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# Perspectives on Small-scale Mining in the Birim North District of Ghana

James Fearon*, Noah Agbah Evans Dawutey
Faculty of Agriculture, University for Development Studies, P.O Box TL 1882, Tamale- Ghana

**Abstract**
Small-scale mining operations in the study area are illegal (*galamsey*). Using the Conceptual mapping approach, we explored the effects of the illegal activity on the environment and livelihoods in two farming communities in the Birim North District. Majority (89%) of the *galamsey* operators (n=180) are migrants from five regions, besides the Eastern. Indigenes from the Volta Region constituted the bulk (53%), followed by Ashanti region with 17%. Participants aged between 16 and 39 years formed 74% of the miners with women making up 10%. They migrated in search for job opportunities that were limited or non-existent in their respective regions of origin. Three types of *galamsey* operations identified were *underground*, *underwater*, and *surface* mining. The activities have degraded vast farmlands through indiscriminate excavation and exposure of topsoil to agents of erosion. With 8% of drinking water sources in the district declared as *unsafe*, contamination of water bodies that serve communities along their course gives great course for worry. Abandoned mines serve as death traps and breeding grounds for mosquitoes. Labour supply for agriculture becomes relatively scarce due to competing interests with mining. The evidence suggests that only 11% of the mineworkers who double as food crop farmers visit their farms daily while an overwhelming majority (89%) work at the mines daily. Despite the negative consequences, *galamsey* is relatively rewarding for those involved in it and favourable to the local economy. At the current GH¢:US$ rate of 3.8:1, mine operators earn an average of $7,280-$9,620 (*good scenario*) and $1,456-$1,950 (*bad scenario*) annually, compared to the seasonal (annual) earnings of $787.5 from agriculture.
**Keywords**: *Galamsey*, mining, small-scale, environment, pollution, livelihoods, sustainable.

## 1. Introduction

Crop farming is a major livelihood activity in most rural communities in Ghana. It is however characterized by countless challenges, some of which are related to price instability. The level of modern implement and input use among farmers is also limited, posing additional productivity challenges. These difficulties among others make agriculture rather risky with limited financial rewards. As a result, the search for alternative sources of livelihood is high in rural communities and inhabitants (mostly farmers) readily go into activities they perceive to offer higher and or relatively stable incomes, despite any potential negative consequence.

Research shows that small-scale mining is an important livelihood activity that employs over 13 million people directly and supports an extra 80 million across the world (Heemskerk & Olivieira, 2003). These households in developing countries depend on mining as a primary source of income or as supplement to farm revenue. Some argue that the record growth in mining activities across the world was in response to widespread unemployment. For instance, Tallechet et al. (2004) suggest that people were forced to take up jobs in the Artisanal and Small-scale Mining (ASM) sector due to economic mismanagement and revised patterns of farming and trading over time, which made them jobless. For others, worsening profitability of agriculture triggered the decline in farming in favour of mining (Banchirigah & Hilson, 2010). In other words, mining and related activities are perceived as ventures that offer the best opportunities to earn income, especially in areas where poverty rates are high (Heintz, 2005; Hilson & Potter, 2005). It is also important to note that whereas agricultural production/productivity declined in mining communities, livelihoods improved as farm workers shift to mining (Mishra & Pujari, 2008). This suggests that the two enterprises complement each other and, as suggested by the International Council on Mining and Metals (ICMM), collaboration between the two is essential (ICMM, 2007). In most cases, mining operations are conducted outside of regulatory and legal frameworks, in which case they are classified as illegal (*galamsey*), yet offer employment to many people (ILO, 2004).

## 2. Mining-agriculture-environment nexus

Globally, the expanse of land used for mining is relatively small compared to agriculture. In Australia for example, sites allocated for mining accounts for less than 0.3% of the total land mass (MCA, 2010). The case is similar in Peru where only 0.08% of the total land allocated as mining concession is actually being used (Salazar, 2010). Mining and farming are however related because they depend on common resources like labour and land. Increasing the demand for any of the factors in one enterprise may adversely affect its availability for the other. Thus, conflicts arise in situations where mining is perceived as competing with agriculture and other land use practices (Mitchell, 2006).

The adverse effects of mining on the environment are well-documented (Veiga & Beinhoff, 1997;

Warhurst, 1994, 1999). For instance, mercury (Hg) is used in mining to amalgamate and concentrate gold metals (Eisler, 2003). In Ghana, mercury is used to recover gold through a process called Panning (Amegbey & Eshun, 2003). Mercury discharge that occurs during the panning process ends up in the environment, creating health problems in the affected communities (Yelpaala, 2004). Owing to the use of inefficient techniques at most mining sites, an estimated 2gHg are released into the environment for every gram of gold recovered, which eventually find their way into the food chain (Veiga & Baker, 2004). Even though the use of mercury (for gold extraction) was banned in Ghana around 1933, the practice continued until it was officially sanctioned in 1989, causing a surge in usage (Donkor et al, 2006). One major problem however is that while the current mining law is specific on good practices with respect to the use of mercury, it is silent on guidelines for handling and disposal, making it difficult to monitor and ensure strict compliance (Amegbey & Eshun, 2003). Land degradation is another challenge that small-scale mining pose in Ghana. According to the World Bank (1995), approximately 15,000ha of land was affected by small-scale mining activities in Ghana. Clearing of vegetation, excavation and other related activities expose the topsoil to agents of erosion, which render the land unsuitable for agricultural purposes. Abandoned pits and trenches also collect water that serves as breeding grounds for mosquitoes.

## 3. Regulation of small-scale mining in Ghana

Small-scale mining is defined as that which is operated on a parcel less than 25 acres (World Bank, 1995). Until the 1980s, activities in the sector were completely unregulated. The situation changed in the mid-1980s when government implemented the Economic Recovery Plan (ERP). The decision to formalize the sector was borne out of official appreciation of its economic potential, thus safeguarding revenue that would have been lost through illegal trade. By the end of the 1980s, government had fully regularized the sector through policies and guidelines. This was meant to ensure that the sector contributes positively to national development through efficient and sustainable management of natural resources. In addition, it intended to achieve a balance between mining and the environment by ensuring that accepted standards of health, safety and environmental protection are observed by all participants in the sector. Others however argue that regularizing the sector in Ghana was due to its resilience and potential to reduce poverty through improved household income (Hilson & Potter, 2005). In line with that, institutions like the Environmental Protection Agency (EPA), Water Resources Commission (WRC), Forestry Commission (FC) among others were established to supervise activities in the sector. The EPA was established under its Act of 1994 (Act 490). It is responsible for among other things, enforcement of environmental regulations. This means that any individual or group that intends to procure or own a mineral right has to acquire an environmental permit from EPA in order to undertake any mineral operations. Similarly, the WRC was established under the commission's Act of 1996 (Act 522), with the responsibility to regulate and manage the use of water resources. Since the commission is mandated to grant water rights to all users, any mineral right holder is expected to obtain approval or license for mineral operations to for example, divert, convey and use water from a river, stream, underground reservoir or watercourse. Together with a Water Use Regulation, 2001 (L.I. 1692) which was passed by the WRC, the two statutes (522 and L.I. 1692) prescribe sanctions for possible violations. Forestry Commission was re-established under its Act, 1999 (Act 571) and charged with the responsibility to regulate the use of forest and wildlife resources as well as coordinate other related policies. With respect to mining, the Act provides that mineral right holders shall obtain permit from the Forestry Commission before undertaking any operations. Apart from these major institutions, District Assemblies also have the authority to supervise mining activities in communities that come under their jurisdiction. They are expected to ensure that such operations are carried out legally in consonance with the environmental laws of Ghana. One of the responsibilities of traditional rulers in Ghana is to mobilize members of their communities and collectively monitor all projects including mining to ensure that they conform to existing regulations. Indeed, mines that are operated legally in the communities pay royalties, expected to go into development projects. It is widely acknowledged that royalties are means of compensating host communities who suffer the consequences of mining.

 

## 4. Methodology

The study adopted the case study approach, purposely targeting small-scale gold mining operators in the Birim North District of the Eastern region (Figure 1).

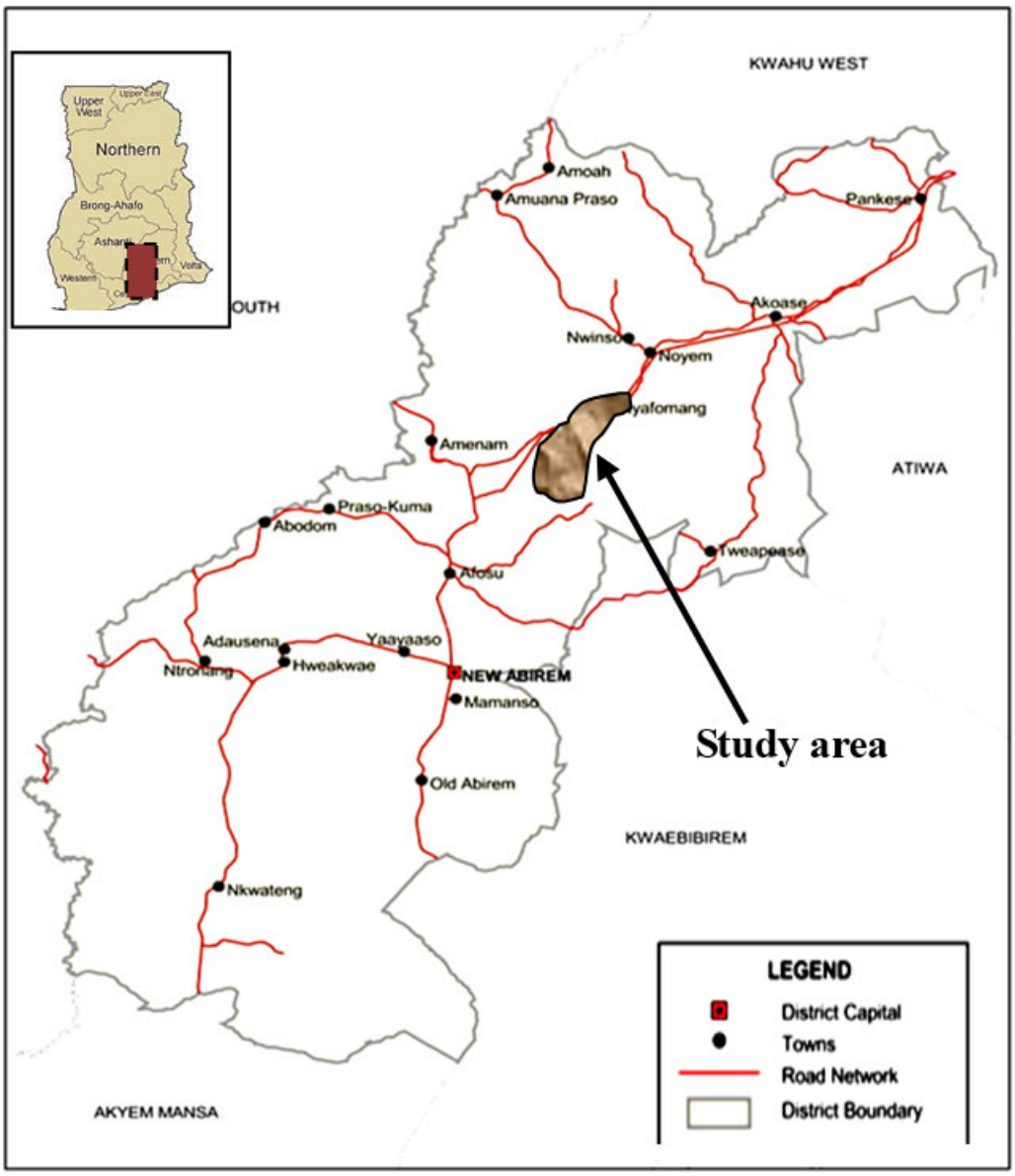


**Fig. 1: Map of Birim North District showing study area**

Emphasis was placed on the association between *galamsey* activities, crop production and how they affect the environment.

Birim North was carved out of Birim District Council in 1987 as part of government's decentralization programme that aimed at promoting effective governance for speedy development. With a total land area of 566.48 km$^2$, the district is bordered to the north by Kwahu West Municipal, the west by Asante Akyem South and Adansi South Districts (Ashanti Region). Akyemansa District, (newly created) carved out of Birim North borders the District in the south while Atiwa and Kwaebibirem Districts border it to the East. The two communities cover 6.3 km$^2$ and 12.6 km$^2$ respectively. Like many communities in Ghana, the mainstay of the economy of Birim North is agriculture with 73% of the workforce engaged in some agribusiness activity. Major crops grown in the area include cocoa, oil palm, rice, maize, plantain, cassava and vegetables.

Questionnaires were used to collect cross sectional data from mine operators/assistants in the two adjoining communities (Nyanfoman and Adadekrom) who were directly engaged in mining and related activities. The purpose was to obtain individual perspectives on small-scale mining and its impact on livelihoods and environment. Regional representatives of the EPA, WRC, FC as well as the District Assembly were interviewed as key informants. At the community level, information was sourced from opinion leaders or their

 

representatives. Focus group discussions involving mine operators were also organized to draw information on the broad issues surrounding *galamsey* activities in the community. Secondary data was obtained from offices of the District Assembly and District Health Centre.

Conceptual mapping also known as the mental model was used. Generally, peoples' idea of the world produces an abstract model of where and how objects are located in their immediate environment (Marr, 1982). It is thus possible for individuals to construct a mental model of the world based on their knowledge and understanding of it (Johnson-Laird, 1982). The models are therefore psychological illustrations of the imagined or real situations presented in the form of conceptual maps of ideas (Bostrom et al., 1994; Morgan et al., 2002). They explain the thought process of persons and produce an image of the environment and the relationships between the different parts as well as the intuitive perception about the actor's own actions and their consequences. The model was used in the study to understand how *galamsey* operators, local and regulatory authorities judge the effects of the operations. To that effect, three mineworkers, three community leaders and three officials each, from the regulatory bodies were involved in the exercise. After brainstorming the problems (causes), participants recorded their thoughts on index cards that were linked appropriately to the problem. They then discussed the consequences for individuals, the community and the environment. Results from the individual concepts were aggregated into a composite map.

## 5. Results

### 5.1 *General profile of the miners*

Although farming was perceived as the most important livelihood activity in the area, mining is gradually taking over, as it was rated highest in terms of income generation. Responses from focus groups suggest that most participants take to mining as a temporal pursuit to support other livelihood interests but often emerge as permanent miners or assistants. Small-scale mining operations in the area may be described as *galamsey* since the 'concession right' holders had not satisfied any of the legal requirements, except to surreptitiously pay their way through the local authorities and some officials at the District Assembly.

Studies have shown that female participation in *galamsey* operations in Ghana is common. This study revealed that women formed about 10% (n=180) of the *galamsey* operators in Nyanfoman and Adadekrom. They are directly engaged as carriers and washers of dug materials. The result departs from findings of Yakovleva (2006) which indicates that 40% of *galamsey* workers from communities in the Birim North District are women. It is however important to note that differences in methodology may have significantly accounted for the disparities. The mineworkers are aged between 16 and 58 years, with a mean of 35 years (Table 1). Majority (74%) of them are below 39 years old. These figures might be a reflection of the general state of youth unemployment in the Ghanaian economy. Even though *galamsey* is illegal in Ghana, the youth are willing to partake in it because there are no alternative employment avenues for them. Approximately 42% of the respondents cited *galamsey* as the only occupation they are engaged in. The rest engage in other economic activities including farming and trading (Table 1).

Table 1: Summary: profile of the respondents

| **Variable** | | **Statistic** | |
|---|---|---|---|
| | **Min** | **Max.** | **Mean** |
| Age of respondent (yrs.) | 16 | 58 | 35 |
| Number of dependents | 1 | 11 | 4.0 |
| No. of years in mining (Av) | 1 | 27 | 5.9 |
| **Major livelihood activities (%)** | **Freq.** | **Percentage** | |
| -Farming | 68 | 37.8 | |
| -Trading (buying & selling) | 20 | 11.1 | |
| -TDC | 17 | 9.4 | |
| -Mining (only) | 75 | 41.7 | |
| **Total** | **180** | **100** | |

*TDC represents other occupations including teaching and carpentry
**Source**: Field Survey; 2014

A few of the miners have been in the business for 27 years while the majority joined quite recently. The average mineworker in the study area had 4 dependents, having worked in the sector for close to 6 years. This means that the factors that drive the youth into the industry go beyond just individual pursuit for livelihood. In other words, the success of one *galamsey* operator benefits four other persons on average.

### 5.2. *Livelihood search and migration*

The search for livelihoods influences individuals to migrate. In Africa, people move to mining areas with the

 

hope of securing mine related jobs to improve their financial status. Similarly, inhabitants of the communities were induced by higher financial gains to move into small-scale mining. According to them, low returns from existing jobs directly influence their decisions to take to *galamsey*. Some key informants alleged that inflow of persons from different parts of the country has been steady since mining started in the district. This was corroborated by participants in a focus group discussion who indicated that they migrated to the area to work as *galamsey* operators because job opportunities were limited or non-existent in their respective places of origin.

Close to 90% of the miners came from five other regions in Ghana. Indigenes from Volta Region constituted the majority (53%), followed by Ashanti Region with 17% (Fig. 2). Mineworkers from Greater Accra, Eastern, BrongAhafo and Northern Regions together constituted the remaining 30%.

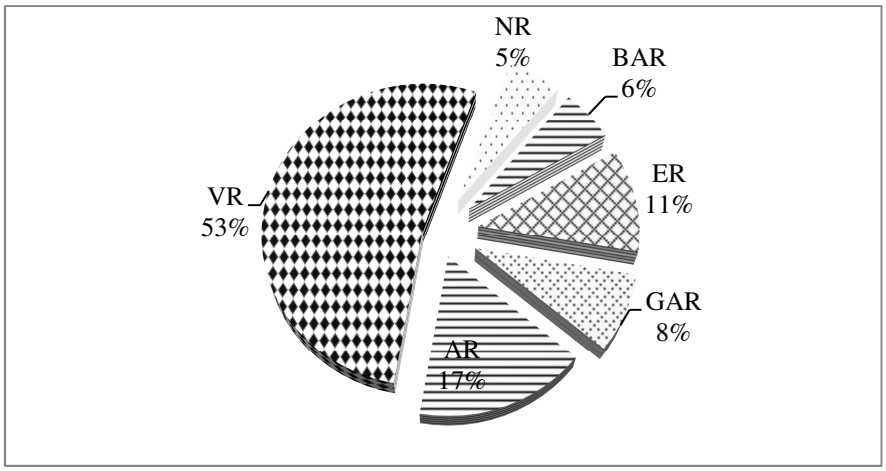


**Fig. 2: Origin of mineworkers in the study area**

If the assertions were anything to go by, then the pattern suggests that employment related problems in the Volta Region are relatively severe compared to Ashanti region, which has the second highest representation of *galamsey* operators in the two communities.

### 5.3. *Consequences-: environment and health*

Experts argue that sustainability in resource use is critical for continuous reproduction of socio-economic capital in any community. Particularly, natural resource reproduction is very important for maintaining environmental sustainability because any form of abuse in the present could lead to decline in usage opportunities for future generations. The illegal activities have extended into farmlands, causing extensive damage. For instance, they have stripped vast lands bare of vegetation leading to accelerated loss of top soils and the creation of dangerous water pits. Key informants from the regulatory institutions also cited air pollution as one of the major consequences of small-scale illegal mining in the area.

The operators engage in three types of mining, i.e. underground, underwater and surface, depending on the prevailing circumstances (Plate 1, 2 & 3). According to them, the nature of underground mining makes it the most risky of the three. Occasionally, workers are trapped to death underground when shafts cave-in. This usually happens when the earth or rocks around the shafts become weak/unstable and/or when the support system (wooden) gets rotten.

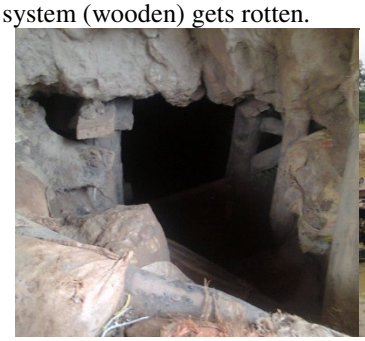

**Plate 1:** Underground **Plate 2**: Underwater (using *chamfaine*) **Plate 3**: Surface mining

In 2010, a similar tragedy hit the people of Dunkwa on-Offin, (near River Offin) in the Central Region where more than 100 miners perished when a pit caved on them. Elsewhere, retorts are used to recycle spent mercury in order to reduce the level of emissions into the environment. Responses gathered from the study however suggest that the operators have no knowledge of the equipment (retort) and therefore handle the chemical without much restraint.

 

Clean water bodies that hitherto served communities along their course have become muddied and polluted with chemicals. *Galamsey* operations have extensively polluted the Birim River, which runs through most towns in Birim North District as well as other neighboring towns (Plate 4) rendering the water undrinkable. The development is even more worrying, considering the fact that 8% of other drinking water sources in the district have been declared "unsafe" and thus opened to pollutants (GSS, 2010). Besides, flooding during the raining season has become rampant due to the widening of sections of the riverbank, caused by indiscriminate excavation. The results confirm suggestions that *galamsey* activities cause siltation, destruction of aquatic habitat and diversion of water bodies (Mol & Ouboter, 2004). The operators in the study area utilize an indigenous technology known as *chamfaine* (plate 4-*Z)*. This equipment utilizes specially designed metal rods (curved) that are powered by machines to drill the riverbed. The earth material (mostly sand and clay) are moved unto the floating *chamfaine*, which is often secured in position, on the river, with the help of ropes tied to stubs on the riverbank.

In a focus group discussion, the mineworkers unanimously conceded that their activities have hastened the rate of desertification in the area. This was reinforced by participants in the mental model, adding that *galamsey* has caused erosion and pollution of water sources, with dire consequences on both human and animal health. After ore extraction is completed in a given concession, no efforts are made by the operators to secure the degraded areas. Meanwhile, it appears that mine operators have no immediate intentions to change their methods of operation, at least in the short term.

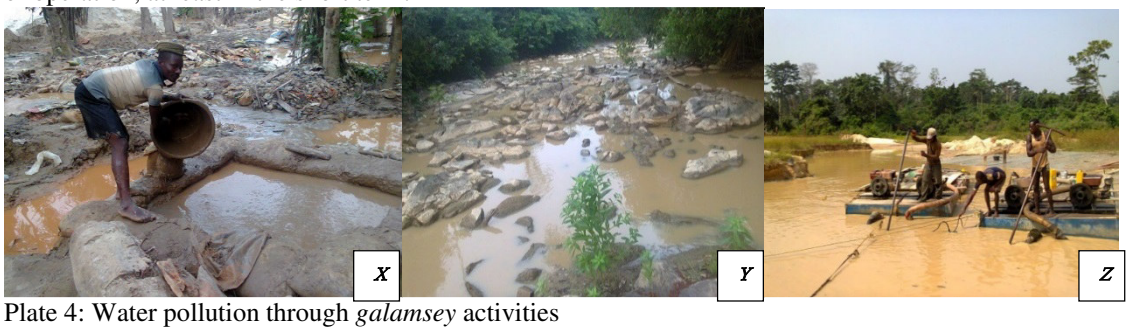


Plate 4: Water pollution through *galamsey* activities

The open pits collect rainwater that serve as breeding grounds for the insect vectors (mosquitoes) that transmit malaria parasites. As a result, incidence of malaria is high in the area (Table 2). Secondly, unsuspecting persons and even livestock occasionally drown in the water in these pits. It appears that the highest number of recorded accidents involved children. Some major health challenges in the communities as revealed by data from the district health facility include malaria and physical injury. A multiple response analysis of interviewee responses corroborates the district report (Table 2). Overall, Malaria (88.3%), physical injury, cough, and headache are ailments that were reported regularly to the health facility in the communities.

**Table 2: Common reported ailments**

| Ailment | Incidence | Cause (perceived) |
|---|---|---|
| Malaria | 159 (88.3)[1] | SW |
| Physical injury | 140 (77.8) | LAP, Accidents |
| Cough/headache | 130 (72.2) | LAP, Dust |
| Blood-stained urine | 33 (18.3) | LAP, WAI |
| **TOTAL** | 462* (100.0) | |

**Source**: Field Survey/Community Health Center-Nyanfoman. *A multiple response analysis makes the total (n)>180. SW=*stagnant water*, LAP=*Lack of protective gear (for mineworkers)*, WAI=*Water related infections*.

### 5.4: *Labour availability and income implications*

Like all farming operations in rural areas, *galamsey* require labour for digging and other related activities. Even though mining is done throughout the year, it peaks around the time that labour demand for agriculture is also high (table 3).

[1] Figures in parenthesis represents percentages

 

Table 3: Summary: time allocation and income outcome between crop production and *galamsey*

| Item | | Agriculture (crop production) | *Galamsey* operations | Tax revenue (max potential @10%) |
|---|---|---|---|---|
| **Peak demand** | | May-August | All year | NA |
| **Time allocation** | | | | |
| -Daily visit (% responses) | | 11 | 89 | NA |
| -No work duration/day (Av.) | | 7 | 10.3 | |
| **Annual Income ($)** | 766[2] | - | - | - |
| -"good scenario" | | 787.5 | 7,280 -9,620 | 962 |
| -"bad scenario" | | - | 1,456-1,950 | 195 |

Source: field data
GH¢:US$ rate of **3.8:1**

The study revealed that agricultural labour becomes relatively scarce when the rainy season starts. In other words, agricultural labour force is lost to the mining sector. This was confirmed by responses from mineworkers who also double as food crop farmers. The evidence suggests that majority of the respondents who are also farmers spend more time at the mines than on their farms. For example, whereas only 11% of this category of mineworkers (*n=68*) make time to visit their farms daily and work for 7 hours, an overwhelming majority (89%) rather prioritize work at the mines where they work for 10.3 hours daily. Despite the negative effects, *galamsey* is more rewarding for the individuals who are engaged in it. The practice is also beneficial to the local economy. Between 2012 and 2013, the average earning from *galamsey* was better than the other activities. At the current GH¢:US$ rate of 3.8:1, mineworkers earn $28.2-$37.6 per day (average), on what they described as "good days" and $5.6-$7.5 on "bad days". For a five-day' work per week, the earnings work up to $7,280-$9,620 (good case scenario) and $1,456-$1,950 (bad case scenario) annually. This confirms the assertion by Hilson & Potter (2005) that the sector has the potential to reduce poverty through improved income. Comparing this to the average seasonal (annual) earnings of $787.5 from agriculture, the incentive to abandon other livelihood activities for *galamsey* is high, especially in a country where GNP per capita is $766 as at the end of 2014. This apparent profit-nature of the illegal industry partly explains the active participation of the youth, some of whom should normally be in school.

Years after regularizing small-scale mining operations in Ghana, it appears that government is still losing revenue in the sector because many operations are taking place illegally. According to the Ghana Revenue Authority (GRA), earnings from small-scale mining should attract at least 10% tax per annum. Since *galamsey* operators in the study area are not registered, they do not pay taxes to government in spite of the immense impact they are having on the environment. In other words, significant quantities of gold are lost through illegal channels to unknown destinations instead of being sold to the Precious Mineral Marketing Corporation (PMMC), created for that purpose. This is in spite of government "crackdown policy" on illegal mining in affected communities. It is generally believed that most of the *galamsey* activities in the Ghana are sponsored by personalities in political circles. Therefore, the so-called 'crackdown policy' only targets specific groups who may be completely independent beneficiaries of the lapses in the system or who are perceived to be political opponents. As shown, in fig. 3, effective supervision and enforcement of environmental regulations by government in collaboration with local authorities can be very beneficial to all including government.

### 5.3. *Causes of galamsey menace*

The mental models show how miners, local and regulatory authorities appreciate the causes and outcomes of the illegal activity in the area. All the participants are aware of the negative human and environmental impact of *galamsey* in the communities. Together they agreed that high unemployment rate and search for alternative livelihood are two major factors that are responsible for the activities in the area. Whereas officials from the regulatory institutions (EPA, WRC and FC) believe that non-enforcement of the existing laws is responsible for the menace, local authorities feel that the problem is due to the search for quick wealth, triggered by greed. The regulatory authorities however acknowledged that genuine search for livelihood is a major cause of the problem. They indicated that they are not able to execute their mandates as expected because they do not get enough support from government. Explaining further, they suggested that their respective outfits lack the requisite personnel and logistics because of poor funding over the years (Fig. 3). Some of the local authority members themselves believe that the institution to which they belong has been compromised through corrupt acts. These sentiments were shared by the miners who likewise alleged that district assembly officials have compromised their positions and thus, ignore what they are expected to do by way of monitoring. Miners on the other hand were divided on the issue of whether they were enticed by inordinate desire for quickly wealth. During a focus

[2] Per capita GNP in Ghana as at the end of 2014 (GSS, 2014).

 

group discussion, one *galamsey* operator who disagrees with that assertion stated thus:

> "*…which of us here can honestly say that he/she would decline an offer of a better paying job? It is the hope of everybody that they make progress in life so anything better will be preferred …….. This is our situation and not greed as they claim. If you (research team) can find us better paying jobs we will all leave here now…*"

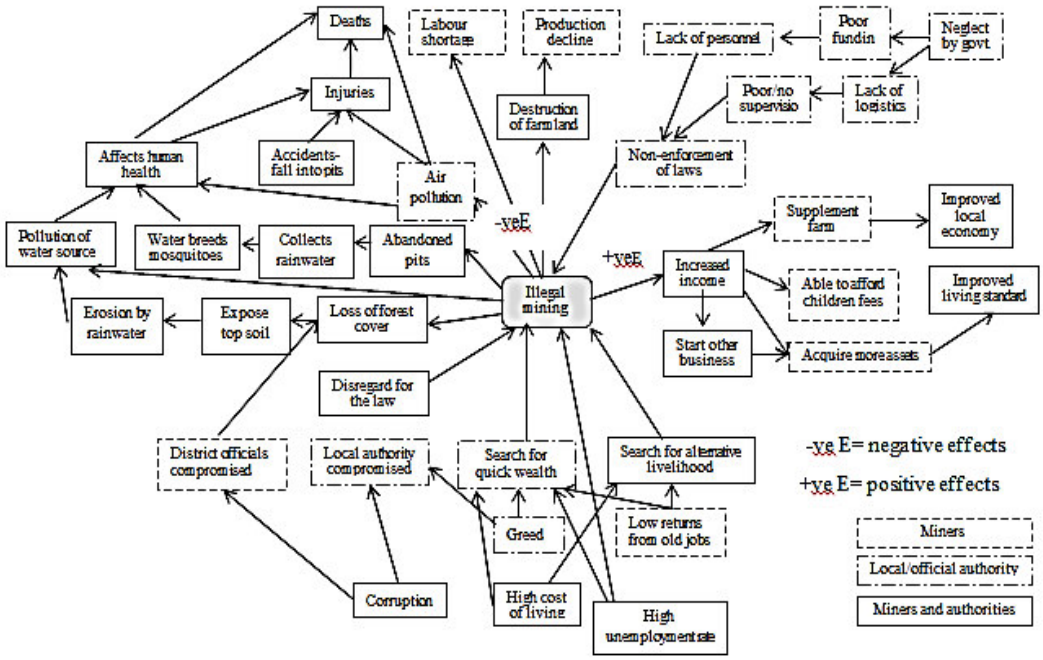


**Fig. 3: Mapping:- cause-effects of illegal mining operations (combined for mineworkers, local & regulatory authorities)**

Overall, galamsey operators, traditional leaders and regulatory authorities were consistent in their views about the effects (negative) of illegal mining operations have as illustrated by fig. 3. In extreme cases, they lead to the death of both humans and livestock. The results (mapping) reveal that despite the problems, *galamsey* operations in the area produce important positive outcomes. For instance, the local economy of Nyanfoman and Adadekrom benefits eventually from the improved personal incomes of operators.

## 6. Conclusion

Without the adverse effects, *galamsey* operations in the study area contribute immensely to the local economy and livelihoods of both natives and migrants. While the sector presents one of the best livelihood options in the study area, government is not getting any revenue since the operations are not regularized. Regularizing the small-scale mining operations is thus, very essential and would require more robust support from government. The general lack of job opportunities in the country, especially in the Volta region significantly induce individual decisions to join the *galamsey* trade, often carried out under hazardous conditions. As pertains in other communities, residents are exposed to constant health risks because laws governing the operations are openly flouted. Although leaders in the community are aware of the consequences, they ignore them because besides benefiting directly, they seem to place more value on the sector's capacity to provide jobs opportunities for the youth in the communities. The other regulatory authorities including District Assemblies have so far not lived up to expectations. They all seem helpless and actually constrained in the performance of their core functions due to lack of the requisite logistics. They therefore exist only in *name* and *offices*. Food production (agriculture) in the area is under threat as less time is allocated to farming. Moreover, if the current trend continues, resident farmers may not be able to go back to their original livelihood activities (farming) after the mineral deposits are finally depleted.

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