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DEPARTMENT OF DEVELOPMENT STUDIES

EFFECTS OF GOLD PANNING ON COMMUNITIES: A CASE STUDY OF SHURUGWI DISTRICT, YEAR 2000-2013.

BY

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Dedication

This research project is dedicated to my family Mr and Mrs M. Sibindi for their sacrifices and support throughout my university struggles. They were my pillar of strength and the source of my inspiration. I want to thank you for your love, care and support. May the Lord bless you more.

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Making of this research project has been really a great experience, but however this project would not have been successful without the support of many colleagues who in different ways contributed to its completion.

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Thank you all for your support, May the Lord our God richly bless you

Abstract

This research sought to investigate the problems associated with gold panning among non-panning rural, urban communities and also the gold panners of Shurugwi district. Although there are many potential socio-economic benefits of gold panning, there are numerous negative impacts from these small and inefficient panning operations as a result of wasteful extraction and processing techniques. The panning operations were found to be worsening social and environmental impacts of non-panning communities. The negative effects are already being felt in Shurugwi district were HIV spread has been on the increase, also theft and deaths by panners through poor mining and to a greater extent bully fighting. Extensive land degradation has further contributed to siltation of rivers and dams, destruction of vegetation as well as contamination of water bodies. The impact far outweighs the potential socio-economic benefits of gold panning as urban infrastructure has been at risk as well. The role of the government and other relevant stake holders as enforcers of laws, regulations and promoter of mining development need to be defined. Environmental destructive mining practises persist as there is lack of enforcement and control mechanisms for the gold panners. On the other hand there is need for gold panners in the district to take responsibility for the negative impacts from their livelihood.

Table of Contents

CHAPTER 1: INTRODUCTION

1.0 Introduction

Gold panning in this research is defined as an activity that encompasses legal and illegal miners who use simple methods and processes to extract mineral resources (gold). These miners are to a large extent unskilled, underequipped and not knowledgeable and have little appreciation of the environment they operate from.. Taylor (1998) notes that gold panning is perceived by many Zimbabweans as one of the few coping strategies employed by people to master, tolerate or minimize the adverse effects of economic hardships. Gold panning therefore, serves as a source of livelihood and income as it has become the major source of cash income, In this research there are instances where the term “artisanal small scale miners” is used to refer to gold panners.

Gold panning has been on the increase in the country worsening during the past two decades causing much of the environmental and community problems the country has experienced that have been mostly directly or indirectly linked to the illegal mining of gold. It is for this reason that the researcher has found it vital to research some of the impacts faced by communities in our times and raise awareness of the urgent need to address gold panning. Zimbabwe has an agricultural and mineral backed economy, most of the population that lives in the countryside practises agriculture and when disasters like droughts strikes these people are left entirely dependent on donations or food handouts. In recent years this pattern has repeated itself a lot more often without adequate planning being put in place for them. This has left the rural population trying any possible means to sustain everyday life, with gold panning being one of the main survival options for the rural folk.

This dangerous activity of gold panning has been done without any professional supervision leading to severe environmental impacts and other problems such as death of people trapped underground and use of dangerous metals like mercury in the rivers and other related serious health disasters associated with unprofessional operations. Leakage of respiratory poisons into the rivers has created other potential disasters such as death of animals in the rivers. The

general physical geographical outlook has been seriously deformed due to the illegal operations in the panning areas.

The research sought to establish the role of gold panning in sustaining local communities' livelihoods and exploring how environmental management can be enhanced by ensuring that panners activities do not irreversibly degrade natural resources within a given ecosystem. It is believed that policies and programmes directed towards the sub-sector will contribute to poverty alleviation and improve livelihoods among Shurugwi communities. The major contention of this study is that gold panning has a bigger role to play in improving sustainable livelihoods among rural communities if the government showed political will to support formalise gold panning activities.

Gold panning is mainly concentrated on illegal or unapproved sites such rivers, disused mines, dams and random earth excavating for the special metal which has threatened farming fields, residential areas, infrastructure (roads, bridges), water availability not for domestic use alone but for livestock and irrigation purposes. With siltation, erosion, deforestation posing a huge problem. Open cast mines also causing a big threat to animals and people who later fall in the dumped pits. At times the poor mining techniques risk most panners who at times end up being trapped in disused mines with some dying and others injured in the process of gold panning. Diseases are a big threat as a lot of settlements are mushrooming in these places with no sanitation posing a health hazard to panners and communities at large while epidemics like the HIV/AIDS are into play in such areas.

Gold panning has had severe effects on communities where the environment, water, air pollution and the threats on the human life are the major problems as the illegal mining involves the release of highly toxic substances to nearby water resources. These toxic substances cause crucial effects on these water resources which raises acid levels in rivers and Lakes harmful to wildlife and people. This has been necessitated by the use of simple measures which have less capital requirements to dig for the precious stone, with some current panners survey the earth using gold detectors which have posed huge damage to the environment or infrastructure in and around urban communities as detectors have opened up gold digging to as close as some back yard homes and even at the middle of some rural roads in the district.

The dependence on gold panning as a commercial activity in Zimbabwe has seen a significant increase in land degradation of farming and grazing land which has been due to high poverty levels and drought persistence at large. With also the emergence of resettlement schemes by the government communities managed to emerge haphazardly in virgin land where abandoned mines existed left by the Germans and other white settlers where people started scrambling for the gold deposits thus gold panning intensified. Another push factor was that workers in small-scale mines worked under dangerous conditions and were paid lower wages than in large mines and at times the workers received nothing when operations were unsuccessful hence resorted to gold panning. The panners would easily use hammers, chisels, picks, buckets, ropes and windlass, (Shoko and Veiga, 2004; Menezvenyu, 1992).

1.1. Background of the Study Area

The mining district of Shurugwi is located in Midlands Province, Southern Zimbabwe. It is an important centre for gold and chrome mining, it is located about 30 kilometres from the Midlands Provincial capital Gweru. The district has seen a series of mining activities after the discovery of platinum at Unki which lies a few kilometres just after the Wolfshall Pass (Boterekwa).This has seen the establishment of a large mining complex by Implats (Impala Platinum) and the refurbishing of houses which used to belong to the old Zimasco employees. The origin of Shurugwi district was largely occupied by the Karanga ethnic people who formed the majority of the population but in the recent years encompassed more minority groups like Shona, Ndebele speaking people in the Rockford small scale farms and the Dlodlo area. Other ethnic people are the few remaining ex-employees of Zimasco who are predominantly of Malawian extraction.

Shurugwi District encompasses much of the rural areas of Nhema, Tokwe, Gwenoro, Hanke, Tongogara and including some parts of Chivi. With the emerging of new rural settlements from land reform programme in year 2000 to 2012 saw Shurugwi rural district extending its borders and accommodating more residents. The region lies along the Great Dyke which has a high concentration of minerals such as gold, chrome, the platinum group of metals and asbestos with much of the rural communities made up of poor sandy soils which support subsistence agriculture. Uncontrolled gold panning is one of the popular day to day business for the communities in Shurugwi district which has made it difficult for one to come up with empirical or statistical data specifying the number of small scale miners involved in panning

since the digging is at will as long as an area is suspected to have gold deposits digging can start at any location which has led to panning moving as extremely inside Shurugwi town with some panning holes destroying roads and bridges around the district.

The small mining town is home to many illegal gold panners popularly known as "Makorokoza" who dig for the precious mineral for survival and mainly compose of poverty stricken men and women of various age groups who earn their living from gold panning. Furthermore mining companies operating in Shurugwi district have very limited staff and the probability of getting a job at Zimasco, Unki or Falcon is fruitless and based on qualifications thus the youth and most Zimbabwe populace lack adequate education to meet the standards of getting a job thus resorted to panning.

Blooming trees, thick bushes, valleys and evergreen grasslands were the beauty of Shurugwi district. The long winding Boterekwa River and magnificent scenery made the area a hit with tourists from all over the world. This beauty has long been taken away by gold panning activities which left trails of destruction as panners recklessly hunt for gold deposits in the district. With the escalating cost of living, high unemployment and poverty, illegal panners from all over Zimbabwe have flocked Mangwende and Ruchanyu resettlement areas 25 kilometers north east of Shurugwi in search of precious metalss.

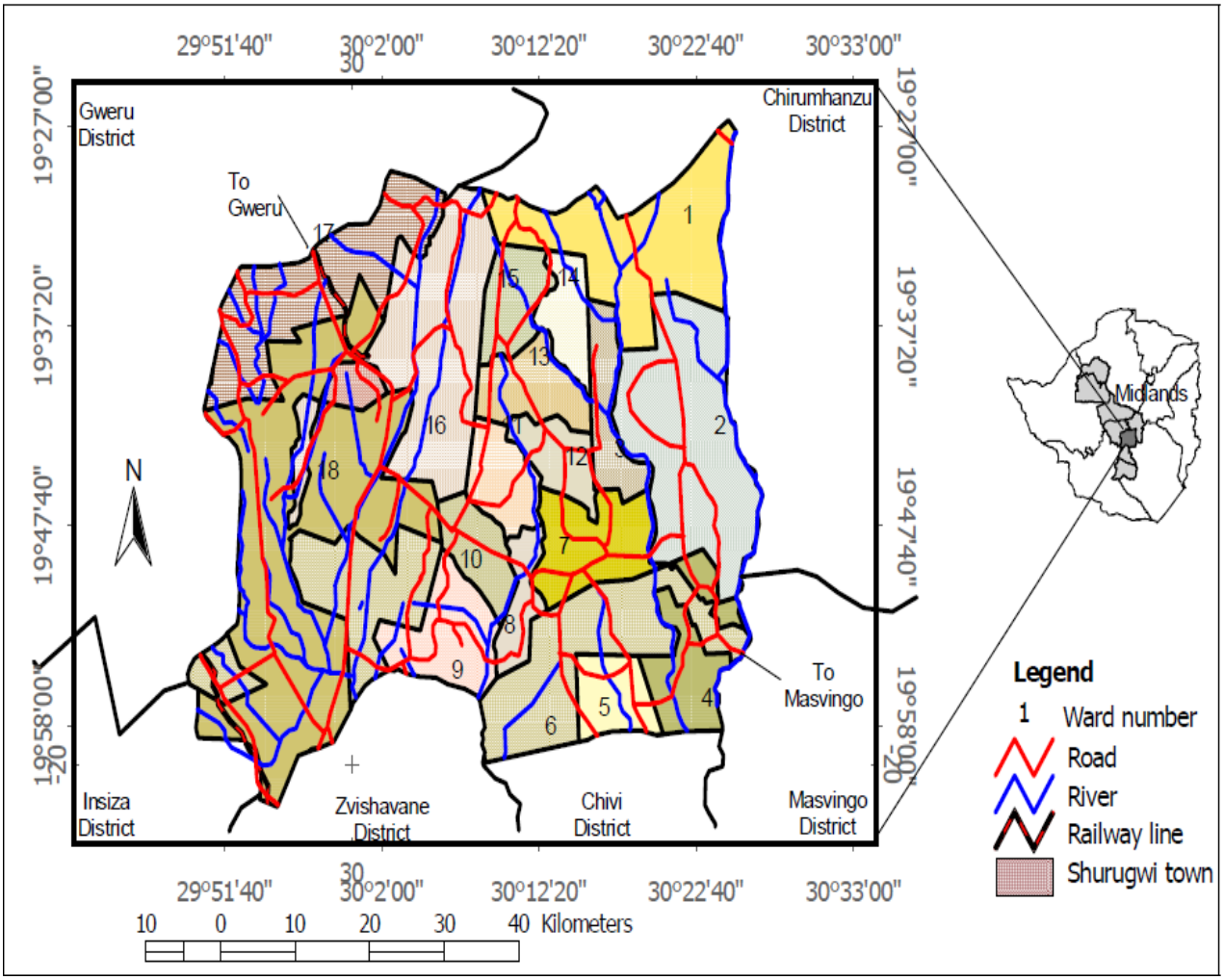
Zvamatenga, Donga and Svika resettlement areas fall under Chief Nhema in Shurugwi which is located in the mineral-rich Great Dyke belt 33km outside Gweru. Minerals such as gold, chromite, nickel and platinum are mined around the town. These minerals are a magnet for people from across the country with the notorious makorokoza have turned the area into a scavenging ground despite frantic efforts by the police to stop them. They leave behind a trail of destruction; devastated fields and forests, mud-choked rivers, and mercury-tainted water. (By David Chidende, http:www.swradioafrica/panning/shurugwi/turnsugly/, Accessed Tuesday 01 April 2014)

Gold panning in Shurugwi increased in the year 2004 from the rising poverty levels with many people losing jobs and some earning less than they can sustain thus end up panning. Also it has been difficult for individuals to acquire mining licences for their proposed cites as they are expensive and difficult to get a prospectus licence from the mines ministry as an individual with a lot of processes that has to go through before being granted an Exclusive Prospecting Order (EPO) for one to own a mine, (Ministry of Mines Act Chapter 21:05) 2013

version. The majority of those people with mining licenses are not from Shurugwi and require a percentage on gold panners who wish to mine for them and the percentage is rather too high for the panners and they resort to uncontrolled mine dumps where they mine at will thus endangering the environment.

Almost every place along the Great Dyke within Shurugwi district has been destroyed by illegal mining of gold. Gold panning comes with devastating effects because enormous tracts of grazing area are lost due to digging everywhere as well as veld fires caused by panners, what makes the situation worse is that we have gold mills scattered around Boterekwa that continuously spill cyanide and other substances onto the land as well as into Muterekwi and Manzimudhaka rivers.

Fig 1.0: Map of Shurugwi District.



Source: Ministry of Lands, 2004.

Table 1.1.

Researched Areas in Shurugwi District as Shown on Fig 1.	
1. Valley Mine	17. Shurugwi Town
6. Gwenoro	12. Gundura
9. Chikato	13. Hanke

Source: Ministry of Lands, 2004.

1.2. Conceptual Framework

1.2.1. Gold Panning

Gold panning, sometimes known as artisanal mining is defined as an informal and unregulated system of small-scale mining which is mostly illegal (Prasetyo, Krisnayanti, Utomo, & Anderson, 2010). Gold panning usually involves the extraction of secondary gold from alluvial, colluvial or elluvial material, that is, free gold that is easily concentrated by gravity processes (Hinton, Veiga, 2013). It usually employs very simple technologies, and there is no planning for rehabilitation after the closure of the mining operation (Prasetyo, et al., 2010).Furthermore, artisanal mining is largely a poverty-driven activity, typically practiced in the poorest and most remote rural areas of mostly developing countries by a largely poorly educated populace with few employment alternatives (Aryee, Ntibery, & Atorkui, 2003).

Gold panning, is a form of traditional mining that extracts gold using cheap means of extracting gold, and is popular with geology enthusiasts especially because of its cheap cost and the relatively simple and easy process, however it endangers the environment since it involves uncontrolled manner of mining without licenses in any given area that panners could find gold deposits. McHugh, J.B. (1988). In many situations, gold panning usually turns up only minor gold dust that is usually collected as a souvenir in small clear tubes. Nuggets and considerable amounts of dust are occasionally found, but panning mining is not generally lucrative. Panning for gold can be used to locate the parent gold veins which are the source of most placer deposits.

Gold panning usually employs very simple technologies, and there is no planning for rehabilitation after the closure of the mining operation (Prasetyo, et al., 2010). Furthermore, gold panning is largely a poverty-driven activity, typically practiced in the poorest and most

remote rural areas of mostly developing countries by a largely poorly educated populace with few employment alternatives (Aryee, Ntibery, & Atorkui, 2003). Gold panning, is however, associated with a number of sustainable development challenges, including various economic, environmental and social issues (Azapagic, 2004).

1.3. Statement of The Problem

Gold panning is a wide spread problem that is found throughout Zimbabwe. This problem has been due to the need for income, food, employment, asset ownership and decent living conditions. River siltation and land degradation are some of the major problems that are associated with the illegal gold panning activities. The problem has brought about high costs in dam reconstruction and water shortages after siltation and a good example is water shortages in the central town of Shurugwi and Gweru city who get their supply of water from Gwenhoro dam where the catchments have a lot of open casts and there is no meaningful flow of water to the dam.

Environmental disasters have been on the increase in the country in the past two decades and a lot of other disasters that the country has experienced have been directly or indirectly linked to the environmental problems. It is for this reason that the researcher has found it important to research on the challenges communities face from gold panning activities and raise awareness of the urgent need to address the effects. Zimbabwe has an agricultural and mineral backed economy. This dangerous activity has been done without any professional supervision leading to other problems such as death of people trapped underground and use of dangerous metals like mercury in the rivers and other related serious health disasters associated with unprofessional operations. Leakage of respiratory poisons into the rivers creates other potential disasters such as death of animals in the rivers.

One other problem which gold panning has created is the siltation and contamination of rivers which has limited the availability of water for animals and people in many areas. The general physical geographical outlook has been seriously deformed due to the illegal operations in the areas. Whilst this is a local problem, it is one with very clear regional links as some of our rivers are also taking water to our neighbours. Many would ask if the strategies being employed to combat gold panning are working since evidence still points to the increase in

the problem not a decline. In the current study, the researcher seeks to find out the limitations of the current strategies and also find out what else needs to be done to alleviate this situation.

1.4. Aim

To come up with possible strategies to control or formalise gold panning activities identifying its effect on the environment as well as rural and urban communities without blocking the peoples' source of income as well as preserving the natural environment and also the nation's economy benefiting.

1.5. Objectives

In any epical qualitative or quantitative study there is need to identify and state the main research objectives, which provide the focus of the study. The study has the following objectives:

1. To assess the environmental impact of gold panning disasters on the lives of the people in and around the affected communities.
2. To assess the effectiveness of measures being taken to address the problem associated with gold panning.
3. To identify if the panners are aware of the laws that govern their legal activities.
4. To assess the impacts of legalising gold panning.
5. To establish some of the mitigation strategies by relevant bodies to reduce gold panning activities in Shurugwi district.

1.6. Research Questions

The research seeks to answer the following questions:

1. To what extent has gold panning destroyed the environment in Shurugwi district?

2. How has gold panning affected and benefited the rural and urban livelihoods of the people in Shurugwi District?

3. Are gold panners aware of legislations that govern such activities?

4. Should Gold Panning be legalised on not?

5. What measures should be put in place by government and various stakeholders to reduce the bad impacts of Gold panning to communities?

1.7. Justification of The Study

The main objectives in developing countries is to reduce the loss of life, property damage and social and economic disruption caused by gold panning. This research will then try to bring to light some of the problems that are a potential hazard and bring about solutions and recommendations. The research on environmental degradation from gold panning provides a fundamental basis for decision making for organizations, gold panners, police force, school children involved in the areas practicing gold panning. The current study provides crucial baseline information to the ministry of natural resources on the disasters and dangers to the natural environment caused by gold panning in Shurugwi district.

The findings from the research will establish the extent of damage or the disasters to the physical environment and community caused by gold panning and the associated reparations on the surrounding dams, rivers, and other water sources. All things being equal the findings could be made available to Shurugwi local authorities, Midlands State University, EMA, Ministry of mine and other NGOs to identify the impact of gold panning on the physical environment. The study shall therefore be a cornerstone to the baseline carried out by the other stakeholders.

1.8. Delimitations

The researcher hails from the nearby area practicing gold panning and thus had enough room to experience the whereabouts of gold panners in their operational areas. The researcher can also take advantage of using a friend engaged in gold panning to explore the panners community for interviews. Also the distance to the study travelling to the study area was less than 50km from the University thus the researcher could travel willingly to and from in terms of the transport costs.

1.9. Limitations

Some of the community members and gold panners may not be free to open up relevant information to strangers as they fear arrest from Police officers who sometimes visit in casual

clothes for arrests thus gathering information from interviews can be fruitile. The researcher will find it hard to visit all areas affected as most panning sites are done kilometres into the forests where robbing cannot be noticed and also encounters with gold panners are dangerous at most from their bullyness.

With little time available for the research it would be difficult to reach all these people and actually talk to them to get their valuable opinions. It would be important to establish the amount of knowledge that the gold panners hold on the mineral deposits along the rivers they work on.

1.10. Summary

The chapter gave a well detailed analysis of the background of study, statement of the problem, research sub questions, research objectives, delimitation of study, significance of the study, limitations of the study which pose the backbones of the research in later chapters.

CHAPTER 2: LITERATURE REVIEW

2.0. Introduction

This chapter establishes the basis for this research by looking at what scholars and authors have discovered in their studies on gold panning. It is of paramount importance as it provides an analysis into the similarities and differences of ideas suggested by other authors on the research. The chapter identifies some of the challenges posed by gold panning to the environment that affect human and animal health as well as protection measures suggested by different scholars.

2.1. Development of Gold Panning

Gold mining is one of the major economic activities in many developing countries (Kitula, 2006). Particularly in rural sub-Saharan Africa (Andriamasinoro & Angel, 2012). For many years the mining of gold has made a significant impact on the socio-economic lives of communities involved directly or indirectly in the sector (Amankwah & Anim-Sackey, 2003). Gold panning or artisanal mining is defined as an informal an unregulated system of small scale mining which is mostly illegal in some of the countries (Prasetyo, Krisnayanti, Utomo, & Anderson, 2010). Gold panning usually involves the extraction of secondary gold from alluvial free gold that is easily concentrated by gravity processes (Hinton, Veiga, & Veiga, 2003).

The term gold panning covers a broad spectrum of activities which makes it difficult to define. The definition depends on the use of the term. Classification depends on the size of operation, that is, large scale and small scale mining or in terms whether they are legal or illegal (formal or informal) as well as according to methods used to carry out the operations. Svotwa and Mtetwa (1997) contend that the mining sector consists of formal large scale subsector, the formal small scale subsector and the informal small scale or artisanal small scale miners who are primarily unregistered gold panners concentrated mainly along major rivers. Dreschler (2001) on the other hand, places artisanal small scale mining under two broad categories of mining activities, namely the formal small scale mining activities and the

informal small scale mining activities. Formal small scale mining in Shurugwi district is also gold panning because it is underequipped and uses rudimentary methods in the extraction of gold.

The major characteristic of this category of miners is that it is highly nomadic in nature and as a result they fail to have permanent infrastructure such as houses, water and sanitation. Only few small scale miners own land and in most cases, this is far removed from the panning area. However, in some cases the panners still manage to produce agricultural crops on their smallholding land. Gold panners mine by stripping the overburden material to get the minerals at the bottom of the riverbed or along river banks. The material is brought out for hand panning. The activity leaves behind large amounts of piled sand together with numerous pits along the riverbanks. Mined waste is usually dumped close to the shafts and abandoned which has degraded the natural environment.

Gold panning activities has been described by Borkowski (2003), as mostly characterised by cyanide heaps leaching which is the most common technique of gold panning, but by using that technique gold mines release cyanide. Cyanide is a extremely toxic material and it poisons and pollutes the water also aligned causes air pollution where it produces a lot of dust and toxic materials that pollutes the air. He further states that the toxic substances which are contained in the waste that gold mines produce could cause instant death on vegetation animals and people.

2.2. History of Gold Panning in Zimbabwe

Gold panning has long been an important economic sector and a contentious arena for policy making in Zimbabwe (Spiegel, 2009). The history of gold mining in Zimbabwe dates back to the period well before colonisation in the late 1890s (Maponga & Ngorima, 2003; Mberengwa, 2010). Despite the immense growth over the years, the sector has essentially remained subsistence and a significant complimentary activity to communal and small-scale resettlement agriculture (Murwendo, Rusinga, & Zinhiva, 2011). Zimbabwe experienced an upsurge in gold panning in the 1990s, largely as a result of a deteriorating agricultural sector and the layoff of public sector workers following implementation of a series of economic structural adjustment programs (Dreschler, 2001).

As a whole, gold panning is an important sector in the mineral production system in Zimbabwe, as miners work on economic deposits often below the threshold levels of the larger operators. The mining systems used in the sector are low-tech, labour-intensive and feature manual procedures using homemade tools such as hoes and panning dishes (Hilson, 2012). Small-scale mining in Zimbabwe includes both legal and illegal operators, mechanised and semi-mechanised miners of varying sizes in terms of output, employment and capitalization. Small-scale miners however, face a host of technical, financial and socio-economic problems that adversely affect productive capacity, capability and compliance with mining, safety and environmental regulations (Maponga & Ngorima, 2003).

Zimbabwe experienced an upsurge in artisanal gold mining in the early 1990s, largely as a result of a deteriorating agricultural sector and the layoff of public sector workers following implementation of a series of economic structural adjustment programs (Dreschler, 2001). The mining systems used in the sector are low-tech, labour-intensive and feature manual procedures using homemade tools, (Hilson, 2012). Gold panners however, face a host of technical, financial and socio-economic problems that adversely affect productive capacity, capability and compliance with mining, safety and environmental regulations (Maponga & Ngorima, 2003).

Unemployment increased to over 80% in the past decade due to economic and political crises which drove away foreign and domestic investments in Zimbabwe. Large-scale mines downsized their operations and even closed due to high operational costs and political uncertainty, releasing many people to Gold panning. The whole scenario was exacerbated by the collapse of large-scale commercial farming activities following the Fast Track Land Reform Programme in the early 2000s. The panners still exploited the narrow unpredictable discontinuous quartz veins. The panners used the same traditional tools used during the colonial period. They worked on sites lacking proper housing, hygiene and sanitation, clean water as well as educational and health facilities, (Legal Resources Foundation, 2003; Government of Zimbabwe,1989, 1990 and 1995).

2.3. Legislative Framework On Mining And Environmental Management in Zimbabwe.

In most developing countries, policy and legal frameworks tend to favour environmental protection and the interests of large gold mine holders instead of promoting more efficient and safer work practices which could result in the development of more stable mining communities, (Cawood, 2004). However In 2002 the government of Zimbabwe promulgated the Environmental Management Act 2002 (Chapter 20:27) with the purpose of complementing and enhancing the Environmental Management Act and other complimentary acts pertaining the environmental protection, management and sustainable development, (Ministry of Environment and Natural Resources Management, 2010). It has numerous pieces of legislation which have a bearing on environmental management and sustainable development. However, some scholars note that these legislations pose challenges in environmental management as they are fragmented and conflicting. The challenges have to be addressed in line with environmental issues cutting across a wide range of sectors.

The mines and minerals Act (Chapter 21:05) does not embody the above listed regulatory acts because they fall under different ministries. As a result, critical stakeholders like EMA and ZINWA are made to police the environment after mining concessions had already been issued by the ministry of mines. In some instances mining activities commence on the ground without the knowledge of rural district councils. Issuance of mining claims depending on the size is done by different office bearers from the mining commissioner up to the President inclusive of the provisions of the Indigenisation Act that requires foreign investors to partner indigenous people in order to carry out mining activities in Zimbabwe. However rampant corruption in government has also seen some bogus investors especially from China partnering indigenous Zimbabweans to prospect and mine without the approval of rural district councils, Environment Management Agency (EMA) and Zimbabwe National Water Authority (ZINWA).

Inadequate public regulation, absence of law enforcement agents and poor medical provisions perpetuate chaos and insecurity in gold panning areas. Heemskerk and Oliviera (2003) regarded gold panning as characterised by formally untrained mining techniques and uses poor techniques for prospecting, extracting and processing of minerals. These panning

activities have been widely criticised for being wasteful, inefficient, ineffective, damaging to the environment and dealing in illegal trading of minerals. It is commonly believed that gold panning is largely informal, technologically backward and a greater proportion of this sector's activities are illegal, (Shoko and Veiga, 2003).

The year 2013 saw the government of Zimbabwe warming to the idea of formalising gold panning or small scale mining operations. According to government sources small scale mining can produce upward 40% of national production if properly regulated and funded. The same sources also reveal that small scale miners contributed 30% of gold output in 2012.The demise of the Zimbabwean economy from the late 1990s saw the increase of small scale artisanal panning activities throughout the country. Many Zimbabweans turned to gold panning because of high unemployment as a result of company closures and the fall of large commercial agriculture (Chimonyo 2012). Increased panning activities forced government to carry out operations such as "chikorokoza chapera" in order to clamp down on illegal panners and safeguard the environment.

2.4. Gold Panning Effects to The Environment

Gold panning operations have their negative impacts on the environment. This particular mining sector poses a severe ecological disaster and thus the economy will suffer and shrink. The Zimbabwe School of Mines module (1997) argues that in as much as mining should continue to flourish and grow in Zimbabwe, it is imperative that it continues whilst upholding the principles of International Strategy for Disaster Reduction (ISDR) in which Zimbabwe is a signatory. The ISDR is an ideology which was created and designed by the General Assembly of the United Nations in 2000 to offer a global framework for action with the "objective of reducing human, social, economic and environmental losses as a result of natural hazards and related technological environmental phenomena" (ISDR, 2002). ISDR is a theoretical framework that puts emphasis on integrating disaster risk reduction (DRR) into a broader perspective of sustainable development and related environmental considerations.

The environmental management act chapter prohibits mining activities within 30 metres of a water course, thus mining activities in the river is prohibited. Alluvial mining in the river disturb the water source through sediment release and construction of impoundments that

affect natural flow of river. This mining method destroy the riverine ecosystem and aesthetic beauty of the countryside. The alluvial gold extracted is taken to the mills for processing where they use cyanide substances to extract fine gold from the solid rocks while other panners resort to the use of mercury to distinguish their gold from the soil where the substances are dangerous if exposed without due care with some reports exposing residents poisoning themselves from cyanide, also wildlife and livestock losing lives within five minutes of drinking water with the substance however chances of getting antidotes for cyanide victims have been fruitless thus losing lives. Nkoma ,J (1987).

Closely linked with vegetation destruction and land degradation is the case of soil erosion. Gold panners as argued by Dreschler (2001) move an average of eight million tonnes of material for panning per year, and this ends up in the streams and dams as silt. In Shurugwi district they have destroyed river banks and dams on either side in cases where mineralisation continues beyond the banks. Some dams and weirs have been known to silt completely within five years (MMSD, 2001).

Dreschler (2001) further argues that when the panners discover a lucrative area, they construct makeshift homes out of pole and dagga using local trees. The Gold panners are responsible for the clearing of extensive areas for fuel and infrastructural development in Shurugwi district. This is as a result of the nomadic nature of artisanal small scale gold mining. The interesting point to note is that almost all of the miners‟ fuel needs come from wood. These rapid overnight settlements as observed by Shoko (2005) in newly discovered gold and gemstone areas does not only result in rampant deforestation, but also social ills associated with urbanization which include alcohol abuse, prostitution, land use conflicts with local communities as well as water pollution, child labour and diseases. He goes on to say that the excess reliance on wood as a source of energy results in the reduction of biodiversity and increasing rates of deforestation. Chiwawa (1993:25) estimates that about four million tonnes of wood is used in Zimbabwe every year as fuel which translates to massive deforestation.

Moreover, Dreschler further argues that 80% of the operations are open casts or shallow pits less than 30m deep and there are left uncovered and unprotected. This kind of land disturbance resulting from gold panning activities leave a noticeable effect on the siltation of

rivers and dams, deterioration of water quality, reduction of grazing land for animals and the overall reduction in biodiversity. In some cases, underground operations require the opening up of vertical shafts and raises as well as underground tunnels leading to land subsidence. Chiwawa (1993) in Shoko (2005) argues that siltation in Zimbabwe, Mozambique and Tanzania is reported to have been increasing at the rate of more than five per cent per annum. He further annotates that siltation results in the reduction of conveyance and storage capacities of rivers and dams.

Furthermore, Shoko, (2005) notes that ore and waste stockpiles established on surface has a negative impact on the environment. These contain significant amounts of sulphides and, with the passage of time, heavy metals, sulphates and other pollutants are dissolved and leached out by precipitation into local streams and community water sources. The impact of mineral pollution on an ecosystem may be severe and may result in the total elimination of animal life from the receiving waters. There has also been an emergency of invasive alien species on the stockpiles.

Most gold panners come from across the country in search for the deposits and however do not care for the impacts they cause on the communities they mine on since it's not their home. The working conditions are typically hazardous and unhealthy and living conditions deplorable. These costs include poor safety and health conditions in the mining communities, (Lockton, 1999). However, externalised costs are bound to surrounding communities, such as environmental degradation around the mining area and social disruption in the form of prostitution, alcoholism, crime (Whitlow, 1990; Wild and Wiltshire, 1971). These communities surrounding the panning sites suffer from environmental degradation, infectious disease and social problems , (Whitlow, 1990; Logan, 2004). These adverse impacts remain for some time in an area well after the panners have abandoned the area. The profits of the activities are generated by employing family members at wages below subsistence levels resulting in the exploitation of women and children in panning areas, (Shoko and Veiga, 2003)

2.5. Social Impact Of Gold Panning

Shoko (2005) puts across that the socio-economic benefits (employment and income generation) of small scale mining environment are seriously outweighed by devastating environmental costs or negative impacts. The irony of it is that the impacts are externalities due to the fact that these costs are usually borne by communities downstream of the mining operations. Communities forced to bear the costs are neither involved in mining operations nor enjoying the mining benefit streams. In the case of Shurugwi district, depletion of water sources as a result of increased siltation is mainly felt by surrounding communities like Shurugwi town and other districts. The drying up of major Gwenoro dam and its subsidiary rivers where alluvial gold mining activities are high has forced the Shurugwi Town and also Gweru City Council to bear the cost of alternative water sources such as drilling of boreholes increasing expenditure in the process (Mabiza, *et al.*,2002*).*

In the same vein, gold panning and small scale mining sector does not compensate the local communities for the loss of common property services. For example in a survey conducted by Environment Management Agency in 2010 in Umzingwane in Matebeleland one woman lamented having lost her plot to gold mining as panners destroyed her farming land and left her landless and destitute in their bid to eke a living. Similarly, Milne and Marongwe, (1995) in a study done in Zimbabwe Mashonaland West Province on the economic and environmental costs and benefits indicated that alluvial gold panning is uneconomic when a full range of economic, social and environmental costs are pitted with the number of limited benefits. Shoko (2005) views the distribution of costs and benefits as an important aspect for policy makers. Policies considerations in most cases seek to have beneficiaries compensating the losers for externalities.

According to Shoko (2001) the set of problems that are caused by gold panning that affect the social health of communities include air pollution and they cause ozone depletion which protects short-wave radiation from the sun and global warming in which greenhouse gases trap long wave radiation thereby increasing the temperature on the earth‟s surface. Noise pollution from stamp mills, pan dishes and blasting also causes ill health, loss of hearing and migration of wild life and birds. Land degradation as well result in the loss of the landscape aesthetic value as mining activities leaves open pits and mounds of sand. These threats to

biodiversity occur in Shurugwi district. According to Dreschler (2001) artisanal small scale gold mining is associated with mushrooming of unplanned squatter camps located close to water courses with poor or no sanitary facilities. This development has high chances of considerable amount of water pollution from human waste.

Higher populations in Gold mining areas however bring about social problems that include crime, prostitution, stealing, drunkenness from the heavy Gold panners spending this affect the local communities. Social impacts of small-scale mining, results in increase in human population leading to possible increased poaching (Zwane, Love, Hoko, & Shoko, 2006). Where panners end up hunting in game parks for food and sometimes steal from villagers leaving nearby there mining sites.

2.6. Political Impact Of Gold Panning

The mining industry in Zimbabwe is saddled with archaic laws and policy inconsistencies that are fuelling corruption in government and aiding plundering of mineral resources by foreign companies. The failure by government over the years to overhaul the mining sector and introduce policies that guarantee revenue inflows to fiscus in order to sustain the country's developmental needs ,has impacted negatively on the economy and increased the vulnerability of communities living in resource rich areas.

An example is in diamond mining where unconfirmed reports estimate that more than 2 billion dollars realised out of Marange diamond sales between 2012 and 2013 has disappeared amid outrageous salaries and benefits for executive officers running diamond mining ventures in Marange. Reliable sources indicate that they has been massive accumulation of wealth by executives of these mining ventures in recent years and some of them are suspected to have channelled huge financial resources realised from Marange diamond sales to multiple private business investments. This however is the same situation in gold dealings across the country where politicians are spearheading the illegal marketing and selling of gold deposits. (Newsdayzimbabwe. T.Marimbe: Article: Mining Industry Shrinks:20 May 2012)

Rampant corruption in government has seen an upsurge in unregulated mining activities taking place on communal land in recent years negatively impacting on the communities. In Marange for example the mining operations and relocations were carried out without conducting due diligence to the social economic and environmental rights of the communities resulting in serious human rights violations. Local partners in these mining ventures have used their political influence to protect unscrupulous mining practices simply because the indigenisation act guarantees them shares out of the mining proceeds. Under these circumstances, several mining projects in recent years have been undertaken sometimes in strategic water sources with devastating ecological results.(T. Marimbe, 2012)

2.7. Economic Impact Of Gold Panning

Gold panning is a crucial livelihood activity employing more than 13 million panners and sustaining 80-100 million people worldwide. It produces between 350-800 tonnes of gold per year contributing about 20-30% of global output. The people depending on gold panning are usually members of poor rural and some urban households in developing countries, (Heemskerk and Oliviera, 2003). Gold panning is viewed as a golden opportunity for the poor, despite the social, environmental and health challenges. It is believed that more than a billion people still earn less than a dollar (US$ 1) per day due to population increase, (Metcalf, 2008). Some rural populations depend on mining as a primary source of income or as a critical supplement to low farming revenues.

In most African countries like Ghana, Madagascar, Zimbabwe and many more, gold panning has become important due to escalating poverty and lack of employment opportunities in the formal sector, (Logan, 2004). Women and children are increasingly getting involved in gold panning with about 50% of Zimbabwean and Madagascan women engaged in illegal mining, (Hoardley and Limpitlaw, 2004). Gold panning has become important for so many poor people and other vulnerable population groups since the panners still have limited access to appropriate mining and mineral processing knowledge and technology.

However, the resilience of gold panning activities especially during economic crises has proved to be one of the major sources of livelihoods in local communities where gold deposits are found since they provide income, employment and income for the day-to-day

survival. Gold panning has been a very important activity often related to direct and indirect creation of employment as other small-scale enterprises like catering, vending and beer halls are attracted by viable business in these areas, (Heemskerk and Oliveira, 2003). It results in the generation of revenue for the national treasury and result in related infrastructural development like roads, electricity and commerce if the deposits have been channelled to government reserves.

Hoadley and Limpitlaw (2004) contend that gold panning can promote sustainable development by increasing the sustainability of poor people's livelihoods. Despite its negative effects, gold panning is an essential activity in many developing countries as it provides an important source of livelihood, particularly in regions where economic alternatives are critically limited (Hinton, et al., 2003). People engage in mining for a variety of reasons. They are unable to find other work, other jobs pay insufficiently and their low educational status limits access to better paying jobs (Amankwah & Anim-Sackey, 2003; Prasetyo, et al., 2010).

In rural communities where mining takes place, the activity has reduced rural exodus, promoted local economic development and contributed towards poverty reduction (Amankwah & Anim-Sackey, 2003), as gold rush miners may be lured by prospects of striking it rich (Heemskerk, 2005). Environmental, economic and social development has been highlighted as the three pillars of sustainable development and their integration is therefore encouraged (Azapagic, 2004; World Commission on Environment and Development, 1987).

Also the country's reserves have benefited to some extent from the gold deposits these small scale miners produce and sale through Fidelity Gold Buyers who buy the precious metal for the government but with lower prices which has led to some illegal local buyers resorting to sale their gold in foreign nations for higher rates. This has led to gold panning opening a huge gap to the nations mining industry falling instantly as almost 70% of the gold deposits leave the country everyday, cited in the 2012 Mid Year Fiscal Policy Review Statement presented to the Parliament of Zimbabwe by the former Finance Minister, Tendai Biti, thus there is need to control the illegal mining activities.

Economic analyst John Robertson said the activities of gold panning are a reflection of lost production economically since there is no revenue trickling into government coffers. Besides

causing severe environmental degradation, the miners' activities are tragic to the economy because minerals extracted illegally are easily smuggled out of the country. He cited economic recovery as the solution since employment creation is capable of shifting the attention of the miners from extracting gold for speculative purposes to prioritising formal job security.

2.8. Summary

The chapter reviewed literature on gold panning activities at a broader view. The historical development and current information on the extent of gold panning risks and benefits have been discussed at a scholarly view.

CHAPTER 3: RESEARCH METHODOLOGY

3.0 Introduction

This chapter is an outline of the methods or instruments to be used by the researcher in gathering data for the research project and it touches on the data sources and types, techniques of collecting data, data analysis and presentation techniques. The chapter also expounds the reasons why the researcher decided to use the instruments of his choice for the research data acquisition or the relevance of these techniques to his project The research will be based largely on qualitative data and relied on document review, interviews and observations for data.

Research methodology is seen by Miller (1979) as the planned sequence of the process involved in conducting research. The research methodology is unquestionably the most complex process in research given the enormous variability in their different paradigms, operations and the interactions that take place. Winter (2000) has it that the research methodology implements and anchor paradigms in specific empirical sites or in specific methodological practices. It specifies how the study addresses the critical issues of representation and legitimating. Stenbacka (2001) has it that the methodology situates the researchers in the empirical world and connects them to specific sites, persons, groups, institutions, physical places and bodies of relevant interpretive materials including documents and archives.

3.1. Research Design

3.1.1. Qualitative Research

Methods used will be those that would allow collecting as much information about the case study, which can be processed to make deductions and conclusions. Whilst a qualitative approach has been chose some quantitative aspects may be used to broaden the scope of data collected for the study. A qualitative research, broadly defined, means “any kind of research that produces findings not arrived at by means of statistical procedures or other means of qualifications (Strauss and Corbin, 1990: 17).

Qualitative research therefore uses naturalistic approach that seeks to understand phenomenon in a context specific setting. The researcher will make visits to the areas where gold panning is prevalent to experience firsthand the social and economic hardships these people experience which are the key causes that push them to pan for gold. During these visits researcher will use the observation to get to some of the issues that are linked to this problem, which may not be instantly seen at a glance.

3.1.2. Target Population

According to Day (2008) the study population should be defined in advance stating unambiguous inclusion criteria and the impact that these criteria will have on study design, ability to generalize, and participant recruitment must be considered. Population refers to all the organisms of the same group that are located in the same area. Population study can be defined as a study of a group of individuals taken from the general population who share a common characteristic such as in the same type of business or operate in the same area of research.

The target population of this research was working with 100 people of Shurugwi District in different parts who include the **panners**, mine owners, Stamp Mill Oprerators, **Non-Panners** (business community, urban and rural community). **Stake Holders** (EMA, the Shurugwi Town Council, the district Administrators Office, Environment Management Agency (EMA), Ministry of Mines, ZINWA, The Zimbabwe Republic Police (ZRP) and selected clinics. The target population was vital as it provided relevant information which is related to the study. For example statistics, frequency, efforts to mitigate the effects of gold panning like existing mitigation measures by these bodies and also challenges facing the community as this addressed the objectives of the study.

3.1.3. Sampling

According to Pilot et.al (2001:234) a sample is "a proportion of a population." William (2006) defines sampling as a process of selecting units from the population of interest so that the sample obtained will be used to generalise results from the population in which the sample was chosen. In other words, sampling refers to the process of selecting a fraction of the population to represent the whole population. This will be done in case of producing a few questionnaires for a selected group of representatives from the target population.

Konthari (2007) notes that the main advantage enjoyed from sampling is that, it saves time and efforts to the researcher by generalising the findings for the entire set.

3.1.3.1. Sampling Techniques

a) Random Sampling

There are four methods of sampling under random sampling. Simple random sampling is a method which allows each element of the population to have an equal chance of being selected to become part of the sample (Frankel and Wallen, 1996). Allison et.al (2001) postulates that systematic sampling has similarities with simple random sampling except that random selection involved relates to which subject is selected as the first one from the sampling frame.

Stratified sampling involves dividing the population into strata with each stratum having relatively homogeneous elements and once the strata have been identified a simple random sample is selected from each stratum separately. Stratified sampling is used when the population is thought to consist of a number of smaller subgroups such as male or female which are thought as well to have an effect on the data to be gathered (Allison et.al, 2001).

b) Non-Random Sampling

Guijt and Woodhill (2002) suggests that non random sampling method make an open choice based on the researcher's own judgment about whom exactly to include in the sample. This method can also be done in four ways which include quota, convenience, snowball and judgmental sampling. Barlett (2001) suggests that quota sampling involves the selection of a sample in the ratio similar to that of the whole population. Convenience sampling involves the process where the most accessible people are chosen as subjects (Sekeran and Bougie, 2009).

The researcher used simple random sampling method as it is considered to be a fair technique of choosing a sample from the entire population and also the student is dealing with an large district which might make the research difficult to conduct with such a limited time. Moreover, simple random technique has less bias than other methods and it is also the simplest of the probability techniques, which can make the interpretation of data gathered

easy. Random sampling is the best technique for such illegal gold panning research as their are no fixed proportions for the number of mining sites in the district and also the actual number of panners operating in the area.

3.1.3.2 Sample Size

Wood and Haber (1998) suggests that the larger the sample the more representatives and the less the sample, the less accurate of results to be obtained because of less representatives.

The researcher used a sample size of 100 respondents in Shurugwi District to collect data which involved random selection representatives from the target population who each was interviewed and some also received questionnaires. The researcher chose to work with a sample of 100 respondents as the population size of Shurugwi District was too large to work with as the time frame and cost bearing was inadequate for the researcher. However the sample size gave the study more chances of credible findings important for the research.

3.2. Research Instruments And Data Collections

Pierce (2009:159) states that, "a research instrument is a survey, questionnaire, test, scale, rating, or tool designed to measure the variables, characteristics or information of interest, often a behavioural or psychological characteristic". Creswell (2003) mentions that data collection steps includes setting of the boundaries for the study, collecting information through unstructured or semi-structured observations and interviews, documents and visual materials as well as establishing the protocol for recording information. In this research project the researcher used the survey design in which data was collected by way of questionnaires and interviews. Research was conducted through primary and secondary data methods which include interviews, questionnaires, study of documents that show the trends for this issue past and present to mention a few. The researcher will choose instruments, which will help get the most relevant information about the study within the limitations of time.

3.2.1. Primary Data

According to Bryman and Bell (2003) primary data refers to the original data which is free from any alteration by human beings and the data has not been published. In other words, primary data refers to original data that has been collected specially for the purpose in mind. It means someone collected the data from the original source first hand and the data has not

been published yet and is more reliable, authentic and objective. It has not been changed or altered by human beings therefore its validity is greater than secondary data (Bryman and Bell 2003). According to Forshaw (2000) primary data are those that the researcher has collected himself/herself. The primary data sources the researcher used in doing this research were questionnaires and personal interviews.

3.2.1.1 Interviews

Interviews were also used to get to the depth of the problem. The researcher probed these people about the failings in the policies in a way that a questionnaire may not collect as much evidence as is required. In this case the interview as the best tool because is able to present a case to the people in question and probe as much as was expected. This helped raise research questions and discuss them fully with the individuals concerned.

The interviews were conducted by talking to groups of people targeted in this research that included 90 respondents. These included the (Stake holders) local authority, the district Administrators Offices, Environment Management Agency, Ministry of Mines, ZINWA, (non-panners) rural and urban households, business community and from the gold panners themselves. The Zimbabwe Republic Police (ZRP) of Shurugwi, urban and rural clinics were interviewed to identify gold panners' dangerous activities in the community and town at large from their behaviours. The interviews aimed at obtaining data on how people conducted the activity to determine compliance with regulations, perceptions about environmental degradation as a result of gold panning, the causes for opting for panning as an income generating activity and the perceived solutions to the effects of the activity to the environment and the community.

3.2.1.2. Questionnaire

According to Weijun (2008) questionnaire is a general term to include all techniques of data collection in which each person is asked to respond to the same set of questions in a predetermined order. Czaja and Blair (1996, p. 106), “The questionnaire is one indispensable means by which the opinions, behaviours and attitudes of respondents are converted to data”.

Questions in the questionnaire seek to identify the views or opinions as well as knowledge and understanding of the issue that the target group has. In so doing the researcher will be trying to establish how much of the panning activity is done with full understanding of the

problems its causes and so how much planning for the future is drafted into the activity. The researchers would also be interested in gathering information from those not involved in the panning but are equally affected by the results of gold panning as it is these people who are likely to push for environmental protection.

The questionnaire allows reaching out to a lot of people at the same time. The researcher has to use simple English to communicate with some villages that may not be educated enough. This will help to get the most correct information on what the research is all about. The questionnaire has the advantage of being able to collect a lot of information on a snap shop, which could cover a lot of areas. Thus the questionnaire is considered an appropriate instrument to use for this group of people.

Questionnaires accounted for 70 respondents where some of the questionnaires went to different rural communities and urban communities representing non panners, the District Administrators office, ZRP Shurugwi, clinics, gold panners and also including clinics Ministry of Mines, EMA, Shurugwi Town Council. The researcher made follow ups in trying to verify whether the respondents understood how to interpret and answer the questionnaires as some may not understand the demands of each questionnaire.

3.2.1.3. Use of a Gold Panner Associate

Most importantly the researcher used a trusted associate engaged in gold panning activities who has knowledge of the study area and also operates in the area. This associate helped in introducing my study to other gold panners who might be rather violent to new visitors which opens up their views and freely share their benefits, grievances and how they ended up panning, why they leave the environment such deteriorated through interviews and distribution of questionnaires. Also the associate will show the researcher some of the damaged areas and how are their relationships with the surrounding communities they operate in.

3.2.2. Secondary Data

Secondary data is the data that have been already collected by or readily available from other sources http//www.secondary-data.com.htm visited on 11/04/2014). According to Forshaw (2000) a secondary data research project involves the gathering or use of existing data for purposes other than those for which they were originally collected. Secondary data also refers

to the information gathered by someone other than the researcher (Zikmund, 2000). Thus, secondary data involve the collection of data from sources that are already available. The theoretical background of the research topic will be framed from secondary data. Secondary data found will be helpful to the researcher especially in the literature review and the analysis section of the research project. Listed below are various sources of secondary data

3.2.2.1. Internet

Internet was found to be of greater importance as it offers convenience by providing a range of service and data at once, thus it has become a "One stop shop" for all information. The researcher will access e-journals, e-books and organisations' websites, PDFs via the internet that have discussed gold panning trends from the study area and also any part of the world that endures gold panning impacts.

3.2.2.2. Textbooks and Journals

Textbooks and journals are manuals of instruction or standard books and codes in any branch of study. Textbooks are only published in printed format and some online mainly known as electronic books, or e-books. The researcher had to use different textbooks and e-jounals on compliance to the mining industry in Zimbabwe and global in determining how to manage the impact of gold panning to communities.

Also the researcher would consult various professional journals in coming up with the research as not much books in the library look at gold panning but small scale mining or rather gold mining at large. The advantages enjoyed by the researcher from using journals and textbooks are, they bring new problem areas to the research which is a move that helps to avoid duplication of researches. This helped the researcher in having a broader and deep understanding of the subject matter.

However journals and textbooks have got their own drawbacks which include time consuming and tiresome process of searching the relevant information about the subject matter under study. Thus, to obtain information from journals online many steps are involved and to be followed.

3.2.2.3. Online Media Tools, (Newspapers, Radio and TV Broadcasts).

This will help the researcher obtain resent news and information on gold panning in the country and importantly the Shurugwi district as there is not much book writers who wrote about gold panning in the district. The newspapers have cited information on the bad behaviours and havoc caused by gold panners in the area, their day to activities that have made the rural and urban communities sleepless.

3.3. Data Analysis And Presentation Plans

Data analyses is a process of inspecting, cleaning, transforming, and modelling data with the goal of highlighting useful information, suggesting conclusions, and supporting decision making. Data analysis has multiple facets and approaches, encompassing diverse techniques under a variety of names, in different business, science, and social science domains.(http://www.answers.com/topic/data-analyses visited on 11/04/2014).

After gathering all the relevant information, the researcher will evaluate data using analytical and logical reasoning to examine each component of the data provided, then present, analyse and establish solutions to the research problem. The collected data from questionnaires and personal interviews will be presented in pie charts and graphs, appropriate to reflect the correct trends. The obtained results will be presented in relation to the objectives and research questions of this study.

3.3.1 Data presentation techniques.

There are a number of techniques that can be used to present data. For the purpose of this research, the following data presentation techniques were used by the researcher.

3.3.1.1. Tables

Tables will be used to display numbers since they are arranged in rows and columns. Tables will be employed to present numerical figures where the exact figures are important. Tables show facts and figures relatively easier than narrative techniques. The tables also represent an easier way for comparison of variables.

3.3.1.2 Charts

Both pie charts and bar charts were used. Pie chart is a form of data presentation that uses a circle which is divided into segments according to the data available. On the other hand, bar charts are like graphs in that they have data in two axis but on one axis data is non-numerical. Charts gave a pictorial view for the findings hence making the findings easier to interpret, make recommendations and draw conclusions.

3.3.1.3. Image classification

The image classification process involved taking pictures around Shurugwi District to portray the activities damaging the environment and at large infrastructure. This technique further involve both supervised and unsupervised classification in order to come up with a current depiction of the state of land-use and land-cover in the district. Five vector layers of affected environment areas to be shown by pictures include forest areas, silted and gullied water bodies (rivers and dams), affected roads, houses, bridges, pit holes, abandoned shafts, cultivated (farming) land will be digitized as sites for the research supervised classification.

This technique was useful in terms of this qualitative research based where correct figures are not used or are not obtained as pictures shows the actual layout of the environment impact at large. Images will be used on most classifications that will work as evidence to explain the different areas covered by the researcher and also reflect the current and extent of damage caused by gold panning activities in the Shurugwi district.

3.4. Summary

This chapter was a summary of the instruments that were used by the researcher in conducting the study. Interviews, questionnaires and image classifications will be conducted to collect data for the research. Only those instruments which the researcher judged as compatible with his population of the study and that brought the best and relevant results were chosen from among the multiplicity and other factors.

CHAPTER 4: DATA FINDINGS, PRESENTATION AND ANALYSIS

4.0 Introduction

This chapter presents the primary and secondary data collected by the research from the field so as to examine the findings. Data is presented in the form of pie charts, graphs and tables image classification. Questionnaires, interviews and surveys were used by the researcher as the source of primary data. Textbooks, the internet, newspapers, magazines and journals were used as the sources of secondary data. Data presentation and analysis involved a set of interpretive and narrative techniques. Data was broken down into manageable units, synthesized and patterns or themes were identified to make it possible for meaningful analysis, (Leedy & Omrod, 2001).

4.1. Response Rate

In a survey, the response rate is the percentage of those selected in a sample who actually provide data for analysis, (www.sociology. about.com/od/r-index/g/response-rate/ accessed 24 April 2014). The response rate is essential in a research as the lower the response rate the higher the probability that the sample is biased, so the response rate has to be greater. The response rate is commonly affected by the methods of data collection, the more the interaction between the respondents and the methods used for data collection the higher the response rate.

The research mainly used the qualitative analysis as well as not much of quantitative analysis. Interviews and questionnaires were accounted for 57 respondents in Shurugwi District, 33 were successful giving a total of approximately 60% response rate which gives almost accurate conclusions to the research. The responses from questionnaires and interviews are presented separately below. The analysis and presentation of data was done in the categories of Panners, (Non panners) Urban, Rural and Business Community, (Stake Holders) Police, ZINWA, Town Council, EMA, Clinics, Ministry of Mines, District Administrator, clinics.

4.1.1. Interview Response Rate

Interviews accounted for at least 90 people with 73 having responded to the interviews giving a response rate of 70% as shown on fig 4.1below. These include police officers, official from ZINWA, Ministry of Mines, gold panners, mine owners and stamp mill owner, business operators and residents from four selected rural and urban communities representing non-panners. Table 4.1 shows that interviews managed to capture more respondents than questionnaires. More respondents were much more comfortable to air their views through interviews thus, managed to get more findings as they allowed uneducated respondents to get along with research questions since they were sometimes asked in their own languages.

However most of the respondents from ZINWA, Mine owners, Stamp mill operators were unavailable to comment on their operations but however observations at the mining sites and ZINWA library managed to add more findings to the research. Gold panners and the community where rather free to participate in numbers who managed to explain on most of the gold panning aspects.

Table 4.1 Interview Response Rate

Respondents	Interview Target	Interviewed	Response Rate/ %
ZRP Police	5	5	100
ZINWA	5	2	20
Min Of Mines	5	2	20
Gold Panners	15	15	100
Mine Owners	5	1	10
Stamp Mill Operator	5	1	10
EMA	5	4	80
District Administrator	5	2	
Clinics	5	5	100
Rural Community	15	15	100
Business Operator	5	5	100
Urban Community	15	15	100
Total	**90**	**73**	**70%**

Source: Primary Data

4.1.2. Questionnaire Response Rate

As shown by table 4.2 below questionnaires accounted for 70 people with 46 people having responded giving a response rate of 55%. This however gives enough accuracy of the research based on Halambos and Halborn (1990) sample size above 33% of the target population can be used to collect data. The researcher made follow ups in trying to verify whether the respondents understands how to interpret and answer the questionnaires as some may not understand the demands of the questions. Table 4.2 reflects that questionnaire response was rather much lower than interview response as gold panners themselves where not comfortable to fill any questionnaire fearing for their security towards their illegal activities. Also the rural community was not that educated enough to complete the questionnaires. Some organizations were rather busy to complete the questionnaires.

Table 4.2. Questionnaire Responses

Respondents	Questionnaires Distributed	Questionnaires Completed	Response Rate %
District Administrator	5	1	10
Clinics	5	5	100
Town Council	10	5	50
ZRP	10	5	50
EMA	10	5	50
Gold Panners	10	5	50
Rural Community	10	7	70
Urban Community	10	10	100
ZINWA	5	5	100
Total	**70**	**43**	**55%**

Source: Primary Data

4.1.3. Respondents by Marital Status and Gender

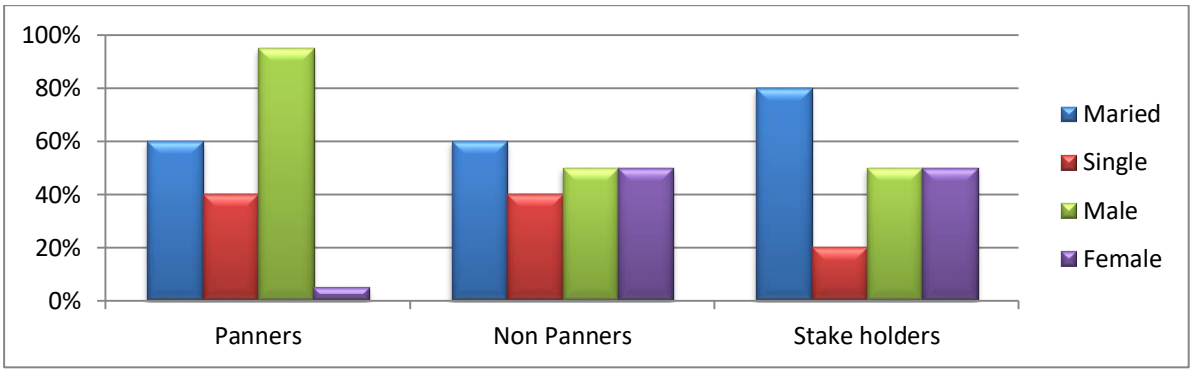
The study established that at the sites visited, men were mainly involved in the digging of the soil with a few women assisting in carrying water. However, some women were involved in searching for the gold, through sieving the soil using some pan dishes or washing bowls which is easier than digging the ground. In most of their responses, the female panners

indicated that the job of gold panning was not suitable for them, but they had no choice in sourcing income. From the Fig 4.1 below, the majority of the gold panners are male (that is 95%). This is probably because gold panning activities involve maximum physical strength, which most women may not equal

As shown on the graph, the majority of panners and non panners are married persons. This is a reflection that gold panning is a poverty driven activity, during periods of economic hardships as people tend to do anything for sustainability. This is in support with Chikowore (2002), who argued that in developing countries like Zimbabwe, most of the illegal panners are rural married man who are driven by hash poverty levels. The current economic hardships and critical food shortages in Zimbabwe however, have forced most rural and urban families in Shurugwi district to resort to gold panning, creating higher risks to the environment concurrently with the economic recession. Also a reasonable number are single men and women, who are trying to assist in providing food security for their families.

The researcher visited the sites in Valley Mine and Bobo mine where gold panners stay, discovered that most panners live in pitifully small huts made from small plastics and some wooden poles. The conditions which make them prone to infectious diseases (cholera). HIV and AIDS are on the rise given the fact that in some cases, single women stay in their huts close to single men which has high risks of sleeping together. The clinic nurses some distance from the mining site said some women stay on the mines for prostitution and condoms are rather not available in the bushes they stay however only a few or non come to collect condoms and many come to cured STIs almost on daily bases.

Fig 4.1 Respondents by Gender and Marital Status.



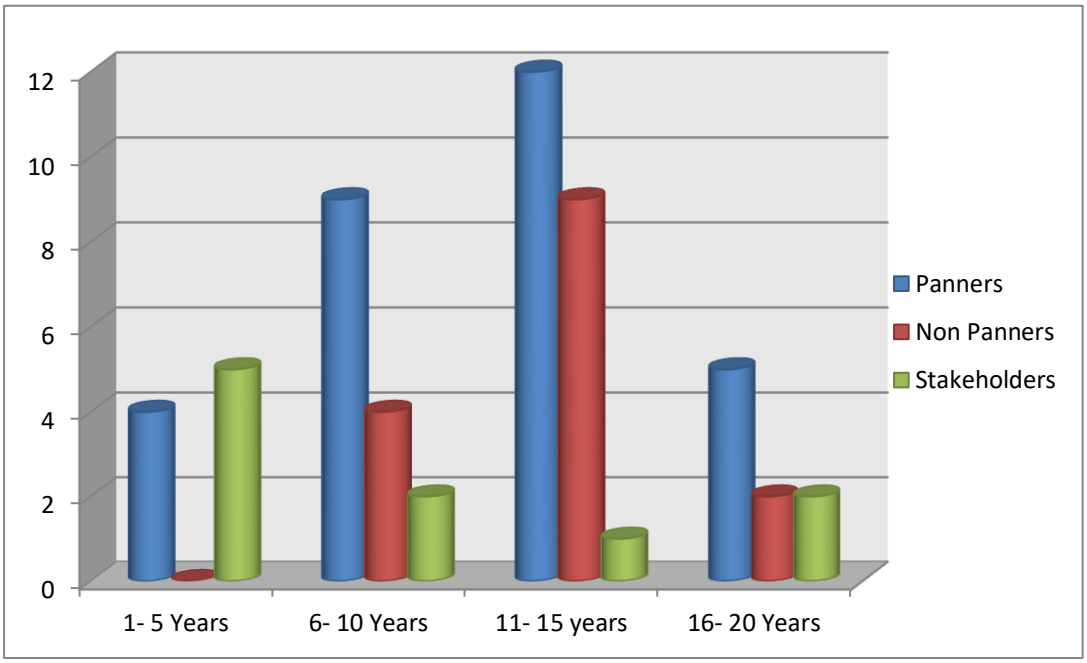
Source: Primary Data

4.1.4. Respondents by Experience

From the questionnaires response, it was established that more gold panners have more than 6 years of gold panning experience as shown below on fig 4.4. With also stakeholders that deal with mitigating the dangers of gold panning have more experience in the field but have failed to effect their duties. One of the panners boasted that he was a senior "*Gweja*" panner and had it been that he was employed at a mine 11 years since 2003, he would have been awarded medals for long service.

When asked whether they were aware that they were causing serious damage to the environment, most of them responded by indicating that they were so much experienced, such that they were no longer a threat to the physical and social environment, given their vast experience as illegal gold panners. Also the experience with the stakeholders (ZRP Shurugwi, EMA, Shurugwi Town Council) is also an issue as the level of their experience notes that they have been presents since year one that they know well the best ways of dealing with gold panning issues. Also the Non panners from both the urban and rural community have been leaving in the panning sites for a long time with some having been the first to arrive at the areas and thus explained much of their grievances towards the behaviour of gold panners.

Fig 4.2. Respondents by Experience



Source: Primary Data

4.2. Analysis, Presentation And Discussion Of Findings

4.2.1. Infrastructural Damages by Gold panning

The researcher established that most of the infrastructure has been lost in Shurugwi Town that includes high risk metal detector operators digging as near as the eastern suburbs, with Wolf Shall Pass (Boterekwa) posing a great risk of falling stone. The panners have discovered deposits of gold and dug up without care of passing vehicles. Also in Gundura a rural resettlement where gold panning activities have destroyed the roads with huge pits having been dug on the side road or even in the middle of the.

Image 4.1 shows a bus that has failed to negotiate a very narrow road to Chachacha that has pits at both sides of the road. The police interviewed explained that the incident happened November 2014 where passengers sustained major injuries. All this was as a result of metal detector operators who survey the earth using modern technology and willingly dig for gold at any point. The researcher asked on what they have done towards curbing gold panning operations, one of the officers posed that raids where done weekly in the areas with most gold panners but however have for years failed to stop their operations in the district.

Image 4.1: Zupco bus involved in accident at a dug up point of the road to Chachacha

Source: ZRP Shurugwi

4.2.1.1. Riverbank Erosion on Bridges.

Below is Image 4.2 showing falling sides of the bridge along Musavezi River posed by alluvial panners along the river beds reducing the passing point of vehicles. However villagers expressed concern on the development as the road no longer supports heavy vehicles that used to supply food donations to the Donga community. The findings concluded that, vegetation destruction and land degradation has been mostly caused by soil erosion. Gold panners dig and move tonnes of gravel for milling regularly and leaves the land bare prone to gully erosion, the movable soils ends up in the streams and dams as silt. Along the Musavezi river they have destroyed river banks. Where mineralisation continues beyond the banks they still continue digging until the deposits are finished which endangers the siltation of the main stream.

Image 4.2: River bank erosion on Musavezi River.

Source: ZINWA , Picture by L. Muzekenyi (2011)

4.2.1.2. Shurugwi Town under siege.

The area along Boterekwa has been dug out by panners where deposits have been found in large quantities. Falling stones are seen coming from above the Boterekwa main road to Zvishavane. The blasts that are used by panners leave stones loose thus motorist have

reported problems to the local authority. As a result of the illegal mining in the town, The current land degradation caused by the panners is only worsening the state of the roads.

Underground tunnels that they sometimes suspect existing beneath their homes and roads have been explained by the residents have posed a serious risk to locals,. Despite the police's attempts to make raids on the illegal activity, there are still many panners operating in the area. When interviewed Shurugwi District Administrator Mr Joraam Chimedza said he is working with the local authority to make an effort and reduce the risks in and around Shurugwi town.

4.2.2. Environmental Damages by Gold Panning Activities

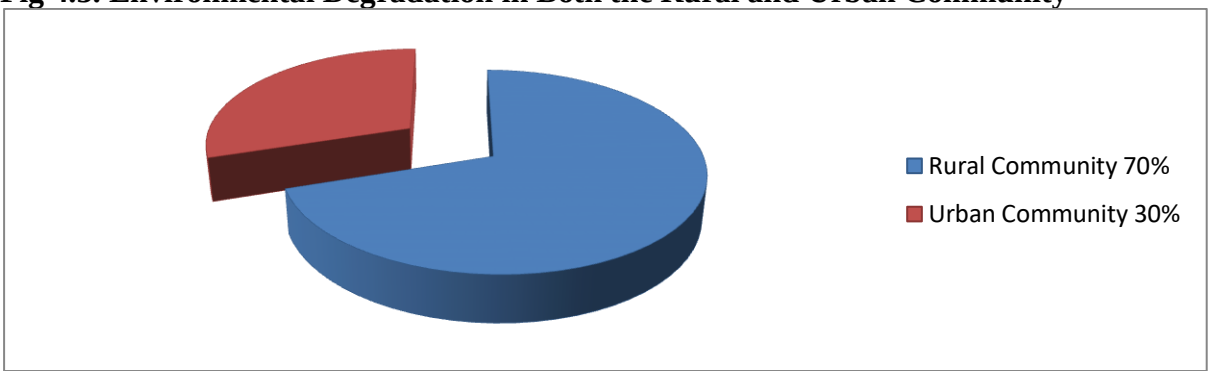
Some of the panners interviewed indicated that they did not know or realize the impact of gold panning to the environment and their health status. All they were after is enough returns to upkeep their children. However, stakeholders and most of the mature panners acknowledged that they were aware of ecological problems associated with gold panning that have created certain identified specific hazards affecting certain elements in the environment.

Stake holders and panners were issued with questionnaires requesting them to identify and list the ecological problems, specific hazards and the elements affected by the hazards. In the same vein interviews also sought out to identify if the same themes could be raised. Observations show the gravity of these environmental disasters whilst existing evidence on the capacities of water contamination helped.

4.2.2.1. Environmental dangers by Gold panners

Fig 4.3 shows the investigations by Environment Management Agency (EMA) where the rural community possed a greater level of damage by gold panning 70% where monitoring by the police has been limited as they are far from intensive raid operations that take place mostly in the urban community. The urban community however posed 30% damage as it has been somehow impossible for panners to operate close to highly populated areas though metal detector operators manage to survey for gold deposits in and around Pick mine and the Boterekwa areas.

Fig 4.3. Environmental Degradation in Both the Rural and Urban Community



Source: EMA (2012)

4.2.1.1. Vegetation destruction

Findings established that when the panners discover a lucrative area, they construct makeshift homes out of pole and dagga using local trees. The Gold panners their for start clearing of extensive areas for fuel, mining sites, making of pulley and ladder systems using wood. This is as a result of the nomadic nature of gold panning which results in rampant deforestation.

Also some mines have been established within the mountains and the surrounding forests and ecosystems have risked being destroyed, whether for fuel or simply to clear space. The mines further degrade the surrounding area by contributing to heavy soil erosion. The trees in the communities are crucial to maintaining the soil on the slopes of the mountains, as no other inhibitors are in place. Reduced trees also lead to increased flooding. Without the presence of trees to soak up excess water, the water continues down slope, bringing along all the chemicals and debris with it to the foot of mountains where livestock have been endangered from drinking the toxic waters.

4.2.1.2 Open Casts and Shallow Pits

Interviews with the gold panners carried observed that most of the panning methods are open casts or shallow pits less than 30metres or more deep and there are left uncovered and unprotected. This kind of land disturbance leave a noticeable effect on the communities as livestock and sometimes children fall in and die. In some cases, underground operations require the opening up of vertical shafts and raises as well as underground tunnels leading to land subsidence. This risk panners losing lives from falling walls as the techniques are somehow unprofessional.

The image 4.3 below evidence the open pits left on a dumped mine site. The officer at the ministry of mines explained that the water at the middle of the pit pose great danger as it holds toxic chemicals thus endangering the livestock of the villagers nearby and sometimes children play with the infected water posing great danger on animals.

Image 4.3: Dumped Mine Pit.

Source: Ministry of Mines By Siduduziwe Phiri (September 2011)

4.2.1.3. Depletion of ground and surface waters

Observations from mine owners found that the dependence on the use of large volumes of water dictates the location of mining operations close to water sources or right at the water source. Generally, gold panning puts a lot of strain on water as a resource. The panning activities along the riverbeds have had the potential to promote water pollution and depletion of both surface and natural underground sources as they are highly dependent on water. Some of the panners in the Shurugwi district carry out their sieving and amalgamation process on the river bed and as such contribute to accelerated evaporation of surface water, drainage of wetlands and the siltation of rivers and dams. This has the overall net effect of promoting dry conditions as well as flooding respectively.

Gold panners in some parts of Tokwe I area have for dug up gullies causing environmental damage in the area as well as risking the animal life. Recently panners had intensified their activities, prompting Environment Management Agency (EMA) to act. Even the intervention of police has failed to stop gold panning in this area. Shurugwi district environmental officer Severino Kangara said open pits were now common place in Valley mine and Tokwe II

wards where vast tracts of grazing land have been lost due to the many open pits and veldt fires, families from nearby farms have complained their livestock has fallen into the pits and died and also the deforestation of Boterekwa was acting as a desertification catalyst and causing siltation in nearby Muterekwi and Manzimudhaka rivers.

Image 4.4: Gold Panning Activities near Donga Dam 6km Southwest of Shurugwi Town

Source: ZINWA Library (09 September 2011)

Image 4.4 shows panning operations jus near Donga dam lowering water levels from siltation. ZINWA official said there is need to monitor the dam water levels to plan for shedding and determine the quantity of dead water in the dam that will sustain aquatic life and the community around. He indicated that experiencing such a situation aquatic life had perished because the dam sometimes had to completely dried up. However, he expressed concern that it might happen more oftenly in future seeing the rate at which land degradation was taking place in Shurugwi district.

4.2.1.4. Mercury and Cyanide Dangers

Questionnaire sent to Environment Management Agency established that the use of mercury in the amalgamation process of gold has polluted water and ecosystems. The authority has castigated that the main pollutants in the rivers and dams are mercury and cyanide, and to some extent human excrete because of lack of sanitation facilities at panning sites. Also in alluvial gold panning operations, mineral concentration is conducted by the use of gravity

separation through the medium of water using panning dishes and sluice boxes (Chiguruguru).

Workers at the milling points said they are no operations if cyanide was not there as it is the main chemical to extract the finest gold deposits. The use of cyanide has led to the death of small and large animals that require water to drink. Interviewed the panners and they said " we usually operate at night without enough facilities at the same time fearing the police raids and also bullies (Magweja) who disturb their operations thus will be operating in a hurry to get the returns as fast as possible". On a survey by ZINWA in Dzamabande Dam 7km South of Shurugwi Town established that approximately 22% of water samples tested in the dam contained mercury in concentrations risky to everyday users of the water.

4.2.2. Social Problems Caused by Gold Panners in Shurugwi District

4.2.2.0. Rural and Urban Household Properties

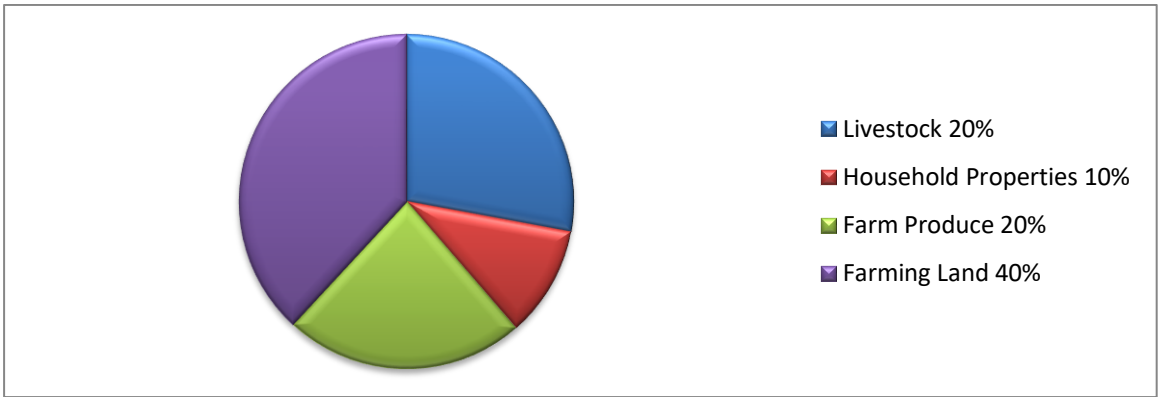
The graph shows that the communities lost much farming land and cattle to gold panners . Farming land has been converted to haphazard mines with pit hole dug all over the land thus farmers failing to produce their usual harvests. The research established that a lot of cattle have died in the pits dug by gold panners especially metal detectors who villagers expressed to be the biggest problems as they dig as close as their yards risking cattle that fall in and die.

Other problems comes from the use of mercury and cyanide by the panners in extracting gold. These chemicals are left uncovered and accumulate in small ponds of water where animals later drink and die instantly especially in the dry season when water will be scarce and stamp mills in at Nyamwiwa mine have running boreholes where water gets mixed with the cyanide and disposed to unprotected waterways that animals later drink from. Apart from cyanide and mercury small animals like goats and chickens are easily stolen by panners including un-harvested crops like maize and other crops in the fields.

However on the other hand gold panning posed a great deal of accumulating wealth on other communities as they are managing to send children to school buy more livestock and sustaining their livelihoods from mining or buying gold. Some of the business community are making a great deal of profits from heavy spending from gold panners. Interviewed where flea market operators on the Shurugwi town who said they come and buy all their high priced

clothes that at some moments when they see them approaching they rise their prices since they do not negotiate a lot.

Fig 4.4. Rural and Urban Community's Properties Lost



Source: Primary Data

4.2.2.1. HIV/ AIDs and Prostitution

The nurses at clinics both in rural and urban communities gave much details on the panners risks of having the highest number of infected individuals as all they have tested only five have come out negative out of 33. Panning sites have attracted the highest risk of commercial sex activities. Sexually transmitted diseases including HIV/AIDS spread among miners who take the virus to their homes. Socio-economic problems include variable incomes and unreliable contracts which produce economic uncertainty. Crime and violence are rampant as traditional authorities cannot control deviant behaviour among migrant miners.

Most growth points and beer halls in the district are home to young girls who have engaged in prostitution behaviors with some having travelled from as far as Kwekwe , Gweru and Zvishabane only to stay close to the unscrupulous spenders “Makorokoza” which has led to an increased HIV/ AIDs infections in the suburbs of Shurugwi town and rural homes, also most young primary and secondary level boys have in recent years of 2008 found no reason in going to school than chase alluvial gold in rivers for survival as they could not withstand drought times.

An investigation at one of the bars is Shurugwi established that young prostitutes are travelling from as far away as Gweru and Masvingo to work in areas such as Seminary, Boterekwa and The Village. Some panners from Cha-Cha-Cha in Zvishavane, said young

girls often lie about their age in order to attract clients where the majority of the girls look all grown up and if they lie about their age, it is easy to fall for them. Also gold buyers from Mambowa suburb, said the majority of the girls first come on the pretext of selling various wares but end up trading their bodies for as little as $1. Sometimes the prostitutes follow the panners to areas where they discover gold posing a great deal of HIV infections. Also villagers expressed concern on their children attending secondary and high schools that they risk being used the gold buyers who come with flashy cars and end up getting intimate with them.

4.2.2.3. Dangers among Gold Panners

Gold panning has brought a great deal of hatred in and around Shurugwi District as cases of panners wars to death happen regularly especially at shopping centres and bar clubs at night. In a case explained by one of the ZRP Shurugwi officers, a panner died when he was shot in the cheek with a revolver while four others were injured when two mining syndicates clashed over the control of a mine in Shurugwi. The interviewed police officer, said the incident occurred at Wandara Mine in Shurugwi december 2013. He said the two groups who were fighting for the control of the mine attacked each other with machetes and stones resulting in one of the groups retreating. The mining syndicate, which was already conducting mining operations, resumed their operations but the group which had been overpowered waylaid the rival group and attacked back. Some of the cases happen when panners stone each other for failure of sharing the returns.

From the observations and review of related literature, gold panning does not generate any environmental benefits besides resulting in health hazards created for people and animals. From the findings, almost 70% of the full time panners and their families did not have access to safe water as indicated before and the majority of the panners were not using toilets but the bush close to their campsite was an alternative for them. The lack of sanitation facilities in most campsites for their families means that the river itself is the ultimate source of human waste, with most of the families doing their laundry directly in the river. All these have some effect on downstream users who may be users of the stream for their drinking water, since this is typical in rural areas that people may fetch water directly from a flowing stream for their home consumption.

Also from an interview with gold panners other dangers they face are Police raids which end them up in jail for two or more years. Sometimes beatings and dog bites risk their operations but have no other source of money to turn to but remain a fugitive group. Also their mining techniques are dangerous in a way as they go dip under the surface without safety belts, also the walls are sometimes lose that they can fall at any time.

4.2.3. Regulations and Mitigation strategies Governing Gold Panning activities in Shurugwi District.

Below is Table 4.4 of the mitigation strategies that are in place, the regulations used, and certain structures are meant to implement them. The structures in place need to be resourced to efficiently carry out their duties. These structures must work hand in glove, the Forestry Commission, the EMA and ZINWA are housed in different ministries and thus their interests clash in most cases. The policies are fragmented and need to be reconciled to pursue a common goal.

From the findings most of the stakeholders castigated that the government and Shurugwi community therefore needs to come up with strategies that seek to reduce destruction of the ecological system. Such strategies as discussed below include policing, penalties, taxes, provision of mining licenses at affordable fees, equipment, training and environmental awareness campaigns and education to both informal and formal small scale gold miners.

Table 4.3 Mitigation Strategies in Shurugwi District

Mitigation Strategies	Regulations	Regulatory Authorities
Awareness campaign	Rural District Council conservation by Laws	Ministry of Mines, EMA, District Administrator, Forestry Commission
Council Rangers	Government and council policies	Town Council
Policing	Ministry of Mines Mineral Act.	EMA
Fines and taxing	Statutary Instruments	ZRP, EMA

Source: Primary data

The current legal framework that guides operations in the mining industry is not have not been synchronised but however bind the operations of gold panning. The following are some of the important acts that govern gold panning activities. (Secondary Data)

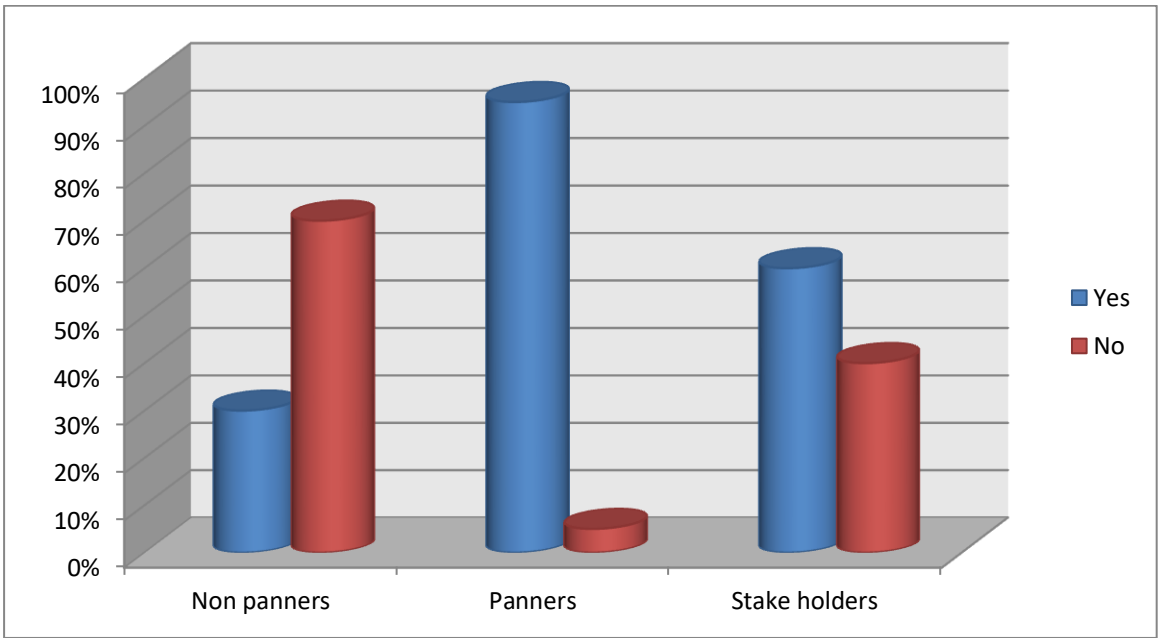
1. (National Water Policy 2013).
2. Zimbabwe National Water Authority, ZINWA Act of 2009
3. Environmental Management Agency(EMA)Act (Chapter 20:27)2002
4. Mines and minerals Act (Chapter 21:05)2013 edition
5. Rural District Councils Act Chapter 29:13)2013 edition

4.2.4. Should Gold panning be Legalised

Fig 4.5 below shows questionnaires and interview findings established that panners are in support of their operations termed legal as it is their only source of income and sometimes their profession. Also the legalisation of gold panning opens up jobs for the unemployed youth lessening unemployment in the country. The stakeholders are hoping gold panning be legalised as the panners would at least be free to implement all the environmental strategies rather than speedy operations in fear of being arrested.

Non panners (Communities) have not been in support of gold panning they are calling for the stopping of such activities as they have lost so much land, livestock and also family members from the activities. An official from the Ministry of mines had to say the legalization of panning activities will however mangae to centralise gold markets and curb gold lost on black market. The government under the Ministry of Indigenization and Youth Empowerment is however in surport of legalising gold panning under the indigenization policy that all locals should have equal access to resources available in their communities and however be free to exploit the benefits from the resources without damaging the environment.

Fig 4.5: Yes/ No Response for Legalization of Gold Panning



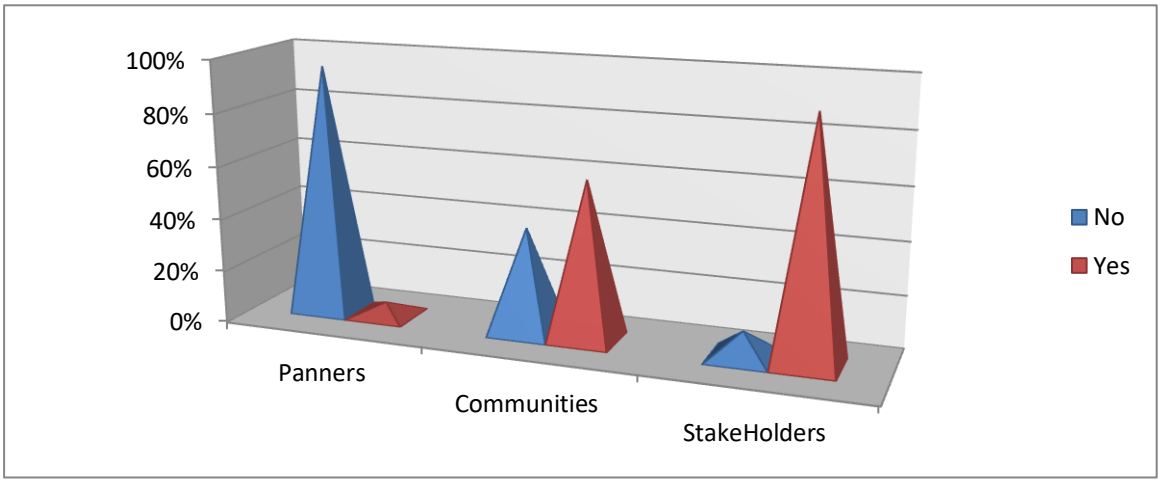
Source: Primary Data

4.2.5. Should Gold Panning be Stopped.

It emerged from both the questionnaires and interviews carried that the stopping of gold panning at the moment is not a viable solution since people are being forced into the activity mainly by lack of employment, drought and general poverty affecting the whole country. Fig 4.6 below establishes that the panners are on the forefront with 95% No response since they have no other mining full sources of money. Also in contrary the stake holders convey 90% on the support to block panning these include the ZRP, Clinics, EMA, Shurugwi Town council, DAs office.

However, based on observations 10% of the stakeholders are in support of gold panning as they own businesses that are being boosted by the spending of panners who are considered the cash barons of the district. Also the government under the Ministry of mines are on bid to improve the panning operations in a way of legalising their operations as the governments reserves are benefiting from the gold deposits thus boosting the countries economy. Gold mining seems to be the only meaningful income generating project in Shurugwi district.

Fig 4.6. Yes or No response on stopping of gold panning operations.



Source: Primary Data

4.3. Summary

The data analysis indicated that gold panning in Shurugwi district was a serious phenomenon likely to result in numerous effects that included social, economic, as well as environmental impacts in communities. The effects on communities were to occur from the hazards posed by gold panning if nothing was done to reduce their adverse impacts. However the target population has a 50- 50 response on stopping gold panning operations as they all benefit from the deposit.

CHAPTER 5: RECOMMENDATIONS AND CONCLUSIONS

5.0. Introduction

In this chapter conclusions and recommendations are drawn from the findings of the research from both primary and secondary data sources. The major aim of this project was to investigate the effects of the activities of gold panning in both rural and urban communities in greater view of environmental hazards caused.

5.2. Recommendations

5.2.0. Implementation of Policies

Currently in Zimbabwe there are no clear rules and regulations governing gold panning operations. First and foremost it is necessary to have a policy aimed at mainstreaming disaster risk reduction in all artisanal small scale gold mining activities. Therefore there is a need for a collaborative effort amongst key ministries and stakeholders concerned with land and natural resources to come together and come up with a policy that will guide prevention and mitigatory plans in artisanal gold mining activities.

In addition, that policy should be regulated and implemented through clear regulations and rules. These involve Ministry of Mines and Mining Development, Ministry of Tourism and Environment, Environmental Agency, Local government, Shurugwi District Council, Ministries of Agriculture, Water Resources, Health, Small and Medium Enterprises, ZNWA and Shurugwi Town Council. Such a policy should be drafted after consultation with all stakeholders to cater for their interest including the local community for everyone to have a buy in. Blackman (2003: 21) underscores the need to involve all stakeholders for any project to be sustainable. Such a policy needs to realise panners as the victims not as unruly elements so that they receive assistance due.

5.2.1. Raising awareness and environmental education

The research indicates that most gold panners are ignorant of long-term effects of their activities. Therefore there is need for extensive education to the local community about the

environmental dangers and their long-term effects and conscientising them of the need for health ecosystems. Panners need to be taught on the risks involved in chemicals they are using. To reduce unplanned destruction of natural resources panners need to be made aware that the environment is for future generation for them to mine with due care. This can be done or organised by the authorities from EMA, District Council, Police and many more stake holders.

5.2.2. Training

Mining is an activity that requires a skill for it to be carried out sustainably. Thus the Local government, Shurugwi District Council, Ministry of Mines and EMA need to take it upon themselves to organise training workshops for artisanal small scale miners in order to reduce associated disaster risks.

5.2.3. Licensing and Giving Permanent Claims to Panners at lower costs.

It is imperative to regularise and formalise all gold mining activities through licensing, giving permanent claims and operating permits to panners to recoup some of the added costs in the form of taxes. However the taxes and licences charged should be reduced so that most individuals will afford legal operations and all miners turn to small scale mining which easily remote controlled. That money will be channelled to community development in rehabilitating the lost infrastructure and land.

5.2.4. Mechanization

Through the Ministry of Small Scale and Medium Enterprises the government needs to offer help to panners in the form of loans, safety clothing and machinery to improve on their activities. Through the legalization of gold panning proper mining methods will be effected thus monitoring will be also easier and the distribution of necessary tools will be possible.

5.2.5. Distribution of Condoms and HIV/AIDs Programmes

They help in preventing the spread of the deadly disease and other sexually transmitted diseases as the panners fail to get condoms at panning sites where shops will be far away for the supply of condoms.

5.2.6. Land Rehabilitation

To reduce land degradation and ecosystems disruptions, panners have to backfill their excavations so that their bid to the legalization of gold panning will be effected. This will go a long way in protecting livestock from falling into pits and also human lives saved including the communities farming land. According to the requirements of the Forest Commission one has to plant two trees after cutting one tree. Thus panners need to be encouraged to practise such ethics if the environment is to be sustained. Taxes and fines paid under the Community Share Ownership Trust (CSOT) by offenders should be channelled into projects that seek to mitigate against community development in Shurugwi district.

5.3. Conclusion

The study made use of the sub problems, which provided some guidelines in the research process. Social damages resulting from gold panning, like spread of HIV, death of some panners, death of livestock, lost farming land, destruction of infrastructure like roads, dams, bridges. Environmental problems like siltation of rivers, deforestation, soil erosion, land degradation, water aquatic based food chains destruction, water pollution costs were outlined in the research.

Although mining plays an important role in the sustainable development and livelihood sustainability of rural communities in developing countries, The research set out to establish the major effects of gold panning in with the environmental damages caused by gold panning in Shurugwi district. The major justification for choosing the research topic was to expose the negative and damages caused by illegal gold panning activities in Shurugwi district. Also the study was undertaken to provide the mitigatory strategies in order to curtail the impacts of gold panning and the associated disasters at community level.

In light of the foregoing observation it is clear that gold panning in Shurugwi district poses a serious threat to the environment which in turn jeopardises human lives and their livelihoods if the problem remains unabated. The cascading effects of veldt fires, land degradation, and water pollution may appear insignificant to some populations, but are real and their cumulative effect needs to be mitigated to reduce their impact on Shurugwi district and the Zimbabwean community as a whole. It needs to be stated that such environmental elements

under threat as water, land, soil are non-renewable economic resources that man depend on for survival. Thus for man to continue enjoying these benefits sustainable means of exploitation are crucial.

The government and Shurugwi community therefore needs to come up with strategies that seek to reduce destruction of the ecological system from gold panning be it legalising gold panning or completely stopping gold panning operations without blocking their source of sustainability. Such strategies include policing, penalties, taxes, provision of mining licenses at affordable fees, equipment, training and environmental awareness campaigns and education to both informal and formal small scale gold miners.

REFERENCE

Amankwah, R. K., & Anim-Sackey, C. (2003). **Strategies for sustainable development of the small-scale gold and diamond mining industry of Ghana**. Resources Policy, 29(3-4), 131-138.

Bell,J.(1993), **Doing your research project**, Buckingham and Philadelphia, Open University Press. London:

Bogdan R . C and Biklen S.K (1982), **Qualitative Research for Education. An Introduction to theory and methods**, Boston Allyn Publications, London,

Czaja, R. And Blair. (1996) **Designing Surveys: A guide to decisions and procedures**, Thousand Oaks, London and and New Delhi, Pine Forge Press. publishers,

Dreschler, B. 2001. **Small scale mining and sustainable development within the SADC region***:* Mining Minerals and Sustainable Development. No. 84. England: SANTREN/ ITDG.

EMA (2009), **Zimbabwe environmental outlook book** 2. Ministry of Environment , Harare

Kamete, A. Y. 2007. **When livelihoods take a battering…Mapping the „New gold rush‟ in Zimbabwe‟s Agwa- Pote Basin**. Project MUSE scholarly journals /pg-13/ [2011, Jun. 06].

Kuter, U. & Tilmaz, C. 2001. **Survey methods: Questionnaires and Interviews**. [Online]. Retrieved from: http://www.umd.edu.html [2011, Sep. 07].

Legal Resources Foundation, 2003; Government of Zimbabwe,1989, 1990 and 1995.

Maponga, O. 1995. **Small scale mining and the Environment in Zimbabwe: The case of alluvial gold panning**. Harare: University of Zimbabwe.

Milne G.R and Marongwe D, (1993), **Small scale gold mining in Zimbabwe, Economic Cost and benefit and policy recommendations,** Jongwe Printers Harare Zimbabwe.

Ministry of Environment and Natural Resources Management. 2009. **National environmental policy and strategies**. Harare: Government Printers Zimbabwe.

Ministry of Environment and Natural Resources Management. 2010. **Zimbabwe' Fourth National report to the convention on biological diversity**. Harare: Government Printers

Munn, P. And Drever, E. (1990), **Using Questionnaires in small Scale Research: A teacher's Guide**, Edinburgh: The Scottish Council for Reseach in Education.

McHugh, J.B. (1988). **"Concentration of gold in natural waters".** Journal of Geochemical Exploration 30 (1–3): 85–94.

Mpendazoe, F. M. T. 1996. **Towards sustainable small scale gold mining in Tanzania**. Proceedings of the First World Mining Environment Congress. Balkema, Rotterdam.

Panners Manual, (2006). **The small scale gold mining in Zimbabwe,** GTZ, in association with school of mines. Zimbabwe.

Sarason, S.B. 1974. **The psychological sense of community: Prospects for a community psychology**. San Francisco: Jossey-Bass.

Shoko, Dennis S. M. "**Small-scale mining and alluvial gold panning within the Zambezi Basin**".ParqueNacionaldaGorongosa.http://files.gorongosa.net/filestore/366-shokod290502.pdf. Accessed April 4, 2014.

Sunga D and Marinda E, (1998), **Economic and Sustainability of gold mining in Shurugwi district**, Jongwe Printers Zimbabwe.

Strauss, A and Cobin, J (1990) **Basics of qualitative research: grounded theory procedures and techniques**, Newbury C A Sage publications, London.

Svotwa, R. & Mtetwa, C. 1997. **The environmental impacts of small scale mining in Zimbabwe**. (Proceedings of the 1997 Conference of Mining, Minerals and sustainable Development held at Harare in August 1997). ITDG.

T.Marimbe, Newsdayzimbabwe, 20 May 2012: Article: Mining Industry Shrinks.

Whitlow, R. J. (1990). "**Mining and its Environmental Impacts in Zimbabwe"**. Geographical Journal of Zimbabwe. 21, pp 50-80.

WEB SOURCES

David Chidende, http:www.swradioafrica/panningshurugwi/turnsugly/, Accessed Tuesday 01 April 2014).

(http://www.scribd.com/doc/6923070/Research-design visited on 06/04/2014).

http://www.answers.com/topic/data-analyses visited on 11/04/2014).

http://www.sadc-usa.net/reference/protocol/h20prot.html.accessed 01/03/2014

http://www.swnehandaradio.org/shurugwi/miners/proti.accessed 04/03/2014

http//www.wcpt.org/disaster-management. Accessed 25/02/14

http//www.dictionary.refrence.com/disaster. Accessed 20/ 02/ 14

"**Gold Mining in Zimbabwe** - Overview". M. Bendi Information Services. March 24, 2010. http://www.mbendi.com/indy/ming/gold/af/zi/p0005.htm/Accessed march 22, 2014.

Simpson, John. "**The Shamva Mining Centre, Zimbabwe**". Technology for Sustainable Livelihoods. April 1, 2010. http://practicalaction.org/t4sl/casestudy_mining.Accessed February 27, 2014.

Zimbabwe Mining. Encyclopedia of the Nations. April 2, 2010. http://www.nationsencyclopedia.com/Africa/Zimbabwe-MINING.htmlAccessed march 22, 2014.

Taylor, S. 1998, **Research network on socioeconomic status and health**. [Online] Retrieved from: http://www.macses,ucsf.edu [2011, May 19].

Appendix A: Gold Panners Questionnaire

MIDLANDS STATE UNIVERSITY

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Gweru
Zimbabwe

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Fax: (263) 54 260233/260311

FACULTY OF ARTS

DEPARTMENT OF DEVELOPMENT STUDIES

Date..../..../ 2014

To Whom It May Concern

Dear Sir/Madam

Introduction

My name is Simbarashe Mangwende and I am a final year student at Midlands State University studying towards a Bachelor of Arts in Development Studies Honors Degree. I am carrying out **A RESEARCH ON THE EFFECTS OF GOLD PANNING ON COMMUNITIES A CASE STUDY OF SHURUGWI DISTRICT.** I kindly ask for your participation in providing your views through completing the attached questionnaire. All information provided herein shall be strictly confidential and will only be used for academic purposes. Your contribution will help in the completion of this research.

No names or information about any individual will be published. Should you require to get more details about the researcher, you are free to contact my research supervisor Mr Pondiwa, 0773 427 652 (Director Central Records Midlands State University).

Your co-operation will be kindly appreciated.

(NB) Tick ☐ or Fill in Where Applicable.

(I) Demographic Information

1) Sex

a) Male ☐ b) Female ☐

2) Age Group

a) Below 18 years ☐ b)19- 30 years ☐ c) 31- 49 years ☐

c) 50 + years ☐

3) Highest Level of Education

a) No schooling ☐ b) Primary level ☐ c) Secondary level ☐

d) Tertiary level ☐

4) Where is your permanent residence or home?_____

5) What other sources of income do you have as household head?

a) Earnings (e.g from Agriculture) ☐ b) Salary ☐ c) Social grant ☐

d) Pension ☐ e) Remittance from relatives ☐ f) Other ☐

If other specify_____

(II) Research Questions

6) How long have you been in gold mining?

a) 1- 5 Years ☐ b) 6- 10 Years ☐ c) 11- 20 Years ☐ d) 21+ Years ☐

7) What prompted you into this activity?

a) Lack of employment ☐ b) Severe Drought ☐ c) Income ☐

d) Other ☐

8) How often do you engage in gold panning operations?

a) Fulltime ☐ b) Part Time ☐ c) Occasionally ☐ d) Seasonally ☐

e) Other ☐

If other specify,_____

9) Have you received any training for gold mining?

a) No ☐ b) Yes ☐

10) Do you have mining licences for your operations?

a) No ☐ b) Yes ☐

If no specify why,_____

_____

_____

11) How have you benefited from gold panning?_____

_____

_____

12) What is your relationship with the authorities who deny you from gold panning? (e.g Police)_____

_____

_____

13) How have you protected the environment from your operations?

_____

_____

_____

14) Should gold panning activities be Legalised?

a) Yes ☐ b) No ☐ c) Maybe ☐

If yes, explain:_____

_____

_____

15) Are communities you operate in happy with your operations?

a) No ☐ b) Yes ☐

If no, specify_____

_____

_____

16) Are you aware of any regulations and policies governing your activities?

a) Yes ☐ b) No ☐

17) Have you used any of the policies in your activities?

a) Yes ☐ b) No ☐

If no, specify_____

_____

_____

_____

18) Are you also involved in the making of these policies with the authorities?

a) Yes ☐ b) No ☐

If no, what should be done,_____

_____

_____

Thank you for your cooperation.

Signature;.....

Appendix B: Gold Panners Interview Guide

1. What led you into gold panning in Shurugwi District?
2. Do you have licences to mine?
3. Do you wish to stop panning in any of the coming days?
4. How do you spend your gains from panning?
5. After mining what environmental precautions do you follow, so as to preserve the natural state of the forests?
6. Can you explain the whole processes you follow until you extract the gold to the market?
7. Are you happy with the life of gold panning?
8. Should gold panning activities be legalised or not?
9. Are you aware of the legislations governing your operations?
10. Do you have any limits or boundaries towards citing your mines?
11. Have you ever been arrested for such activities?
12. What are the dangers of gold panning?
13. What are your plans when gold panning has been stopped?

Appendix C: Stake Holders Questionnaire

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FACULTY OF ARTS

DEPARTMENT OF DEVELOPMENT STUDIES

Date..../..../2014

Dear Sir/Madam

Introduction

My name is Simbarashe Mangwende and I am a final year student at Midlands State University studying towards a Bachelor of Arts in Development Studies Honors Degree. I am carrying out **A RESEARCH ON THE EFFECTS OF GOLD PANNING ON COMMUNITIES A CASE STUDY OF SHURUGWI DISTRICT.** I kindly ask for your participation in providing your views through completing the attached questionnaire. All information provided herein shall be strictly confidential and will only be used for academic purposes. Your contribution will help in the completion of this research.

No names or information about any individual will be published. Should you require to get more details about the researcher, you are free to contact my research supervisor Mr Pondiwa, 0773 427 652 (Director Central Records Midlands State University).

Your co-operation will be kindly appreciated.

(NB) Tick ☐ or Fill in Where Applicable.

(I) Demographic Information

1) Sex

a) Male ☐ b) Female ☐

2) Age Group

a) 18- 25 years ☐ b) 25- 50 years ☐ c) 50 + years ☐

3) Highest Level of Education

a) No schooling ☐ b) Primary level ☐ c) Secondary level ☐

d) Tertiary level ☐

4) What is your position in the organization?_____

5) How long have you been employed at this organization?_____

(II) Research Questions

6) How long have you been dealing with gold panning issues_____

5) Are you aware of Gold panning taking place in this District.

a) No ☐ b) Yes ☐

7) Do you think gold panning has positive impacts on communities?

a) No ☐ b) Yes ☐ c) Maybe ☐

If yes explain,_____

_____

_____

8) Are you aware of the environmental or infrastructural damages caused by the activities of Gold panning?

a) Yes ☐ b) No ☐

If yes, name them_____

_____

_____

4) How can the environmental problems mentioned in (8) be protected from gold panning activities?

_____

_____

_____

5) Should gold panning activities be Legalised?

a) Yes ☐ b) No ☐ c) Maybe ☐

If yes, explain:_____

_____

_____

5) Are you aware of the Social problems caused by Gold panners in Shurugwi District?

a) No ☐ b) Yes ☐

If yes, name them_____

_____

6) If your answer is Yes to the above question, how best can they be addressed?

_____

_____

_____

7) As the Authorities what have you done to mitigate or made awareness for the dangers of gold panning?

_____

_____

_____

8) Do you think it is important for panners to possess knowledge on environmental management and skills on their operations?

a) No ☐ b) Yes ☐

If yes what have you done so far in educating them?_____

_____

_____

9) Are there any regulations and policies governing gold panning activities?

a) Yes ☐ b) No ☐ c) N/A ☐

10) Are gold panners involved in any way on formulating these policies?

a) Yes ☐ b) No ☐ c) N/A ☐

If yes, specify_____

_____

9) What do you think the government can do to enhance gold panning operations?

_____

_____

_____

10) Can you name five (5) of the areas in the district that are infested with gold panning activities?

Area	Less Damage	High Damage
a)		
b)		
c)		
d)		
e)		

11) How many registered mines are there in Shurugwi district?

_____

Thank you for your cooperation.

Organization:.....

Signature:.....

Appendix D: Stake Holders Interview Guide

1. How many registered Gold mines are there in Shurugwi District?
2. Does all gold panners have licences to mine?
3. Are non- panners living in the areas manifested with panning activities happy with their operations?
4. How have you improved the policies and regulations of gold panners?
5. Are there any stakeholder meetings or workshops done regularly to mitigate socio impacts of gold panning?
6. Should gold panning activities be legalised or not?
7. Are gold panners aware of the legislations governing their operations?
8. Have you done any awareness campaigns on educating panners how best they can improve their mining activities and also behaviour in society?
9. How has gold panning destroyed infrastructure in both rural and urban communities?

Appendix E: Non-Panners Interview Guide.

1. How long have you been living in this community?
2. What made you not to engage in gold panning?
3. Are you not in any way benefiting from gold panning?
4. Should gold panning be stopped?
5. What is your relationship with gold panners like?
6. Do you have family members who are also gold panners?
7. Do you have any property destroyed by gold panners?
8. What do you wish the government could do for you in terms of gold panning in your community?
9. Any political instabilities caused by gold panning in your community?