Socio-economic and environmental Impacts of gold mining

with examples from Penhalonga

Manicaland Province Zimbabwe

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ACRONYMS AND ABBREVIATIONS

ASM	Artisanal and Small-scale Mining;
AVA	Acidification-volatilisation Absorption;
BSAC	British South Africa Company;
BSAP	British South Africa Police;
CAMPFIRE	Communal Areas Management Programme for Indigenous Resources;
CRD	Centre for Research and Development;
CSR	Corporate Social Responsibility;
DAB	District Advisory Board;
DTZ	Development Trust of Zimbabwe;
DTZ	Development Trust of Zimbabwe;
ECA	Economic Commission for Africa;
EIA	Environmental Impact Assessment;
EIR	Extractive Industries Review;
ELAW	Environmental Law Alliance Worldwide;
EMA	Environmental Management Agency;
EPO	Exclusive Prospecting Order;
ESAP	Economic Structural Adjustment Programme;
GMI	Global Mining Initiative;
ICME	International Council of Metals and the Environment;
IIED	International Institute for Environment and Development;
IMR	Institute of Mining Research;
MAB	Mining Affairs Board;
MMCZ	Mineral Marketing Corporation of Zimbabwe;
MMSD	Minerals, Mining and Sustainable Development;
MRDC	Mutasa Rural District Council;
NANGO	National Association of Non-governmental Organisations;
OZGEO	All Russian Economic Association on Geological Prospecting;
UDI	Unilateral Declaration of Independence;
UN	United Nations;
UNEP	United Nations Environment Programme;
UNIDO	United Nations Industrial Development Organisation;
USA	United States of America;
UZ	University of Zimbabwe;
VIDCO	Village Development Committee;
WADCO	Ward Development Committee;
WB	World Bank;
WBCSD	World Business Council on Sustainable Development;
WHO	World Health Organisation;
ZINWA	Zimbabwe National Water Authority;

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PREFACE

Throughout history gold production has played an important role in the political economic development of many nations. In Zimbabwe gold mining was the reason why the country was colonised to begin with and it played an important role in political developments in the country. However social analysts doubt whether gold production has played any significant role in the socio-economic development of the local people. Large-scale gold production has been and it remains in the hands of foreign interests with the local people involved in inefficient and unproductive artisanal and small-scale production.

The current project that is looking at the socio-economic and environmental impacts was premised on the observation that, despite the visible wanton destruction of the environment caused by gold mining, local communities are not benefiting from the activity. The large-scale companies unfortunately do not have corporate social responsibility for communities in which they are mining the gold. They are not obliged to assist in the development of the societies in any way. The government on its part seem not to have taken the issue of National Sovereignty over Natural Resources seriously by adhering to the archaic piece of legislation that control mining in Zimbabwe, the Mines and Minerals Act 21:05. Despite the much talked about need for black empowerment, very few blacks are involved in the lucrative gold mining industry.

Penhalonga is a good example of demonstrating the interaction between gold mining, local communities and the environment. All forms of mining, artisanal and small-scale, large-scale alluvial and large-scale underground mining are all represented. Each form of mining has its own social and environmental impacts but focus was large-scale mining because of the presence of foreign interests and the magnitude of the impacts. The aim was to establish the extent of benefit sharing and the reasons for that situation and to explore understanding amongst community members of the issues of environmental degradation.

The project should be seen as exploratory, that sought to establish the need for in depth investigation of certain issues. It is hoped that the information given in this project will be useful as a guide to mining policy reform that promotes benefit sharing with local communities

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It was an arduous process to collect the field information that is presented here. Until one gets exposed to real situations, one would not be aware of what is on the ground in terms of people's lives. It was difficult to understand that a large number of people in the Penhalonga/Tsvingwe area living in constant fear, which makes it difficult for them to trust anyone especially those they do not know, but who are asking questions about their way of life. If the following had not helped, it would have been impossible to get adequate information from people: Ms Margaret Makina, Mr. Musiwenyama, Ms Mugombe and Ms Randinyu. There are others who assisted in so many ways but who have not mentioned by name. It is not that your assistance was not important. It was very important and thanks you all.

We would also like to thank staff members at Mutasa Rural District Council who were eager to give the necessary information and also who supported the project. In particular we would like to thank the Penhalonga-Tsvingwe sub-offices for generously giving support to the project.

Our sincere thanks go to all those who were willing to be subjected to several minutes of "interrogation" on the issues the survey was trying to address. Should anyone feel that they were harassed, please apologises.

For such an intense project to be successful there is need for support from many people but there is no support that is needed most than support from family members. Family members, who endured the disturbances caused by the project, thank you very much.

Last but not least, we would like to thank the Centre for Research and Development for providing the necessary funding and logistical support for the execution of the project. There were times when things were so difficult that one felt like downing tools. This did not happen, we all persevered.

EXECUTIVE SUMMARY

Gold production, similar to the mining of previous minerals such as diamonds or platinum, can be a lead factor in rural development and poverty reduction more so in communities residing in areas where there is gold mining. For this to happen, there is need for gold producing companies to apply the doctrines of social responsibility and Permanent Sovereignty over Natural Resources in communities in which they are mining the gold. The aim of this project was to establish the extent to which companies were sharing benefits with the local communities with the objective of developing advocacy tools to influence policies to those that favour the development of local communities using resources found in their locality. Penhalonga was used as an example in order to authenticate claims.

A review of the legal framework governing gold mining in Zimbabwe revealed that the Mines and Minerals Act 22:05 of 1961 can be the main problem for companies failing to apply the doctrines of social responsibility and Permanent Sovereignty over Natural Resources. The Act was promulgated in order to protect the minority gold mining interests. The Act, although applauded in some cases, has been criticised for favouring big investor who are invariably foreigners at the expense of the local entrepreneur let alone the local community members. These are discriminated against on financial grounds. Few if any local people are familiar with the provisions of the Act. In addition to failing to provide for issues related to social responsibility and Permanent Sovereignty over Natural Resources, the Act does not adequately provide for the protection of the environment.

If one traced the history of gold production in Zimbabwe, one would find that it was dominated during the colonial era by the white minority as small-scale producers and large-scale producers who were foreigners. During the Unilateral Declaration of Independence (UDI), not only were the indigenous people not allowed to participate in gold mining, but they were not supposed to even possess some. There is silence on production quantities during UDI, since gold was used to sustain the economic as the country was under sanctions. Revealing production and export quantities meant revealing companies that were busting sanctions. As far as the relationship with local communities is concerned, mine companies had no social obligations to these communities and the communities lived contently nearby without interfering with mining operations.

The secrecy that shrouded gold mining during UDI made it difficult for anyone who was not involved in the production of gold to know what was happening in the mines. For this there is no information on revenue. Nothing has been written about the impacts of gold mining on the environment.

One would have hoped with the coming of Independence the situation was going to change to allow more indigenous people to participate in gold production. The literature shows that gold mining remained in the hands of foreigners although there was a changeover from overseas multi-national companies to regional and continent investors. Issues of social responsibility and PSNR were not a priority to the government. Civil society has however been trying to bring these issues to the discussion table with the hope that local communities will eventually benefit from resources in their area. That there is need to consider social responsibility and PSNR issues when talking about gold production is clearly demonstrated by what is happening at Penhalonga.

The Penhalonga area is unique in that it has all types of gold mining from gold panning, small-scale, large-scale shaft, and large-scale alluvial gold mining. Gold mining at Penhalonga dates back to the early days of colonialism and was dominated by the Penhalonga and Rezende Mines. These are deep shaft mines. Recently however there has been a new comer DTZ-OZGEO. The company which is doing open cast mining is a joint venture between a Russian company and a Zimbabwean company, the Development Trust of Zimbabwe based in Bulawayo. Using mainly qualitative methods of data collection and through field observation, the study revealed that little has changed as far as the relationship between the local communities and the gold producers is concerned. Community members claimed that they were not benefiting in any way from the establishment of DTZ-OZGEO, which instead has created a number of problems. The first issue was that the company was causing extensive environmental degradation but no one was doing anything about it, pointing out the disturbance of the river flow, destruction of vegetation and the habitat of wild animals and dust pollution. Members of the community pointed out that perhaps the biggest impact was the loss of source of livelihood since a large number of households were surviving on gold panning in the Mutare River. A third area of concern was the increased prostitution and domestic violence since the establishment of the mines.

Lack of consideration about local communities is seen in the fact that the Zimbabwe partner is not from Mutasa Rural District, if the operations were going to benefit the locals but from Bulawayo. One criticism on the policy of black empowerment and indigenisation is that it means transferring wealth to a few who are well positioned politically. Members of the community in Penhalonga are of the opinion that DTZ-OZGEO is more of a political venture than a business enterprise.

The alluvial mining by DTZ-OZGEO has completely destroyed the local ecosystem of the Mutare River and has potential to affect the local hydrology. Small-scale miners have also contributed towards this in no small measure with hill slopes traversed by deep trenches that cause tremendous erosion into Mutare River. In addition the water contamination by the acid drain from the mine dumps at Redwing Mine should also be considered. Members of the community did not consider degradation by small-scale miners and gold panners as environmental degradation because it was done in pursuit of livelihood and that at Redwing because the mining has not affected them.

Despite all issues that were raised including the environmental issues, it seems however that the main issue is finding out how local communities can have an equitable share of participation in the gold mining industry whilst taking care of their environment. It seems one of the stumbling blocks to social responsibility and the application of the doctrine of PSNR is the Mines and Minerals Act which should be either drastically amended or should be replaced by a new one that takes into account the concerns of the local communities.

1. INTRODUCTION

1.1 Background

The study on environmental and socio-economic impacts of gold mining, with example from Penhalonga was premised on the need to establish the relationship between gold producers especially the large-scale producers and the local communities. The aim was to establish the extent to which the local communities were also beneficiaries of the income being generated from a resource that is found in the locality. Since the early 1950s there have been debates on the doctrine of Permanent Sovereignty over Natural Resources. The doctrine specifies that people living in a certain area have the sole right to decide on how a resource that is found in their area should be used. It is hoped that through this doctrine local communities would become beneficiaries of the mineral resources that are found in the area that they live.

The study intended to establish, not only the socio-economic impacts of gold mining drawing examples from Penhalonga, but also the environmental impacts of gold mining. It is known that all forms of mining have an impact on the environment, but the extent of the impact varies from one type of mining to another. Penhalonga makes a good example to examine these impacts since it contains all types of mining from panning in the Mutare River, small-scale mining, large-scale alluvial mining and underground mining.

Environmental and socio-economic impacts have been extensively commented on in the literature. Most comments has however not been on gold mining in Zimbabwe. In Zimbabwe very little has been written on large-scale miners' social responsibility. Very little has also been said about the environmental impacts of large-scale mining. Most criticism on the deleterious effects of gold mining on the environment has been on small-scale miners and gold panners (Jerie and Sibanda, 2010; Maponga and Ngorima, 2003; and Mungoni, 2008).

The study topic has included two areas of study, which are, on their own considerable research areas. There was a need to form a multi-disciplinary team to look at specialist areas of the research topic, the social aspect, the economic aspect and the environmental aspect. The scope of the study was revised so that the available resources would be adequate to complete a rapid appraisal of the environmental and socio-economic impacts of gold mining. The rapid appraisal involved Focus Group Discussions with local community members, members of Makoni Rural District Council and the miners, both small- and large-scale. The study was intended to provide an overview of gold mining and how it relates to local community development rather than an exhaustive statistical analysis of the relations.

The piece of legislation governing gold mining in Zimbabwe is viewed as the best in Southern Africa and many countries have adopted it. The study intended to establish the adequacy or inadequacy of the Mines and Minerals Act Chapter 21:05 of 1961 to address issues of gold producers assisting in local level socio-economic development and environmental protection. In fact, any analysis of the relationship between the gold producers and the local communities in terms of income sharing should start with the legal framework governing the production of the gold and the extent to which the legal framework acknowledges the doctrine of Permanent Sovereignty over Natural Resources.

Finally, in many cases civil society organisations have been accused for making a lot of noise on issues that did not have substantial backing, weakening their case although the conceptual framework of the issue would have been correct. It is hoped that a study such as this one will inform and provide information for civil society organisations fighting for community

empowerment to carry out advocacy work from an informed point of view. The Centre for Research and Development, with sponsorship from Norwegian People's Aid decided to establish what is on the ground in relation to community benefits from gold producers in various communities in the country. It was therefore hoped that the study would cover an exploration of the global trends in terms of resource ownership and environmental degradation, the historical context of gold mining in Zimbabwe, the legal framework and then examine how Penhalonga gold producers are related to the local communities.

1.2 Aim and Objectives

The long-term objective of the study was to develop advocacy tools based on authenticated information that can be used to influence policy makers to establish policies that support the doctrines of social responsibility and Permanent Sovereignty over Natural Resources. This would enable local communities to decide how they should use the gold resources in their area for their own development. The specific objectives of the study were as follows:

1. To review the global situation in relation to gold mining and socio-economic and environmental impacts
2. To trace the history of gold mining in Zimbabwe in order to establish the historical trend of social responsibility and environmental protection
3. To give a critique of the Mines and Minerals Act Chapter 22:05 to establish its support of social responsibility and environmental protection in Zimbabwe
4. To establish the perception of members of the local community in Penhalonga on the issue of social responsibility and environmental degradation that is caused by gold production
5. To come up with recommendations based on integration of international, national and local views on socio-economic and environmental impacts of gold mining with special reference to the situation in Penhalonga.

1.3 Justification

The study can be justified on several grounds. Zimbabwe was under colonial rule for almost a century during which time the indigenous people were marginalised in all spheres of economic development apart from providing labour. During this time, the indigenous people were not allowed to be involved in mineral extraction of any sort. They were not supposed to have any knowledge of gold production. Because of this, they did not benefit from gold production except indirectly through employment.

Since Independence, there has been a lot of talk about indigenisation of the economy and to establish projects that will develop rural communities. It would be interesting to find out if there has been any change in control and ownership of gold. If there has been such a change, to what extent are the local communities benefiting from the mineral resources found in their area. The existing literature seem to suggest that there was no difference between the way gold miners were given special treatment, and the way they are treated now.

Saunders (2008) pointed out that the only new development in the gold production industry in Zimbabwe after Independence was the replacement of overseas multi-national corporations by regional and continental tycoons. The extent to which this regional take over integrated local community's developmental needs has still to be established. Hawkins (2009) has commented on the issue of licenses to small-scale gold miners in an effort indigenise the gold mining industry.

There is need to find out how the small-scale miners relate to local level community development.

The study can also be justified from the point of view of providing authenticated advocacy information to change the current pieces of legislation that control gold mining and gold trading. Although the Mines and Minerals Act 22:05 of 1961 and its subsequent amendments, including the 1965 amendment has been applauded as the best piece of legislation in southern Africa, which other countries have adopted but it is also said to have weaknesses. The Act has been criticised for favouring foreign investors with a lot of money to invest in mining at the expense of the local communities who do not have enough money that can be invested. The study can assist in the formulation of a new piece of legislation that takes into account local level development needs.

Because of the historical development of gold mining in Zimbabwe, little or nothing has been done to ensure equitable sharing of profits with local communities. People are therefore generally not aware of their rights to natural resources in their locality according to the doctrine of Permanent Sovereignty over Natural Resources. The study can be justified on the grounds that it will inform the public about the need for gold producers to play an active role in the development of the areas in which mining is taking place bearing in mind that the local people are the custodians of the resource.

Apparently literature has been silent on environmental impacts of large-scale gold production and oversubscribed on the impacts of small-scale miners and gold panning in Zimbabwe. It is shown in many parts of the world that any form of gold production including large-scale production causes environmental degradation (McBain-Haas and Bickel, 2005). The study is therefore justified on the grounds that the exact nature of environmental impact of gold mining will be exposed. This might influence the Environmental Management Agency (EMA) to lobby for strong legislation on environmental protection.

1.4 Methodology

Initially it had been decided that standard rural survey techniques of a mix of questionnaire survey and face-to-face interviews would be used to gather both quantitative and qualitative information on the relationship between the gold producers and the local communities. A questionnaire was developed to be administered to members of the community living in the Penhalonga area soliciting information on the following issues:

- The extent to which the local communities were benefiting from the gold producers
- Whether or not the gold producers had initiated together with the community and implemented any development project
- Social effects of gold production in the area
- Views on environmental damage
- Personal opinion on expected or desired relationship between the gold producers and the communities.

Face-to-face interviews were supposed to be held with Mutasa Rural District (MRDC) to get information on the relationship between the District Council and the gold producers. There was also need to establish the Council's stance on the doctrine of Permanent Sovereignty and the issue of environmental degradation. Face-to-face interviews were also going to the held with the gold producers including the small-scale producers and the gold panners focusing on the gold

production, methods and quantities produced and their roles in local level development, the issue of environmental degradation and land rehabilitation after the gold gets exhausted.

The questionnaire survey and the face-to-face interviews were going to be supplemented with extensive field inspections to establish the extent of environmental damage and any rehabilitation works that might be taking place. Initially it had been decided that water samples would be collected upstream and downstream of the mines for laboratory tests in order to establish the degree of contamination.

Unfortunately not all these activities succeeded. Face-to face successful interviews were held with MRDC, small-scale miners and gold panners. Attempts to interview the management of the large-scale mining companies met with resistance. At DTZ-OZGEO only one person was said to be qualified to respond to questions related to gold production and unfortunately he was reported to be out of the office at every attempt to arrange a meeting to interview him. At Redwing interviews failed because of the appointment of a new manager who had hardly settled in and the transference of senior personnel to Arcturus Mine in Mashonaland East.

Attempts to carry out a questionnaire survey did not succeed right from the beginning with respondents accusing enumerators of trying to have them evicted from either Tsvingwe or Penhalonga Townships.Thus members of the community refused to give individual answers for fear of victimisation but were comfortable to talk about the issues that had been raised in the questionnaire when in a group. Interesting that, even on a face-to-face basis, members of the community could respond to issues but they did not want the information written on the questionnaire. It was for this reason that the researchers decided to change the methodology, from using questionnaires to holding interviews with groups of people rather than individuals.

With the assistance of some members of the community people would be invited to join in discussions about the socio-economic relationship between the gold producers and the communities. In old Tsvingwe discussions were held with at least four groups of community members and the group of teachers being a separate group on its own; in new Tsvingwe discussions were held with two groups only after finding out that most residents of this section of Tsvingwe are new comers, some having been barely a year in the area. In Old West, only one group was interviewed since the residents are also new, some coming from Mutare and others being workers of DTZ-OZGEO. In Penhalonga one group was also interviewed having established the general similarity of answers with the other groups.

The number of people who were involved in the group discussion varied from discussion to discussion. Some groups were composed of around five or so people only, as was the case in the new section of Tsvingwe and Old West but some involved as many as ten or twelve people as in some groups in the old section of Tsvingwe. It later emerged that there was greater interest in the study here because the area has the largest number of small-scale miners and gold panners and this is the reason why they live in consistent fear of being evicted or arrested.

1.5 Literature Review

1.5.1 Environmental Impact of Gold Mining: An Overview

Environmental impact of gold mining has drawn more attention in the literature than any other aspect of gold mining locally, regionally and internationally. It is agreed that all types of mining, from alluvial mining to open-pit mining through to underground mining all have deleterious

effects on the environment. Commentaries on the environmental impact of gold mining can be grouped into the following:

- Those that have given general environmental impacts of gold mining
- Studies that have presented case studies and specific environmental impacts
- Those that view environmental impacts of gold mining from a human rights issue point of view
- Commentators providing remedial action.

Both formal and informal small-scale mining have received a lot of attention in the literature for two reasons: (i) for its role in poverty alleviation and (ii) because of the alleged negative environmental impacts. The Centre for Development Studies, University of Wales, Swansea (2004) commented on artisanal and small-scale mining (ASM) world-wide observing that although Asia has the highest number of people involved in ASM, it is Latin America that has drawn most attention in the literature despite having fewer people engaged in ASM. It was also observed that various studies have taken different approaches in studying ASM. For example, a large number of studies have taken a holistic approach that includes the sustainable livelihoods approach (Gilman, 1999; Labonne and Gilman, 1999); others have concentrated on specific aspects of the ASM industry, for example, the environmental consequences of ASM (Straaten, 2000)

The Centre for Development Studies however pointed out that there is a paucity of in-depth studies of ASM communities such as micro-level socio-economic studies, studies that seek to profile the needs of people living within ASM communities or those that consider artisanal mining from the perspectives of those who identify themselves as miners and live within these mining communities.

Focus has been on ASM in Third World countries since this is where activity takes place The availability of literature however does not reflect the magnitude of the activity in any region. As pointed out by Kramcha (2004:4) that geographically the highest number of people involved in ASM are found in Asia but there is little coverage of their activities in the literature. Latin America however which has a smaller number of people engaged in ASM than Asia has received a lot of attention in the literature. Whichever the case however, the commentary on the environmental effects of large scale mining in Third World countries has received disproportionately low attention as compared to the attention on ASM. In fact very little has been written on the environmental impacts of large-scale miners. Both academics and environmentalists in most Third World countries have remained silent on how large-scale miners degrade the environmental.

Among others, those who have given general information on the environmental impacts of gold mining against which one can evaluate the performance of a certain mining project include the Environmental Law Alliance Worldwide (ELAW) (2010). The Alliance has pointed out that all phases of gold mining from development, through site preparation, extraction and beneficiation have an impact on the environment. The ultimate environmental impacts however differ considerably depending on the method of extraction and beneficiation. Methods of extraction include open-pit mining which is regarded as the most destructive type of extraction requiring removal of all vegetation and complete destruction of the local habitat and local hydrologic system. The second type of extraction is placer mining which is normally related with the release of gold from stream sediments and floodplains and therefore it is associated with destruction of

riverine ecosystems. Underground mining does not involve massive removal of the over-burden and therefore this is considered a less destructive method of extraction, creating a network of tunnels underground only. The final method of extraction that was mentioned is reworking of inactive or abandoned mine dumps and tailings as a result of the introduction of better beneficiation methods, which determine the nature of the environmental impact. Different beneficiation methods, whether physical or chemical have different environmental impact. In the final analysis however, the general environmental impacts of gold mining that one can expect at any mining site are as follows:

1. Water pollution pointing out that the most significant impact of any mining project is its effects on water quality and availability
2. Atmospheric pollution including particulate matter and gas emissions (noise and vibrations were included as part of atmospheric pollution)
3. Impact on wildlife including habitat loss and fragmentation
4. Impact on soil quality.

The European Bank for Reconstruction and Development (2010) commented exclusively on the impact on the environment of open cast mining, and health and safety issues that should always be considered in the development of open cast mining. The Bank agrees to a large extent with ELAW (2010) on the significant environmental aspects affected by open cast gold mining. The following are some of the impacts that are emphasised:

1. ***Degradation of water resources:*** this occurs due to the following (i) drawdown of groundwater levels leading to drying up of wells, (ii) diversion or damming of surface water courses, (iii) contamination of water by uncontrolled site discharges, (iv) contamination during gold processing, (v) generation of wastes – top soil and overburden and hazardous wastes from gold processing
2. ***Land use and biodiversity:*** affected by excavation of area, dumping of waste materials on land away from the site of interest and infrastructure development
3. ***Dust:*** generated by blasting, excavation, moving equipment, traffic on unsealed roadways, loading and unloading operations, stockpile stacking, beneficiation processes (crushing, grinding, compaction and drying
4. ***Fires and explosions:*** where there is use of explosives and coal
5. ***Geotechnical stability:*** landslides, rock falls, face slumping or land collapse

Specific aspects of environmental impact of gold mining were discussed for example by Ogola, Mitullar and Omulo (2002) who gave details of environmental impacts of artisanal gold mining in the Migori Gold Belt in Kenya. The authors attempted to quantify the various additives to the environment and their health effects. They reached the conclusion that the concentration of heavy metals, Pb (lead), As (arsenic) and Hg (mercury) at mine sites, stream sediments and water far exceeded the recommended values of the World Health Organisation (WHO). The concentrations of Pb and As in the Macalder stream were 13.75mg L^{-1} and 8.04mg L^{-1} respectively against the WHO recommendation of 0.05mg L^{-1} for both metals. Poisoning from lead was particularly emphasised pointing out that it does not breakdown naturally but it impairs the nervous system, it affects foetus development, and it affects the IQ of infants and children.

Jerie and Sibanda (2010) agree with Ogola *et al* (2002) that international standards are being neglected in gold mining operations. Examining the environmental effects of effluent disposal at Tiger Reef Mine in Kwekwe they found out that the chemical composition of the effluent did not meet the standards set by WHO which Zimbabwe follows (Table 1) and that this has dire health implications. McKinnon (2002) who examined the environmental effects of gold mining waste

disposal at Likir Gold Mine, Papua New Guinea also share the same view pointing out the health issues associated with cyanide disposal. McKinnon (2002:7) pointed out that, "The most common environmental problems are likely to result from the chronic contamination of surface and ground water by lower concentrations of cyanide and related breakdown compounds. Such chronic releases are much more difficult to notice and evaluate than are acute high concentration spills that are often associated with rapid, observable deaths of aquatic organisms." Indeed, when examining environmental impacts of gold mining, one should not focus on those impacts that are felt immediately but one should also consider the long term and creeping impacts that can be devastating. Two issues were raised that have immense implications on gold mining and the environment in Penhalonga:

1. International mining operators operate under different environmental standards in developing countries where their host government has extreme economic pressure
2. A Code of Practice (such as the mandatory Environmental Impact Assessment in Zimbabwe) is not enough as this may simply be a way of persuading shareholders, the public and officials that everything is "right" but when everything is "wrong" on the ground. There is therefore need for independent outside monitoring of performance and activities of the mining company.

Table 1: Sampling sites and sample parameters *(after Jerie and Sibanda, 2010)*

Parameter	Sample Site/ Identification	Results	WHO/SAZ Standards
Cyanide	1. Turura Stream	0.23 mg L^{-1}	0.02 mg L^{-1}
	2. Borrow Pit	0.105 mg L^{-1}	0.02 mg L^{-1}
Mercury	1. Discharge from stump mills	2.13 mg L^{-1}	0.05 mg L^{-1}
	2. Down stream	0.13 mg L^{-1}	0.05 mg L^{-1}
pH	1. Borrow Pit	2.5	6.5 to 7.5
	2. Down stream	3.0	6.5 to 7.5

McBain-Haas and Bickel (2005) have looked at the issue of environmental degradation due to gold mining from a human rights point of view. They viewed the case of gold mining at Marlin Gold Mine in San Marcos in Guatemala as a sure case of violation of human rights since the mining project and the ensuing environmental impacts affected communities' access to livelihood resources and sources.

There has been much comment on the use and disposal of mercury and cyanide, two very important chemicals in the beneficiation of gold at all scales of gold mining, whether small- or large-scale mining. Cyanide use has particularly come under the spotlight. McKinnon (2002) reports that the United Nations Environment Programme (UNEP), working with the partnership of the International Council of Metals and the Environment (ICME) convened an international meeting on cyanide and gold in Paris in 2001 and that there was consensus at the meeting that there should be Code of Practice and Management Systems in cyanide disposal. McKinnon recommended that, in view of conclusions reached at this meeting, the mining operation needs to:

- Use the minimum effective amounts of cyanide required to recover metals.
- Dispose of cyanide in a way that eliminates or minimizes environmental impacts. A contained tailings dam or enclosed vats allowing recycling can bring this about.
- Monitor all operations, discharges and the environment to detect and deal with any escape of cyanide and subsequent impacts of that release.

- Stay abreast of the latest recycling techniques. For example there are two new technologies available: the acidification-volatilization absorption (AVA) method for recycling of cyanide, and a process called the Degussa peroxide process for detoxification of cyanide.
- Identify and implement appropriate options for reusing, recycling and disposing of residual cyanide from plant operations.

The overall conclusion reached however was that, it would be far better if the use of cyanide in gold beneficiation was avoided altogether.

There has also been much comment on the use of mercury as well including in artisanal gold mining in Zimbabwe. In all case studies of the environmental impacts of gold mining, there are always sections that are devoted to the health impacts of mercury (Ogola, Mitullar and Omulo, 2002; Jerie and Sibanda, 2010). There are, however some publications that were concerned more with remedial action to reduce mercury contamination rather than simply pointing out at the health implications. Maponga and Ngorima (2003) suggest that mercury impact on the environment can be reduced through education and legislation. Metcalf and Spiegel (2007) reporting on the Global Mercury Project Activities in Zimbabwe 2002-2007 agree that there is need to educate communities on the impacts of mercury on health and the need to adopt new technologies. For this reason, in its third phase, the Global Mercury Project (GMP) trained 32 artisanal small-scale miners (ASM) trainers to communicate simple messages about the impacts of mercury on family health, and to train miners in the use of better gold recovery methods. The Institute of Mining Research (IMR) was subcontracted to run the awareness campaign and to introduce the new technology.

There are many reasons why there has been much comment on the impacts of cyanide and mercury. To begin with, these two chemicals are the most used in gold beneficiation. Second the chemicals pose a serious environmental and health hazard. Mercury contamination has two pathways: releases to water bodies as inorganic mercury but soon becoming organic mercury when it is consumed by fish and other aquatic or it is released into the air when the mercury-gold amalgam is heated. There has been much comment on the environmental and health effects of mercury, for example Ogola *et al* (2003) and Jerie and Sibanda (2010). It is pointed out that once the mercury has accumulated in the human body it attacks "the central nervous system causing numbness and unsteadiness in the legs and hands, awkward movement, tiredness, ringing in the ear, narrowing of field of vision, loss of hearing, slurred speech, loss of sense of smell and taste and forgetfulness", (Ogola *et al*, 2003:150).

Jerie and Sibanda (2010) added the following health and environmental problems: depression and exaggerated emotional responses which can be mistaken for alcoholism, fever and malaria, dysfunctional kidneys, unitary tract infection, vomiting and potentially death.

Cyanide also has devastating environmental and health problems. Fish and other aquatic life are killed due to the blockage of absorption of oxygen resulting in the suffocation of the organism. Birds and mammals are known to have died after drinking from cyanide drainage ponds if they are not properly protected. Other effects of cyanide poisoning include inhibition of reproduction in many species, delayed mortality, pathology, and susceptibility to predation, disrupted respiration, osmoregulatory disturbances and altered growth patterns (Flying and McGill, 1995). Middler (2001) has pointed out that other problems arise from the formation of cyanide related compounds such as thiocyanite, cyanite, ammonia and nitrate. Thiocyanite, ammonia and nitrate are particularly problematic because they are toxic to aquatic life.

One form of pollution that is very serious even after mining has stopped is acid drainage from mine dumps where sulphide minerals are present. The acid comes from the oxidation of the sulphide minerals so that sulphuric acid and ferrous hydroxide are formed. The sulphuric acid gives the very low pH values while the ferrous hydroxide gives the jelly-like orange colouration of water in nearby streams. The presence of sulphuric acid leads to further water pollution when it attacks other metals such as lead, copper, zinc, cadium, nickel and arsenic. Contamination of water sources from sulphuric acid not only kills aquatic life, but it also pollutes the soil and underground water sources.

All mining activity is associated with air pollution. The air pollution that is considered very dangerous is when the dust contains silica. Ogola *et al* (2003) agree with Mossman (1993) that exposure to silica dust causes silicosis which occurs in three different ways:

1. ***Chronic or nodular silicosis*** which is caused by the inhalation of quartz particles that are 0.5 to 0.7μm which may lead to heart or respiratory failure
2. ***Acute silicosis*** due to the inhalation of a high concentration of fine particles of silica filling up the lung airspace and making the heavy and breathing difficult
3. ***Accelerated silicosis*** which develops 5-10 years of exposure to silica dust with death resulting from cardiopulmonary failure within 10 years of the onset of symptoms.

1.5.2 Socio-economic impacts: an overview

The issue of social and economic benefits and that of ownership of mineral resources has only been recently added to development discourses in Zimbabwe. Internationally however, the issue has been on the development agenda for some time. There have been many initiatives that were instituted to try and address the issue of benefits to local communities and ownership of the resource. As long ago as 1952, the United Nations General Assembly has been a focal point for the development of the doctrine of Permanent Sovereignty over Natural Resources, which meant that the regulation of natural resources would be within the domestic jurisdiction in which the resource was located. Although the intents of the doctrine were blocked by the USA and most European countries, increasingly Permanent Sovereignty is being considered in debates regarding environmental protection and sustainable development of natural resources. The issues being considered include whether international law should impose obligations on state authorities in relation to management of resources located within the country.

An initiative that dealt directly with local communities is the Global Mining Initiative (GMI). Nine of the world's largest mining and mineral companies who are also members of the World Business Council on Sustainable Development (WBCSD) instituted a three-year project called the Global Mining Project. The GMI has contributed immensely to sustainable development issues through the Minerals Mining and Sustainable Development (MMSD) project. The WBCSD commissioned the International Institute for Environment and Development (IIED) to execute the project and it produced a report entitled "Breaking New Grounds" which addresses among other issues the following:

- The control, use and management of land;
- Acquiring, managing and distributing mineral wealth;
- Protecting and promoting human rights;
- Maximizing mining's contributions to local communities;
- Mining, minerals and the environment;
- Access to information;

- Artisanal and small-scale mining; and
- The roles and responsibilities of different actors in the regulation of the
- sector

Pursuing the general theme of the need for mining projects to address issues of poverty reduction at the local level, the World Bank also came up with its own initiative called the Extractive Industries Review (EIR). The objective of the EIR was to assist the Bank to understand the views of interested and influential actors as to its role in the extractive industries in the context of poverty reduction and the promotion of sustainable development. The consultation process started in September 2001 and a final report was submitted to the Bank in January 2004.

Despite these and many other initiatives, which are discussed by the Economic Commission for Africa (2002) both social and economic benefits by local communities remains illusory. Environmental Law Alliance Worldwide (2010) made the following comment:

> *The social impacts of large-scale mining projects are controversial and complex. Mineral development can create wealth, but it can also cause considerable disruption. Mining projects may create jobs, roads, schools, and increase the demands of goods and services in remote and impoverished areas, but the benefits and costs may be unevenly shared. If communities feel they are being unfairly treated or inadequately compensated, mining projects can lead to social tension and violent conflict.*

Conflict and tension normally arise where the mining activity has affected subsistence and livelihoods of the local communities. Factors that affect the social fabric of the local communities include the following:

- Human displacement and resettlement
- Migration (both emigration and immigration)
- Loss of access to livelihood resources including clean water
- Health risks taking into account the World Health Organisation's definition of health, that is a "state of complete physical, mental and social well-being, and not merely the absence od disease or infirmity
- Infringement on cultural and aesthetic resources

The European Bank for Reconstruction and Development (2009) has written on human rights, local communities and indigenous peoples in relation to large-scale mining development pointing out that, because of lack of title, the local people are vulnerable to eviction with little or no compensation at all and those who remain suffering economically because of loss of traditional livelihood resources. The Bank also points out the social problems that may arise due to the influx of migrant workers including health issues. It is not only during the life time of the mine that social problems can be experienced. There can be problems as well when the mine closes down when people who previously depended on the mine find themselves without an income or accommodation. The Economic Commission on Africa (2002) also discusses the issue of human rights in relation to mining.

An issue that has received high attention is the health issue. As was pointed out above, in all case studies of environmental impacts of gold mining the issues of cyanide and mercury contamination and the resultant health issues are discussed. The attendant social problems arising from the chemical poisoning are also discussed.

It is a paradox that in most developing countries the possession of large deposits of precious minerals such as gold has not translated into boosting the country's economy. It has been noted that in some cases the presence of large deposits of mineral resources contributes to increased poverty for many reasons including mismanagement and institutional corruption (Siden and Johns, 1990; Gelb *et al*, 1988; Auty, 1990). Some have observed that even where there is national economic growth, the benefits may not be equitably shared so that the local communities closest to the source of the mineral suffer most.

The paradoxical situation is clearly illustrated by the Zimbabwe situation as explained by Saunders (2008). It seems despite the huge mineral base of the country the local population has not benefitted from the mineral wealth as they are left out from playing an active part in the extraction and marketing of the minerals. It is seen that most of the mineral exploitation in the country is done by foreigners despite the government's indigenisation policy. Saunders (2008) states that this policy has largely failed, making the following observation:

> *Similar questions over the degree and direction of local benefit as well as the public accountability of foreign investors, apply to most of the market entrants who arrived in the 2000s. A deepening pattern of marginalization of mining communities, independent business entrepreneurs and indeed state regulatory and producer agencies themselves, has seemingly become entrenched. There is scant evidence of a state-based strategy to systematically encourage and extract public value from new foreign mining investment. In contrast, recent policy-making focus has typically been devoted to the question of individual ownership stakes, rather than matters of performance, production, reinvestment and other crucial, more broadly developmental issues that are vital to the revival and growth of the mining sector.*

Agreeing with Saunders (2008), Hawkins (2009) points out that it is inconceivable for local communities to benefit from the mineral resources of the country since there is no room for a trickle-down effect. The situation was going to negatively affect the recovery rate since most of the wealth is in the hands of a few and in most cases in the hands of foreigners.

1.6 Limitations

The study faced many challenges. To begin with it became clear after carrying out reconnaissance visits that the budget requirements were far higher than what had been indicated as the level of funding of the project. For this reason the approach that had been agreed on as the best approach, of assigning a specialist to the various topics to be examined was abandoned. It had been decided that the investigation would be a multi-disciplinary investigation involving a sociologist, an economist, a lawyer and an environmentalist to look into socio-economic impacts, legal aspects and environmental impacts. The approach had to be abandoned because of lack of adequate financial resources.

A second challenge the study faced due to lack of adequate financial resources was the failure to interview personnel in the Ministry of Mines and the Mineral Marketing Corporation of Zimbabwe. It is hoped that these would have provided more information from a historical point of view and the current gold mining situation in Zimbabwe in general and Penhalonga specifically.

A final challenge that caused this study to be a difficult one is nature of the resource that is being studied, gold. The mining of gold has been mystified because it is shrouded in secrecy so that

people are afraid to talk about gold. In an area such as Penhalonga, where there is conflict between large-scale miners and the small-scale miners and gold panners, with the community suspicious of the intent of the gold producers, it is very difficult to get information. Because of the relationship of DTZ-OZGEO and ZANU(PF), people are afraid that if they criticise what is taking place they would be victimised. This is the reason why they did not want responses to be identified with a single individual but were prepared give group responses. Such responses might not give accurate information.

2. Gold Mining in Zimbabwe: An Overview

2.1 Introduction

Gold production has played an important role in the economic and political development of Zimbabwe from pre-colonial times through to the post-colonial period. Huffman (1974) examining the rise of the Zimbabwe state, centred around Great Zimbabwe, suggested that the gold trade was directly responsible for this whist the decline in gold trade centuries later resulted in the destruction of the Zimbabwe state. The building of the Great Zimbabwe was facilitated by a booming gold trade, which was carried out by individuals, presumably hereditary leaders. These became very wealthy and powerful to put together a labour force for the construction of the Great Zimbawe. Gold continued to play an important economic role during the colonial period. In fact one of reasons for the colonisation of Zimbabwe was the belief that there were large quantities of gold that rivalled those of Witwatersrand in South Africa. To an extent, the economy of Rhodesia during the period of Unilateral Declaration of Independence (UDI) was sustained by gold production. It continued to play an important role in the economic development of the country after independence. However, the extent to which gold has been used in community development is being questioned. Others are worried about the extent of environmental degradation that gold mining causes.

This Section examines *inter alia* the history of gold mining in Zimbabwe, from pre-colonial times (before 1890), through colonial times (1890-1979) and during the post colonial period (from 1980 to the present). The Section attempts to elucidate the issue of ownership in gold production and why local communities are not involved in large-scale gold mining and why environmental issues are generally not considered in the context of the three historical periods the country has gone through: (i) Pre-colonial times – before 1890, (ii) Colonial period – 1890-1979, and Post colonial period – 1980 to the present

2.2 Pre-colonial Period (before 1890)

Although some claim that there has been gold mining in Zimbabwe since the beginning of recorded history (Bent, 1896); Hall and Neal, 1904), others are of the opinion that gold mining did not start until about the 14th Century AD (Huffman, 1974). He pointed out that the local economy was a largely closed subsistence economy. Such an economy could not support the labour force that was needed to the building of the large walls of the Great Zimbabwe. Huffman (1974) is of the opinion that it was during the 14th Century that trading in gold became important. It is perhaps at this time that, hereditary leaders became very wealthy and powerful that they could martial the labour force that was needed to build the Great Zimbabwe. Huffman (1974:4) concluded that "The gold trade was directly responsible for the rise of the Zimbabwe state, and restrictions of trade a few centuries later destroyed the Zimbabwe's successors."

Because of technological constraints, the extraction of gold was an arduous task. Of the three techniques that were used in gold mining, (i) scavenging, (ii) open pit and (iii) vertical shaft

scavenging seems to have been the most popular, followed by the open pit mining. Vertical shaft mining was restricted by the available technology that could not deal with excess water and poor light. Despite this gold mining in pre-colonial times had become a very important activity that was carried out in many parts of the country. Summers (1969) points out that by the end of the 19th Century, there were as many as 4,000 'ancient working'. Although many ancient workings have been discovered, pre-colonial Zimbabwean remained basically a subsistence farmer. Gold mining was done by a few to supplement income for luxury goods such as beads, bracelets, ceramics and clothes, and in some cases to purchase status items such as guns and gun powder (Masiya *et al* (2011). It seems these are items which only a few can aspire to possess. Coupled with the laborious nature of gold extraction and the low recovery of extraction methods, only 60% (Summers, 1969) perhaps this is the reason why trading in gold is said to have been the privy of ruling elites.

Phimister (1975) claims that the gold mines were owned by the ruler and there were rules that the miners had to adhere to. For example, in the Mazoe districts, a tax of half the gold produced was paid to the ruler. Under the Mutapa State it is said that no one was allowed to extract gold without a licence from the emperor and in order to control prices and a avoid exploitation by traders, rich deposits were banned.

The environmental impacts of gold mining during the pre-colonial times were minimal as operations were very small due to lack of adequate technology and tools to carry out large operations. Summers and Phimister (1976) compiled a list of tools and techniques frequently used in both open and underground mines as follows:

1. Rock breaking tools/techniques – stone hammers and pounders, iron gads/chisels, stone wedges and fire-setting (explosives were only introduced during the colonial period)
2. Digging tools – hoe and shovel
3. Haulage and hoisting – small wooden bowls, buckets (wood, hide, bark or clay) and baskets

The tools and techniques imposed limitations to the sizes of mining operations so that operations were generally small. For example the depth of operations both in the open and underground mines was constrained by the depth of the water table since the pre-colonial miner did not have means of pumping the water out. Other factors affecting depth of operation included the need for ventilation especially in cases of fire-setting, the difficult of transporting the ore to the surface and the caving of mines due to rock instability. In open mines therefore, individual mines were rarely over 24 metres deep and stretched for a few hundred metres only in length although some are known to have stretches for several kilometres.

Underground mines were even smaller with typical shaft diameters ranging between 0.45 metres to 1 metre. The depth of working varied from 6 metres to 10 metres although some shafts could be as deep as 20 metres. The horizontal galleries varied from being as short as 10 metres to as long as 30 metres.

Similarly the techniques used to process the gold were small operations that had minimum adverse environmental impacts. Furthermore, since no chemicals were used, the total environmental impact was almost negligible. Processing of the gold involved crushing or grinding the ore and recovering the liberated gold was done by panning or sluicing to remove the rock particles. Although various devices were used in crushing the ore, the most popular was the *dolly hole* a cylindrical hole carved on hard rock outcrops and used as a mortar (Anderson, 1961). Other crushing devices included the conventional grinding stone and the rocking stone. In the

recovery of the gold, an important ingredient was the availability of water to wash away the lighter quartz by sluicing or to concentrate the gold by panning using a shallow wooden or clay bowl. Such operations done on a small scale did not pose a threat to the environment.

2.3 Gold Mining during the Colonial Period (1890-1979)

Gold mining during the colonial period has its origins from the misconception of Cecil John Rhodes and others who believed that there was gold that rivalled South Africa's Witwatersrand's gold. This led Rhodes obtaining the Rudd Concession fraudulently which was signed between Charles Rudd and King Lobengula of Matebeleland on 31st October 1888. In order to control the gold production, Rhodes convinced the British Government in London that the area was rich in gold. He was therefore granted a Charter on 29th October 1889 for his company the British South Africa Company, which was given powers to rule, police and make treaties and concessions from the Limpopo to the great lakes of Central Africa. In July 1890 Rhodes sent the Pioneer Column of white settlers to Mashonaland, using the Rudd Concession as justification. This was the beginning of a new chapter in the gold mining history of Zimbabwe.

It is said that the "most important single element which determined the nature of economic and political development in Southern Rhodesia, has been the over-estimation at the end of the 19th Century of its mineral resources on the part of the British South Africa Company (BSAC) and the persistence of such an over-estimation for roughly 15 years," (Arrighi, 1967). The first 15 years of colonialism were years filled with lies and treachery. Although the failure to realise the "Second Rand" was attributed to "political interruption" that include the Jameson Raid of 1895, the African Risings of 1896-97 and the Boer War of 1899-1902, the real reason for this situation seems to lie in the failure of the dream to 'discover' a "Second Rand".

The period 1890-1896/97 can be said to be the period that laid the basis of gold mining in the country and leading to the formulation of the laws that govern how the gold is mined. It was a period of high expectations to begin with but in the end it was shattered dreams. The Pioneer Column was accompanied by a large number of prospectors who swarmed the 'new' country to locate the "Second Rand". One of the first things Rhodes did was the designing and issuing of the *Mashonaland Mining Regulation No. 1, 1890*. This was intended to promote the rapid development of gold mining by large companies but ensuring the maximum benefit for the BSAC. Unfortunately the indigenous population was not included in all this. The Regulations however had a section that pointed out the need for labour. It means therefore that the local communities had become dispossessed off the precious mineral.

Gold prospecting and the possibility of finding deposits that rival those of South Africa's Rand was met with enthusiasm so that by the third week of October 1890 there were 300 prospectors trying to locate the lucrative gold deposits and already there were 465 gold claims that had been registered, with shaft sinking having commenced.

The enthusiasm soon turned into dismay for a number of reasons, some of which can explain the role of gold in the political economic development of Zimbabwe. Firstly, the thought of easy riches was dashed at the onset of the rainy season which made movement of supplies from South Africa impossible but miners had not even started producing the gold. One of the most worrying issues however was the discovery that there were no large deposits of alluvial gold that prospector hoped to find as evidenced in historical accounts. But even more worrying was the fact that there were signs everywhere of pre-colonial gold mining. Unlike the Rand where the rich outcrops were untouched, in Southern Rhodesia these had been mined and therefore there was need to look for the gold at greater depth.

Having to get the gold at greater depth meant additional expenditure which the miners had not anticipated, coupled with the 50% of the gold production that was claimed by the BSAC, miners were not going to make a profit. The situation was made even worse by the ensuing economic depression which caused the miners to become almost destitute.

That there was not as much gold as the Rand was confirmed by the total gold output of 1892 of only 779 ounces putting the BSAC into an economic quandary. The Matebele uprising in the Victoria District in July 1893 made things even worse for the BSAC as it affected the only two gold mines that were productive at that time plunging the BSAC in further financial woes and driving away shareholders.

The easy defeat of the Matebele force in the Victoria District in July 1893 gave the BASC the idea that there was need to militarily defeat Lobengula. The idea of defeating the Matebele gave hope for many opportunities for the BSAC including: (i) an increase in share price since shareholders had become apprehensive about the Matebele threat, (ii) access to the rich Matebele gold fields which were said to be richer than those in Mashonaland and offering a chance of discovering the "second Rand", and finally (iii) creating a more favourable financial climate for the purchase of the Rudd Concession for total control of the mineral wealth of the country. The development of gold mining in Zimbabwe during colonialism was such that local communities were completely left out as they could not become shareholders or partners.

Lobengula's defeat resulted in the Rudd Concession being purchased from United Concessions Company at a price shareholders could not complain about given the fact that the Lobengula threat had been removed. The renewed interest in gold exploration shifted from Mashonaland to Matebeleland where it was believed rich deposits could be found. The defeat of the Matebele had tangible results as far as BSAC was concerned as it was said that at the end of March, 1894, the Company reported that "a sum of over a million pounds has within the last few months, been subscribed in cash by independent Companies, as working capital for new mining ventures …", (BSAC, 1894). Indeed the Matebeleland venture had paid off as many companies had been floated by 1895 and share prices had improved. However, Phimister (1976) observed that the improved financial situation of the BSAC was not because of having struck a "Second Rand" but because of the over valuation of what was on the ground and improved share prices due to what was happening in South Africa's mining.

The changeover from manual gold production to mechanisation meant that only those with access to capital would engage in profitable gold production. Furthermore, no sizeable surface deposits had been discovered in the country and therefore there was need for more sophisticated equipment to engage in under-ground mining. The primary source of power at the time before the use of electricity became widespread was steam, which was required to move all machinery and at large companies to generate electricity. Apart from being left out of gold mining through legislation, the need for equipment that required capital meant that local communities could not participate in gold mining except supplying labour. By 1912 Phimister (1976) indicates that the gold mining industry was employing as many as 35,000 Africans.

Developments from 1903 to 1929 of the construction of the main railway line system and road network assisted in the mechanisation of the gold mining industry as equipment could be brought to the mining sites. Masiya *et al* (2011) however pointed out that despite these developments most small-scale miners could not afford the new technology so that mining remained seasonal as they could not afford the pumping equipment.

Even the processing of the gold required capital. The processing now involved the use of either stamp or ball mills to crush the ore; the use of copper amalgamation plates to recover the free gold; and the use of cyanide or mercury to increase recovery from the copper plates or tailings. Without financial assistance, few could afford the new technology.

Although there was no direct benefit to the local communities, gold production was of great significance to the settlers, in the formative stages of the colony and after the Unilateral Declaration of Independence. Phimister (1976) points out that, although not at the same level of production as South Africa's Rand region, gold production during the colonial era ranked high among the world's most important gold producers. In 1914 the country was already producing £34 million worthy of gold annually.

This income was however not equitably shared since the local indigenous population who were now denied possession of gold only participated in the gold production industry through the provision of permanent or seasonal labour.

The Mashonaland Mining Regulation Number 1 of 1890 was meant to enable the formation of large companies that would then be involved in gold mining. It was soon discovered that this was not possible since the establishment of large companies as was the case in the Rand could only be done where there were large deposits. The BSAC was disappointed that they had not discovered such large deposits and therefore there was need to revise the legislative framework of gold mining. In 1903/04 the BSAC made revisions to the mining legislation so that even individuals and syndicates could be involved in gold production in order for them to "mine on a small-scale instead of going to floatation as large companies," (Masiya *et al*, 2011: 7). Small-scale meant individuals or syndicates crushing not more than 750 tonnes of ore per month. This was the genesis of the small-scale miner, the basis on which gold mining later developed in the country.

It was not only a change in legislation that assisted the rise of the small-scale miner but the various government incentives also encouraged the rise of the small-scale mining. The small-scale miner was only asked to pay a 2.5% royalty to the BSAC if he/she exceeded a monthly profit of £100,00 to begin with and this was later changed in 1914 to £200,00. These developments were considered a successful story as far as small-scale mining was concerned so that their number rose from 20 in 1904 to over 400 in 1923 and each producing at least 1000 ounces of gold and in 1914 producing £34 million worthy of gold.

Unfortunately all this applied to white miners only since throughout the colonial era, no black indigenous person could legally own and operate a gold mine. The white miners were variously supported as follows:

1. Facilitating access to capital on easy terms of repayment from the BSAC or other financial institutions
2. Setting up of infrastructure, facilities and supporting institutions, e.g. the establishment of the Geological Survey in 1910; the establishment of the Department of Metallurgy in 1928; and the establishment of a roasting plant in Kwekwe to assist small-scale miners process refractory sulphidic gold ores
3. Introduction of the ex-Servicemen Scheme in 1945 to train returning solders from the Second World War in mining before assisting them to start their own operations. Viewing (1984) states that the scheme was a huge success since 221 men were trained, 279 mines were re-opened and by 1952 these had produced gold worth USD51 million.

Not much has been written about gold mining during UDI. However Stoneman (1974) has pointed out the following: "Despite sanctions, the value of mining output has tripled in money terms. The share of GDP is now around 8% having been below 6% before UDI." This applied to all minerals. Nickel and copper were two major contributors to the growth. It is at this time of expansion in the mining industry that a number of foreign players started becoming involved in gold mining in Rhodesia including Rio Tinto Rhodesia, Newall and Lonhro. The new players either expanded existing gold mining ventures or they established new ones.

Mining output during UDI was however a guarded secret but it is believed that it was contributing tremendously to the inflow of foreign exchange. For example, Stoneman (1974:9) gives an example of how sanctions actually assisted in the inflow of foreign capital through companies that continued doing business with Rhodesia and claiming that they were not sanction busting.

2.4 Post-colonial Period Gold Mining

Whilst the UDI period is criticised for lack of information on any aspects of gold mining, the post-Independence period saw increasing interest in gold mining resulting in a large volume of publications on the industry. The interest arose from the observed decline in gold production after the 1990s, civic organisation that were worried about the issue of sovereignty over natural resources and community benefits, and increased conscientiousness on environmental degradation.

2.4.1 Gold Production

Gold production after Independence can be divided into recognisable period corresponding to political economic conditions prevailing at the time as follows: (i) the period immediately after Independence (1980-81); (ii) the 1982-87 period; (iii) the 1987-90 period; (iv) the 1991-94 period dominated by issues related to the Economic Structural Adjustment Programme (ESAP); and (v) the period when government is attempting ownership of mining by the local communities, the policy of indigenisation from 1994 onwards.

Immediately after Independence there was generally low level activity in the mining sector in general, with the setting up of the Mineral Marketing Corporation of Zimbabwe (MMCZ). The MMCZ was seen by the foreign mining houses as a measure to penalise the mining companies for backing UDI, (EIU, 1982, No. 1, cited in Ericsson and Gibbon, 1993) and an attempt to transfer sales from the western countries to socialist countries that supported the liberation war. It should be noted that the MMCZ made no attempt to include local communities in the mining sector.

The second period, 1982-87 also witnessed a sluggish growth in the mining industry, with investors reluctant to commit themselves due to the low prices in minerals and due to the political situation in the country that included the uprisings in Matebeleland. The political issue also controlled developments during the third period, 1987-90 when there were conflicting political statements, Marxism on the one hand and capitalism on the other. The abandonment of socialism and acceptance of the Economic Structural Readjustment Programme (ESAP) however ushered in a new era in the gold mining industry. Some mining houses viewed ESAP positively but Ericsson and Gibbons (1993) are of the opinion that it was only the small to medium sized international companies that found developments as encouraging. This was because:

> *"Large resident companies had always been powerful enough to insulate themselves from the worst effects of a less enabling environment, which it had succeeded and hence had little to materially gain from concrete changes*

> *envisaged by ESAP. Large incoming companies felt themselves powerful enough to set their own terms regardless of whatever particular policies were in place,"* (Ericsson and Gibbons, 1993)

It would appear there was not much change in terms of resource ownership and control between the miners and the local indigenous people. Apart from the fact that the large companies operated as "untouchables", Ericsson and Gibbons (1993) pointing out how the older miners could get what they wanted corruptly:

> *"One director called 'Striking a deal with governments all over the world led older mining houses to establish direct links with government leaders in order to cut through difficulties they anticipated with the state. They distinguish between the Zimbabwean elite, who they regard as basically cooperative and 'middle level state officials' whom they viewed less sympathetically. Relations between themselves and government were personalised through the company management and top/senior government official/politicians, the latter always solving the companies' problems,"* (Ericsson and Gibbons, 1993)

In all these developments, there is no mention of the local communities. The miners and government official and the government had reached an agreement on mining issues, but the local communities were not included in the agreement. The production of gold which picked at 27 tonnes in 1999 remained rooted in the hands of big foreign mining corporations and local communities playing an insignificant role. According to Siebert and Sternberg (2009) in a NEDGROUP Securities Country Report, Zimbabwe October 6, 2009 between 1994 and 2009 all large-scale gold mining in Zimbabwe was done by foreign companies.

The period 1991-2000 was a momentous period in the history of gold mining in Zimbabwe with supporting policies being issued side-by-side with detracting ones. In 1994 gold was the most important mineral accounting for 48% of the value of the total mineral exports. The Gold Trade Act was passed in 1995 and this gave the Government the monopoly of buying and selling gold and silver. This was followed by the closure of all foreign currency accounts, a move that ushered the decline of gold production in the country. The whole mining sector depended on foreign currency for supplies and equipment. With the closure of foreign currency accounts companies were forced to purchase supplies and equipment using the over-valued local currency. Large companies including Eureka Gold Mine, which was expected to be the second biggest gold producing mine (Saunders, 2007), folded up together with 40 other companies by 2002.

From 2000 to 2008, there was a precipitous decline in gold production. Saunders (2007) claims that gold production declined from 21.3 tonnes in 2001, to 12.5 tonnes in 2003 and only 8 tonnes were produced in 2007. Hawkins (2009) however gives a more dramatic decline in gold production from 21.3 tonnes in 2004, to 11.4 tonnes in 2006, to 7.0 tonnes in 2007 and only 3.6 tonnes in 2008, an 83% decline in gold production since 2004. The decline in large-scale gold mining did not translate into a benefit for the local communities, unlike in the farming sector.

2.4.2 Ownership and the Indigenisation Policy

A policy pursued by Government during the 2000s which was unpopular with investors but one which the empowerment group gladly welcomed was the indigenisation policy. The thrust towards this policy was meant to allow more blacks to participate in gold mining. Saunders (2008) has looked at the issue of indigenisation in the mining sector and concluded that it was a paradox. The government was making an effort to empower black Zimbabweans and one way of

doing this was through allowing a large number to be involved in the seemingly lucrative mining business. The following was however observed: "Remarkably little transformation of ownership in the mining sector has actually taken place … if there has been black empowerment in Zimbabwe mining in the 2000s, it has typically involved non-Zimbabweans based outside the country," (Saunders, 2008:1).

The Government had announced the introduction of the Indigenisation and Economic Empowerment Bill in May 2007, which Parliament quickly passed in September 2007 and the President signing the new Act into law in March 2008. Unfortunately the new Act did not bring benefits to the ordinary Zimbabwean, let alone the local communities in which the gold is found. To begin with, the Act did not get support from local mining houses (mostly foreign companies) and the Chamber of Mines, both of which had engaged in consultation with government around the empowerment issue. South African miners and their government did not support the Act as well despite having pledged to support Zimbabwean's indigenisation programme from as early as 2005. The bilateral arrangement had been that Zimbabwe and South would establish an empowerment-related exchange programme in late 2005 in which South Africa offered to assist with policy making inputs, "leading to the implementation of a mining indigenisation and empowerment charter," (Saunders, 2008:).

Many reasons have been given for the failure of the Indigenisation and Economic Empowerment Act but Saunders (2008) suggests that the reason for failure was because , "State empowerment strategies that assumed a scenario of low-cost transfer of ownership, such as happened in the commercial agricultural sector, therefore failed to recognise the specificity of production in the mining sector. Empowerment by participation alone would not be feasible" … "Empowerment became widely understood to mean the enrichment of the political and military elite from both Zimbabwe and neighbouring countries," (Saunders, 2008).

It is a clear case that despite the indigenisation policy there has been very little empowerment in large scale gold mining. Interesting though, the new investments in the 2000s primarily involved mergers and acquisitions rather than the start of completely new ventures. The equitable sharing of the gold resources with the Zimbabwean blacks, let alone the local communities remains elusive.

2.4.3 Post Colonial Artisanal Small-scale Gold Mining

In Zimbabwe small-scale gold mining has played an important role in providing livelihoods to a large number of people. Whilst during the Colonial Era small-scale gold production was the privy of white miners only, in the post colonial period it became open to every body with the Government encouraging black entrepreneurs to also venture into this lucrative business. In the 1980s the Government promoted small-scale mining by facilitating registration of claims after payment a nominal fees and introducing a number of support schemes. Because of this the number of registered small-scale miners increased from 1 000 in 1983 to 10 000 in 1990 and to as many as 20 000 by the year 2000 (Maponga, 2003). The small-scale miner was also assisted by non-governmental organisations, international organisation and the private sector with production facilities, training and technical support. Unfortunately however this assistance did not extend into the 2000s when the Government and the country in general were facing enormous economic challenges.

Zimbabwe however saw an upsurge in ASM in the 1990s as a result of increasing unemployment because of factories closing down, down-sizing of mining operation and reduced farm labour force because of the Land Reform and Resettlement Programme. It is estimated that by 2003, as

many as 300 000 to 400 000 people were involved, formally or informally in ASM supporting a population of nearly 2 million (UNIDO Global Mercury Project, 2007). By 2006 it is said that the number of people involved in ASM had risen to perhaps 500 000 and with the economic hardships, the number was expected to grow. However it was at this time that Government decided to enforce the country's new environmental legislation and to clamp down on what were called illegal activities associated with trading in gold on the black market. As many as 32 000 small-scale miners were arrested as a result of "Operation Chikorokoza Chapera" suppressing virtually all ASM operations.

Despite the claim that the small-scale mining, especially gold panning in some of Zimbabwe rivers was causing environmental degradation and that some of the miners were involved in illegal activities, Operation Chikorokoza Chapera was not popular especially with civil society. It is argued that government should not have taken such a heavy hand since a large number of households were dependent on artisanal gold mining as their main source of livelihood.

The economic significance of ASM in poverty alleviation, rural development and hence national development is widely acknowledged for example Hentschel *et al* (2002). Chimsasa (1996) pointed out that ASM contributed 5% to the gold production in Zimbabwe in 1996 and it is associated with other downstream benefits and positive synergies in the rural economy in addition to poverty alleviation. Mungoni (2008) and Gocht *et al* (1988) indicated the expansion of the clientele base for rural business centres, creation of both capital and market for other income generating activities and also providing linkages with economic and social developments external to the communities through marketing.

3. Legal framework of gold mining in Zimbabwe

3.1 Introduction

The main piece of legislation governing the exploitation, control and use of mineral resources in Zimbabwe is the Mines and Mineral Act Chapter 21:05 of 1961. The Zimbabwe Chamber of Mining has asserted that the Mines and Minerals Act has been acknowledged as "a good piece of legislation by both local and international investors. Some countries in the region and elsewhere have developed their own mining laws based on the Zimbabwean model". Despite this view however, the Act has been criticised for being too pro-investment at the expense of local communities and for lack environmental protection guidelines. The Act should be read together with the Environmental Management Act, Chapter 20:27 but in some cases the two are conflicting.

The Mines and Minerals Act stipulates that mineral resource ownership in Zimbabwe is vested in the State through the President. This is seen by commentators as agreeing with the concept of National Sovereignty over Natural Resources. The concept states that natural resources should be exploited for the benefit of the nation and its entire population. Local and international investors only get mining titles but profits from mining are shared. The procedures for acquiring, relinquishing or forfeiting these titles are clearly stated.

3.2 Mining Titles

3.2.1 Prospecting Titles

The law stipulates that any person of 18 years of age and above and who is a permanent resident of Zimbabwe may acquire one or more prospecting licenses on payment of a fee. Despite this one

has to be registered as an approval prospector. The registration as an approved prospector is valid for five years and can be renewed for a similar period.

The holder of a prospecting license is entitled to peg and register claims which become a registered mine where mining activities can take place. The license, which is valid for 24 months and renewable for the same period at the discretion of the Minister, is solely for the purpose of discovering areas with potential. The prospector therefore should not be involved in any drilling or excavation work or removal or disposal of any discovered minerals.

In addition to the prospecting license, the law makes provision for an Exclusive Prospecting Order (EPO). An EPO confers the exclusive right to prospect for specified minerals in any defined area in Zimbabwe. The EPO is obtained by submitting an application to the Mining Affairs Board (MAB) for recommendation to the Minister who is responsible for conferring the order. The application should be accompanied by a deposit payment which is equivalent to the total number of hectares to be prospected. For the MAB to give a favourable recommendation to the Minister, it must be satisfied that the applicant is a fit and proper person to obtain the order and is of adequate financial standing to undertake the operations under the order; and that it would not be against the national interest to make such an order. If such an order is conferred, it would be valid for three years and can be renewed for a similar period at the end of the first three years.

The conditions and rules that a licence holder should adhere to, make EPOs inaccessible local communities. The conditions and rules stipulated in the EPO are as follows

- The license is personal to the license holder who may not cede or assign any such rights to another person
- The license holder should submit a programme of work to the MAB for approval, which should include an indication of the prospecting work and the anticipated cost
- Carry out the activities that are indicated in the programme of work submitted to the MAB
- Submit a report of the work carried out within the period stipulated by the programme and stating the expenditure on the work carried out
- If report is not submitted within 21 days of being reminded in writing by the MAB, then the Minister shall revoke the license.

3.2.2 Mining Licenses

Mining titles also seem to discriminate against local communities. The permit to carry out mining activities is called a mining claim. Usually mining claims cover a small area and therefore for operational purposes several claims are grouped together into mining blocks, which are transformed into a Mining Lease for easy administration. The Mining Lease confers on the holder the exclusive right to mine the mineral resource for which the claim was registered and the lease granted. The Lease also gives exclusive prospecting rights to the holder for other minerals on the claim. The holder of a Mining Lease is required to fulfil the following conditions:

- Commitment to development work programme or production or capital expenditure
- Particulars of the mineral that is being mined
- Sketch plan of operations showing position and aerial extent
- Financial status to carry out mining activities
- Programme of mining operations carters

The mining lease also applies to small-scale miners and therefore it does not have strict requirements of a technical and economic plan. It also does not need an Environmental Impact Assessment to be carried out. However, where it discriminates is the requirement that the lease holder should have adequate financial resources to meet inspection and landowner's fees as the majority of local communities in rural Zimbabwe cannot afford this.

The mining lease can be transferred but this is subject to the approval of the MAB. Notice of transferring of the lease should be sent to the Mining Commissioner within 60 days of the transfer, informing the Commissioner of the name of the person the lease has been transferred to and the date of transfer.

The law also has provision for the Special Mining Lease which seems a reserve for large-scale miners involving multi-national companies. The Special Mining Lease is granted to a holder who intends to develop a mine with the investment in the mine being wholly or mainly foreign and exceeds USD100 million in value and the mine's output is intended primarily for export. In order to be granted a Special Mining Lease, a person submits an application to the MAB, which then forwards the application together with recommendations to the Minister. The Minister in turn forwards the application to the President with his/her recommendations for the President's approval. If granted the Special Mining Lease is valid for 25 years and can be renewed for a period not exceeding 10 years.

It is clear that the requirements for a Special Mining Lease are beyond the reach of local communities but it seems most large-scale mining operations in all mining sectors belong to this title arrangement. Saungweme (2005:78) observed that the Special Mining Lease is quite detailed and exclusive requiring the following:

- Feasibility study
- Financial plan
- Marketing plan
- Proposals for efficient economic exploitation and treatment of ore
- Economic evaluation of proposed mine plus detailed forecasts of capital investment, operating costs, and projected revenue and profits
- Detailed mineral resource and reserve estimate reporting distinguishing between probable and proven reserves
- Environmental Impact Assessment carried out
- Any insurance details of liability arising from mining operations and damage to the environment
- Extent of use of local goods and services for the development and operation of the mine
- Manpower requirements, including the number of expatriates and any training for locals.

A lot is required to be granted a license to operate a large-scale mining venture. This is the reason why Zimbabwe's mining industry is dominated by foreign interests. The local entrepreneurs and local communities will find it difficult if not impossible to meet these requirements, let alone the technical requirements.

The Mines and Minerals Act 21:05 of 1961 and its subsequent amendments, provides for a variety of issues in its 27 Parts and 407 Sections. However, of interest here are issues related to mine 'ownership' and sharing of profits with the local communities who have been guardians of the resource. Other provisions of the Act somewhat relevant to this issue include Mining Rights (Section 177) and Preservation of Mining Rights (Part XI). Mining Rights state that in case of

dispute over a claim, the second pegger shall be subordinate to the first pegger, an issue of interest in relation to small-scale claims and large-scale claims of the Special Mining Lease category. The law provides for the Preservation of Mining Rights to ensure that there is production at the mining location, providing for a certificate of inspection for the work executed on the mining location. With alluvial, eluvial, rubble deposits, dumps and precious metal blocks, the law expects the holder to continuously work the claims from the date of registration of such blocks, and "shall pay the Mining Commissioner annually in advance the prescribed fee in respect of such blocks". It is perhaps the issue of paying many types of fees that the local member of the community finds himself/herself with no choice other than becoming an illegal gold panner.

3.2.3 Commentary on the Mines and Minerals Act

Most of the reactions to the Mines and Minerals Act 20:05 of 1961 and its subsequent amendment appear as grey literature which is difficult to reference. However most of the criticisms of the Act were presented in the policy monograph prepared by Muranda for the National Association of Non-governmental Organisation (NANGO), the University of Zimbabwe (UZ) and Progresso-Zimbabwe with financing from the European Union. The findings of the study were summarised in a NANGO (2009) policy brief, singling out the following shortcomings of the Mines and Minerals Act (Chapter 21:05) that inhibit local communities to access mineral resources as follows:

- The Act was established in 1961 and amended in 1965 at the time of the Unilateral Declaration of Independence (UDI). It therefore does not have provision for servicing the interest of local communities who were not supposed to know anything about gold to begin with.
- Most members of the local communities if not all are not vested in the provisions of the Act for them to make full use of these provisions as the Act is complex and it has not been disseminated and explained to the local communities.
- The Act provides for partnerships and this was meant to include local communities to access mineral resources but the restriction of numbers to not more than six owning a mining location defeated the purpose of community involvement since community participation in cases entail upward of 100 people. The Mines and Minerals Act, Chapter 21:05 states that, "No more than six persons shall be registered as the joint holders of a mining location".
- The institutional structure that is used to administer the provisions of the Act, the MAB is composed of mainly technocrats and local community representation almost non-existent. Even when the effort to rectify this problem is considered, that of establishing the District Advisory Board (DAB), it is seen that local community members' interests could not be served. The DAB, because of the way it was set up could only serve the interest of the Minister who makes appointments to the DAB and not the interest of the local communities in a district. Furthermore, the mining districts which fall under the mining commissioners have different boundaries from the administrative boundaries making it difficult to administer mining activities within the local government framework.
- The Act does not provide for sharing of the resource. Section 188(7) of the Act states that:

  In respect of Communal Land as if all Communal Land within the area under the jurisdiction of any one rural district council were a holding and the rural district council were the owner thereof. Provided that any payments due in respect of

> *such Communal Land shall be paid to the District Development Fund (DDF) referred to in Section 3 of the District Development Fund Act Chapter 29:06.* (Mines and Minerals Act 21:05, 1996)

One wonders whether this is the right set up for development projects that are district specific but the distributive approach to central government resources is used. Furthermore, the Act does not make it mandatory for mining companies to pay anything to the local authority. Section 255 of the Act states that:

> *The Minister, acting with the approval of the Minister responsible for finance and after consultation with the Minister responsible for local government and any organisation, which the Minister consider represents mining interests, may by statutory instrument require any miner of a registered mining location, or class of such miners, to pay a specified sum at specified intervals to any local authority within whose area the registered mining location is situated",* (Mines and Minerals Act Chapter 21:01, 1996)

From the above, it is clear that the law does not have provision for sharing of mining benefits with local communities and perhaps this is the reason why miners do not care about social responsibility. The brief review of the Act shows that most if not all consultations are between the Ministry of Mines and the miners, and rarely is the local authority consulted.

3.2.4 Environmental Considerations of the Mines and Minerals Act

The Mines and Minerals Act Chapter 21:05 is the main instrument controlling mining in Zimbabwe. It however has to be read in conjunction with other pieces of legislation especially when it comes to issues of environmental protection considering the extent of environmental damage that mining causes. Out of the 30 or so pieces of legislation that must be considered in conjunction with the Mines and Minerals Act, 11 are concerned with environmental matters one way or another as follows:

1. *Environmental Management Act Chapter 20:27* administered by the Ministry of Environment and Tourism and providing for the establishment of the Environmental Management Agency (EMA)
2. *Mining (Management and Safety) Regulations SI 109 of 1990*
3. *The Hazardous Substances and Articles Control Act Chapter 15:05* administered by the Ministry of Health also deals with the use and control of hazardous substances in mining.
4. *The Mining (Health and Sanitation) Regulations SI 182 of 1995* administered by the same Ministry makes provisions for adequate hygiene in and around mines.
5. *The Mining (Alluvial Gold) (Public streams) Regulations, 1991* deals with small scale gold panning and places restrictions on the miner and the minimum distance he/she can work from a river-bank.
6. *The Water Act Chapter 20:22* makes provision for the prevention of water pollution and the preservation of water resources and is controlled by the Ministry of Lands, Agriculture and Water Development.
7. *The Natural Resources Amendment Act (1975)* deals generally with the conservation of natural resources and is administered by the Natural Resources Board.
8. *The Atmospheric Pollution Prevention Act Chapter 20:03* is the responsibility of the Ministry of Health and is concerned with the prevention and control of air pollution by gases, dust, fumes, and smoke.

9. *The Forest Act Chapter 19:05* is designed to protect forests and trees and is controlled by the Forestry Commission.
10. *The Parks and Wildlife Act (1975)* is administered by the Department of National Parks and Wildlife and deals with the preservation of plants and animals, including specially protected animals and indigenous plants.
11. *The National Museums and Monuments Act (1972)* provides for the protection of sites of historic or cultural interest.

There has been much talk about the degree of environmental damage emanating from mining activities especially alluvial gold extraction, gold panning and small-scale gold mining. It is alleged the Environmental Management Agency which was supposed to police environmental degradation was doing nothing about it. The main problem is how these pieces of legislation are related and the degree of interaction. The pieces of legislation are administered by too many different ministries with different and sometimes conflicting agendas. It then becomes impossible to implement the provisions of one Act to a ministry that has a different agenda. For example, EMA's duty is to see to it that mining is done in a way that minimises environmental degradation, but EMA is not involved in the licensing of the mining operations. It then becomes difficult for EMA to enforce environmental regulations as it is ignorant of the agreement between the miner and the Ministry of Mines.

ZINWA is said to be responsible for water issues in the country including establishing water quality and therefore assessing pollution levels. ZINWA might obtain the water test results but it has little use for them since EMA has the responsibility of ensuring certain environmental standards, failure of which the perpetrator will be fined. All in all it has been said that the pieces of legislation governing good mining practices are fragmented and difficult if not impossible to implement. This is the reason why environmental degradation goes on unchecked in mining. It is seen that an activity that is condemned by one piece of legislation is condoned by another: disturbing river flow and therefore the water resources of an area is condemned by EMA (reason for crying out loud against gold panners). However, what can EMA do when a company has been issued with a license by the Ministry of Mines to do alluvial gold extraction on a grant scale from a river?

3.3 Indigenisation in the Mining Industry

Although the Mines and Minerals Act has been herald as a very good piece of mining legislation, many commentators feel than there is need to reform the legislation. The legislation should look inward to the Zimbabwe citizen rather than targeting the needs of foreign investors. The Act does not make specific provision for local communities to benefit from mineral resources found in their area. Indigenisation of the mining sector is an issue that has been talked about much since the early 2000s. It has however been observed that the indigenisation policy has not succeeded in the mining sector unlike in the farming sector.

The current indigenisation initiatives have been criticised for being dominated by government agencies and political heavy weights. The black empowerment is said to apply to a few well placed people in government only rather than applying to all citizens of Zimbabwe (Saunders 2007). Instead of the door to participate in mining opening to all Zimbabweans, the door has been opened very wide to new foreign investors coming mostly from South Africa, who have formed partnerships with the political heavy weights.

The Indigenisation and Economic Empowerment Act of 2007 called for the acquisition of a 51% stake in foreign-owned mining operations including an uncompensated expropriated stake of

25%. Twenty per cent of the stakes in question would be acquired within a two year period with the state holding rising to 40% after five years and reaching 51% by the end of seven years.

Investors were reminded that according to Zimbabwean law, all mineral resources were state owned. However foreign investors would be allowed to participate in the mining sector with tenure security guaranteed. In order to acquire a mining title, foreign investors are required to have a Zimbabwean registered company in terms of the Company's Act. All new foreign investment into Zimbabwe would require an Investment Certificate issued by the Zimbabwe Investment Authority and all foreign investment into Zimbabwe requires an indigenous partner in terms of the Indigenisation and Empowerment Act.

Whilst on paper this seems the right course of action to indigenisation but in practice, critics of the Act wonder how this will translate to local level black empowerment in the mining industry when local community members do not have the financial resources that are required for them to participate. Saunders (2007) observed that many people have adopted a new definition for "black empowerment" which is widely understood to mean the enrichment of few political and military elites in Zimbabwe and the region and not the ordinary Zimbabwe. It also seems impossible to implement the black empowerment policy in the mining industry before the Mines and Minerals Act is amended since some of the provisions of the Act conflict with those of the Indigenisation and Economic Empowerment Act.

Recently government has been encouraging blacks to be involved in small-scale gold mining, an attempt seen as admitting that it is not possible for blacks to participate in large-scale mining, which will remain in the hands of foreign investors for some time in the future. Government has come out openly in support of small-scale mining and has issued thousands of licenses to black miners. In order to encourage blacks to register, the licensing procedure were simplified. The development of the small-scale mining sector has however met with many challenges and it is only now that government now supports small-scale mining activities. In the early 2000s the government was quite impatient with small-scale miners including gold panners accusing them violating exchange control regulations by smuggling gold and other minerals and operating illegally without a license. This culminated in the massive move to stamp out small-scale mining activities that was thought to be operating outside the law in "Operation Chikorokoza Chapera".

3.4 Legal Reform in the Mining Industry

The need for legal reform in the mining industry can hardly be over-emphasised in view of shortcomings that were highlighted above. There is need to make the mining legislation be responsive to the needs of Zimbabwe citizens and to make the legislation comparable with legislation anywhere else in the world and to make the legislation protect the environment. Government is in the process of amending the Mines and Minerals Act but Muranda (2009) has reservations whether the proposed amendments will make local communities benefit from mining and whether environmental degradation will be reduced.

Muranda (2009) pointed out that the Amendment Bill still has shortcomings in relation to local community benefits from mining as it did not address the issue of rights of communities in terms of compensation in case of displacement because of mining. He further mentions that the issue of Corporate Social Responsibility (CSR) by mining companies operating in the country has not been mentioned while the issue of black empowerment is not clear. Similarly, the Amendment Bill does not adequately address issues of environmental protection, stating clearly the roles of the Environmental Management Act Chapter 20:27 and the Mines and Minerals Act.

In a policy brief, NANGO (2009) gave a summary of the recommendations that Muranda proposed as follows:

- Corporate Social Responsibility (CSR) be a legal issue whereby all mining companies are legally required to plough back into the community in which they are operating in by either doing life changing projects or employing people from the local community
- Creation of Sovereign Wealth Fund for revenue generated from mining as has happened in countries such as Botswana, Nigeria, Norway, South Africa (The Royal Bafokeng Community) among other countries that will benefit the future generations long after the minerals have been exhausted.
- Finally communities (including local communities in mining areas, artisanal miners and the country as a whole) should benefit mining revenue.
- Decisions on the distribution of mining revenue should be done at provincial levels
- The mining sector should be treated like the Communal Areas Management Programme for Indigenous Resources (CAMPFIRE) model, where communities can lease to a private operator and gets shares from the profits.
- There should be clear guidelines on the role/operations of Community Share Ownership Trusts, District Development Committees, Ward Development Committees (WADCO) and Village Development Committees (VIDCO).

It seems there is a lot that should be done for legislation to both support empowerment initiatives in the mining sector and at the same time protecting the environment. Whilst small-scale miners are not required by law to carry out Environmental Impact Assessment (EIA), the large-scale companies are expected to do so. (It does not mean that the small-scale miners are less destructive of the environment). The law is not clear on what happens in case of failure to mitigate the negative impacts the EIA identified and penalising those who degrade the environment is EMA's duty. However, the miners might have been made to understand differently from the Ministry of Mines.

4. Socio-economic and Environmental Impacts of Gold Mining in Penhalonga

4.1 History of Gold Mining at Penhalonga

4.1.1 Gold Mining in Penhalonga during the pre-Colonial Period

Gold mining in the Penhalonga and surrounding areas is unique in that it is one of the very earliest areas to be opened up for gold mining by the settlers. Apart from that, it has now been established that even before the settlers started mining the gold, the local indigenous people had already been exploiting the gold resources. Ann Kritzinger in 2005 made the following observations after preliminary investigation relating pre-colonial mining in Nyanga and the Penhalonga area:

> *The Nyanga districts of the Eastern Highlands of Zimbabwe between the Makaha and Penhalonga gold belts are not known for the occurrence of gold. Paradoxically, and supported by recent discoveries of primary sources, today's undercover gold panners are living testimony to the presence of gold in a landscape modified by hill slope terracing about which oral tradition is silent.*

Although tradition has it that the name of Mutare River comes from *utare* referring to the glittering gold that was found and mined by the locals. There has been however little documentation of gold mining in the area before colonialism.

4.1.2 Gold Mining in Penhalonga during the Colonial Period

During the colonial period, gold mining in the Penhalonga and surrounding area was associated with the two earliest mines to be established in the area, Penhalonga and Rezende Mines. These are the two mines, which have been changing hands from as long ago as 1895 when Penhalonga Mine was opened to the changes still taking place even after Independence.

In 1888 a British mining engineer, James Henry Jeffreys laid out the earliest two claims in the Penhalonga area, only to learn that the area was part of Manica Province in Portuguese Mozambique. Jeffreys therefore decided to name the mining claims after the officials from the Comphanhia de Moçambique, the company that controlled trade in Manica Province and other parts of Mozambique. The first claim was named Penhalonga after Count Penhalonga, chairperson of the trading Company and the second was named Rezende Mine after Baron de Rezende, the Company's Director of Operation.

With Cecil Rhodes having been granted a Charter in 1889 which gave the BSAC powers to rule, police and make treaties and concessions from the Limpopo to the great lakes of Central Africa, the claim in Penhalonga soon changed hands. The area was annexed by Cecil Rhodes' "Pioneer Column" in 1890. The BSAC representatives for the region (Archibald Ross Colquhoun and Frederick Courteney Selous) got a concession from Jeffreys in September 1890 effectively taking control of the mining claims.

The acquisition of the mines by the BSAC did not consider the local communities as would be beneficiaries of the gold mining since the Mashonaland Mining Regulation Number 1 of 1890 made it clear that gold mining was the privy of the settlers only. Unfortunately only grey literature is easily available on the lives of the local communities. Information on how the workers lived and on the socio-economic conditions of the local communities in the Penhalonga area has not been documented. It is however known that there was importation of foreign labour mostly from Malawi during the early days of the mines. This has had socio-cultural ramifications, which are felt even up to today as will be discussed in the section on 'Socio-economic Impacts of Gold mining in Penhalonga.'

Similarly information on the mining itself is scant. There are no production records and reports on mining operations. Most literature that is easily available from early times of the mines is geological information with geologist and the like describing the ore bodies and the gold embedded in them. For example, Maclaren (1908:434) stated that the Penhalonga ore body "varies in width from 25 to 50 feet, of which some 8 to 20 feet may be economically worked. It is made up of a series of quartz lenticles occupying a zone of crushing in soft chloritic schists of the Swaziland Series. In the oxidized portion of the lode crocoisite (sic: crocoite) (chromate of lead) was abundant. In depth this mineral gave place to galena, with which blende, pyrite and chalcopyrite are associated."

There seems to have been pessimism on the profitability of gold mining in the area resulting in many geological surveys. However, some of the statements from geologists and engineers were prophetic about gold mining in Penhalonga that it will one day be on a big profitable scale. Curle (1902) reports that a mining engineer reported on gold mining in Penhalonga as follows:

> *The notable mine in this part of Rhodesia is Penhalonga. It is a strong lode, nine feet wide, lying vertically in a mountain, and opened and driven on by a number of adits. It is of low value, but the facilities for cheap work are unusual. There is water power to drive a big mill, good timber, and an abundant labour supply. The mine is near a railway, and the climate is healthy. The one drawback is the low value of the ore, but I believe the Penhalonga will some day be worked on a big scale and at a profit."*

The BSAC was confident that Penhalonga had a future and that it was going to be a success story The 1903 by J. F. Jones, the Joint Manager and Secretary of the BSAC is an example of the optimism that the BSAC had:

> *In Mutare district over 12,500 feet of work has been accomplished at the Penhalonga Mine, where upwards of 200,000 of ore have been opened up. The average width of the reef is reported to be over 8 feet with an assay value of not less than 8 dwts., and as it is possible to work the mine by means of adit levels to a depth of 150 feet below the present third level, working costs will be exceptionally low, while water power is available to drive the 40-stamp mill which it is intended to erect in the first instance. The construction of a branch line of railway from Umtali to the mine is now under consideration.* (Jones, 1903:17).

It is clear from the information that is available, as shown by the quotation that the early miners were not interested in the environment or the welfare of the workers. The early miners were more concerned with how the gold occurred geologically, the easy with which it can be mined, the abundance of water and availability of labour.

Not much has been written on gold mining at Penhalonga from the early 1900s up to the Second World War with reports simply pointing out that most operations before World War II were on a very small scale but picked up when Lonrho took over operations at Redwing. Information on mining activities by Lonrho and other operators in the Penhalonga area during UDI is unavailable. This is expected since the big brains behind Lonrho operations the Zimbabwe had connections with loyalty and it would have been very embarrassing for the British government if sanction busting by Lonhro became public knowledge. It is only after Independence that a lot has been and is being written about gold mining in Penhalonga.

4.1.3 Post-Independence Gold Mining in Penhalonga

(a) Redwing Mine – Metalon Gold

Not much has been said about gold mining in Penhalonga in the first few decades of Independence. In the early 2000s the only issue that drew people's attention to traditional gold mining in Penhalonga was the takeover of Redwing Mine by Metallon Gold, a private company, which took over Independence Mines from Lonmin in 2002 and Redwing Mine in Penhalonga was one of the mines that belonged to Lonmin. For the takeover to have the blessing of the government Metallon Gold had to partner with a local company. At first it appeared there was no problem with these arrangements, but it soon turned out that Metallon Gold might not have been negotiating in good faith. The company had agreed to partner with Stanmarker Mining as part of the empowerment drive but at the end Stanmarker Mining was sidelined and Metallon Gold acquired Independence Mines directly. Despite this, it was not possible to completely ignore the Zimbabwean partner and in order to bring in a Zimbabwean partner 30% stake was sold to

Manyame Corporation. Unfortunately the deal did not go well ending up in lawsuits against each other. Although Metallon Gold agreed to relinquish the 30% stake to the Zimbabwean partner, it stopped its expansion programme of Zimbabwean activities. These had been projected at tripling gold output over a five year period, and involving an investment of upward of USD100 million.

Even after Independence the issue of local communities' involvement in gold mining remains unresolved. Metallon Gold, a foreign South African company took over Redwing and in the spirit of indigenisation a 30% stake was supposed to be sold to a local company. It was not said that the shares should be sold to the local community or local community organisation but to a large company with the capital base to acquire the shares. It is unfortunate that this situation is allowed by the piece of legislation that controls mining in Zimbabwe.

Despite the fact that officially there is no active mining at Redwing Mine, there has been speculation concerning employees who are still at the mine including those resident in Mutare who are ferried to and from work on a daily basis. The fact that people do not know what is happening shows the extent to which gold mining has remained, from the colonial period to the post-Independence period a secret activity with only those involved knowing what is happening. Otherwise if one is outside the gold mining business, the information that one gets is fragmentary.

Although Metallon Gold claims that there are no operations at the mine since mining stopped with the flooding of the mines, the research revealed that there is a lot of activity based on reworking the many mine dumps (Plates 1 and 2) using improved technology for extracting the gold. It is now common practice to rework the mine dumps since traditional methods of gold extraction were very inefficient with the popular stump mill recovering only 30% of the gold in the ore. The new methods that include the placer method of extraction and the use of cyanide to recover the gold have a higher recovery rate.

***Plate 1**: New (light coloured area to the right) and old (light coloured area in the left-hand corner) dump sites at Redwing Mine*

This has given Redwing an opportunity to produce even more gold at reduced cost since the ore is already available and it has crushed. There is also reduced labour and energy cost. Similar to what happened during the colonial period environmental issues, workers welfare (the majority were

made redundant) and social responsibility to the local communities are completely being disregarded. What is worrying is whether there is any remittance to the government since the miner is said to be closed? Whilst the government might believe that there is no gold production taking place, in reality there is even bigger production because of the advanced extraction technology. Unfortunately mine management could not be drawn to address this issue raising suspicion that gold is being smuggled out of the country.

During interviews with members of the community in Penhalonga Township, they were of the opinion that the mine was changing hands. However attempts to get confirmation from management were fruitless apart from being told that the company had a new manager who at that time knew very little about the history of Redwing. It was further said that it would not be possible to get any official statement since most of the senior staff had been reassigned, most of them to Arcturus Mine in Mashonaland East.

Plate 2: *An Old Mine Dump being reworked at Redwing Mine Penhalonga*

(b) DTZ-OZGEO

The second large-scale company mining gold at Penhalonga is a partnership between the Development Trust of Zimbabwe (DTZ) and a Russia registered company called OZGEO. DTZ was set up as an initiative of the Vice President Dr. Joshua Nkomo to ensure the active participation of Zimbabweans in development projects and the management of their natural resources. The Trust was founded in June 1989 as one of the projects that leaders of ZANU-PF and PF-ZAPU agreed would be launched to improve the economy of Matebeleland, which hitherto had not featured much in terms of development projects. The Trust Deed indicates that the objective for which the company was established was "to promote the interests, wellbeing, education, and experience of all Zimbabweans". The agreement between the two leaders was that the profits from the Trust's projects would be used in development projects in Matebeleland to offset low government investment in the area. Apart from mining DTZ has been involved in a range of projects that include cattle ranching, timber projects, and tourism business.

The political base of DTZ has played a key role in the growth of the Trust's asset base and it also explains the development of the gold mining project in Penhalonga in partnership with OZGEO (Pvt) Ltd, a Harare based subsidiary of a Russian state-owned company – All Russian Economic Association on Geological Prospecting (Zarubeyhgeogica) to form DTZ-OZGEO.

Apart from providing the financial resources OZGEO has skills in using satellite technology to locate mineral deposits but partnership with DTZ was necessary as this facilitated the acquisition of exploration licenses. In 1995 the company acquired Exclusive Prospecting Orders for gold, diamonds and platinum for a big area covering Chipinge, Masvingo, Mwenezi, West Nicholson, and the Victoria Falls area. The company is currently carrying out mining operations along Mutare River in Penhalonga and in Chimanimani.

The partnership of DTZ and OZGEO meets the requirements of the Indigenisation and Economic Empowerment Act that all foreign companies that intend establishing business in Zimbabwe should partner with a Zimbabwean company. Unfortunately however it seems the partnership falls short of black empowerment since very few Zimbabweans are involved and there have been very few benefits to the local community. The mining operations are shrouded in secrecy and there is very little involvement of the local members of the community in the mining activities except providing labour (mostly manual labour).

Very little is known relating to the processing of the gold, which is said to be done by the Russian counterparts only. Any attempts to get information are met with mild but very effective resistance. The information that one gets is the same as the information that would have been given to the news media, which in most cases would not be adequate information. For example, during a media tour on June 24, 2011 DTZ-OZGEO co-director could not give information on production quantities leaving observers speculating that the failure to give this information was because there is illegal trading in the gold.

Speculation on production varies widely from 4 kilograms per days to as much as 8 kilograms per day. The Herald on 14th October 2011 suggested much lower levels of production of about 2.5 kilograms per day so that the company produces slightly less than one tonne per year.

The alluvial mining method is the most environmentally destructive method. Apart from worrying about the environmental damage local community members who had etched a living out of small-scale gold mining have been put out of business by DTZ-OZGEO. The company has taken over mining claims of small-scale miners along the Mutare River. The small-scale miner had been informed that they are not allowed to mine within 30 metres of the river. DTZ-OZGEO was however allowed not only to mine within 30 metres of the river but to mine in the river itself. Members of the community are not happy with this differential application of the law.

(c) Artisanal and Small-scale Miners

There has been in recent years a proliferation of small-scale miners in the Penhalonga area attracted by the shallow depth of the ore. With government's encouragement to have their activities registered, a large number of the small-scale miners have registered claims. Unfortunately however, there is no consolidated information on the number of small-scale miners that are operating in the area since some are not registered. These claim that they cannot afford the license fees. The Rural District Council indicated that they are aware of a large number of small-scale mines having been opened up. However, the Council does not have details of how many and the quantities of gold they are producing. The council feels that it is being prejudiced of revenue.

The small-scale miners complained of low returns because of two main factors. To begin with, there are no mills in the Penhalonga area. The nearest mills are located almost 30 kilometres away at Odzi and they have to transport their ore there which is very expensive. The second problem is that the stump mills that they use are very inefficient as the miners only get 30% of the gold in the ore. The rest remains behind and it is extracted by more efficient extraction methods by the millers. During the interviews, the small-scale miners complained that they are getting very little from their labours since they get 15 to 20 grams only per two tonne load of ore. In many cases the income is far less than the labour cost, cost of transporting the ore and cost of processing. Small-scale miners explained that in this regard the panners in Mutare River are better off because they do not need a capital investment.

4.2 Environmental Impact of Gold Mining in Penhalonga

4.2.1 Environmental Impact Overview

Gold mining in Penhalonga represents all methods of gold extraction from deep underground mining, to small-scale mining with mines only a few metres deep, through large-scale alluvial mining and the most infamous gold panning. The area therefore is affected by the environmental impacts of each of these mining methods. It is a fact that whichever mining method, gold mining has environmental impacts that one needs to be always aware of. What might differ is the extent of the impact from one method to another. In a rapid appraisal study of community members perception of environmental impacts it was clear that, as was expected the impacts that were said to be important were those that were visible and those with immediate impact. Other impacts that needed laboratory analysis to be identified and those with delayed effects were said to be not that important. People were more concerned with issues that had immediate and dramatic impact, which were visible to everyone. The impacts that were emphasised therefore were as follows:

1. Water resources degradation
2. Loss of biodiversity with emphasis on flora
3. Dust pollution
4. Effects of small-scale gold mining

Issues related to the exact nature of water resources degradation that would involve laboratory analysis of water samples drew little attention; issues related to the effects of more than a century of gold mining at Redwing were not of interest to most people except those who had lost employment because of the closure of underground mining. Similarly issues of groundwater depletion and changes in soil properties only became of interest when these possible environmental impacts were mentioned.

4.2.2 Water Resources Degradation

Water resources degradation is perhaps the most talked about form of environmental impact of gold mining in the Penhalonga area. Discussions have centred on the alluvial mining method by DTZ-OZGEO and the status of the Mutare River. The company is mining gold along the Mutare River in Penhalonga and considerable distances along the river have been replaced by deep excavations and large water impoundments where water is pumped into out of the area of interest.

Plate 3 gives an overview of the areal extent of water resources disturbances. Plate 4 is a close look at the impoundments asking the question of the role they play in local hydrology and the water resources of the Mutare River basin. It is clear that the Mutare River has been disturbed for a considerable distance with no sign of the activity stopping as mining continues to progress

eastwards. Mine officials however have indicated that their Environmental Impact Assessment plan includes rehabilitation of the land. They pointed out at the rehabilitation that has taken place in the area they started mining (Plate 3a).

Despite the much criticised disturbance of the Mutare River hydrology it seems the concern is from people outside the Penhalonga community. There is divergent local thinking on the issue since the interpretation the local community took of water resources degradation relates to how their water uses were affected by the mining developments. In old Tsvingwe, situated far away from the Mutare River and with the Tsambe River nearby, they showed complacence on the effects of the mining activities on the water resources. Responses from groups that were interviewed in the old part of Tsvingwe Township indicated a greater concern over the destruction of the reeds and water turbidity in the Mutare River than over water resources degradation.

In the new sections of Tsvingwe however, residents were more conscientious of the effects of mining on water resources. Whilst the large-scale mining companies could be blamed for water resources degradation members of the community were concerned that the degradation caused by small-scale miners was rarely talked about. However, the truth is small-scale miners cause very high water resources degradation (Plate 5). There are many gold panners working in the Mutare River, and some of them working in DTZ-OZGEO area and there effects on water resources leaves a lot to be desired.

***Plate 3a**: A Satellite Photograph showing the area that has been affected by DTZ-OZGEO Gold Mining Operations in Penhalonga in its first phase of operation. Of note are the large impoundments that are now used as sources for water for irrigation by the mine owners and the large area that is now devoid of vegetation.*

The group of panners raised an interesting point. DTZ-OZGEO is licensed to mine to a depth of 20 metres along the river bed. Any depth beyond this would not be regarded as alluvial gold

mining. The panners wanted to know whether there were two pieces of legislation, one applicable to them and the other to the large-scale miners such as DTZ-OZGEO. According to the Environmental Management Act no one is allowed to mine within 30 metres of a water course (and hence gold panning in rivers being illegal) but DTZ-OZGEO was allowed to extract gold not only from the river bed but also from an extensive area away from the river bed (Plate 6).

Plate 3b: *A middle section also showing water impoundments, loss of river course and bare ground that needs rehabilitation. Mining has stopped in this area.*

Plate 3c: *A Satellite photograph of the area that is currently being worked. Note that the river course has been completely destroyed (top right-hand corner) and the sizes of water impoundments*

Plate 4: *A Current water impoundment: underneath the body of water is the course of the Mutare River*

Plate 5: *Water Resources Degradation by Gold Panners in Mutare River*

Issues that came up after much probing during the interviews were the effect of alluvial gold mining on underground water and whether operations at Redwing have had at any point in time an effect on water resources. Most respondents were of the opinion that there was no correlation between underground water and the gold mining. Only a few acknowledged the dangers of the ground water reserves being quickly emptied. Similarly there was no agreement on whether or

not mining operation in the form of reworking the mine dumps had an effect on water resources. The majority of respondents in the groups that were interviewed indicated that the operations did not have an effect. The few pointed out that the chemical treatment might have an effect if the chemicals find their way into Mutare River. These observations support the claim that members of the community were more aware of visible impacts and impacts that had an immediate and often dramatic result. The creeping impact such as falling groundwater reserves and those related to the chemical composition of the water were not highlighted.

Plate 6: *DTZ-OZGEO is not extracting gold from the river bed only, but also from an extensive area away from the river bed destroying the whole river valley.*

4.2.3 Morphological Changes and Loss of Aesthetic Value

In all the four areas of Penhalonga were interviews were carried out, people complained about the heaps of earth that were created by the alluvial mining. Community members are also worried about the huge heaps of overburden (Plate 7) that are not only unsightly, but also pose a threat to water resources downstream in case of heavy rains and to life. The heaps are made up of loose material and they are a potential source of sediment that will silt up Mutare River and the rivers into which it is tributary. Related to the overburden heaps are the impoundments that have been created to hold the water back before it is released into the Mutare River. Respondents fill that they have potential for a disaster as the embankments might rapture if there is heavy rains upstream resulting in flooding downstream. It is interesting to note that the mine management is using the old impoundments for fish farming and for irrigation.

Whilst respondents have pointed out the unsightly nature of the heap of earth that alluvial gold mining created, there was no mention of the mine dumps at Redwing. A majority of those who participated in the group discussions were not aware of the unnaturalness of the mine dumps. There are two reasons for this: (i) most of the residents in Penhalonga are relatively new comers to the mine dumps and one has not been created in recent years, and (ii) the dumps are very old so

that some are now colonised by vegetation and there look like part of the natural landscape. As shown in Plate 1, the mine dumps at Redwing have given the area a completely different morphology, which has affected the local ecological processes.

Plate 7: *Overburden heap in the background of an impoundment of water. Local communities fear that these can cause disaster downstream if rainfall is heavy.*

4.2.4 Biodiversity and Dust Pollution

Because settlements are township settlement types, most people who were involved in group discussions were not worried about loss of bio-diversity. A few old people in the old section of Tsvingwe mentioned the loss of fishing sites but a large number of women in all the nine group that were involved in discussions bemoaned the loss of reeds in the Mutare River. They reported that the reeds played an important economic role to many men and women, some coming from long distances away from Penhalonga to collect the reeds. This is the raw material that is used in basket and mat making. Land preparation for alluvial gold mining entails the complete removal of all surface material that is not connected to the extraction of the gold. It therefore means complete removal of the reeds (Plate 8). DTZ-OZGEO talks about restoration of the land after they have finished mining, but members of the community are asking whether it would be possible to introduce the reeds in this part of the river. It was pointed out that the first section that was mined and is said to have been rehabilitated has been fallow for three or four years, but there is no sign of the reed colonising again.

The issue of reeds is seems important to the local community since it is also pointed out that the destruction of the reeds has something to do with the decreased bird live. The birds' habitat is said to have been the Mutare River with its thick vegetation cover of reeds. The removal of the reeds, together with the noise and dust pollution has driven away the birds.

Although members of the community appear not to be worried about loss of bio-diversity, they are very conscious of one product of mining that can lead to loss in bio-diversity, which is dust pollution. Nearly every member of the community in Penhalonga is aware of the dust pollution

which is caused by the heavy machinery used in the mining (Plate 9). An analysis of the situation however shows that in the townships and areas away from the mining, dust pollution is the result of vehicular traffic. The roads in all sections of Tsvingwe are not tarred and with the soil type (brown earth) any vehicular movement raises a lot of dust. Dust pollution was said to be one of the biggest impact of mining in the Penhalonga area. Some members of community during discussion pointed out the health hazards of dust pollution but the majority was concerned with the loss of aesthetic beauty of the area. All vegetation and other surfaces would be having a brownish colour. Some complained that it was a worst of time to paint one's house with a light coloured paint as this will soon turn into a brownish or reddish colour. Incidentally, whilst during the dry season the menace on the roads comes from the dust; during the wet season it is the puddles on the road and the effects of heavy vehicles in making the roads sleeper. Driving a small car is almost impossible.

Plate 8: *An area being developed showing the reeds that will be destroyed and the overburden in the background and along the fence*

***Plate 9**: Heavy machinery that is used in gold mining is said to cause dust pollution.*

4.2.5 DTZ-OZGEO Rehabilitation of Mining Sites

DTZ-OZGEO in their Environmental Impact Assessment report indicated that they were going to rehabilitate the mining area before abandoning it. One central issue which people who participated in group discussion were concerned with in relation to rehabilitation was the restoration of the Mutare River. People were felt that a degree of rehabilitation would have been done if the flow of Mutare River is restored. A majority of community members in all the nine groups that participated in the discussion felt that it was not possible to do this. They cite the failure of rehabilitation works that were done on the first sites of DTZ-OZGEO mining operations.

The rehabilitation that DTZ-OZGEO undertook received great publicity and citing the company as perhaps the only environmentally conscious mining company in the country. The Herald of the 13th October 2011 reports that the Environmental Management Agency (EMA) had commented DTZ-OZGEO for using environmentally friendly mining methods and rehabilitating over 60 hectares of land it mined in the past four years. The Herald of 8th May 2010 had also carried favourable comments about DTZ-OZGEO mining, pointing out that people were happy with the mining and that people are now farming on the reclaimed land. The Standard also carried an article claiming that the miners and mining methods had been applauded by Chief Mutasa **of Penhalonga**. However the Daily News of 5th February 2012 carries a story that the mining firms had upset Manicaland Communities: "Communities affected by mining operations in Manicaland province have confronted the Environmental Management Agency (EMA) for failing to adequately police environmental degradation caused by mining firms".

Community members in both Penhalonga and Tsvingwe residential areas expressed dissatisfaction with the rehabilitation works, pointing out that the rehabilitation works were a potential hazard. The main worry was the fact that the soil material that was piled back was loose

and could be washed away by heavy rains should these occur. The second fear was that the loose sediment posed a threat to would be "gold scavengers" following behind what is believed to have been left behind by DTZ-OZGEO. Furthermore, the rehabilitation did not take into account the fact that for the rehabilitated land, the soil that formed the top soil should be on top rather than being mixed with the subsoil.

4.2.6 Perception of Environmental Impacts of Shaft Mining at Redwing Mine

There was much comment on the alluvial mining by DTZ-OZGEO partly because it is a new company using new mining technology and partly because the environmental impacts are visible. Changes happening to the environment are seen by everyone and therefore anyone can critique the changes brought about by the mining venture. From the mining technology and the historical development of Redwing Mine the environmental impacts might not be that apparent. It is because of this that community members indicated that they did not think Redwing Mine has caused an environmental damage. The mine has stopped underground operations and the company is simply reworking the old mine dumps.

It is a pity that members of the community are not aware of the wider environmental implication of gold mining or any mining for that matter. The mine dumps that are found at Redwing Mine are not viewed as features of concern since they were made a long time ago. However, although Redwing has suspended underground mining it is involved in reworking the mine dumps. What then becomes of importance is the method of beneficiation that is being used. At the same time, it should be realised that the mine dumps are artificial features with a different chemical composition to the surrounding. Members of the community should therefore be aware of such issues and this requires environmental education at the local level.

It was pointed out above that one of the biggest environmental problems with mine dumps is the formation of sulphuric acid especially if the dump contains sulphide. In a report by EMA at a Workshop that discussed community participation in resource governance, it was reported that water tests had indicated greater degree of contamination for water upstream of DTZ-OZGEO than the water downstream. The reason for this could be because of the chemical recations in the mine dumps. However, as far as communities were concerned, their failure to think of the mine dumps as features with an adverse environmental impact is due to the fact that the majority of those living in Penhalonga are newcomers who have not seen anything else other than the mine dump-riddled landscape. As one respondent commented, "This land appears natural. What can bring all that soil from underground?"

4.2.7 Environmental Impacts of Small-scale Gold Mining and Gold Panning

Similar to small-scale gold mining and gold panning elsewhere in the country, the activities in the Penhalonga area and in the Mutare River and its tributaries have received a lot of criticism from policy implementers and environmentalist. For example, it is reported in The Herald of 14th October 2011 that whilst DTZ-OZGEO can be commended for doing a good job in rehabilitating the area they had mined small-scale miners can be blamed for causing massive environmental degradation. Members of the community are divided on the effects of small-scale gold mining and panning on the environment. The activities of small-scale miners and gold panners were not considered as having negative environmental impacts since they are carried out in pursuit of livelihood options. The group of panners who participated in the discussions on environmental impacts of their activities found it strange that 'when it is being on a small scale, it is environmental degradation and when it is done on a grant scale as is being done by DTZ-OZGEO then it is not environmental degradation. Small-scale miners in particular were dismayed with the

14th October 2011 Herald report that praised DTZ-OZGEO for good mining practices but blaming the small-scale miner and panner for environmental degradation using mercury in the gold recovery. The miners pointed out that it was misrepresentation since millers were found some 20 to 30 kilometres away at Odzi and if there was any use of mercury, this is where it is used and not in Penhalonga.

Women, especially those in the old section of Tsvingwe felt that despite their protestations, small-scale miners and panners were causing a lot of environmental degradation. The scale of small-scale mining has far exceeded acceptable levels since large areas on slopes of hills around Penhalonga are now scarred with trenches and deep depressions. One has to be very careful when looking for firewood in these areas as one risks falling into these trenches. Although the slopes of mountains surrounding Penhalonga used to be well-wooded, they are now bare because of the wide-spread small-scale mining (Plate 10, 11 and 12).

***Plate 10**: Extent of environmental damage due to small-scale gold mining; light coloured areas show locations where there is mining while slopes have been burnt to facilitate prospecting*

***Plate 11**: A hill slope showing the extent of small-scale mining to the north of Penhalonga*

Plate 12*: Huge trenches made by small-scale miners on hills to the east of Penhalonga*

Apart from degrading the environment through mining methods, small-scale miners are also blamed for other activities that cause environmental degradation. In discussion groups an issue that was discussed at length was the issue of clearing the land by fire before going in to prospect for gold. Some members of the discussion groups were of the opinion that most of the loss in vegetation was through veld fires purposefully started in order to clear prospecting land.

Plate 13: *A veld fire during field work that was said to have caused by small -scale miners*

The issue of gold panners is also a contentious issue amongst members of the community as some supports the activity while others point out that the gold panners are no better than DTZ-OZGEO. Despite the fact that this might be the only means of subsistence for the gold panners, their action is considered harmful to the river ecosystem. Those deriving a livelihood from gold panning have defended the activity pointing out that all they do is working the sediments in the river and not diverting the river as is the case with DTZ-OZGEO. From such arguments, it is clear that there is a lot of animosity between members of the community and DTZ-OZGEO, which if not carefully handled might result in confrontation. There is a strong feeling amongst the gold panners that the company, because of having the capital and government connections took away their source of livelihood.

4.2.8 Other Environmental Considerations

Unfortunately members of the community seem not aware of any other environmental issues from gold mining apart from those with visible impact and those that affect their lives directly. For this reason, the issues of chemical contamination of water and soil were not important. However these are issues that should be examined in the laboratory. The fact that there are no longer any fish in Mutare River was attributed to water turbidity rather than possible chemical pollution of the water. Furthermore most members of the community are of the opinion that since Redwing Mine has stopped underground operations, its contribution to environmental degradation is negligible. Whilst it might be possible that the current activity of reworking the mine dumps might not contribute as much to environmental damage as active mining, there is a possibility that the century or so of mining activities can continue to damage the environment for some time. This is because of the possibility of acid drainage from the mine dumps. It was pointed out above that mine dumps are a source of sulphuric acid especially when the dumps contain sulphide. Perhaps this is the reason why EMA at a Workshop by CRD on "Management of Natural Resources: A Community-based Approach" on 31st January 2012 reported that water tests had revealed water with less chemical contamination downstream of DTZ-OZGEO than upstream, which is downstream of Redwing Mine. The chemical contamination might be the result of acid drainage. At the same time one would expect little or no chemical contamination from DTZ-OZGEO since it uses the placer method of gold extraction that does not require chemicals such as mercury and cyanide.

It was noted during the surveys that views on environmental impact depend on social class with the less educated emphasising livelihood issues and loss of area from which to obtain resources or to produce crops and the more educated and the affluent emphasising health issues and issues such as those pertaining to aesthetic beauty. The Rural District Council argues that it was not involved in the issuing of the mining licences and therefore it cannot interfere. EMA has maintained its stance, similar to what was said at the 31st January 2012 Workshop on "Natural Resource Management: A Community-based Approach," that they can only act within the legal framework established by the Environmental Management Act and also the Mines and Minerals Act, two legal instruments which are sometimes in conflict.

If one compared the situation in Penhalonga and what is happening elsewhere throughout the world, one would notice that the environmental issues are similar to those confronting communities in developing countries. It seems where the mining interest is foreign, there is a tendency not to take into account environmental considerations and to neglect local communities apart from seeking labour from them. The Penhalonga situation is reminiscent of the Marlin Gold Mine, San Marcos, Guatemala which McBain-Haas and Bickel (2005) coined an abuse of human rights and destruction of the environment. The issue of groundwater drawdown has also been observed as a big environmental problem. The Environmental Law Alliance Worldwide (2010) had this to say about groundwater drawdown:

> *"Groundwater drawdown and associated impacts to surface waters and nearby wetlands can be a serious concern in some areas. Impacts from groundwater drawdown may include reduction or elimination of surface water flows; degradation of surface water quality and beneficial uses; degradation of habitat (not only riparian zones, springs, and other wetland habitats, but also upland habitats such as greasewood as ground water levels decline below the deep root zone); reduced or eliminated production in domestic supply wells; water quality/quantity problems associated with discharge of the pumped ground water back into surface waters downstream from the dewatered area. The impacts could last for many decades. While dewatering is occurring, discharge of the pumped water, after appropriate treatment, can often be used to mitigate adverse effects on surface waters".*

Whilst the problems associated with big mines will continue to confront communities in the Penhalonga area, the environmental issues raised by small-scale miners and gold panners will continue. The United Nations Development Programme (2002) pointed out that although there have been many attempts to improve the economic and social status of small-scale and artisanal miners, this has met with little success. Very little has come out of the many meetings that have been held worldwide in order to minimise environmental damage from small-scale and artisanal mining. The main reason for this being that the increasing poverty is making environmental considerations take second place to livelihood issues.

4.3 Socio-Economic Impacts of Gold Mining in Penhalonga

4.3.1 Socio-economic Impacts – an Overview

Statistical analysis of responses to issues of social responsibility for companies mining gold in the Penhalonga area defeats any method of significance tests because of the unanimity of responses to issues of benefits and sharing of profits with the exception of some of the employees at the mining companies. Given the background of the development of gold mining in the country and the fact that little has changed in terms of the legal framework controlling gold mining, the

responses fit the general model – foreign control of large-scale mining with little or no benefit to the local communities. The legal framework in Zimbabwe as explained in Chapter Three does not make it an obligation for any company mining gold to assist in the socio-economic development of communities. Responses from members of the community were a reflection of the provisions of the mining legislation. Despite the lack of support from the legal framework, local community members were still willing to discuss their expectations in relation to socio-economic benefits. It should be pointed out that the Penhalonga experience seem to be what is prevailing throughout Zimbabwe as all gold production is controlled by the same piece of legislation. There is therefore need to examine the issue at a bigger scale than the local scale such as the Penhalonga area.

4.3.2 Economic Impacts

All members of the community who participated in discussions on the economic impacts of gold mining shared the same view that the arrival of DTZ-OZGEO had a negative economic impact. The people in the Penhalonga area have a long history in gold extraction dating back from pre-colonial times. Their expertise in gold mining was affected by the colonial legislation of gold mining and possession but after Independence there was a proliferation of small-scale miners including gold panners in the Mutare River. For a large number of people, gold panning was the main source of livelihood but in recent years this was complimented by the several small-scale claims that have been licensed. However, small-scale mining entail ore extraction and processing which most panners cannot afford. Gold mining activities in Penhalonga are seen as having had a negative effect on gold panners who relied on Mutare River, which now is "owned" by DTZ-OZGEO.

The discussions with small-scale miners and panners was filled with so much emotion that one wonders whether the situation in Penhalonga should be allowed to continue. DTZ-OZGEO is accused of robbing some households of their income, making some panners so desperate that they have now resorting to crime (stealing) for survival.

The loss of source of livelihood has caused a fall in households' income, a situation that is exacerbated by the fact that the mining companies do not favour to employ the locals. Starting with Redwing Mine when it was called Independence Mine, the majority of employees were not locals but Malawi nationals. It is claimed that the majority of DTZ-OZGEO employees are from outside Mutasa Rural District. This is an important issue with some questioning the wisdom of economic empowerment if the empowerment is not to members of the local communities. It is in this spirit that questions were asked why a Bulawayo/Matebeleland company partnered with a Russian company and not with a company in Mutasa District or at least in Manicaland Province.

Although the general feeling was that local community members were not benefiting as they should from the gold mining, participants in old Tsvingwe wanted a distinction between benefits to indigenous people and benefits to local communities. It is possible to have some indigenous people benefit from the gold mining but the local communities might not be benefiting anything. It was a strong community feeling that all types on miners did not take into account local community needs. The small-scale miners and gold panners were more interested in their families than the community in which they live while the large-scale miners were interested in profit taking and pleasing the shareholders.

The small-scale miners and gold panners were of the opinion that they should be exempt from social responsibility issues since their gold mining was a livelihood and life-sustenance issue. Because of ignorance of what is going on, some members of community felt that Redwing Mine should be excused from social responsibility since there was no active mining. Some however felt

that the company should pay their social responsibility in retrospect. Former employees of Redwing who were made redundant on the pretext that the mine had flooded and therefore there was not going to be any mining expressed the need for Redwing to be involved in their welfare.

Despite the fact that the mining legislation in Zimbabwe does not carter for social responsibility, members of the community were expectant that DTZ-OZGEO was going to work with the communities. The expectation arise from, (i) it is a new company and with all the talk about indigenisation and black empowerment, the company should have moved in the that direction, (ii) the license is unique in the sense that the company was allowed to mine where others, with restrictions, derived their livelihood, and (iii) the mining operation have caused visible environmental degradation and it is hoped that the companies one way or the other for the environmental degradation.

Members of the community agreed with Mutasa Rural District Council that the main issue is not individual benefits from the company but community benefit where it is seen a large number of community members will benefit. For example, issues that the company should be looking at are, for example, infrastructure development such as road construction and maintenance. The current state of the roads is that during the dry season they are a source of unbearable dust emissions from the mine's heavy vehicles but during the wet season the roads become impassable because the roads become very slippery. It is almost impossible to cross the Tsambe River from the old sections of Tsvingwe Township to the new section close to Old West Mine.

Whilst the community feels DTZ-OZGEO is not doing enough to meet its social responsibility obligations, the company claims that it is doing a lot and this is supported by the local news media. For example, the Newsday of 16th November 2011 carried an article reporting that DTZ-OZGEO was ploughing back to the community, providing a list of activities that the company was involved in that had direct benefit to the community:

- Approximately 40 hectares of land had been rehabilitated and were now being used for agricultural production
- The company had renovated several schools around Penhalonga and was supplying learning materials and school fees to needy children
- The company had also given financial support to Robert Mugabe Orphanage in Penhalonga

Other activities of benefit to the community that the company was involved in included building of houses for *long-serving* workers (to date 15 houses had been constructed); supplying of medical kits and other materials to Old Mutare Hospital; providing ambulance services to community members who wish to be ferried to hospital.

During the Rapid Appraisal, it was established that DTZ-OZGEO had come to the rescue of early closure of St. Augustine's Secondary School because of many challenges including the school having run out food for the students. DTZ-OZGEO is reported to have bought the food that was required for the school does not close early. It was during the Rapid Appraisal that DTZ-OZGEO was observed participating in social responsibility activities, which were under normal circumstances were police and fire brigade responsibility. DTZ-OZGEO came to assist in a road accident that involved an overturned trunk that blocked the Mutare – Stapleford Road just after the Imbeza Forest turnoff (Plates 14a and b).

A few participants in the discussion groups indicated that they appreciate these activities as part of the company's social responsibility, but the majority consider these actions as sporadic and

only small gestures to what can be considered an act of social responsibility taking into account the issue of "Permanent Sovereignty over Natural Resources".

Other activities which the company did were: (i) levelling off of the football field at Tsvingwe High School, (ii) construction of a classroom block at Tsvingwe High School, (iii) repainting of classroom blocks at Tsvingwe Primary School. Both schools appreciate what the company did but officials who were interviewed feel that this is far too small a contribution to community development compared with the profits that they are making. Agreeing with the Rural District Council and members of the community, some education officials feel that the social role that DTZ-OZGEO is playing in society is small and negligible. Perhaps it is the individuals who would have been helped who appreciate these small gestures.

***Plate 14a and b**: DTZ-OZGEO assisting in a road accident*

(a)

(b)

4.3.3 Social Impacts

The social impacts of gold mining in all cases are intertwined with the economic impacts, as there exists, a causal relationship. An issue that has received a lot of attention is the social implications of resettlement, which also has economic connotations for large-scale gold mining operations. In the Penhalonga area, it is fortunate that there was very little resettlement that took place from pre-colonial or post colonial times. Only agricultural land and other natural sources of livelihood such as areas from which people got fish were affected. It is seen that the alluvial mining by DTZ-OZGEO has deprived them of good agricultural land bearing in mind the rough terrain and limited area that is suitable for agriculture. Such area was found along the Mutare River but because of the mining, it is no longer accessible.

A social impact that is connected to individual rather than community economic benefits is prostitution and loose moral behaviour that has been ushered in by gold mining. This is connected to the effects of migrant workers on the local culture. It was pointed out above that a large number of the mine workers are not local. During the colonial era they were mostly not even Zimbabwean but migrant workers from Malawi.

Employees of the mining companies have a regular income and therefore they are better off than those (mostly locals) without a regular income. The relative affluence has created an opportunity for the proliferation of prostitution. This is aided by the fact that the migrant workers do not share the same culture as the locals and they use money from wages to get what they want. This might lead to the erosion of local culture. Married women in discussion groups were particularly incensed by the issue claiming that the majority of unmarried girls and women who have come to live in Penhalonga area are prostitutes. Prostitution in the Penhalonga area started as long ago as the 1950s at a time when there was massive immigration into the area by foreign mine workers. DTZ-OZGEO only reinforced what other foreign mining companies had already started creating social classes with the class that has the money "abusing" those without money.

Housewives for those who are employed at the mines also indicated an increase in prostitution. This was lead to breakdown in families as husbands join their foreign counterparts in participating in prostitution. Apart from the fear contracting HIV, housewives pointed out that husbands are spending most of the little income they are getting on prostitutes and beer. Some of the girls observed in bars, drinking beer and sharing cigarettes with miners were so young and one wonders why they were allowed to enter to begin with.

In relation to the small-scale miners and the gold panners it was found out that gold mining in Penhalonga area has created a class of people on their own who are not afraid of killing or dying. These gold producers are so violent that a good night out is when there would have been a fight wherever they would have been socialising. Housewives were particularly critical about the small-scale miners, pointing out that they are rude and dangerous.

It is generally agreed that gold mining has profound social impacts when the mine is operating such as prostitution, drunken fights, and cultural defeat. The closure of the mine also has far reaching socio-economic consequences. Some former Redwing Mine workers indicated that the closure of the mine had made them destitute as they did not have their own accommodation and they did not have a pension scheme that they could fall back on. Although some tended to blame the mine owners for not giving these provisions, the majority of the former mine workers who were interviewed were of the opinion that the mine workers should have organised themselves and requested for secure housing and income after closure of the mine. It was felt that employees should make sure that they are given permanent accommodation and that they are participating in some pension scheme of some sort. Incidentally, some of the houses that former Redwing Mine employees used to occupy are now housing DTZ-OZGEO employees.

There was intense debate over whether the growth of Tsvingwe Township, which is partly attributed to DTZ-OZGEO mining and the 400 plus workers is good or bad in terms of local community development. There were differences according to gender and/or gender and age. The youth (both males and females) was of the opinion that such growth was a positive development since Penhalonga might soon become an urban centre. Young married women however view the rapid growth as having a negative impact in the area because of increased prostitution and loose moral behaviour. The elderly deplore the growth, seeing this as the source of increased incidence of disease and death in the community and pointing out that it was becoming an urban centre but it lacked the urban amenities. Indeed the area does not have amenities that would make it an urban area.

4.4 Ownership of Gold Production

The doctrine of Permanent Sovereignty over resources attempted to address the issue of resource ownership and sharing of benefits from the extractive industries in relation to foreign companies and individual states. The Global Mining Initiative (GMI) of the Business Council on Sustainable Development has pointed out, among other things, the need to address issues of control and use of mineral wealth and viewing the need for this from the point of view of protecting and promoting human rights. Even the World Bank has realised that there is need to use the locally available resources for poverty reduction in those communities. These and similar initiatives seem to suggest that local communities should be the main beneficiaries of resources in their localities.

Unfortunately this does not apply to gold mining in Penhalonga where ownership of the mines, let alone the gold seems a closely guarded secret in the case of large-scale miners. In the case of gold panners and the small-scale miners, although the benefits accrue to the individual miner and his or her family, it is still questionable whether he or she owns the mine and the gold. Few members

of the community know who owns Redwing Mine and the role played by Metallon Gold at the mine. Few are aware of the ownership changes that have taken place since the 1950s.

The same applies to the ownership of DTZ-OZGEO. Community members were of the opinion that the mining company is owned by Russians but there is participation of some "unknown" Zimbabweans. This is the reason why they refer to the mine as "the Russian mine" and that the Russians are destroying our environment. A few members of the community believed that the mine was the "result of a bilateral agreement between the governments of Russia and Zimbabwe" but since they were not involved in the agreement, they do not know what sort of agreement this was.

Members of the community feel that as far as gold is concerned, it is either foreign owned or it is owned by the government. Even small-scale miners with licenses and the gold panners, they do not own the mines or the gold. A case in point was a small claim that was in the path of DTZ-OZGEO which was over run despite the fact that the "mine owner" had a license. It is further argued that no member of the community owns gold since no one can trade in gold freely.

It is interesting to note that Mutasa Rural District Council is not involved in the licensing of these mines. The MRDC was not involved the setting up of DTZ-OZGEO nor in the takeover negotiations of Redwing between Metallon Gold and some local business people. The MRDC is not informed of the licensing of the small-scale miners, which makes it difficult for the council to collect revenue from the miners or to enforce environmental standards.

5. Discussion and Way Forward

5.1 Discussion

Penhalonga offers a unique opportunity for examining both socio-economic and environmental impacts of gold mining in relations to how the locals are affected. The area possesses all forms of gold mining, from artisanal and small-scale mining, through large-scale alluvial mining to underground mining. Members of the community seem to share the same perceptions on the socio-economic and environmental impacts of the different forms of mining. Gold production in the area is a livelihood issue and therefore a very important aspect locally. There is an uneasy neighbourly existence between the large-scale producers, especially DTZ-OZGEO and the community in Penhalonga.People interviewed have a strong feeling that members of the community and not the company should be doing the alluvial mining. Indeed members of the community have all the right to complain since, before DTZ-OZGEO came, they were told that they should not mine for gold within 30 metres of the river, but DTZ-OZGEO has been allowed to mine in the river bed. Because of this, the course of the river has been permanently destroyed.

The differential application of the law is not the only reason why there is tension between the community and DTZ-OZGEO. Gold panners and small-scale miners feel that the company usurped their mining area from which they derived a source of livelihood. It is indeed true that a large number of households in Penhalonga were surviving on gold production. This is one of the reasons why the issue of environmental degradation by the small-scale miners was not popularised in comparison to the large-scale mining now taking place in Penhalonga.

Members of the community made heavy criticism of the environmental degradation that DTZ-OZGEO is causing but were silent on the environmental impacts of Redwing and also that of small-scale miners that is also quite visible. It seems the heavy criticism arises from the strained relation between DTZ-OZGEO and the community that i have already mentioned. Few members

of the community blamed Redwing Mine for causing negative environmental impacts. Since Redwing is involved in underground mining, it does not affect the livelihood source of artisanal and small-scale miners. Furthermore, there was in some cases genuine believe that there were no negative impacts at Redwing Mine. This is because the impacts of underground mining, apart from the mine dumps that are creeping with less drastic consequences.

The potential conflict between DTZ-OZGEO and the community can be avoided if the company was prepared to share its profits by ploughing some into development projects in the community. Members of the community are worried about the loss of their source of livelihood and the lack of alternatives. The company feels it is doing its share of social responsibility, but members of the community are saying "it's too little and of no consequence to development" of the Penhalonga area, let alone Mutasa Rural District and Zimbabwe as a whole.

The so-called social responsibility activities, which DTZ-OZGEO has lauded itself through the national media have been condemned instead of being applauded because it was only selected institutions and members of the community that benefitted rather than the community as a whole. Incidentally, one might ask how DTZ-OZGEO arrived at selecting the institutions or members of the community without going through the community structures. As long as the assistance is not people driven and for the benefit of the community as a whole, it is difficult to call this social responsibility and the strained relationship between the community and the large-scale miners will persist.

It is also an interesting issue to look at how the large-scale miner was granted a license to do exactly what the small-scale miner or individual was prevented from doing by the "law". The small-scale miner or gold panner was not allowed to exploit gold deposits within 30 metres of the river but DTZ-OZGEO was granted the license to mine in the river, in fact to change the course of the river in order to extract gold from the river. It is granted that gold panning or any mining activities close to the river have a negative effect on water resources but normally the impacts are felt after a long time of the mining activity but with large-scale mining the effects are immediate. One wonders whether there is any logic in the differential application of the law, forbidding the small-scale artisanal miner but granting license to a large-scale operator to do the same but at a larger and faster scale.

Permanent Sovereignty over Natural Resources looks at the relationship between a nation and its natural resources. If one looked at this relationship in terms of the mining legislation in Zimbabwe and what is happening at Penhalonga, one would argue that the spirit of the doctrine was being upheld in the country in terms of the Mines and Minerals Act 21:05 of 1961 although some prefer to call it of 1965. The Act states that all minerals are vested in the state through the President and one would assume that ownership under such a scenario would be the citizens of Zimbabwe who therefore are supposed to be the main beneficiaries of proceeds from mining production.

It is seen from the Penhalonga example that the main beneficiaries of gold production are not the local communities and the citizens of Zimbabwe. This is because gold production is controlled by foreign interests and these interests are protected by the current legislation controlling mining in the country. It should be borne in mind that the current legislation was crafted by the colonial regime in order to protect their colonial interests, which did not take into account the needs of local communities. The existing legislation on mining could be the most important reason for failure to equitably share profits from mining between the mining companies and the local communities. It is unfortunate that the current legislation does not carry any statement pointing towards community benefits from mining.

The issue of environmental degradation has been emphasised in most critiques of gold mining. Open-cast mining similar to what is happening in Penhalonga has been criticised for having the most devastating effects on the environment. People are asking questions as to how the Environmental Management Agency is allowing this to happen, disturbing the water resources through sediment release and the construction of impoundments that affect the natural flow of the river, destruction of the riverine ecosystem and destroying aesthetic beauty of the countryside, and not to mention destruction of habitats.

There are many issues to consider here which seem contradictory. As far as the miners are concerned, they are interested in the extraction of gold for which they have been granted a license. The license is issued by the Ministry of Mines without consultation it is said from other line ministries such as the Ministry of Environment and Tourism, which mandated with ensuring environmental protection through the Environmental Management Agency (EMA). The Environmental Management Act, 2002 (20:27) states that for any large-scale mining operations, it is mandatory that an environmental impact assessment (EIA) is carried out. The EIA should be approved by EMA, which should make sure that any mitigation measures suggested are carried out. Unfortunately however, it is not possible for EMA to ensure that the EIA's mitigation measures are implemented since in the issuance of the license, EMA's concerns would not have been taken into consideration. As a result it is difficult for EMA to challenge the activities of a company that another ministry would have given a go ahead. This is what happened at Penhalonga. The Ministry of Mines granted DTZ-OZGEO with a licence to carry out alluvial gold mining in the Mutare River. EMA cannot enforce any environmental regulations under such circumstances.

As far as environmental degradation is concerned, members of the community were more worried about the forms of degradation that were visible and were not aware of any other forms of environmental damage such as chemical water and soil pollution, effects of mining operations on the water table and the effects of mining aquatic life. These issues were not raised because members of the community were not aware of these forms of environmental degradation. This shows a lack of education on mining issues to the ordinary Zimbabwe citizen. Indeed the majority of Zimbabweans do not have a clue about any issue on mining including environmental degradation and civic rights to mineral resources.

There has been much talk on community or black empowerment and indigenisation but very little has been done to make communities be aware of their rights in relation to resources in their areas. This is one of the reasons why some have argued that the indigenisation programme in Zimbabwe is meant to enrich a few influential and already rich Zimbabwean and is not meant to benefit everybody. If there was real black empowerment, mining companies would not have behaved as independent institutions in the communities in which they are mining. This is what is happening at Penhalonga. The productive mines are controlled by foreign interests with the involvement of some Zimbabweans who are not from the local communities. The issuance of licenses to hundreds of local members of the community might be seen as one way of black empowerment and indigenising the gold mining industry. Unfortunately production is low in this sector because it's not mechanised to the extent that one cannot say that the gold production industry has been indigenised.

5.2 Recommendations

The Penhalonga situation seems to point at a number of issues that need looking into in order for equitable profit sharing. Both the gold producers and the communities seem unaware of the

doctrines of social responsibility and Permanent Sovereignty over Natural Resource (PSNR). The complaints from the local communities about not benefiting from the mining operation are due to the fact that members of the community are bitter about loss of gold as a source of livelihood rather than a resource right. For this reason, the mining companies do not feel obliged to play any part in the development of these communities while the communities do not know of a better approach to discuss the issue of social responsibility.

It is unfortunate that this situation, a situation that prevails throughout the country, is allowed and perpetuated by the legal framework that controls gold mining in Zimbabwe. The Mines and Minerals Act 22:05 of 1961 does not have provision for social responsibility. Members of the community know very little about the provisions of the Act. It is therefore recommended that an amendment of the Mines and Minerals Act incorporates social responsibility and (PSNR) to enable community beneficiation in the mining industry. Whilst it has been indicated that there are moves to amend the Act, it is also believed that the legislation, not only is it archaic, but it is out of phase in as far as the socio-economic aspirations of the country is concerned. It was promulgated by a political regime that was not in favour of black empowerment in whatever form. Attempts to amend the Act might not achieve the desired goals but perhaps what is needed is to repeal the Act and come up with a home grown Act that takes into account the concerns of local communities.

The World Business Council on Sustainable Development (WBCSD) in a report by the International Institute for Environment and Development (IIED) produced a report in the early 2000 which was entitled "Breaking New Grounds". The issues that were indicated as important issues to consider if local communities are to benefit from mining ventures can form the basis of the new legislation. The issues are as follows:

- "The control, use and management of land;
- Acquiring, managing and distributing mineral wealth;
- Protecting and promoting human rights;
- Maximising mining's contributions to local communities;
- Mining, minerals and the environment;
- Access to information;
- Artisanal and small-scale mining; and
- The roles and responsibilities of different actors in the regulation of the 'mining' sector".

The new legislation should clearly address the issue of artisanal and small-scale miners since these seem to have been completely left out in the current legislation. Artisanal and small-scale mining has however been identified as an important livelihood source for many people and this is a viable solution to poverty alleviation. A second issue that the new act should also address is the issue of human rights in communities affected by mining operations. More than often, there are violent clashes between the mining companies to whom the government would have granted mining licenses and the local communities who will be claiming certain rights in line with their understanding of the local situation. In such circumstances, government agencies have supported the mining companies and brutally suppressed any opposition to the mining projects.

The way the mine was established and the mining license granted make it difficult to conceive the local communities as co-beneficiaries of the gold mining. The Ministry of Mines issued the mining license to DTZ-OZGEO, and the Ministry sets and collects the mining fees and other charges without having consulted the local authority (MRDC) and the local communities. As the

Chief Executive Officer of MRDC pointed out, it is difficult to interfere with what is happening at Penhalonga because they were not consulted to begin with. There is need to amend the Mines and Mineral's Act or to come up with a new Act that provides for A Memorandum of Understanding between the mining company establishing a mine and the Rural District Council. The Council's expectations from the mining company and vice versa should be clearly stated.

As was pointed out above, that gold producers and members of the community are not aware of the doctrines of social responsibility and PSNR. In order to increase understanding of the need to act like partners there is need to educate both parties of civil rights in the extractive industry. If both parties at Penhalonga knew what social responsibility entails and what is meant by PSNR, perhaps the strained relation could have been avoided.

On the issue of environmental degradation, it is also clear that it is a legislative issue. The Mines and Minerals Act and the Environmental Management Act seem not to talk to each other most of the time. The former might encourage what the later is discouraging as in the case of alluvial gold mining. One recommendation to remedy this is to come up with a new Act that synchronises the provisions of the Mines and Minerals Act and those of the Environmental Management Act.

It is also recommended that educational campaigns are carried out in communities residing in gold mining areas to inform them of the environmental consequences of gold mining. This should include elaboration on those impacts for which there is need for laboratory analysis to establish their existence and those which take a very long time to have an effect.

It was also observed that small-scale gold mining was causing extensive environmental damage because of the huge number of miner involved. The government in an effort to indigenise the gold mining industry has issued thousands of licences to small-scale miners resulting in too many miners in a relatively small area scrambling for gold. It is recommended that these miners should form groups so that only a few sites will be worked at a time rather that the current situation where hundreds of licences holders are scattered everywhere on the slopes of the hills surrounding Penhalonga.

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