws and policies in order to improve the conditions for local communities.

8.1.1 The legal and policy framework relating to mining should be overhauled in order to impose stronger environmental and social responsibility and accountability on the mining companies. Incentive packages similar to those provided for by the laws for the mining companies should be designed for communities affected by mining projects. The state

and the relevant mining companies could then work out the modalities of meeting such community incentives.

8.1.2 The current mining environmental guidelines are riddled with weaknesses that enable mining companies to destroy with impunity the environment and the livelihood of local people. For instance, the confidentiality clause providing for non-disclosure of Environmental Audit Reports on mines and Annual Audit Reports makes them inaccessible to the public. Ironically, these are meant to be public documents because the audit reports are part of the EIA process that requires the participation of all stakeholders. There is, therefore, the need to review the mining environmental guidelines to make the audits public documents and to ensure environmental compliance and accountability.

8.1.3 There should be effective co-ordination among public sector mining support institutions and other stakeholders such as the Traditional Councils, opinion leaders and members of the communities affected by mining. This would promote transparency and ensure harmonious enforcement of policies governing Ghana's extractive sector

Inadequate cross-sectoral linkages among these institutions contribute greatly to some of the environmental and social problems. Currently, there is no effective co-ordination among mining sector institutions. Cross-sectoral linkages on mining issues are more administrative in nature than a policy and legal requirement. A number of the public sector mining support institutions take unilateral action on mining investment issues. Co-ordination between the Minerals Commission and the Environmental Protection Agency (EPA) has just begun in the area of the granting of concessions and EIA administration. It is now the practice that an environmental permit is a condition to granting mining license/lease and concessions.

8.1.4 The current environmental laws should be reviewed to strengthen their deterrent effect and also to provide for on-the-spot fines for offences such as cyanide spillage which might occur due to inappropriate technology and the management style of mining companies. The EPA should then be appropriately funded so it can recruit and retain qualified professional staff and also ensure effective monitoring of the industry.

8.1.5 The provisions of the mining laws that enable mining companies to shed a minimum of 50% of their concessions must be vigorously enforced. This is particularly important because many mining companies hold large tracts of land that would otherwise be available to farmers. The mining laws mandate all mining and exploration companies to shed at least 50% of a minerals concession as the company advances from the reconnaissance stage to detailed exploration, and then to further shed 50% of the remaining land area before it is granted a mining lease.

8.2. Environmental Impact Assessment Procedures

Procedures exist for the application of environmental impact assessments (EIA) to all mining projects beyond exploration stage. These procedures are well documented on

paper but are confronted with problems of implementation on the ground. It is thus recommended that:

8.2.1 The confidentiality clause attached to EIA Audits should be removed to facilitate public access to these documents. Environmental audits are considered confidential reports. Deprived of access to the information contained in these reports, the public is, therefore, unable to press demands for environmental compliance.

8.2.2 The procedure should clearly demand the effective participation of communities in in the adoption of the study methodologies and in baseline studies. Effective community participation is provided for but not guaranteed in the EIA process because the proponent or their consultant conducts the EIA independently. In this way, the investor establishes the desirable content of the EIS after consultation with selected opinion leaders in the project community. The EIA information system is transformed into a consultation process reaching out to only those with power and authority in the project community. This process is not participatory enough to reveal potential, cross-sectoral impact.

8.2.3 The content and the style of communicating information on EIA procedures should be reviewed to address the peculiar circumstances of local communities. For instance, communities should be adequately prepared for EIA hearings and mining companies should be made to bear the cost of such training. The mining companies should also be required to bear the cost of professionals whom the communities may engage for negotiations and other technical services. The present format and style of communicating data on the EIA reports do not favour affected local communities. Most of the communities affected by mining lack the capacity to study and understand the issues that are raised in the reports because of their technical nature. Communities, therefore, have very limited capacity to negotiate on issues that affect their livelihood. Also, the style of communication tends to place more responsibility on the regulatory agency than on the proponent because complaints are directed to the regulatory agency.

8.2.4 The EIA procedures should make it obligatory for mining companies to accept and implement their own recommendations. There are no provisions in the guidelines that make it obligatory for companies to accept their own recommendations in the EIA. This makes the EIA appear to be restricted to the submission of a report (for example, a pre-project evaluation of possible environmental consequences).

8.2.5 Communities affected by mining projects should be represented in the nine-member Technical Review Committee of EIA reports. Currently, the committee does not include representative of the communities. This will promote transparency in the process.

8.2.6 Adequate financial support and technical equipment should be provided for mining and environmental regulatory institutions to ensure effective monitoring of mine operations around the country in general, and in Tarkwa in particular. This would also enable the institutions to build the capacity of the local communities to monitor environmental compliance. The concept of self-monitoring by companies is not suitable

because companies can manipulate the data to suit their own circumstances. Also, inadequate monitoring equipment compels some of the regulatory institutions to place their monitoring stations far away from some of the communities. This then results in some misleading information on the level of pollution in the area. Monitoring is also restricted to selected sampling sites and so the threshold values obtained could be misleading. A monitoring station could be as far as 6km away from the nearest surface mining operation.

8.3 ECONOMIC AND SOCIAL ISSUES

The restructuring exercise in the country's minerals sector has resulted in significant expansion of the sector and a great increase in gold production, but has failed to generate the much-needed revenue for Ghana's economy and for communities affected by mining projects. The failure of the sector to generate revenue to mitigate the problems it has created and to adequately support displaced communities remains pivotal to the social and human rights problems in the Tarkwa mining area. The resolution of these problems in the interests of sustained peace, enhanced economic performance in the mining sector and improved welfare of communities affected by mining projects lies in the following:

8.3.1 There is the need for a thorough cost-benefit analysis of the mining sector to ensure that the appropriate policy changes are effected to guarantee sustained and improved mining sector investment in the country. The analysis should take into account the incentive packages to investors, the amount of foreign inflows to the sector, the quantum of investment to the sector and the net returns to the home economy and to host communities. The analysis should also factor in the environmental and health damage as well as the social crises arising from the sector.

8.3.2 The restructuring and divestiture of the mineral industry should be preceded by a thorough environmental and socio-economic study to inform policy and decision making. Competent, independent professionals should conduct this kind of study. Unfortunately, the findings of studies conducted by African experts in the mineral industry have often been used to support the interests of transnational mining companies and to perpetuate continued oppression of the local communities who sit on valuable minerals.

8.3.3 More harmonious relations are needed between small-scale and large-scale miners. The frequent clashes between small-scale miners and large-scale miners can undermine investor confidence.

8.4 TARKWA MINING AREA

There is a general lack of commitment on the part of mining companies to preven, minimise and mitigate the impact of their activities on the Tarkwa area. This lack of commitment, coupled with weaknesses in policy, monitoring and enforcement, has put the survival of the unique ecological and climatic zone of Tarkwa under constant threat. It is therefore recommended that:

8.4.1 There should be an intensive and systematic study of the area to ascertain the cumulative impact of mining. This study would provide the baseline data for effective monitoring and sound environmental management practices. This study is even more necessary in view of the concentration of mine projects and mining investment in the area and its unique ecological position in the country as a whole.

8.4.2 An holistic strategic plan for the District that factors in the eventual closure of the mines is required to minimise the long-term effects of the destruction caused to the area by the current concentration of mining investment. Such planning should take into consideration the environmental media such as water, land, vegetation, and shelter that have been seriously impacted but which constitute important elements in the continued viability of human existence.

8.4.3 As part of the reclamation bonds, mining companies should be compelled to bear the cost of drawing up the holistic strategic plan. As a short-term measure, the companies should be compelled to pay some compensation package to address the social costs arising from their activities. The amount of compensation would be worked out on the basis of scientific, social study data analysis. Even more urgently, mining companies should be compelled to take immediate steps to address the physical destruction caused to community water sources and other natural resources.

8.4.4 Issues of relocation, resettlement and compensation should take into account the peculiar circumstances of rural women. Discussions preceding action on relocation resettlement and compensation should involve the active participation of women. Resettlement, relocation and compensation schemes so far implemented appear to have benefited men more than women and have, at the same time, placed a greater burden on women than on men.