

# Small Scale Gold Mining Activities on Mining Employees' Livelihoods in Kenya

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**Abstract:** *This study was conducted to find out how the gold mining activity affects the livelihoods of the employees in small scale gold mining in Kenya. This was done by focusing on small scale gold miners in Ikolomani Sub-County where much of the gold mining is done. The study had three specific objectives namely: to assess the effect of labor input into small scale gold mining on the livelihoods of mining employees' households; to establish how capital inputs into small scale productivity of small scale gold mining on the livelihoods of mining employees' households. The study adopted a case study approach that employed survey techniques in data collection. The target population was the small scale gold miners in Ikolomani Sub-County. A total of 98 respondents participated in the study. Data collected was analyzed with the aid of SPSS. Descriptive statistics was used in the analysis. The study found out that labor input in small scale mining contributed significantly to the livelihoods of Ikolomani residents though it was affected by the challenge of using innovative methods. It was also found out that capital input had positive significant influence on the mining employees' livelihood. The study concluded that small scale gold mining is an attractive venture which had attracted the residents of Ikolomani. However, it is associated a myriad of health risks. Labour and capital input contribute positively to the mining employees households' livelihoods except for productivity which has a negative effect. The study recommended that government should put in place mechanisms to improve the skills of the gold mining employees through training, employee development and compensation. Further, the small scale gold miners should be empowered by the government to make them have access to capital to finance small scale mining and install mechanism to ensure the proceeds from gold mining activities benefit the small scale gold mining employees and stakeholders and the host communities.*

**Keywords:** employee development, Ikolomani Sub-County, small scale gold mining

## 1. Introduction

The Small-scale gold mining (SGM) can be defined as gold mining operations that can be easily controlled both technologically and financially by under-equipped persons with limited means and being exploited as families, individuals, cooperatives or associations (Ralph & Gilles, 2018). The sector is an important and increasingly becoming a popular source of livelihood for millions of people in the world (Long & Sun, 2015). Miners often reap a wide range of benefits depending on the labor and the capital they invest in it and the productivity of the inputs (Lahiri-Dutt, 2012). According to the World Bank report of 2013, an estimated 20 million people around the world rely on SGM for livelihood, working in more than 80 countries. They produce some 10% of the world's mined gold (World Bank, 2013).

However, in spite of the gains in gold mining, small scale gold mining activity has its downsides. In countries where mining is prevalent, destruction of the environment is done to critical levels due to cutting down of trees to satisfy the needs of the mining activities, or changing the topography, and even causing change in the river course (Geenen, 2013). People also get caught up in the vicious cycle of poverty for they spend so much time and energy generating little income, leading to low savings, and eventually poor or no investment (Rasheed & Amuda, 2014; Herman & Keri, 2014). The health of the miners gets threatened when they

continuously work in damp environments and carrying heavy loads. All these effects constitute the livelihood of the gold miners (Tiffany, 2012).

The significance of gold mining in spurring economic development in the nations where gold mining is conducted varies. South Africa has one of the largest deposits of gold in the world and produces over 32 million ounces of gold which makes two thirds of the world's total production of 47.5 million ounces (Ledwaba & Nhlengetwa, 2016). The former Union of Soviet Socialist Republics (USSR) region is second, producing 6.5 million ounces. Canada, the United States of America (USA) and Australia produced 2.4, 1.7 and 0.6 million ounces respectively (Ledwaba & Nhlengetwa, 2016). The rest of the world accounted for less than nine percent of gold production. In Kenya, gold mining has been an on-going activity in Kenya right from the pre-independence especially the small-scale form. However, gold produced is too little to attract serious government attention (George, 2015).

Although the history of gold mining in Kakamega County, Kenya spans as early as 1892 but in Ikolomani area, mining began in 1930. The miners continued with small scale gold mining activity long after the closure of gold mining at the better organized Rosterman mines in 1952 (GoK, 2010). The Sub-County of Ikolomani whose name is the adulteration of "goldmines" is riddled with high poverty levels. The underlying issues include lack of economic empowerment,

illiteracy, Human Immunodeficiency Virus (HIV) and Acquired Immune Deficiency Syndrome (AIDS), ignorance of profitable way of gold mining, and environmental degradation among others. Other economic activities in the area include: small scale mixed agricultural production of maize, beans, millet and tea as well as transport activities, especially motor cycle transport, commonly known as Bodaboda (GoK, 2010).

### Small Scale Gold Mining Activity

The measurement and interpretation of productivity varies from its context of use and may vary from industry to industry. Small scale gold mining industry is no exception. Small scale gold mining relies on non-renewable resources as inputs for production and requires large investments in new capacities and time to become operational. Key inputs in mining include capital and labour inputs and their efficient use can determine the amounts of mining products generated. Capital refers to the man-made resources, including money resources applied in the mining of gold. Labour refers to the human mental and physical effort used in gold mining. Productivity in mining reflects changes in production efficiency, changes in the underlying quality and quantity of products, in this case gold (Topp & Soames, 2008).

Small scale gold mining is a product of capital input, labour and the resultant productivity (Goumandakoye & Hilson, 2016). Higher labour inputs measured in terms of the amounts of time and the number of people participating in gold mining will indicate high level of mining activity (Jønsson & Fold, 2009). Higher capital inputs generally indicate higher mining activity. On the other hand, the intensity of labour as shown by how much work is done by a worker per hour and the number of hours a worker spends at the mine will partly measure productivity. The amount of work done by capital equipment and the rate of work done with changes in money investment will also partly measure gold mining activity. The revenues realized from the gold mining will also measure activity with higher revenues indicating higher activity (Topp & Bloch, 2008).

Scoones (1998) averred that the livelihood of people revolves on six specific aspects. These are: the assets people have and how the assets interact; the strategies people have in using the assets they have; the sustainable outcomes of using the assets the people have; the transforming structures and processes (or the rules) that determine which person can do what as regards the use of assets people have; the risks people face in owning and using their various assets and how they mitigate the risks; and the influence people have on the rules and access to assets. Furthermore, Funoh (2015) posits that there is a close connection between gold mining and the livelihoods of the miners' community. In his study conducted in Ngoyla-Mintom Forest in Cameroon, Funoh (2015) established that mining employs many people in rural areas due to the minimal requirement to join the activity, low technology requirements, minimal capital and limited specialized skills. Inferentially, small scale mining could contribute to poverty alleviation and provides many employment opportunities. However, small scale mining is associated with some negative social impacts. For instance,

miners are exposed to chemical contaminants, unsanitary conditions, prostitution, alcoholism and drug-taking (cites).

Small scale gold mining is not a new activity in Kenya. Small Scale gold mining activities are carried out in Migori and Kakamega Counties. In Migori County, small scale mining is conducted in the Migori Gold Belt. In the Gold Belt, gold was discovered in 1920 and by 1927 about 100 kg of gold had been recovered (Senelwa, 2016). By the time of closure of the mines in 1966, a total of 4,284 kg of gold had been recovered. In Kakamega County, gold was discovered in 1923 at the Rosterman Goldmines (Senelwa, 2016). The activity spread within the county to areas such as Ikolomani Sub County where it is still conducted on small scale to date (Ogola, 2012).

Ogola (2012) posits that despite the activity having been practiced in the area for decades, the area is still one of the poorest. This situation has raised many questions as to whether gold mining activity has impacted positively or otherwise to employees' livelihoods. It is against this background that the research sought to examine the effects of small scale mining activities on mining employees' livelihoods in Ikolomani, Kakamega Sub-County in Kenya.

## 2. Statement of the Problem

According to Kenya's blueprint, the Country endeavors to be an industrialized nation by the year 2030 (Vision 2030). Most Counties in Kenya are endowed with a range of mineral resources. The revenue generated from this resource has the potential to stimulate both development and economic growth of the areas. However, the presence of small scale gold mining activity in Ikolomani area has failed to stimulate achievement of the sustainable development goals, Vision 2030 and sustainable development of the area. This has been made worse by the increasing population of the Ikolomani community which reduces resources to support the influx population. Inadequate employment opportunity is also leading to an increase in the number of the population settling for gold mining as a form of income generating activity as a survival strategy. Various government interventions and activities have not been able to bring desired results. Consequently, if this trend should continue, the Vision 2030 will just be a day dream, and the rate of unemployment and poverty will be soaring high, people living with HIV/AIDS will be increasing and instead of gold mining bring sustainable development to the area, the reverse will be the case.

In view of the above, the study therefore seeks to assess the nexus that exists between small scale gold mining activity and the mining employees' livelihoods in Ikolomani Sub-County, Kenya. Past studies on the impact of gold mining focused on health and environmental impacts (Telmer & Veiga, 2009). The study by Lahiri-Dutt (2012) investigated the economic effect of mining on a global scale. The uniqueness of this study lies on the fact that the study sought to establish the effect of small scale gold mining activity on the mining employees' livelihoods in Ikolomani Sub-County of Kenya leaving a research gap considering the volume of mining activities in the sub-county. This study sought to address the identified research gap.

### Research Objectives

This study was guided by the following objectives:

- a) To assess the effects of labour input on mining employees' households in Ikolomani Sub County, Kakamega County, Kenya.
- b) To examine the effects of capital inputs on mining employees' households in Ikolomani Sub County, Kakamega County, Kenya.
- c) To assess the effect of the productivity of gold mining on households in Ikolomani Sub County, Kakamega County, Kenya.

### 3. Literature Review

African continent is the last continent that wants to realize the full force of modern day mining and quarrying techniques to exploit its mining potential. It is still host to many of the large and unexploited deposits of minerals (Hilson & Osei, 2014). For instance, Africa has up to one-fifth of world's gold supply (Hilson & Osei, 2014). However, according to Hilson, and McQuilken (2014), Africa doesn't consume or add any significant value to its mineral, also, Africa is net exporter of raw materials that fuel prosperity and development in other regions. Studies have shown that Africa has the largest mineral reserves in the World. According to a report by the United Nation Economic Commission for Africa, East African region had been estimated to hold mineral reserves of more than USD25 trillion, which is greater than the Gross Domestic Product (GDP) of the United States.

Since the end of the 1980s, an increasing number of African countries like Mali, Benin, Burkina Faso, Ghana, Niger, and Guinea have engaged in so-called artisanal gold mining activities (Hilson & McQuilken, 2014). This is a type of mining activity where small scale miners often migrate for a long distances and across national borders, but maintain close ties with their home areas. In spite of the expansion of small scale mining activities, however, it seems that the total volume of manually extracted gold in Mali has decreased from some 4.5 tons per year in the mid-1980s to around 2.5 tonnes annually in recent years (The Economist, 2016).

Evidence from the colonial maps shows the presence of gold in various parts of Kenya. However the nation's post-independence development plans e.g. The National Development Plans (1964-1970), did not put a great emphasis on mining as an important economic activity. It was not until the seventh National Development Plan (1994-1996), that the government first outlined a policy on mineral resources, titled 'Resource Mobilization for Sustainable Development'. The policy further emphasized on the significance of ensuring a clean environment in mining activities and private sector full involvement in the mining sector.

Small-scale gold mining (SSGM) in Kenya remains an important activities for some households. Although there is no official data, estimation by Seccatore et al. (2014) shows that 14,000 people were involved in SSGM by 2012. The total production of gold by 2013 was estimated at 3.6 tons although independent experts indicate small-scale gold

mining production alone at approximately five metric tons per annum (George, 2015). According to Murray (2003), the process of mining gold is usually involving and hazardous, which exposes the employees in mining field to various health risks with little or no protection from work related hazards and injury. The Kenya's mining code contains the subset of laws that regulate exploration, extraction and production of minerals. The clauses within the mining codes outline rights and obligations of individuals and private company and interests and obligations of the various levels of government. It addresses matters of the applicable taxes and licensing, sharing of accrued royalties among the stakeholders and access to foreign currency and markets.

A number of studies highlight linkages between artisanal mining and people's livelihoods mainly in countries with considerable high rate of engagement in artisanal mining. Asia is one of the continents with the highest number of people involved in artisanal small scale mining (ASM) but it is the least covered by the ASM literature and this is the same with Africa (Labonne, 2001). However, several scholars, such as Laonne and Gilman (1999) and Labonne (2001), have looked at some livelihood security indicators such as education, capital, employment and possible vulnerabilities that characterize the sector. According to them, employment artisanal mining is a global source of employment both formally and informally with Asia being the most significant region, followed by Africa and Latin America (ibid).

Artisanal small scale mining (ASM) is faced with a myriad of challenges; key among them is the issue of vulnerability; which ends up offering a (often short term) coping mechanism for poverty. Vulnerability 'is a person's (or group's) particular characteristics or situation that influences their ability to anticipate and overcome shocks and hazards' (Wisner, 2004). Poor people are especially vulnerable, as they have few buffers or resources to cope with hazards or shocks.

Furthermore, ASM faces the same marginalization as other small scale sectors. Many miners operate in remote regions with poor transport and market access, suffering geographical marginalization that makes them less able to access information, key technologies and inputs. It also leads to political marginalization, as communities far from the capital or Centre are less able to influence policy and keep in sight of policymakers. Small scale producers may be marginalized in terms of access to markets forced to sell through informal, illegal or less lucrative channels. Marginalization is often linked to food insecurity. Concern International defines marginalized farmers as farming yet hungry (Murphy, 2010). The same approach can be applied to ASM mining yet hungry—meaning the miners have insufficient assets or income to purchase adequate food for themselves or their dependents.

The other challenge borders Informality; this is where the miners operate without an applicable or appropriate legal framework. It was once considered synonymous with subsistence activities that offer no real opportunity for economic development. More recently, interpretations have become more nuanced. Informality can represent innovation

and dynamism, and can offer poor producers and accessible route into economic activity (De Soto, 2002; Hart, 2006). However, it can also exacerbate problems of marginalization and vulnerability. Informality marginalizes a community politically, economically and even socially. Informality can both increase resilience by providing an economic livelihood activity and increase vulnerability as it removes the protections and opportunities provided by the government.

In conclusion, the above challenges range from weak legislation, policies and implementation and often government marginalization or repression (favoring LSM at the expense of ASM) to cultural marginalization and exclusion of certain demographic groups. At the same time, there is the challenge of lack of legal protection for land and resource rights rampant poverty not to mention uncontrolled migration and poor access to financial services. Other challenges as noted by Hilson (2012) include: inadequate market information; lack of technological and geological data; political exclusion (meaning miners are often excluded from decision making at various levels) and policy blindness; lack of baseline/census data on ASM individuals and communities and over reliance on mining in ASM communities due to vulnerability and marginalization. Therefore, there exists a gap in knowledge concerning the effects of AGM on livelihoods in Kakamega County; hence the study intended to fill this gap.

#### 4. Methodology

This study adopted a descriptive survey research design. The target population of this study included local small-scale miners in Ikolomani Sub-County, Kakamega County, Kenya. This study used purposive sampling techniques. The study considered four administrative wards in Ikolomani Sub-County, Kenya. Samples of 100 respondents were drawn from the target population. Semi-structured questionnaire was used for data collection. Data collected from the field were sorted out, coded and put into the computer for analysis using Statistical Package for Social Sciences (SPSS), version 21. Quantitative data was analyzed descriptively using percentages and frequencies. The findings were then presented through the use of figures (graphs and pie-charts) and tables.

#### 5. Research Findings and Discussions

##### Demographic Analysis of Respondents

The study obtained the respondents' responses on gender, age, marital status, level of education, length of time in the gold mining, and alternative source of income. These demographic details pointed at their appropriateness in responding to the questions items of the current study.

Table 1 indicated that 21.42% of the respondents were female while 78.58% were male. This clearly indicates that there were more males than females. This also means a relatively high gender disparity in the small scale gold mining in Ikolomani sub-County where only few females were taking part in the mining activities. This observation may be partly attributed to various cultural reasons and the fact mining is a tedious and risky venture for women. The

current finding responds to previous studies both local and international. For instance, Neingo and Tholana (2016) in their study about trends in productivity in the South African gold mining industry also observed that there were more males than females. The same observation was registered by Ncube-Phiri, Ncube, and Kundhlande (2015) in Mzingwane District, Zimbabwe.

Like any other form of livelihood, small scale mining is an industry associated with myths and cultural factors which influence people who take part in the industry. These cultural tendencies include barriers which tend to prohibit women from physically demanding activities, which are usually deemed to be "men's work" (Verbrugge, 2017) and banning them from pits (Weldegiorgis & Buxton, 2017). They also restrict women's access to the valuable first pickings. One can therefore conclude small scale mining in Ikolomani is surrounded by stereotypes and myths that revolve around gender allocation of roles.

##### Respondents' Age

Regarding their age, few of the miners were aged below 20. Considering Table 1, 1.02% of those who participated in gold mining in Ikolomani Sub-County were below 20 years of age. Those between 20 and 30 years were 34.69%. Most of the respondents who participate in gold mining were between 30 and 49 years making 48.98% of the sample. Those aged above 50 years made 15.31 percent. This was an indication that the miners were mature people and had dependents and as such their participation in gold mining was to sustain their households. Table 4.1 summarizes the findings.

##### Marital Status of the Respondents

The participants' marital status were analysed and presented in Table 1 which shows that 80.61% of the respondents were married. Those who were single among them are 11.22% while the remaining 8.16% were widowed. The indication is that most of those who were active in gold mining were people with families. This indication was very crucial for the research since the investigation was aimed at finding out how the activity impacted on their families. The study corresponds to a similar study conducted by Mwakwambirwa (2015) in Kenya.

##### Level of Education

The highest levels of education of respondents are also shown in Table 1. The largest number of the gold miners, 55.10% had up to primary education. This was followed by another category of miners (33.67%) who had secondary education. Respondents with college education were 4.08% of the respondents. This was an indication that gold mining was not practiced as a profession, but rather as a means to sustain livelihoods. This was because the primary school drop outs constituted the majority who neither have professional skills nor any certification rather what they have were apprenticeship skills in the field.

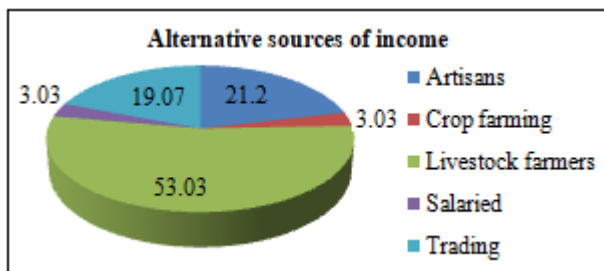
##### Length of Time in the Gold Mining

Experience in the practice was also considered important for the study because the longer one stays in the field, the more knowledge one has regarding the research. The majority of the respondents, 45.92% had spent less than 10 years. This

was followed by those who had spent between 10 and 20 years were 28.57%. However, 25.51% had spent over 20 years. This indicates those sampled had been in gold mining in their current locations for long enough time to provide reliable data required by the researcher.

**Mining Employees’ Alternative Sources of Income**

This question was aimed at ascertaining whether the respondents have an alternative source of earning apart from gold mining. This was important because since this was small scale artisan mining, it was expected that the respondents use it not as a full time occupation, but as a supplementary source of earning income. Figure 1 gives the findings.



**Figure 1:** Mining Employees’ Alternative sources of Income

The results revealed that 21.2% of the respondents were artisans while 3.03% engaged in crop farming. However, a majority of them, 53.03% indicated that they were livestock farmers. A few of them, 3.03% were salaried people and 19.07% participated in trading activities which helped them support their households.

**Table 1:** Respondents Demographic Characteristics

	N = 98	Frequency	Percentage
Age	< 20 years	1	1.0
	20-29 years	34	34.7
	30-49 years	48	49.0
	50 years and above	15	15.3
Gender	Male	77	78.57
	Female	21	21.43
Marital Status	Married	79	80.61
	Single	11	11.22
	Widowed	8	8.16
Highest Level of Education Attained	No education	7	7.14
	Primary Education	54	55.10
	Secondary	33	33.67
	College	4	4.08
Length of Years in mining	< 10 years	45	45.92
	10 – 20 years	28	28.57
	Over 20 years	25	25.51

The findings implied that livestock farming is the most visible industry, and probably the primary source of employment/income. The other indication is that gold mining was more of a complimentary or substitute source of income to invest a lot of capital in it through advanced technology.

**6. Findings on the Effects of Labor Input on Mining Employees’ Livelihoods**

**6.1 Training in gold mining**

In line with the objectives of this study, a question was asked to try and understand the effect of labour input on mining employees’ households in Ikolomani Sub County, Kakamega County, Kenya. The result of the question indicated that the majority of the respondents, 90% indicated that they never underwent formal training while a paltry 10% indicated that they had indeed undergone training in gold mining. The attainment of professional training was seen as an important step in the mining activity because those who have undergone it possess valuable expertise that can make the business thrive. Those who indicated having no professional training indicated that their skills were acquired apprenticeship. They copied what their parents used to do and with time, they understood these skills and they also pass the skills to their children. The skills are cross generational.



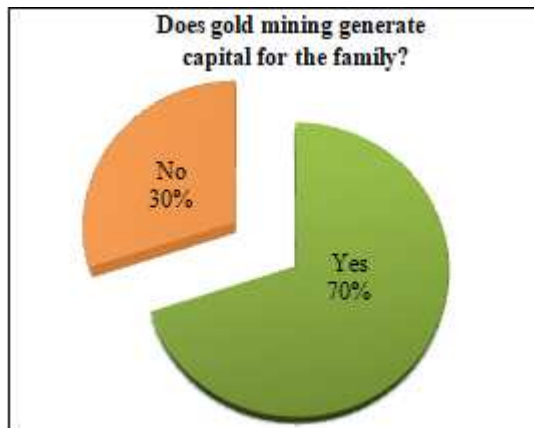
**Figure 2:** Training in Gold Mining

Asked about the methods that they use in mining, the respondents indicated that the methods are not highly advanced. From the mining and extraction procedures described by the respondents, it is apparent that the mode of mining in Ikolomani was artisanal and small scale. The tools and materials used include spades, crow bar, wooden sluice box, pickaxe, machete, boots and a motorized pump. The inference was that the work done by the small scale gold miners was labor intensive.

**6.2 Findings on the Effects of capital input on mining employees’ livelihoods**

The respondents were asked this question to enable researcher understand effects of capital inputs on mining employees’ households in Ikolomani Sub County, Kakamega County, Kenya. The gold miners were asked whether gold mining generates enough capital for their families. The result from the respondents is represented in Figure 3 indicated that a majority of the respondents which constituted 70% indicated in the affirmative while the remaining 30% answered in the negative. They indicated that since mining was a complimentary source of income for them, they were convinced that indeed it helped them to sustain their families. Those who were not satisfied explained that since they invest a lot of time, energy and even risked their lives for the sake of mining, they did not

get enough compensation for the same. They indicated that the task is tedious and very involving and that at times, it exposes them to health risks.

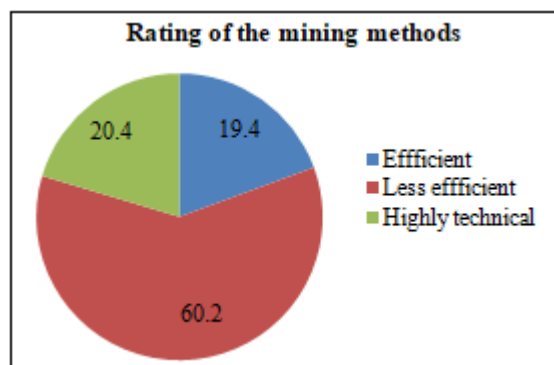


**Figure 3:** Whether gold mining generate enough capital for the family

The dissatisfaction registered by the respondents about the income generated from their work may be explained by the fact that being a small scale activity, they depend on middlemen who tend to exploit them. Therefore, the final product is generally weighed and sold to middlemen, who pay the miners very little and far below the market value. Asked about the challenges that they face in the process of gold mining, all of them indicated health risks as the greatest challenge that they face. Some were left with life threatening injuries. They also cited increase in expenditure and unwillingness by financial institutions to advance them with capital in form of loans to enable them grows their business. They also stated that they were constantly harassed by the NEMA (National Environment Management Authority) officials, who often at times demanded licenses from them and barred them from carrying out with their activities.

### 6.3 Findings on the Effects of productivity on the miners' livelihoods

This was aimed at finding out how the miners' rated their methods of mining in accordance with modern technology. The responses were tabulated in Figure 4.



**Figure 4:** Rating of the methods employed in the mining

From the Figure 4, it can be deduced that the methods used to mine in the area are largely less efficient as indicated by 60.2% of the sampled population. However, almost an equal

proportion of the respondents were divided between whether the methods were efficient (19.4%) and highly technical (20.4%). One of the reasons why the respondents indicated that the methods were less efficient is the fact that mining was mainly small-scale hence did not require more sophisticated equipment.

The current study concur with previous study by Mwakwambirwa (2015) who separately observed that small scale gold mining was associated with less efficient equipment. According McMahon and Moreira (2014), small-scale mining in most developing countries is still largely informal and unregulated and as a result, most of the small-scale miners depend heavily on relatively outdated, inexpensive and mostly polluting technologies with high risks to human health and environment, hence a direct bearing on the food production and access.

## 7. Conclusion

Based on the findings of this study, it was concluded that gold mining has far reaching effects on miners' households. Also, the family members often contribute either directly or indirectly to gold mining. Furthermore, it was established that gold mining affected capital inputs of the households a lot of money was used in facilitating the process and at the same time the money is ploughed back to the family for use. Lastly, it was also established that to a large extent, family productivity was affected by gold mining; a lot of those miners who participated in the study alluded to the fact that they spend most of their productive time on gold mining; as such, other sectors have been also affected such as agriculture, education and trading activities.

## 8. Recommendations

Based on the findings of the study, it is recommended that government of Kenya should put in place mechanisms to improve the skills of the gold mining employees through training, employee development and compensation. Also, the government of Kenya should formalize and legalize the activities of small scale gold mining activities and educate employees in small scale mining on the importance of a clean and preserved environment. Further, the small scale gold miners should be empowered by the government to make them have access to capital to finance small scale mining and install mechanism to ensure the proceeds from gold mining activities benefit the small scale gold mining employees and stakeholders and the host communities. In addition, attempts should be made to introduce environmentally friendly mining technologies into the activities of small scale gold mining in Kenya.

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