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The Impact of Gold Mining on Local Farming Communities in Ghana

Emmanuel Yamoah Tenkorang and Patrick Osei-Kufuor

The increase in leases for surface gold mining in Ghana between 1983 and 1998 has had drastic consequences for sustainable land use and management in the country. Most of these leases were for surface mining displacing the original owners from large arable land needed for their livelihoods. This situation makes the local people vulnerable to economic uncertainties. The real benefits accruing to the ordinary Ghanaian in these mining communities is simply taken, for granted as monetary compensation is paid to affected community members. Such palliative payments to people displaced by mining activities do not address the existing vulnerabilities of these mining communities. This study looks at the effects of mining on households, but from the perspective of the needs expressed by individuals living in the mining area. Using descriptive survey research design, a total of 90 respondents were sampled for structured interviews. Furthermore, 27 focus group discussions with different demographic and occupational groups were organized in selected communities in the Tarkwa, Obuasi, and Kenyasi mining areas of Ghana. The needs of households identified in this study varied and included access to productive lands, education, and basic necessities of life. However, household needs have not translated into higher levels of development as a result of mining. It is recommended that a proper cost benefits analysis be conducted when the potential for mineral mining is discovered in any area before the decision to mine. These analyses should go beyond just the economic indicators to social and development indicators, which include more quality of life issues.

Introduction

The entry of mining companies into communities has oftentimes meant that access to large tracts of land owned by local people and used to sustain their livelihoods are curtailed or denied. These people who formerly owned land and depended on this resource now have to look somewhere else to earn a living. This leads to rapid changes in the societal structures and the loss of indigenous knowledge and social cohesion, which make farmers and their communities lose their self-confidence and capacity to adapt, innovate, and survive at the same level of livelihood that existed before the reallocation of land rights.

Ghana had only five gold mining companies operational in the country in 1983 but the government increased the number of companies in surface mining to 13 in the 1990s. Moreover, the government granted more than 200 mining leases resulting in mining companies holding 30% of the country's land surface area in mining concessions (Vital Statistics, 1998). According to the Ghana Trades Union Congress (GTUC), by 2006, the Government of Ghana had granted 166 new mining leases to companies to operate surface mining in Ghana (Trades Union Congress of Ghana, 2007).

The essence of granting these numerous gold mining leases and reforming the mining sector was to attract direct foreign investments in the form of foreign exchange, taxes, and employment. Ayee, Søreide, Shukla, and Minh Le (2011) highlight the potential benefits of mining to the rural economy in terms of its contribution to better communication technology, banking, electricity, health, education, human resource development, and technology transfer in general. In 2008 for instance, the members of the Ghana Chamber of Commerce spent \$12 million (USD) on voluntary social responsibility projects (Eijgendaal, 2009; cited in Ayee et al., 2011). For example, in 2008 the mining sector contributed approximately 41% of total export earnings, 14% of total revenues and 5.5% of Ghana's GDP (Ayee et al., 2011).

However, the contribution of mining and quarrying sub-sector to real GDP in Ghana for 2011 was 8% with the agriculture sector contributing 24.7% to real GDP (Ministry of Finance, Ghana, 2012). The Ghana Statistical Service (2012) states that skilled agricultural, forestry, and fishery work remains the dominant occupation for both males (44.9%) and females (37.7%). Specifically, the agricultural sector employs about 41.5% with the mining and quarrying sector employing 1.1% of the economically active population. Even though mining contributes a significant proportion to both total export earnings and government revenue, its contribution to real GDP is still less than agriculture.

Notwithstanding the positive contribution of mining to the economy, there are negative impacts on the economy especially at the micro-level. A consequence of the location of mining in communities is the influx of people into these areas in search of jobs with the mining companies or with allied services or to engage in other occupations, which are sometimes criminal. Some of the effects of this situation are that there is pressure on the available facilities in the communities which gives them low quality service and finally breakdown; increases in the competition for jobs, accommodation, and food lead to price hikes and increases in crime and social vices leading to HIV/AIDS. Mining activities are usually said to be destructive to the environment and livelihoods (Akabzaa & Darimani, 2001).

The inability of mining to provide the local people with alternative livelihood makes them vulnerable and reduces their livelihood security thereby increasing poverty (Adjei, 2007). In mining affected communities, vulnerability is a major obstacle to social and economic development especially in areas where majority of the people have few buffers or resources to cope with hazards or shocks, especially when lands on which people undertake their farming activities are taken over as concessions by these mining firms. Mining firms have a poor understanding of the vulnerability of local communities and fail to conceptualize vulnerability as a combination of limited economic and social assets (Hickey & du Toit, 2007). Furthermore, the range of different assets and activities that local people seek to sustain and improve their well-being after mining operations have started is rarely considered by the mostly multinational mining companies that come on board to acquire large tracts of farming lands as concessions and mine in these communities.

Mining communities are also significantly more likely to be affected by health problems, unemployment, trade shocks, famine, or conflict. Thus, the vulnerability of the households in these communities connotes the extent to which the households can adequately resist or withstand shocks. The households' vulnerability is usually influenced by several factors including: (i) Loss of own land or food production or livestock; (ii) Loss

of income and/or tradable assets; (iii) More difficult economic access to food (e.g., due to price increases), and (iv) Breakdown of traditional support systems (FAO/WFP, 2005). For these affected communities to be able to develop on their own, they need encouragement and support to strengthen their innovative capacity.

The dominant approach in ameliorating the effects of mining on communities as well as individuals is through monetary compensation, yet this approach has not addressed vulnerabilities of mining communities (Sweeting & Clark, 2000) and mining activities have often led to the alienation of local communities because they lose access to their farmlands and sometimes they are relocated (Aubynn, 2003). The extent to which the amount of compensation equals the value of a loss, both short-term and long-term, is not the focus of most mining firms and other government agencies. Compensation payments are often not based on what the “sufferer” of impact is losing, but most often than not, the estimation of compensation is shaped by what the mining firms can potentially offer. Objectively quantifying communal and individual assets and converting them into direct cash payments is often problematic and leads to unintended negative consequences on the community and its members.

Furthermore, indigenous knowledge is often insufficient to support the sustained development of effective livelihood systems and for these to be sustained, various interest groups in the communities have to co-operate for the realization of sustained development. But to be helping these people out of their vulnerability, an understanding of the state of vulnerability is imperative. Once the vulnerability is understood and estimated, the next step is to determine and assess the needs of the people affected by surface mining. However, people whose livelihoods depend on local resources assess them in a way that allows them to use or manage them for their activities and not those introduced through mining. Local people’s livelihood priorities and assessments have rarely been incorporated into policy decisions affecting the relevant resources, and this can have serious implications for the relationship between land use patterns and local people, especially if management and land use decisions are based on conventional monetary assessments only (Lawrence & Ambrose-Oji, 2001). Participatory methods of assessing must ensure that those with the perceived needs have an opportunity to express them so that policies on surface mining have a beneficial impact on local communities.

One major need that every society has is to secure jobs for people who can work. For one to be able to work in any enterprise, one has to have appropriate skills for particular activities. In the mining areas, one of the promises given by the mining companies is that they would create jobs for the youth. On the contrary, most of the jobs that are later on made available to these youth are low-paying menial jobs. This is because the youth in these areas often are not well educated. They can therefore not be employed to do any well-paying jobs. Apart from job losses, mining is associated with other social impacts such as the displacement of indigenous communities and (subsequent) loss of livelihoods, and the adulteration of local cultures. This also aids the build-up of social tension in these places.

Statement of the Problem

Traditionally indigenous people own forestlands and due to their dependence on the land for their livelihoods and subsistence, communities have strong ties to these lands (UNEP,

2002). The granting of concessional leases for large-scale mining with little or no consultation of local communities has consequences for rural dwellers who engage in farming activities for a living (Yaro, 2010; Awusabo-Asare, Kendie, & Abane, 2000). Furthermore, mining communities are characterized by poor social conditions such as poverty, unemployment, poor housing and infrastructure, prostitution, and poor health as well as the high influx of migrants (Akabzaa & Darimani, 2001).

Efforts to address the problems caused in communities affected by mining have usually been the payment of compensation to landowners without regard to tenant farmers, the provision of social amenities, and provision of alternative livelihood training programs or recruitment of locals into menial, low-paying jobs in the mining companies. These activities have often been criticized by researchers as not being useful to the beneficiaries as their situations do not improve afterwards (Aubynn, 1997; Aubynn, 2003; Mate, 1998). Even in instances where community members are perceived to benefit from the operations of the mines, little attempt is made to examine how the mining activities transform the community development in the long run.

As noted, there have been contradicting positions on the impact of mining on development. These different perspectives see mining as either contributing negatively or positively to development. This paper moves the discussion further from the macro-level perspectives to the micro-level with emphasis on the household. The key argument of this paper is that expressed needs by households are a good indicator or pointer to the level of development of that household. Thus, if mining should impact positively on a locality, then the assumption is that households will move from lower level needs of subsistence to higher levels needs as categorized by Alderfer (1967, 1967). On the contrary, if the needs expressed by household are lower level needs then mining would have contributed negatively to development.

The questions that arise include: Can expressed needs tell us anything at all about the state of development? To what extent do mining activities in a particular context bring about improvement in people's needs? Do people move from lower level needs such as existence to higher levels needs in the form of relatedness and growth levels? This study emerged precisely in response to these kinds of questions.

Conceptualizing Needs and Theoretical Framework

A need has been defined as a hunger that compels action for its satisfaction. They range from basic survival needs that are common to all human beings and are satisfied by necessities, to cultural, intellectual, and social needs that depend on situations. Needs are said to be the drivers of human action. People have needs depending on their circumstance and there have been various attempts at explaining human needs in several settings and in various communities.

The word "need" is used in a variety of different idiomatic usages, both as a noun and as a verb (Jackson, Jager, & Stagl, 2004). As a noun, need comes with three generic meanings: namely needs as an internal force that drives or guides action, then needs as an (external) environmental requirement for achieving an end, and then needs as justified requirements for performing behavior (Gasper, 1996; cited in Jackson et al., 2004). Jackson et al. (2004) write that most modern needs theoretical frameworks such as Maslow's hierarchical ordering of needs and Alderfer's Existence Relatedness and Growth theory

draw on the first meaning of needs. The usage of needs in these theories is basically concerned with illuminating the links between motivation, values, and behavior. Such a usage of needs is located within various branches of psychology, which differs from the conventional economic approach that regards needs as subjective desires and preferences that can be satisfied through consumer choices. For this particular study, Maslow's hierarchy of needs theory and Alderfer's ERG theory will provide the theoretical framework.

Maslow's hierarchy of needs theory has categorized individual needs into five categories (Maslow, 1943). These are: Physiological, Safety, Love/Belonging, Self-esteem, and Self-actualization. These needs are hierarchical and begin with the physiological through self-actualization. Physiological needs refer to the lower level needs like food, shelter, breathing, water, excretion, etc. These needs as the name implies are needs that the human physical body demands so that it functions normally. Safety needs are those that provide security for the individual in terms of body, health, employment, and crime. The individual tries to ensure that the things that he or she has inherited or worked for to make life comfortable are secured and not compromised in any way. Love or belonging needs are those needs that the individual has to have to feel that they are part of a group, family, community, or fraternity. These needs include friendship, sexual intimacy, and family. Self-esteem needs are those that give the individual confidence, respect for others, and respect from others. Self-actualization is the need that the individual has with regards to morality, creativity, spontaneity, etc. (Maslow, 1943).

Maslow's hierarchy of needs theory has been criticized based on the fact that individuals can have affection even if their physiological needs are not fully satisfied. For some authors such as Jackson et al. (2004), Maslow's theory over-emphasizes the individualistic nature of needs-satisfaction and understates the importance of society, culture, and the natural environment by treating these as secondary in importance to individual motivation. Furthermore, the claim that only sufficiently well-off people can achieve self-actualization is often seen as problematic because poor people in reality may also be able to develop well their individual potential. Alongside some of these criticisms is the argument that individuals can pursue multiple needs at the same time (Max-Neef, 1991).

In response to the limitations of Maslow's hierarchy of needs theory, Alderfer (1969) proposed a modification of the theory by first proposing three levels of needs instead of five. For Alderfer, the three levels are the Existence, Relatedness, and Growth levels (ERG). The physiological and safety needs are categorised as existence needs, the love or belonging and esteem needs are classified as relatedness needs, and self-actualization as growth needs.

Maslow stated that when a lower need is satisfied, the individual then moves on to trying to satisfy the next higher need and that when an individual at a higher need level is faced with a situation that results in a deficiency in a lower need, the individual will suspend pursuing the higher need and pursue the lower need. If the lower need is satisfied, then the individual prioritises the next higher need. In other words, it was not possible for an individual to pursue more than one need concurrently. Alderfer (1969) maintains a different position and argues that an individual can pursue more than one level of need simultaneously.

Alderfer's ERG theory further proposed a frustration-regression component. This component suggests that an already satisfied need can become activated when a higher need remains unfulfilled. Thus, if a person is continually frustrated in his or her attempts

to satisfy growth needs for instance, relatedness needs can again surface as key motivators.

Alongside the theory on needs, this study also uses the concept of sustainable livelihoods to discuss how people draw on different assets and undertake different activities to respond to variations in their livelihoods due to the incidence of mining. Chambers and Conway (1992) define a livelihood system as comprising the capabilities, assets (including both material and social resources), and activities required for a means of living. A livelihood strategy connotes a combination of assets and activities to make a living. A livelihood system or strategy encompasses not only activities that generate income but many other kinds of elements, including cultural and social choices (Ellis, 2000). For Carney (1998), sustainability is achieved when a livelihood “can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base” (p. 4). In the context of mining, the stresses and shocks refer to the changes that occur at a setting as a result of mining related activities. Most often mining communities encounter displacements from farm lands and this has consequences for livelihoods and level of vulnerability, especially those who are unable to cope or adapt to the changes brought in by mining. The outcomes in terms of vulnerability will have consequences for the level of needs and development.

Location of the Study

Figure 1 provides a detailed map of gold deposits in Ghana as well as areas where gold has been mined in the country. There are three major gold producing areas in Ghana: the Tarkwa, Obuasi, and Kenyasi areas. In Tarkwa, AngloGold Ashanti, Iduaprim, and Goldfields Ghana Limited are the major mining companies. AngloGold Ashanti, Obuasi Mine is the major mining company in Obuasi while Newmont Gold Ghana Limited is in Kenyasi. The Tarkwa area has the largest concentration of mining companies in Ghana and therefore the local communities are assumed to experience the greatest effects of mining. The Obuasi area hosts the oldest mining company in Ghana and has the only underground mining in Ghana. The Kenyasi area boasts of one of the biggest mining companies in the world as well as one of the mining companies accused by environmentalists of having the least regard for the environment.

Research Design

The descriptive survey design was used to obtain information concerning the current status of the needs of the population in the sampled areas. The study sought to establish the effect of mining on households in mining communities. The study used both quantitative and qualitative methods.

Figure 1: Map of Ghana Showing Location of Gold Deposits



Source: <http://www.infomine.com/minesite/images/chirano5.jpg>

Sampling Techniques

Three communities were purposively selected from each of the three mining zones to constitute the sampling area. Two communities where mining had directly affected in terms of access to lands for livelihood activities were selected in each of the districts and one community selected to act as control group. However, in Obuasi Municipality, all the three towns were affected by mining. Table 1 shows the affected and non-affected communities sampled for the study.

Table 1: Communities Selected Per District

Area	Affected Communities	Non-Affected Communities
Kenyasi	Ntotoso Kenyasi Nos 1&2	Hwidiem
Obuasi	Anwiam Anyankyerem Akatakyieso Amamom	
Tarkwa	Dumase, Atoabo	Atwereboanda

Source: Fieldwork, 2009

Ten people were conveniently selected from each of the communities to respond to structured interviews designed for the study. The respondents were generally heads of households. Three focus group discussions of 8 to 10 people each were constituted in each community: one for male youth, one for female youth, and the third for a cross-section of both adults and youth. The youth consisted of people whose ages ranged from 15 to 24 years. As much as practicable, gender balance was observed in the sampling.

The primary data for this research was collected between June and July 2009. Data was gathered from a variety of sources including existing reports, community representatives (including Assembly members and some traditional leaders), heads of households, and community members. Focus group discussions and structured interviews were used as the main data collection tools. In total, 90 interviews and 27 focus group discussions were done in the study.

A major limitation of the study was that the three mining companies contacted to be interviewed all failed to grant audience to the researchers. These companies were Newmont Gold Ghana Limited in Ahafo, Goldfields Ghana Limited in Tarkwa, and AngloGold Ashanti in Obuasi. This therefore denied the study the perspective of the business entity in all these deliberations.

Analysis and Discussions

Background Characteristics of Respondents

Seventy-nine percent of the respondents were selected from communities directly affected by the mining operations. In total, 90 respondents were sampled for the structured interviewing and 27 focus group discussions were held. The statistical data for the analysis were computed for the household interviews and the FGD discussions were used to give further explanations to issues raised in the interviews. Of the respondents, 52.2% were males and the average age of respondents was 46.29 years old with a standard deviation of 18.36 years. The average household size was 7.6 people and standard deviation of 5.3 people. The average household size in the sampled districts was higher than the national average household size of 4.4 people (Ghana Statistical Service, 2012).

Occupation of Head of Household

The occupation of the head of household, who is usually the breadwinner, was determined. The most prevalent occupation of heads of households was farming (agriculture) with 61% of respondents. Compared with the occupational situation in Ghana, agriculture makes up 55% of occupation nationwide (Ghana Statistical Service, 2008). This therefore means that the respondents are more predominantly engaged in agriculture and since this activity is land-based, access to land is a matter of survival for most of these households.

Educational Level of Respondents

The educational level of people often times determines the types of skills one possesses and therefore, the types of economic activities one can engage in. This was determined for the respondents and is shown in Table 2.

Table 2: Educational level of respondents

Level	Frequency	Percentage
None	37	41.1
Primary	20	22.2
Middle school/JHS	21	23.3
Secondary	11	12.2
Tertiary	1	1.2
Total	90	100

Source: Fieldwork, 2009

From Table 2, 63.3% of respondents had either primary level of education or no education at all. This means that respondents generally did not possess much skill to gain employment in formal jobs. From the survey, 41.1% of respondents had never been to school. Comparing this figure to the proportion of Ghanaians who have never been to school, that is 35.2% (Ghana Statistical Service, 2008), respondents were less educated. Lack of schooling is viewed by the researchers as a primary reason why respondents were mostly engaged in the much more labor-intensive job of farming.

Income of Household

Incomes within households generally determine the kinds of social amenities and livelihood support assets that the household can access, and an attempt was made to determine the income levels in the households. However, it has been the general experience in household surveys that it is much more difficult to capture all elements of income (GSS, 2000, p. 100), and therefore income figures determined in this subsection may understate total household income. This is so because income was generally understood as money paid to someone at the end of a period and sometimes people did not want to disclose their incomes (Tenkorang, 2003). The mean income in the household per month was GH¢128.25 with a standard deviation of GH¢143.62. The mean annual household income in Ghana is GH¢1,217.00 (GSS, 2008) which translates into GH¢101.42 per month. On

average, incomes in the households were higher than the national average. However, the median income in the households was GH¢ 90.00 per month. This means that half of the households in the selected households earned less than GH¢90 per month.

The views of respondents on adequacy of their incomes for meeting health, education, and welfare needs of the household are as follows: 88% of respondents said their household's income was not adequate to cater for health costs while 85.6% said it was inadequate for education costs. In addition, 90% said it was not adequate for the welfare of the household.

Expenditure of Households

The mean expenditure of households were determined from the respondents and it was given as GH¢230.64 per month with standard deviation of GH¢187.56. The mean annual expenditure of households in Ghana is GH¢1,918.00 (GSS, 2008) which translates into GH¢159.8 per month. This shows that expenditure levels in the sampled areas was higher than the mean for Ghana. The mean expenditure for the households determined in this study was higher than the mean household income and this may be explained by the possible under reporting of income explained earlier (Tenkorang, 2003). Expenditure of the household had generally elevated even though they have not experienced any significant improvement in the incomes. This could be partly attributed to the rise in cost of access to and scarcity of land, agricultural production in these areas had gone down, and households then had to buy food they once produced themselves.

Changes in Expenditure of Households

When respondents were asked whether there had been changes in the expenditure of the household since the advent of mining in the communities, they said their expenditure had increased. Some of the respondents said the increases were either excessive or outrageous.

The explanations given for the increases in the expenditure of households included the mining activities destroying the land because of chemical pollution. Respondents were of the view that the chemicals that were used in the mining sometimes polluted rivers which when there were rains overflowed their banks and degraded the land. Also, the granting of concessions to mining meant that community members who were farming there had to stop doing the work they have done for generations. Before mining, community people hardly spent money on food because they had most of what they needed from their farms. But now they have to start spending money on things that hitherto they could get from their farms. This diminished accessibility to land for farming had resulted in less food on the markets and higher prices.

Another reason adduced for the increase in expenditure was that before the mining, room rental prices were very low. Since there had been general increases in prices, landlords had also increased their rents in order to make more money. This is not because people in the mining areas earn higher salaries as compared to other surrounding communities but rather the few who are employed by these mining firms are able to pay the higher rates which later become the benchmark that guides the setting of rents in the area. In some instances, tenants had to only go and assist their landlords on their farms once

every two weeks or once every month without paying money for rooms they occupied, but now because of the influx of people into the communities and the dwindling farming activities, they had to pay higher rents than they used to before the mining companies came.

Pricing of goods and services by the providers was influenced by the expectation that since there were mines in these areas, then people could afford higher rates. Those times that mining companies were not doing surface mining, some of the people were engaged in small-scale mining. However, when those lands were to be used for surface mining by the corporate miners, state security had been used to enforce compliance therefore those people had become unemployed and could not therefore afford to take proper care of their families.

Access to Land and Conditions of Access

In most of rural Ghana, the livelihood activities of the population are tied to the land and the resources of the land. Access to land for livelihood and the conditions under which this access is held was discussed. Generally, 61.1% of respondents' households owned land for farming but when the data was disaggregated for affected communities and non-affected communities, the affected communities' had significantly less people owning land. Table 3 shows the distribution.

From Table 3, 94.7% of households in non-affected communities owned lands while 52.1% in affected communities owned land. When the emerging relationship between type of community and ownership of land was tested with the chi squared test at 5% significance and 1 degree of freedom, the p-value obtained was 0.001. This value is less than the significance level of 0.05 and therefore, there was a statistically significant relationship between type of community and whether the household owned land. That is, the number of people that lived in mining-affected areas that owned land was significantly less than their counterparts from communities that were not affected by mining.

Table 3: Ownership of Land, Disaggregated for Type of Community

Type of community	Does family own land?				Total	
	Yes		No		#	%
	#	%	#	%		
Affected	37	52.1	34	47.9	71	100
Not affected	18	94.7	1	5.3	19	100

Source: Fieldwork, 2009 $\chi^2=11.459$, $df=1$, $\alpha=0.5$, $p\text{-value}=0.001$

Those households that owned land said the lands were lands they had inherited from their ancestors, i.e. communal lands and once one is a member of those families or clans, they could also farm on them. They just had to inform the family heads of their intention to farm the land and in which area. There were, however, problems encountered with the availability of lands. The first is that the concessions granted to mining had made the quantity of land available smaller than it used to be, and coupled with population in-

crease, there is a lot of pressure on the little available land to support more people. This creates a problem for accessibility as there are more people for limited areas of land. Another issue for the land is that because of the scarcity of land for farming coupled with old farming practices, the land is not allowed to lie fallow to regain its fertility.

The second problem with land for households whose families owned land had to do with the proximity of land. Some respondents complained that most of the lands they had to relinquish their access to were rather closer to home. They now had to travel long distances to farm. Of the households that had access to land for economic activities, there was also a statistically significant relationship between the adequacy of the available land and the type of community. Table 4 shows the relationship.

Table 4: Relationship Between Adequacy of Available Land and Type of Community

Type of community	Is land adequate?				Total	
	Yes		No			
	#	%	#	%	#	%
Affected	2	21.4	44	78.6	56	100
Not affected	12	70.6	5	20.4	7	100

$$\chi^2=14.281, df=1, \alpha=0.5, p\text{-value}=0.00$$

Source: Fieldwork, 2009

From Table 4, people in mining affected communities' access to land for economic activities was significantly more inadequate than communities which were not affected by the mining operations. Other people had no access to any parcel of land on their own to farm. The reason for this situation was that most of the family lands had been acquired for mining. Some of the respondents who did not have lands for farming said that the mining company ordered them not to farm on their land again. In New Atuabo, for instance, some of the respondents who were resettled from their former town said they had still not been compensated for the acquisition of the lands. Those who were compensated complained that the compensation was not adequate.

Farming Activities on Available Lands

Eighty-two percent of respondents had at least one member of their household engaged in farming. Of those households engaged in farming, most of the farming was done in food crop, cash crop, and fish farming. The food crops grown include plantain, cassava, cocoyam, etc. The major cash crops grown are cocoa, oranges, and oil palm. However, there was high fragmentation of land because neighbors had to be catered for; therefore, people could not farm on large scales as they would have wished.

Loss of fertility of the land had also forced the farmers to shift the type of plants grown to more hardy plants like especially cassava. Soils that used to support cocoa, citrus, and other less hardy plants could not sustain them anymore. Other farmers now had to buy and apply fertilizer to the land before it could support crops. In addition, some farmers now had to travel over long distances to get to their farms as lands closer to them had been acquired for mining affecting how much work could be done.

Conditions of Usage of Land

The conditions under which the lands were available to farmers to farm are the real indicator of how accessible land is in the sampled communities. There were various systems of access that people had to the available land and these are discussed. Private ownership of land, though not very widespread, was one condition under which people had access to land for cultivation. Under this condition someone buys the land from the owning family and it becomes private land.

When people cultivated family lands, the produce were generally not shared with anyone as each member of the family had a right to those lands. Every family member is entitled to what s/he is able to cultivate. In other instances noted in the Kenyasi area, however, since the land belonged to the entire family, when any member cultivated any part, the produce was divided into two and the farmer took half. The other part was given to the entire family of which the person who cultivated the land took another share because s/he was a member of that family. This arrangement was based on the reason that one who cultivated land and his/her siblings jointly owned the land therefore a little amount of produce should go to all the owners.

Another condition of access to land was the *abunu* system of sharecropping. Here a token of money was paid to the landowner to serve as a witness and the farmer was shown a place to farm. When the produce matured, the farmer shared it equally between themselves and the owners of the land. Another variant of the *abunu* system was the situation where the tenant farmer planted food crops for themselves and then planted tree crops, especially cocoa, for the owner of the land. For as long as the land could support food crops, the produce of the food crops were for the tenant farmer. In this case, when the land was compulsorily acquired for mining, compensation for the food crops went to the farmer who cultivated the land but for the cocoa and land, it went to the owner of the land.

People who did not have land or had lost their land for any reason could also approach either a family or an individual who owned land and rent a piece of land for an agreed period of time and under agreed terms. On the issue of whether there was enough land available for livelihood activities, respondents noted that acquiring arable land was a problem, especially as population increased. People could only add more land when these were purchased from places generally far from their home communities. Some people had left their communities to farm in other areas where land was still available. Other respondents said that the chemicals used in the mining process had destroyed the fertility of farming lands. This also resulted in less arable land, as well as generated flooding of local rivers due to increased siltation.

Fertility of Land

Most of the respondents stated that the fertility of the land had deteriorated over time and now, it was poor. They generally said that the fertility currently could not support crop development. Those farmers, who could afford it, had to apply inorganic fertilizer to the land to be able to harvest anything. For both cash and food crops, the fertility of land had deteriorated so much that it was difficult to plant any crop and get good yields. One re-

spondent also noted that weeds grew too quickly on the land and that the land had become sandy, both indicators of fertility loss.

Labor Conditions

In Ghana, more than 55% of the citizens are engaged in agriculture as their main occupation (GSS, 2008). The agricultural practices used mostly in Ghana are labor-intensive and the conditions under which labor is available to the farmers, to a large extent would determine production levels from farming activities.

There were two main sources of labor available to the households for farming: household members and hired labor. For the household members, they contributed the labor simply because they were household members and such labor was generally not paid for. With regards to the hired labor, there were several arrangements used to contract these services. The first arrangement was when the services of labor were contracted on daily basis. That is, laborers were paid at the end of the day. The charge per day was a mean value of GHC 5 for males and GHC 4 for female labor.

For some workers, the rates were negotiated on yearly basis and terms of contract signed based on agreed terms. Others stayed with the landowner and assisted him/her in cultivation on the condition that at end of the year, the landlord paid an appropriate fee to the worker depending on the input the worker made. Some also negotiated on contract basis, where the work to be done was inspected by the person(s) to provide the labor and the amount negotiated and agreed upon. A few cases of farmers coming together as a cooperative were also noted. In this case, the members of the groups worked on members' farms on a rotational basis.

Usage of Farm Produce

Most of the produce from the farms, i.e. 73.6%, were consumed in the households because of various reasons. The major reason was that since the farmlands were very small, there was not much surplus produced to sell, that is, they engaged in subsistence farming.

Some respondents also said that at times when they sent food to the market, it was not readily sold and this discouraged them from producing to sell. Others also said the land was not fertile; therefore, one could not produce for sale because it was not profitable to do so while others said they did not have enough capital to go into producing for sale. They just tried and farmed what the family survived on.

Market Conditions

Crops grown by people in communities are either consumed by the producers or exchanged for other goods, services, or cash. The market is a platform for exchanging produce for other goods, services, or cash to secure the household's livelihood. Conditions on the market therefore determine how these negotiations are transacted and the utility that players in the marketplace derive from these transactions.

People's ability to purchase items they needed on the market was seen by some respondents as being eroded. The reason given included the fact that the compensation given for the acquisition of the lands for mining was not adequate. People therefore did not

have enough money to buy all that they needed. Some traders at times sent items to the market but came back home without any sales because of people's inability to buy. Sometimes customers bought the produce on credit and promised to pay at a later date. The credit system was very much in practice in most of the communities. The traders had no choice than to sell on credit because if one did not give out the food on credit, most of the time it rotted. However, during a bumper harvest of food, the prices normally went down and more people could afford to buy produce. The respondents who sold produce on the market said that when one sent good quality farm produce to the market it was usually readily bought.

Food items that were cultivable in the communities should obviously be available on the local market and also be cheaper to buy. There was however a general shortage of such kinds of food on the local markets. The reason given was that there was not enough capital to work on a large scale to serve the local markets. A respondent also suggested that pollution, especially air pollution, affected the production of locally cultivable food crops. An example of mango trees not bearing fruits in some years in the Kenyasi area was said to be due to air pollution from the mines.

For cash crops, because they were usually bought by produce buying companies, there appeared to be a more readily available demand. This may also be one of the reasons why food crops were not readily available on the market as people felt more secure in planting cash crops on the little fertile lands available than food crops.

Eighty percent of the respondents acknowledged that there had been a change in the conditions on the market. The reduction in people's ability to buy and sell on the market was given as the major change observed in the local markets. In other words, the economies of the communities had shrunk. It was further explained that buyers' incomes had shrunk thereby reducing their purchasing power. Since buyers could no longer buy frequently, it naturally reduced the sellers' ability to bring in more goods for sale. Some other respondents contended that due to population increase, when goods were sent to the market, there was ready market for it but the problem was because people lacked capital and farmland, they could not work on a larger scale to meet the demand of the market.

Small-Scale Mining Activities

In most areas where gold is available in the soil, people engage in small-scale mining as a livelihood activity or as a result of dwindling opportunities to engage in the original livelihood activity of farming. Thirty percent of the sampled households had at least one member of their household engaged in small-scale mining activities.

In all the sampled areas, people engaged in artisanal mining to make a living. Their motivation was that since the mining companies did not employ all the youth, then they had to fend for themselves and their families. Some respondents suggested that government should withdraw the license of the corporate miners and give the land to the artisanal miners because they provided more jobs than the corporate miners did and the money and gold stayed within the Ghanaian economy. In the artisanal mining, there were both forward and backward linkages with other subsectors of the economy and they were not an enclave activity as compared to the corporate miners. They even intimated that the corporate mining companies did not provide half the number of jobs created by the artisanal miners and that even food sellers that serviced the artisanal miners were more than

the staff strength of the corporate miners. One artisanal mining pit employed an average of 50 people, excluding people who were employed to cook for the workers and the porters. In 2003, registered small-scale mines in Ghana employed an estimated 100,000 people with almost an equal number suggested to be working in illegal mining (Amankwah & Anim-Sackey, 2003).

However, because of the concession of lands given to the corporate miners, the artisanal miners had problems with both the security staff of the companies and state security. In Dumase in the Tarkwa area for instance, the artisanal miners spent a lot of money buying a transformer for their mining site but the state security institutions did not allow them to develop the place further and the electric poles the miners had bought were taken away from them. This further worsened the unemployment of the local youth.

There was a lot of migration of local people to other towns. Migration is related to rural poverty and when conditions in a particular area are not favorable for well-being, people, especially the economically active ones, migrate to look for better employment opportunities. Dasgupta (1981) has noted that the migration of labor from an area would reduce agricultural production unless this movement takes into consideration the agricultural cycle or takes place in the off-season, or when there is a shift in the crop combinations in favor of less labour intensive crops, or crops which can be cultivated by women mostly or a technological shift to capital intensive agriculture or an increasing reliance on hired labor from other villages.

The issues surrounding migration in the households of the sampled respondents were discussed. Most of the respondents reported that a member of their household had migrated to either another rural community or to an urban community. The reasons given for the migration included the fact that small-scale mining had not been introduced to that area, so people had little to do after the mining company acquired the land. People therefore migrated to other areas either to look for jobs, to look for land to farm or to engage in small-scale mining. Other people migrated because of the poor level of development in their communities.

Others also migrated because the lands had been degraded by the mining. Another reason for the migration was the harassment of illegal small-scale mine (*galamsey*) operators by both corporate mining and state security. For these reasons, some of the young people dropped out of school and migrated to other mining communities to engage in *galamsey* and others to big towns to look for non-existent jobs.

Food Security

One very important existence need of every human being and family is food. Every household needs an adequate amount of food both in terms of quantity and quality to thrive and develop. Even though the mean number of times family members ate the day before the interview was 2.6 times, some of the respondents felt that the quality of food that they consumed was not the best but they ate it anyway because they had to fill their bellies. They complained that their food did not contain all required nutrients for healthy growth and that now, most of their foods contained too much carbohydrates. Natural foods like green leaves, mushrooms, snails, crabs, and bush meat that they used to get in the past from the forest were now non-existent. This is because of the degradation of vegetation and pollution of lands caused by the mining.

There was less variety in the types of food respondents ate and some of the respondents said their staple diet was then made up of polished imported rice or cassava fufu without plantain. Owing to the degradation of the farmlands, plantain for instance did not do well in the soil. Another issue affecting the quality of food that respondents took was that owing to the worsening fertility of the land, there was increasing application of various types of inorganic fertilizer to nourish the plants and this affected the quality of the food grown. Other respondents also explained that the compensation that was given to farmers as a result of taking over their lands was not enough so they had exhausted the money and could not afford to buy better food for themselves and their families.

The payment of compensation and the wages received by the few people who worked in the mines had also resulted in the creation of a localized inflation within the communities as traders had artificially raised the prices of their items. One used more money to buy few items now compared to the periods when mining was not done in the areas.

Emergency Food Situations

Basically, access to secured source of food is an existence and a physiological need; therefore, when the individual or family does not get it; they will adopt strategies to satisfy this need. Individuals or families adopt one of four major strategies in emergency food situations: consume famine foods, borrow or buy food on credit, adopt alternative livelihood strategies, or sell valuables to offset bills.

In the sampled communities, respondents frequently consumed famine foods to satisfy their needs. These activities included foraging through the bushes for wild cassava, yams, bananas, and leafy vegetables. However, these types of foods, when not properly matured, prepared, and cured before consumption could lead to food poisoning or in extreme cases to death.

When the household or family was stressed, sometimes borrowing food was an option adopted to deal with the situation. Respondents had to frequently buy food on credit because they often did not have money to buy it. When one bought on credit, he or she took into consideration whether the seller was on good terms with them before that transaction could go through. When the time was due for payment and the debtor was not in a position to pay, there was renegotiation of the payment date. However, sometimes debtors could not just pay and they resorted to playing hide and seek with the creditor. At certain times, people borrowed food from their colleague farmers and replaced them at a later date or they reciprocated the gesture when their colleague was in need.

The adoption of alternative livelihood strategies is also used by families or households in crisis. Sometimes people gathered firewood in exchange for a cup of rice. Sometimes the price of the firewood was more than the cup of rice but it had to be exchanged to ensure the family had food to eat. Sometimes people looked for menial jobs to do either in their communities or other communities. Another alternative was to skip some meals in the day or to reduce the amount or quality of meals taken to satisfy their need for food. Other alternative activities had been engaging in the production of animals like grass cutters, snails, fish, and to grow mushrooms to supplement the household income.

Some of the respondents expressed interest in engaging in these non-traditional farming activities and were willing to be trained in doing it. But for those who were already

trained, they complained that they were taught without being given any stock to begin with or any support to start with. Some of the trainees said they were promised that they would be given pigs after their piggery training but only three people received the promised pigs. They were told that after the pigs given to the three trainees produced young ones, the piglets were going to be distributed to the other trainees as stock for their own farms. That was supposed to take two years and they wondered if one had children in school, how long they could wait to even get the stock to begin their farms.

Others who were trained in mushroom cultivation suggested that the type of mushroom they were given to plant was not easily marketable. People were even afraid to eat them because they were exotic and local people were aware of the danger of eating unknown mushrooms. The newly trained mushroom farmers had the preconception that the mining company was going to buy them for export but that did not happen. This confirms studies done in Ghana in 2009 which showed that the alternative livelihood schemes did not generate sufficient income to replace farming, and was seen as being inappropriate, inadequate, and poorly sequenced which did not restore community independence and individual pride that access to land brought (Temeng & Abew, 2009).

In all these alternative livelihood schemes, if the trainees were given microcredit facilities it would allow them to acquire the stock of materials and equipment to set up their own enterprises. Access to microcredit facilities would also enable even already established alternative livelihood enterprises to expand their activities in terms of both the size of the undertaking and improvement in technology. However, these credit facilities, at relatively low interest rates, were not very common in the areas.

The last strategy to be considered in this study is the sale of families' valuables to offset existence or belongingness needs. Respondents have had to sell jewelry, mobile telephones, television sets, clothes, or bicycles to be able to satisfy a need of the household or family. The most prevalent of the reason for selling valuables was to buy or pay for food. This usually peaked between the planting and harvest seasons when the families did not have either food in store to use or to sell. Another reason was to be able to either pay for school fees of children or to set up a child in apprenticeship.

Recommendations

It is recommended that the Government of Ghana and its implementing agencies involved in the management of mining in Ghana conduct exhaustive cost-benefit analysis that broadly considers development of both the areas where mining is done and the whole country prior to granting a mining lease to any company. This analysis should not pay attention at the volumes of FDI that flows into the economy and the amount of infrastructural development that the mining is perceived to bring but rather on how individuals from the mining communities would stand to benefit in terms of their quality of life.

It is also recommended that the interpretation of displacement in Ghana's Mineral and Mining Law of 2006 (Act 703, 2006), section 73, subsection 4 should include those who have lost access to the land for any economic activity, not only people whose houses are to be relocated. The Minerals Commission should ensure that there is this reinterpretation of the provision to include all the people who are actually displaced by the mining activity to ensure that they are adequately catered for by the compensation packages available.

Last but not the least, the mining companies who are the direct beneficiaries of the mineral resources should be compelled by the Minerals Commission to release lands that have been given as concessions to them but which are not being used for production to community members to farm for a living.

Conclusion

The introduction of mining in the communities studied engendered a lot of change in the socioeconomic structure of the people. Most of the economic activities in these mostly rural areas were agricultural. Owing to the rudimentary technologies used in the farming, access to fertile land in adequate amount is crucial. However, surface mining as practiced in the area require large tracks of land and this has resulted in the dispossession of local people of their farming land. This leads to unemployment of the people resulting in increasing levels of poverty in households. Households then become less able to feed themselves well, send children to school, or care for their health and welfare needs.

The needs of the households studied include accessing adequate sizes of fertile land for farming and other livelihood activities, protection of their human rights, and access to education, jobs, and health facilities. Most of the needs of the households determined were deficiency needs, i.e. physiological and safety needs. These needs are the lowest two level needs of the individual (family) on the Maslow's hierarchy of needs. The communities in the selected areas are therefore not as developed as the resource discovered in their land should have allowed them to be.

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