The impact of mining on the Environment in Gwanda District Zimbabwe: A case study of Blanket Mine

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Abstract: Environment has been an essential source for the livelihood of people and other living things. An environment is our surrounding and that surrounding includes the air, water and the soil. These three components of the environment were subjected to anthropogenic impacts due to mining and consequently polluted the environment. Mining has always been the major sustaining activity but with negative impacts on the environment; as a result, the physical environment in Blanket Mine area was adversely affected. Due to the challenges that people found themselves in as a result of mining it was essential to investigate the anthropogenic causes of air pollution, land pollution as well as the degradation of land in a mining area at Blanket Mine in Gwanda. The analysis of the data was guided by the objectives of the study. It was found out that mining activities in Blanket Mine have altered the ecosystem in a physical and chemical aspect of the environment.

Key terms: anthropogenic causes; pollution, mining, environmental impact; Blanket Mine

1. INTRODUCTION

To realize economic growth, many countries resort to the extraction of various natural resources and the most common activity being mining. As a result, mining was important in Gwanda because it was found to have had two effects, it offered jobs and also contributed to the country’s GDP earnings. Research showed that in 1998, North America earned more than US$70 billion from the sale of minerals and the mining sector also employed about a million people, [10]. It was noted that in Peru, the mining industry contributed about 50% of their yearly export incomes. It was also recorded that in 1993, the mines contributed $240 million was received in taxes in Peru. $400 million was used for construction, $280 million was used on imports and more than 11% was from the Gross Domestic Product [1]. Such statistics reflect the high dependence on minerals in various countries.

South Africa used to have large gold deposits and the country economy was heavily supported by mining as it was predominantly its biggest earner of foreign currency. Gold mining has contributed about 27.4% revenue for the Republic of South Africa and the sector employed about 56% of South Africa’s workforce, [10]. For countries like Zimbabwe, Botswana and other African nations, mining has been the backbone of their economies. In Ghana mining contributed 42% to the country’s foreign earner and by then it was a leading foreign earner [8]. It was reported that gold earning in Ghana increased to US$600 million and the country also accounted about 90% of mineral output surpassing cocoa earnings which held to be the main foreign earner in Ghana, [2]. Basing on these findings, there was no doubt that mining contributed immensely towards the welfare of the people as well as the foreign earnings.

In Gwanda, gold production arena was dominated by foreign owned company named Caledonia Mining Company, which bought Blanket Gold Mine from Kinross Gold Corporation in 2006. Caledonia Mining Company was known to be producing about half of the gold tapped from Gwanda District. According to [10] the company produced 37 tons from the three mines in 2003. Most gold mines in Zimbabwe are on the green stone belt, [8]. Zimbabwe’s huge economic potential was mineral based because of the mineral deposits she has and that dated back to the pre-colonial times. In 2009, several local people were granted mineral rights for the exploration of gold. That led to the partitioning and fencing that took place in the district. One issue that was not taken into consideration was that mining has impacted the environment negatively. The study investigated the impact caused by mining on the ecosystem.
The study established that the extraction of minerals’ increased investment which was achieved at the expense of the environment, and the social cost to the communities around Blanket Mine. For example in, March 2013 there was a public outcry against Blanket Mine when cyanide was found in the main source of water for Gwanda town which forced residents to go for weeks without drinking water. The Authorities in the mine and the Minister of Minerals and Water conceded that the mining activity was inherently a major polluter and a source of the cyanide that was found in water, [15].

2. OBJECTIVES THAT GUIDED THE RESEARCH WERE:
   - Assess the impact of the mining industry on the ecosystem.
   - Determine prevalence of disasters that resulted from mining in Blanket Mine.
   - Examine interventional measures Blanket Mine put in place to promote sound livelihood of residents in the surrounding communities

3. RESEARCH QUESTIONS OF THE STUDY:
   - What types of negative impacts were associated with mining at Blanket Mine?
   - To what extent does mining impact on the environment?
   - What mitigation measures were put in place by Blanket Mine to contain the environmental challenges

4. ASSUMPTIONS
   The extraction of minerals had both benefits to the nation state as well as to individuals as it created employment for the people. It is assumed that mining activity contributed towards the country’s economic development. On the other end mining activities involve a lot of digging, earth moving as well as treating the ore with chemicals which lead to huge degradation of the environment. All forms of pollution existed in a mining area and because the focus of the miner was the economic gain the environment is not taken into consideration. It is assumed that mining is good but the question can be on health of the people as well as the state of the environment.

5. JUSTIFICATION OF THE STUDY
   Mining has been an important business venture for any country rich in minerals. Economic gains can be realized if the extraction of minerals was well managed and effectively co-ordinated. Africa has had a lot of wars that resulted from the discovery of precious stones. A few examples were Sierra Leone, DRC, and Zimbabwe with the discovery of the Marange Diamonds fields. The economic gains of mining by a country were that employment was created and the country earned foreign currency through the sale of the mineral resources. Studies that had been conducted and they looked at the environment and socio-economic impact of mining on the environment. It was found that some mines had put in place measures to mitigate their impact on the environment and the people’s livelihood.

   The study was significant as it took a broad investigation on the environment and socio-economic impact that resulted from mining at Blanket Mine. The paper would help reduce the prevalence of hazards caused by mining in Gwanda and the findings were valuable to other regions and other countries that have resources to be mined or those that also extracted mineral resources from the earth. Legislatures and policy makers would find the issues important in policy debate, which may inform policy making.

6. METHODS OF COLLECTING DATA
   Several methods of collecting data from the respondents were used. The idea was to capture their awareness and how they perceived mining regarding its impact on the environment as well as on the health of people in the mining area. Data was collected using primary sources as they provided first hand and vivid information on how mining impinged on the biotic and abiotic components of the environment.

6.1 SOURCES OF DATA AND DATA COLLECTION
   These methods included, conducting of interviews to Blanket Mine community and some mine workers. In addition, there were interviews that were extended to Blanket Mine officials as well as the residents in the mine and in Gwanda town. There were also interviews with other opinion leaders in the surrounding areas such as from Sigodo village which is less than a kilometer from the mine. Field observations were undertaken in the mine area and outside the mining area to establish if there were symptoms of the environmental pollution. Community workshops were also used to collect data, on the environmental impact of mining activities in Gwanda District.
6.1.1. THE OBSERVATION METHOD

Observation was seen as an interactive method of gathering data [9], and the researcher spent a substantial period of time among the community to a point that he was more like a member of the community in the study. [6] defined participatory observation by saying, “…research method that aims to gain a close and intimate familiarity with a given group of individuals and their practices through an intensive involvement with people in their natural environment.” The method enabled an in-depth data collection. Observation method was relevant to this study because Environmental Impact Assessment relied on observation in collecting data. The observation method was complimented by use of a camera in capturing some of what was observed.

The researcher interacted with the respondents; made observations and also took part on some of their daily activities. This enabled the collection of data from the natural setting provided the researcher with an understanding of the experiences and challenges faced by the respondents. The conversation involved informal and unstructured interviews in collecting data from the subjects [3]. The interactive method was preferred to other modes because it emerged to be a valuable way of collecting continuous assessment of the environment. The data would build up as it was collected through the participatory observation method with the aid of research’s notes were recorded on paper as the data was collected and recorded using electronic devices for analysis. The method was found to be relevant in collecting data in that through interaction language challenges was overcome by code switching whenever a need arose, for example, one of the farmers was unable to understand Ndebele, the data collector can switched to Venda, Shona or even Nyanja and by so doing no one from the sampled population was left out.

6.1.2. STRUCTURED INTERVIEWS

The structured interviews were used, schedules were drawn and respondents subjected to the same conditions so as to be able to control both input and output. According to [9]; and [3] there was no need to code and categorize the collected data. The assumption was that interviews were sufficient and detailed enough gather of data relevant for the study. [9] noted that some, researchers did not like surveys as they considered them to be an impersonal method of data collection. It was further pointed that surveys were momentary interactions of the respondents and the researcher; which needed establishing rapport if it were to be compared with fieldworkers with the subjects. To overcome the weakness of the interview method researcher adopted usage of different methods of collecting data so to generate credible data.

6.1.3. COMMUNITY WORKSHOP METHOD

A community workshop was also used as a data collecting tool. The method was relevant when conducting an environmental impact assessment. Observations on the respondents were made and recorded in a debating manner which also proposed the way forward to sustainable management of the environment. Responses from the community workshop were recorded using a recording device. This enabled the researcher to electronically store the outcomes of the study for further analysis. The workshop was useful in drawing the views from a larger group and the dialogue helped in pushing an environmental agenda to the community. The researcher had two reasons in using the workshop as a data collecting tool. It was a platform to discuss as well as debate on environmental issues and it allowed engaging the community that aroused their attention to the challenges on the environment.

7. SAMPLING DESIGN

The methods of sampling used combined random sampling, and stratified methods of sampling. Various sampling methods captured different variables of the sampled population such as their proximity to the mine, nature of work they do, their socio-economic position. The perceptions of the target population towards mining activities and their effect on the ecosystem were documented. The population was randomly selected for community workshop as well as the touring guides on the mining area. The entire population was about 6000 people [7]. The sample size was representative enough of the population so the findings were representative. The percentage of the sampled population was 18.1% which is assumed that it was representative of the population of the study are.

<table>
<thead>
<tr>
<th>Sample</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blanket Workers</td>
<td>500</td>
<td>46.04</td>
</tr>
<tr>
<td>Sabiwa High School</td>
<td>30</td>
<td>2.76</td>
</tr>
<tr>
<td>Gwanda Urban</td>
<td>500</td>
<td>46.04</td>
</tr>
<tr>
<td>Mineral Commission</td>
<td>4</td>
<td>0.37</td>
</tr>
<tr>
<td>Chamber of mines</td>
<td>6</td>
<td>0.55</td>
</tr>
<tr>
<td>Blanket Mine top Officials</td>
<td>26</td>
<td>2.39</td>
</tr>
<tr>
<td>Health workers</td>
<td>20</td>
<td>1.84</td>
</tr>
</tbody>
</table>

Source: Field work by the researcher
A sample was drawn from Blanket Mine residents 500, Sabiwa High School 30 and Gwanda urban 500. This was done purposely by the researcher because the selected residence was closer to the mine sites. Purposive sampling enabled the researcher to gather data that was likely to answer the research questions of the study. Data was collected from respondents from different background such as the distance from the mine to their place of residence. The period on which respondents have stayed in the mining area was significant. Interviews were conducted to different stakeholders such as environmental officers, health officers, mine workers and some respondents were drawn from Gwanda urban.

8. DISTRIBUTION OF BLANKET MINE FACILITIES

It was observed that mine concessions usually covered a large area and this was also observed with the area covered by Blanket Mine. Blanket Mine concessions extended into rural areas that were under the jurisdiction of Gwanda District Council, for example Sigodo village. Blanket mine’s operations consisted of open cast, shafts, sample points, slime dams, and treatment plants. The views of villagers about the impact of mining were drawn from Sigodo Village, Mtshazo Village, and Gwanda urban as well as from respondents staying in the mine compound.

9. MINING METHODS USED AT BLANKET MINE

The views of respondents on the methods of extracting gold by the company were drawn from respondents. A large percentage of the respondents pointed that Blanket Mine used both surface and underground mining which was confirmed by observation. An Environmental officer at Blanket Mine confirmed that in the past Blanket Mine used both surface and underground. For the past ten years the mine has been using the vertical shaft method of mining. The ore was found vertically down in the earth leaving the mine with only one option of using vertical shaft Mining.

9.1 OPEN CAST MINING AND ITS IMPACT ON THE ENVIRONMENT

Open Cast Mine method involved removal of the top layer of the earth that bore the mineral. Heavy machinery was used to remove the top layer of the earth. The rocks that contain gold were accessed after removing the top layer of the earth and gold ore was finally taken for processing. The Open cast mining method was only used when the mineral resource was found near the top layer of the earth. Rock blasting using dynamites was done to the gold ore. Open cast was undertaken, “… where the overburden material covering the valuable deposit is relatively thin or the material of interest is structurally unsuitable for tunneling,” [4]. Open cast mine has impacted the topography of the earth, the plants as well as water. The degradation of land contributed to the loss of biodiversity around Blanket Mine.

9.2 UNDERGROUND MINING

The extraction of minerals using the underground mining method was used when minerals were deep underground such that the open cast mining could not be used. Underground method of mining was used at Blanket Mine. Studies have shown that underground method of mining can be characterized by a vertical shaft, as was the case at Blanket Mine. The cage would be used to take logistics into the mine and was also used to bring the ore to the surface.

Plate 4: On the background is a shaft mine at Blanket Mine, miners used it to get into the inner part of the earth.

Source: Photographed by author, 2013

Environmental impact included erosion of the soil, the formation of sinkholes, reduction of biodiversity and at times ground water gets polluted as well as the waters on the rivers because of chemical substances drained from the mining area. The pollution by noise and vibrations were linked to the blasting of rocks and crushing of rocks. The impact of these activities was known to weaken built structures such as
buildings and dams. Such noise and vibrations had impacted negatively on living organisms as they preferred a stable environment for life processes such as mating and reproduction.

10. METHOD OF EXTRACTION OF THE MINERAL

The method used at Blanket Mine to extract gold from the ore was the biological oxidation which was done at the sulphide treatment plant. When gold ore was extracted from the ground it would be covered by sulphure. In the biological oxidation plant, enzymes from bacteria were used to act on the sulphure through a chemical reaction. The processing of the ore essentially involved several stages such as crushing, floatation, and roasting to drive away the sulphure that would have remained during the other stages.

Plate 5: The ore being carried by conveyor belt at Blanket Mine, Gwanda

Source: [16]

The impact of the Biological Oxidation method was that it released pollutants into the air such as chemical vapor that had carbon dioxide and arsenic trioxide. The processed ore was called mine tailings. The slurry was pumped into a tailing dam and allowed to settle and water eventually evaporated while some seeped into the ground. Tailing dams were toxic because of the un-extracted sulphide, and some cyanide and other chemicals used in gold processing, [12]. In the processing of the ore, it was noted that the surface and ground water got polluted. The soil which has been a home of different microorganisms got altered as the pH of the soil was lowered. This was also confirmed by the residents of Blanket Mine as well as those of Gwanda town.

11. RESULTS

Mining activities at Blanket Mine have impacted negatively on the environment and water sources. The pollution of Mtshabezi River as well as its dam waters was one of the examples were mining activities have threatened life, [15]. Landscape was found to have been altered as a result of mounds of the mine tailings and the liquid chemical waste from the mine. It was also established that the physical health of people living in around Blanket Mine was impacted negatively. This was because some people suffered from respiratory infections as well as other diseases that are mine linked such as malaria.

12. ANALYSIS

Mining activities are connected to a number of environmental and socio-economic wellbeing of individuals in the mining area. These were a result of the extraction of the ore and the process used to get gold from its ore. The paper looked at the environment and health challenges related to mining which were strongly connected to the activities of mining. This was confirmed by respondents who indicated that they used to get fishing worms on the banks of some streams near the mine but now they could not find any, probably was due to the soil pH that would have been lowered to the extreme low band. The researcher took a sample of soil near the Blanket mine compound area and used a universal indicator and found the soil pH to be 5. This meant that the soil was acidic.

<table>
<thead>
<tr>
<th>Effects of Mining Activities</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Degradation of land</td>
<td>193</td>
<td>17.77</td>
</tr>
<tr>
<td>Pollution of water</td>
<td>814</td>
<td>74.95</td>
</tr>
<tr>
<td>Pollution of land</td>
<td>56</td>
<td>5.16</td>
</tr>
<tr>
<td>Failure to acknowledge the impact</td>
<td>23</td>
<td>2.12</td>
</tr>
<tr>
<td>Total</td>
<td>1086</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Author’s Survey, 2003

From the survey, 1086 respondents (74.95 %) of the respondents indicated, mining affected the
surrounding and 23 (2.12%) failed to indicate that mining polluted the environment.

12.1 IMPACT OF UNDERGROUND AND SURFACE MINING

The respondent showed an understanding that mining affected the environment. This was pointed on both surface and underground mining. Respondents were able to pick varied degrees of the impact mining. About 82% of the respondents pointed that the environmental challenges were linked to mining activities. It was noted that about 13% of the respondents did not see the negative impact of mining.

12.1.1 IMPACT OF SURFACE MINING

The degradation of land was predominantly as a result of surface mining at Blanket Mine, and most researchers [15]. indicated that land degradation was a major concern. The removal of trees and other plant life by heavy machines as well as the soil led to land degradation. The removal of plants and top soil removed nutrients altered the biological systems found in the soil and also made it vulnerable to forces of erosion. For instance, on the way to Gwanda town from Blanket Mine there were mine tailings which were dumped by the mining company.

Plants do not grow on mine tailings probably the chemicals in them kill plants as well as the soil organisms that aerate the soil. Such areas became inaccessible for other activities and they became fatal zones for animals. This was confirmed by observation method because low pH dangerous to both animals and people were observed. Pits were observed in and around Blanket Mine, Sigodo Village as well as near Mtshazo village which were about fifty meters deep. In cases where such pits were to be reclaimed they could be filled with other debris from the mine or covered by earth to reduce the danger. Some mine tailings were observed near Sigodo village threatened domestic animals.

12.1.2 PLATE: BLANKET MINE TAILING DAM

This facility is less than 200m from Sigodo Business Center such that if liquid wastes flows out during the rainy season livestock can be affected.

A study of this site showed that runoff from the mine tailing flow to small streams and can eventually collect in rivers like Mtshabezi River. Efforts by the mining company to address land degradation were assessed. It was established that the company policy was well articulated but lacked implementation. The restoration of the land degraded by mining activities was not being done. Probably the unfortunate was that they own the land they operate on such that at time they compromise their activities. They seem not to realize that some environmental pollution cannot be contained in a single locality.
12.1.3 POLLUTION

A large percent of respondents (70.9%) experienced pollutants of different forms associated with both open and underground mining and the oils from machines used as well as chemicals found in explosives. Mine tailings increased every day and posed danger to aquatic organisms because during the rainy season most chemical substances drain into streams and rivers. The field observation confirmed the effect of mining as a result of the alteration of the environment was observed. Both types of mining at Blanket contributed to the pollution of surface and underground waters. In Gwanda there has been a challenge of water pollution and the pollutants were traced back to the mining site. Residents in villages around the mine do not depend on surface and underground water for domestic use as it may be polluted and those who dared to do so put their lives in danger.

Surface and underground water in the municipality of Gwanda was polluted and examples of surface water in Mshebezi River and Blanket Mine Dam. Recent sample of water tests (February, 2013) that was conducted on water quality resulted in water found to be having cyanide sodium. An official from Zimbabwe Water Authority of Gwanda pointed that, cyanide concentration in the water from Blanket Dam was established mid-February, 2013. The reduction in the concentrations was because of the intervention measures that were adopted by both the Water Authority and the min, [14]. At times the pollution would go unnoticed until living things that depend on water show signs of illness or were seen dying such as birds.

Another form of pollution which was found to be associated with mining was the release of chemical substances into the air. Dust particles were released into the air during blasting. Residents expressed concern in that the dust does not only impair visibility but also affected the respiratory system, triggering lung and heart diseases. This was evidenced by responses from sampled population located close to Blanket Mine. The concerns of residents were confirmed by the observation in the field. It was observed that those who stay close to the mine plant were affected more than those staying far from the mine.

Sounds of high intensity were common in Blanket Mine and in areas close to the mine. Noise and vibrations in the area were caused by big mobile equipment, rock blasting and the crushing of the ore to facilitate the separation of gold from the ore. The blasting of the ore has damaged infrastructure and some installations. It was observed that houses cracked because of the vibrations during the blasting. Some roofs have been damaged particularly those roofed by asbestos. Some respondents pointed, that mining produced loud noise and caused vibrations of the earth and in addition caused cracks and destroyed roofs of their buildings. In animals it caused panic and shock which affected their wellbeing time and again. “The impact of high-pitched and other noises frightened animals and interfered with their mating processes as a result causing abortions that adversely affect the animal population,”[11]. At Sigodo village, villagers raised concern of noise between two and three during the day while at night it would be around twelve at night.

12.1.4 UNDERGROUND MINING AND ITS IMPACT

Mining activities that take place under the ground disfigure the internal structure of the earth. Power machine were used to drill the gold ore as well as taking the ore out. The ore had to be crushed using dynamites which are powered by chemical substances such as ammonia nitrate. These chemical substance used underground pollute the underground water which is usually destined to the surface as it was pumped out. Oils used to lubricate the machines also contaminate the underground water. Most respondents in Gwanda noted the underground activities polluted the sub-surface water. Residents, “complained that water pumped from some of the abandoned dug bore holes were contaminated with toxic chemicals since they previously suffered from waterborne infections when they drink it,”[11]. The vibrations of the earth was also found to be a concern at times the source was from underground and contributed to challenges in communities. The challenge was a result of dynamiting gold ore and breaking it into chunks. Respondents, residing close to the mine complained about this problem were large cracks observed on their houses developed cracks as big as 7cm wide.

12.1.5 BIOLOGICAL OXIDATION PROCESS

Biological oxidation process of gold extraction had contributed a lot towards air pollution that was produced at different stages of production. The examples of the gases were sulphide, carbon dioxide, arsenic trioxide, cyanide and others. The named substances were highly toxic and harmful to both people and animals. A respondent at the Sulphide Treatment Plant of Blanket Mine indicated at, times there was pollution of the air which resulted from substances being flushed into the air. This resulted in gas and other chemical substances filling the air. “…in addition, there were cases of exposure to chemicals such as cyanide, harmful materials and others by both workers and people close to the mining activities,” [11]. Therefore, poisonous substances were released into the environment during
the extraction of gold and dumped into tailing dams were a point source of land and air pollution in the area around Blanket Mine. Tailing dams’ failure had never been recorded at Blanket Mine since 2010 probably it was because the area was fenced and a strong wall had been built around the tailing dam.

12.1.6 THE IMPACT OF MINING ON HEALTH

A number of respondents from the sampled area indicated that mining activities had effect on their health. A security guard contracted by Blanket Mine did not allow the researcher to enter the mine area with a child aged two years. The security officers pointed that the child might inhale toxic substances that may be harmful to the child. This exemplified that mining impacted negatively on the environment.

13. ENVIRONMENTAL POLICY OF BLANKET MINE

The Zimbabwe EIA policy is administered by the Ministries of Mine, Environment and Tourism and the assumption is that while mining companies come up with their own EIA policy it would be informed by the national EIA policy which Blanket mine subscribed to. The EIA policy was in place at Blanket Mine because for the mine to be licensed and awarded an operating permit it would have met some specifications. The implementation of the EIA policy at Blanket Mine was not effectively implemented hence the findings pointing at Blanket Mine as fueling the degradation of the environment.

Blanket Mine in Zimbabwe is run by Caledonia Holdings. The mine is located in Gwanda in Matabeleland South. Mine is located within the greenstone region. Blanket Mine has an environmental policy that was passed to it by [13] said, “…Caledonia is committed to maintain the highest environmental standards such that its operations and/or its products do not present an unacceptable risk to its employees, its customers, the public or the environment”. The citation was relevant to this study because the paper looked at environmental impact caused by mining. The company that runs Blanket Mine has fine policies as it acknowledges that there was need for protecting the environment and other living things such as human beings and other animals.

Blanket Mine operates under its mother company’s Environmental Policy which stipulated that, “Caledonia directs its employees and its subsidiary companies to conduct their exploration and operations activities in a professional, environmentally responsible manner, in compliance with all applicable legislation and policies in the jurisdictions in which they undertake business,” [13]. The findings of the study were that the environment was altered by the mining activities at Blanket Mine. It was found that there were huge mountains of mine tailings along the road to Gwanda town and also near the residential area of mine workers. There was no doubt that during the rainy season the water that flows from the mine tailings was acidic. A universal indicator was used after taking a sample from a fresh mine tailing and on the pH scale it was below 7 which indicated that the mine tailings were acidic.

The [13], says “…Caledonia liaises closely with the applicable government regulatory bodies and the public to optimize communication and an understanding of Caledonia’s activities in relation to environmental protection”. One was bound to say the government regulatory bodies may not have been doing a good job. This is because on the government side, Environmental Policies and other regulatory structures exist. The mine operations were supposed to be monitored and evaluated and that would have reduced the environmental impact experienced.

[13], “Caledonia on a regular ongoing basis monitors it environmental protection management programs to ensure their compliance with the applicable regulatory requirements.” The environmental damage that was observed does not agree with the Caledonia Environmental Policy. The monitoring implies that an EIA is conducted at regular intervals with the aim of early identification of environmental damage. If this was effectively done traces of sodium cyanide was not going to found in drinking water at Gwanda town on which the source was Blanket mine. The Environmental Policy of Blanket Mine is more like a paper tiger because if one is furnished with the Environmental Policy, one is bound to believe that the environment was well thought of. The Environmental policy does exist at Blanket mine and the environmental challenges experienced at and around Blanket Mine are an indicator that the implementation lacked commitment and dedication. The employs of Blanket Mine did not adhere to the safety occupational code and laid down safety standards because if they had adhered to their code of practice some environmental challenges would have been averted. It can be pointed that some alteration of the environment cannot be avoided such as the residual impact as noted by [5].

14. SUMMARY

The study established that there was a high prevalence of diseases in and around Blanket Mine due to pollution. It was realized that the mining activities do pollute the air, the land as well as the sources of water. The excavations that take place in the mining area create pockets of water basins which then became the breeding spot of malaria and
Bilharzia. Respiratory infections had been caused by air pollution because of particles and other substances released into the air. Skin infections, fever and diarrhea were linked to polluted water which people depended on. This was confirmed during the community workshops as well during the interviews. Most respondents pointed that while the mine provided employment it also affects their health.

15. RECOMMENDATIONS

The environmental Management Department at Blanket Mine needs to revise their environmental policy so to encompass issues of sustainable development. It is therefore recommended that the wellbeing of residents should come first with considerations on sustainability of the environment.

On health, Blanket Mine was encouraged to take an initiative of supporting the health institutions in Gwanda urban. The social responsibility of the mine sector was supposed to impact positively to the communities in which they extract minerals. It was recommended that, the clinic operated by Blanket Mine should be usable by all people who may seek medication regardless of where they work. Worse in that Gwanda General Hospital was also a referral center for Blanket Mine clinic. This is because the Gwanda General Hospital and the clinic run by the Gwanda Municipality cannot adequately fulfill the health needs of all residents in the town and beyond more importantly, the water body at Blanket Dam and Mtshabezi River needed to be protected from contaminants from the mine so that the people in Gwanda urban may have safe water to drink.

When fatalities like death occurs in the mine the diseased would be taken to a dilapidated Gwanda Hospital Mortuary. Whose cooling system has failed when we took over from the Rhodesian government. The social responsibility policy of Blanket Mine if it is there it’s on paper to appease Mining License Awarding Body but not put into practice, this need to be improved by assisting in the rehabilitation of the Mortuary the mine depend on.

16. CONCLUSION

The study examined the mining methods used at Blanket Mine, their environmental and socio-economic impact on communities in and around the mine. Moreover, measures put in place Blanket Mine to reduce the impact on the environment. The degradation of land and different forms of pollution were observed in and around the mining site. The air, water and noise pollution were common in Blanket Mine. Land degradation resulted from both underground and surface mining was experienced in and around Blanket Mine. The vibrations of the earth were a result of rock blasting using dynamos. The spillage of chemical substances polluted water pollutants affected plants and soil organisms and soil pH was also altered by these substances. It was observed that, water resources within and around the area was not in good as a result of pollutants from mining activities.

Mining had been found to have a lot of economic benefits to the communities and the country at large. There was also a need to acknowledge that mining impacted negatively on the environment. After a thorough investigation Blanket Mine activities it became clear that mining contributed to land degradation. It was also noted that pollution of different forms took place. The combined impacts of environmental challenges culminated into socio-economic and the wellbeing of people who had been vulnerable to the infection of the lungs and other infectious diseases linked to mining activities were malaria, diseases of the respiratory system as well as skin infections were found to be prevalent in areas around Blanket Mine. Apart from infectious diseases, deficiency related diseases such as anaemia and some chronic diseases were also common in the mining area.

17. ACKNOWLEDGMENTS

I would like to acknowledge the assistance received from the people of Blanket Mine and Gwanda Urban, who willingly shared their experiences with the researcher during the data gathering session. Their input was as valuable as it opened up some issues that lay concealed from the public and other stakeholders about the impact of Blanket Mine on the environment.

REFERENCES


15.Bulawayo24.com, Retrieved 17 May 201