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Impact of Illegal Gold Mining / Panning on Farming Activities in Zimbabwe's New Resettlement Areas; A Case of Selected Farms along the Mazowe River in Bindura District; Mashonaland Central Province

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Abstract: ***Since the launch of the Fast Track Land Reform FTLR in Zimbabwe in year 2000, agricultural production on farms has been badly affected by illegal mining activities particularly gold panning along the country's major rivers. Mazowe River which stretches from areas bordering northern parts of Harare to Kaborabasa in Mozambique was never spared from the destructive operations of the miners, as it is one of the country's richest sources of alluvial gold deposits. To assess the impact of this illegal scavenging of the precious resource "chikorokoza" on farming activities; a study was conducted in selected farms along the Mazowe River in Bindura district. Central to the research was to explore the extent to which the current primitive mining methods have negatively impacted on the farming activities of the newly resettled farmers in Zimbabwe as a whole. To generate relevant data a purposive sampling was found to be the most ideal technique as it focused only on knowledgeable members of the artisanal miners and the farming community. The study solicited data from 60 participants constituting 20 miners, 30 farm workers and 10 A2 farmers some of whom were randomly picked in the provincial town of Bindura. Guided interviews complemented by questionnaires were used to gather varying responses from participants. The collected data was later analyzed through descriptive statistics where tables, frequency counts and percentages were employed for purposes of presenting the findings. The findings indicated that there is need for government and other stakeholders to adopt a holistic approach in implementing policy and monitoring strategies that will totally plug the illegal activities for the good of farming in Zimbabwe's resettlement areas.***

Keywords: Illegal gold panning alluvial gold deposits farming activities resettlement areas effluent disposal, cyanide and mercury concentration

1. Background of the Study

Mining is an important economic activity which has the potential of contributing significantly to the development of communities endowed with mineral resources. Mining though synonymous with the extraction of mineral ore from the ground; in a broader sense can be viewed as inclusive of the extraction of petroleum, natural gas, and even water (Wikipedia, 2006). In countries where corruption is not a menace mining activities constitute an integral part in the economic development and expansion of the economies of the respective nations. This is due to the ability of such activities to generate revenue, employment opportunities and stimulate foreign exchange for the benefit of the entire nation. Communities endowed with these minerals world-over have been found to be benefitting directly from the investment opportunities, employment, royalties paid to them and other supplementary benefits; which is not the case in Zimbabwe where the poorest segment of the population is found in communities rich in mineral resources, with Marange diamond fields in Manicaland and Shamva gold deposits in Mashonaland central province being living examples. Small-scale artisanal gold mining has attracted many people, especially during times of economic hardship. The International Labour Organization (1999) estimated that between 50,000 and 350,000 persons are involved in small-scale mining in Zimbabwe.

According to Jerie and Sibanda, (2010) Zimbabwe's mining sector plays a crucial role in fuelling the economy, especially through both backward and forward linkages. Significant contributions have been noted in areas of employment creation and foreign currency earnings that are essential for socio-economic development. Zimtrade, (2006) cited that over the years, mining has accounted for approximately 4% of Zimbabwe's gross domestic product (GDP). It is imperative that gold production, in particular, is one of the significant sectors in terms of foreign currency earnings and contributes about 30% of the total foreign currency earnings in the country. Gold is regarded a precious mineral world over and in Africa's developing nations, revenue generated from the mineral increases disposable income by citizens, tax revenue, GDP per capital, create more employment, open the doors for more investment, and help finance agricultural and economic activities like trading. This is not the case in Zimbabwe as the evil of corruption has seen a few politicians and government officials lining their pockets to the brim through exploitation of the mineral.

Gold mining in Zimbabwe's farming communities represents all methods of gold extraction from deep underground mining, to small-scale mining with mines only a few metres deep, through large-scale alluvial mining and the most infamous gold panning along major rivers. Artisanal mining and processing methods are employed to work both hard rock and alluvial gold deposits. Seam gold is mined by excavating pits to levels where "a dark coloured stone which is interspersed with gold" is reached. The gold is then recovered "by grinding the stone to powder", and then "washing it". In Zimbabwe alluvial gold is mined by collecting gravel from the beds of streams/rivers and

washing sediments clean of sand and earth. The practice which is popularly known as 'chikorokoza' is flourishing along major rivers and the recovered gold is mainly smuggled to neighboring South Africa and Botswana for trade through black market channels. Despite contributing nothing economically, panning causes significant environmental damage, health, social and economic problems.

In areas where panning or 'chikorokoza' is rampant the environmental impact of the activities is prevalent. It is a fact that whichever mining method is used, gold mining has environmental impacts that communities need to be aware of. It is imperative to bear in mind that mining has its benefits and hazardous effects particularly on the people living in communities where minerals are found. Focus in the mining sector should therefore not only be on the economic aspects, but furthermore on sustainable environmental management, which is part of the integrated global efforts for environmentally friendly production processes as cited by Ajusa, (2003). As communities with mining are subjected to catastrophic effects of pollution, land degradation, deforestation, high cost of living and poverty which expose young people to immoral behaviors such as prostitution and drug abuse.

Artisanal and illegal gold miners are cited as the major culprits as they do not have any measure even to protect themselves, let alone the environment and communities in which they operate. News on the death of illegal miners caused by a collapse trenches or them being buried alive in collapse pits is common every year in Zimbabwe. Research shows that people should not underrate the dangers of chemicals used in mining to communities as they pollute air, water and render agricultural land infertile to support plant growth. The pollution is cited as not only dangerous to human life but also to other living organisms which support human existence, thus, in turn destroying the ecosystem. It is also one of the factors contributing to the deforestation of the country's forest reserves. According to the World Bank Group, "Small-scale mining is largely a poverty-driven activity, typically practiced in the poorest and most remote rural areas of a country by a largely nomadic, poorly educated populace with few employment alternatives". Small-scale mining in Zimbabwe however is now an undertaking even for the highly educated youths who are victims of unemployment and liquidity crisis as a result of the country's economic meltdown. The resource poor illegal miners use rudimentary tools in their mining operations hence their low levels of production make insignificant impact on the country's GDP.

The primitive ways of extracting the gold along the Mazowe River and its tributaries in Mashonaland central province has received a lot of criticism from the newly resettled farmers and environmentalist, but policy implementers seem to be reluctant in putting measures to curb the activities as they are suspected to be the major funding dealers of the elicit operations. Farmers blame the small-scale miners and panners for colossal land and environmental degradation as apart from causing massive silting up of water bodies are using mercury and cyanide in the gold recovery which are highly toxic chemicals to humans, livestock and aquatic organisms threatening the country's fishery industry. The scale of small-scale mining has far exceeded acceptable levels since vast tracks of land along the banks of the rivers are besieged with trenches and deep depressions, disfiguring the natural beauty and scenery view of the river-line. Farmers have to exercise caution when herding or taking their livestock to watering points as they risk falling and getting trapped in these trenches. This therefore presents the backdrop upon which a study that sought to assess the impact of illegal gold panning "chikorokoza" on farming activities was conducted but with particular reference to selected farms along the Mazowe River in Bindura district. Central to the research was to explore the extent to which the current primitive mining methods have negatively impacted on the farming activities of the newly resettled farmers in Zimbabwe as a whole, in an effort to urge government and other stakeholders to set institutions and enact laws that will regulate the activities of the panners.

1.1 Statement of the problem

Since the launch of the fast track land reform FTLR in Zimbabwe in the year 2000, agricultural production on farms has been badly affected by illegal mining activities particularly gold panning along the country's major rivers. Mazowe River which stretches from Christonbank / areas bordering northern Harare to Kaborabasa in Mozambique was never spared from the destructive operations of the miners, as it is one of the country's richest sources in alluvial gold deposits. There has been an outcry and lots of criticism from the newly resettled farmers and environmentalist, who have been blaming the artisanal miners and panners "makorokoza" for colossal land and environmental degradation as apart from causing massive silting up of water bodies, the mercury and cyanide used in the recovery of gold recovery are highly toxic to humans and livestock. They reiterate that despite contributing nothing economically, activities of the illegal miners are causing significant environmental damage which would cost the country economically in the near future. Adjei et al, (2012) cited that the pollution is not only dangerous to human life but to other living organisms which support human existence, thus, in turn destroying the ecosystem. It is also viewed as one of the factors contributing to the deforestation of the country's forest reserves. It is therefore imperative that in an effort to restore sanity and synchronization of Zimbabwe's small scale mining with agricultural productivity a study to analyze the impact of illegal gold panning on farming activities was conducted in selected farms along the Mazowe River in Bindura district. Central to the treatise was to explore the extent to which the current primitive mining methods have negatively impacted on the farming activities of the newly resettled farmers in Zimbabwe.

1.2 Research objectives

The overall objective of the study was to analyse the impact of illegal gold panning on farming activities in Zimbabwe's resettlement areas; but with particular reference to selected farms along the Mazowe river in Bindura district; Central were the following specific objectives;

- Explore the extent to which the current primitive mining methods employed by gold panners popularly known as (makorokoza) are negatively impacting on the farming operations of the resettled farmers in Zimbabwe
- Establish whether farmers are educated enough on the dangers of chemicals used by the panners to their communities as the pollution tends to destroy the entire ecosystem which supports human existence.
- Identify ways through which the governments and other stakeholders in the region and world over are monitoring and enforcing laws to control the destructive mining operations (chikorokoza) and uphold sustainable farming activities.

2. Research methodology

2.1 Site Selection

The study was carried out on 3 farms namely Avoca, Barrasie popularly known as (Dough-Mill) and Stella in Bindura district; Mashonaland central province. For purposes of accessibility due to poor road networking in the area the study focused on (A2) resettlement models. As cited by Chisango and Dzama, (2013) Bindura district is characterized by a wide variety of land tenure typologies, namely: communal areas (Musana, Masembura and Chiweshe), newly resettled small scale (A1), newly resettled large scale (A2) and the old resettlement areas. The district is made up of ecological zones of varying agricultural potential ranging from agro ecological zone 2 receiving as much as over 1000mm of rainfall annually to agro-ecological zone 4 which receives as little as below 450 mm of rainfall per year, signifying special need for the resuscitation of irrigation systems in the district. Mashonaland central province is very rich in both the hard rock/reef and alluvial gold deposits. This coupled with the escalating unemployment has fuelled the massive exodus of poverty stricken families into the valley in search of the precious mineral, which they extract using unorthodox means.

2.2 Sampling procedure

The Selection criteria of participants for the study therefore focused on members who were willing to impart their knowledge and experiences on the possible hazardous effects of illegal gold mining (chikorokoza) on agricultural productivity especially among farmers resettled during the FTLR program of the year 2000. A purposive sampling technique was therefore the most ideal tool for the study as it focused on knowledgeable members of the artisanal mining and the farming communities. The study used data from 60 participants constituting 20 miners and 30 farm workers and 10 A2 farmers some of whom were randomly picked in the provincial town of Bindura. Guided interviews complemented by questionnaires were used to solicit for relevant data from the participants. The data collected was analyzed through descriptive statistics where tables, frequency counts and percentages were finally used for purposes of presenting the findings.

3. Results and Discussions

3.1 Impact of gold panning on labour supply trends and availability for the 2016-2017 farming season

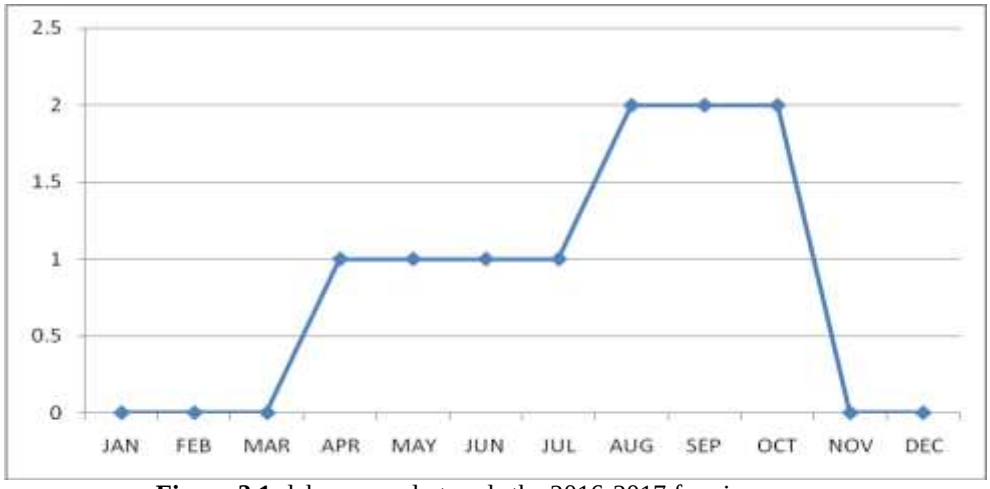

Figure 3.1: labour supply trends the 2016-2017 farming season
Source: Sampled A2 farmers

The interviewed farmers indicated that influx of illegal gold panners has fuelled major fluctuations in the labour supply on farms throughout the year. It has become a common phenomina that labour is highly mobile during the months of March to November, a period during which gold panning is assumed to be at peak as mining activities are not disrupted by the rains. This period is characterised with low labour turnout as the majority of farm workers would prefer to work for the panners who will be offering better incentives than the new farmer. The scarcity of labour during these months has badly affected harvesting of summer crops and the winter cropping program as former workers with winter wheat irrigation expertise would be inticed to engage on the more lucrative mining activities. High labour turnout is witnessed during the months of November, december, january to end of march as due to inssent rains rivers are flooded and mining trenches are filled up and become death traps. It has always made headlines that the death toll of

illegal miners caused by collapsing of trenches or some being buried alive in collapsing pits is at peak during this time.

3.2 Challenges associated with illegal gold panning on farming communities

Table 3.1: Problems associated with mining in farming communities

Nature of challenge	No. of Respondents	%
Environmental and Land degradation	10	16.7
Land becoming infertile to support plant growth	12	20
Chemicals discharged pollute air	6	10
Chemicals discharged pollute water	4	6.7
Muddy pollutants change water colour, taste and give off bad smell	14	23.3
mercury and cyanide destroying the ecosystem	8	13.3
Change in societal lifestyle	6	10
Total	60	100

Table 3.1 above reveals that environmental and land degradation leading to barrenness or infertility of agricultural land were the major challenges cited by participants mainly farmers and farm workers. The respondents accounted for 16.7 and 20% respectively. It was however discovered that the miners were not at liberty to share their views on the issue. The observation concurs well with Jerie and Sibanda, (2010) who cited that land in communities where illegal mining is rampant is deteriorating day-in day-out making it infertile to support plant growth. A significant number of participants constituting 23.3% and 13.3% expressed panic over the rate at which sedimentation is polluting water bodies resulting in changing the natural properties of available water hence rendering it useless for both domestic and agricultural purposes. 10 and 6.7% retorted that toxic chemicals used in mining pollute air and water such that the pollution is not only harmful to human life but also to other living organisms which support human existence, thus, in turn destroying the ecosystem. It was therefore generally observed that the government of Zimbabwe needs to craft policy that would be deterrent to the illegal mining activities.

Table 3, 2: The government's capacity to Monitor and Enforce Laws

Country or State	Number of Inspectors	Number of Mines	Ratio of Inspectors to Mines
Zimbabwe	4	300	1:75
Venezuela	3	400*	1:133
Arizona, USA	13	538	1:41
Colorado, USA	15	1.944	1:129
Idaho, USA	6	65	1:11
Nevada, USA	13	225	1:17
New Mexico, US	7	185	1:26

Source: Holloway and Associates (1994).

Table 3.2 highlights the lack of monitoring and enforcement of laws to regulate mining activities in a select group of developed and developing countries; with Zimbabwe included as it has 4 Inspectors to man 300 Mines countrywide giving an unwarranted ration of 1:75, as a Ratio of Inspectors to Mines Holloway and Associates (1994). As a result, the findings indicate that monitoring capacity is unevenly distributed across the ten provinces of the country. Lack of funding, staffing, and training have been cited as the major constraints for countries to carry out periodic site visits to determine compliance with standards set for the proper disposal of pollutants or toxic chemicals which are normally discharged as effluent into water sources. Farmers bemoaned policy makers and implementers whom they accuse of being reluctant in putting measures to curb the unorthodox activities as top officials are suspected to be active participants in illegal mining and smuggling of gold which they trade outside the country mainly South Africa.

4. Conclusions and Recommendations

4.1 Conclusions

Mazowe River which is one of the country's richest rivers in alluvial gold deposits is heavily infested with illegal gold panners (makorokoza). The illegal miners have always been blamed for causing immense land and environmental degradation as apart from causing massive silting up of water bodies, the mercury and cyanide used in the recovery of gold are highly toxic to humans and livestock. Research by Adjei et al, (2012) noted that the pollution is not only dangerous to human life but a wide range of living organisms which support human existence, thus, in turn the chemicals destroy the entire ecosystem. It is therefore viewed as one of the factors that are grossly contributing to the deforestation of the country's forest reserves. The exploitive and destructive sector is being accused of not contributing significantly to the national economy as much of the gold recovered is not being traded through Fidelity; the official marketing channel but is smuggled outside mainly South Africa where it is traded through black-market. It is therefore imperative that the government and other stakeholders need to come up with strategies that will restore sanity and aid the harmonization of small scale mining activities with agricultural productivity for the good of the nation's food security.

4.2 Recommendations

In light of the findings of the study the following recommendations were submitted:

- The majority of the participants indicated that toxic chemicals used in mining are not only dangerous to human life but also to other living organisms which support human existence, it was therefore imperative that the government of Zimbabwe has to craft policy that is deterrent enough to curb illegal mining activities.
- Communities endowed with these minerals world over have been found to be benefitting directly from the investment opportunities, employment and royalties paid to them; which is not the case in Zimbabwe where the poorest section of the population is found in communities rich in mineral resources. It is critically important that the Zimbabwean government adopts similar strategies so that there is equity in the distribution of wealth generated from mineral resources.

- Government and stakeholders must fight against corruption as politicians and top government officials are always suspected of being engaging in illegal mining and smuggling of gold which is traded outside the country, mostly South Africa.
- To boost agricultural productivity in resettlement areas the government needs to totally ban the primitive mining systems which are retrogressive to farming and impact negatively on agricultural productivity.
- The Environment Management Authority EMA regulations need to be enforced as this will result in environmentally user friendly methods being employed rather than the chaotic methods of mining which are destructive to the landscape and the environment.

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