



## Of Natural Resources, Poverty Alleviation and Local Communities: Case of Quarry Mining in Mutoko District (Zimbabwe)

<sup>1</sup>Jephias Mapuva, <sup>2</sup>Freedom Chimbangu

Bindura University and Bindura University, P.O. Box 1020 Bindura-Zimbabwe.

Department of Geography Department, P.O.Box 1020, Bindura-Zimbabwe.

### Abstract

A good local resource base can benefit local communities as people are able to exploit available natural resources to their advantage. The astronomically high unemployment levels in the country have exacerbated the attendant poverty levels, which has led to local communities seeking alternative survival strategies. In the case of Nyamuzuwe, the local community has embarked on the exploitation of black granite quarry to irk out a living. However, it has been noted that the local community has derived socio-economic benefits from the quarrying venture, while on the other hand, the quarrying activity has taken its toll on the local environment. Consequently, the paper examines the socio-economic and environmental impacts of black granite quarrying on local communities in the community of Mutoko District. A total of 185 respondents were selected through random sampling and data was collected through questionnaires. Additionally, focus group discussions and interviews were conducted to establish the extent of spin-offs from black granite quarrying which cumulatively brought infrastructural development, stimulated vending, employment creation, improvement in housing, and the provision of transport to the area. However, there has been negative environmental impact emanating from quarrying. Black granite quarrying activities have resulted in lowering of water table for agriculture, loss of agricultural lands, demolishing of graves and health problems and land degradation. Additionally, air, water and noise pollution have been a culmination of quarrying in the area. However, there have been attempts at restoration and intervention measures by Natural Stone Export Company in the form of re-forestation, review of methods of operation and provision of alternative sources of drinking water to the affected communities. The authors recommend that the company revise its environmental management policy in the area to ensure that negative socio-economic and environmental effects of mining activities in the area remain minimal.

**Keywords:** Poverty, Social Development, Local Community, Sustainable Development, Quarrying, Mining, Environment.

### Introduction

This paper sought to undertake a research study in Nyamuzuwe Ward 3 of Mutoko District (Zimbabwe) to establish the socio-economic benefits deriving from black granite quarrying as well as the attendant environmental impact of the mining venture in the areas. The mining activities was undertaken by the Natural Stone Export Company which is a host company for the extraction of quarry in Nyamuzuwe. Quarrying is a process of obtaining quarry resources usually rocks found on or below the surface. This mining activity is the major economic activity worldwide which plays a crucial role in socio-economic development. According to Chenje et al (1998), the sector plays a crucial role in terms of foreign exchange, gross domestic product (GDP), government revenue and capital formation. This can be evidenced in the 1990s when Zimbabwe derived 42 percent of foreign exchange from mineral exports, 6 percent of its GDP, while 5 percent of its labour force was employed in mining sector (Government of Zimbabwe 1991). Although, mining has contributed to growth of various it has got a variety of negative impacts on local communities socially, economically and environmentally. Among the negative impacts of mining include the displacement of local people, destruction of natural landscape, pollution of groundwater resources, contamination of soils, erosion and disturbance of vegetation and ecosystems, displacement of local wildlife, creation of ghosts towns and impingement of human health and safety, including extreme cases of death of mine workers through accidents at work (Kessler 1994). Therefore, this study seeks

to investigate the socio-economic and environmental impacts of black granite quarrying on local communities of Nyamuzuwe Ward 3, Mutoko District in Mashonaland East Province.

## Research Aim

The principal objective of the research was to establish the socio-economic and environmental impact of black granite quarrying within the Nyamuzuwe community of Mutoko District. In the intermittent discussion, the study seeks to identify the various benefits emanating from black granite quarrying as well as the ensuing environmental impact of the mining enterprise. Additionally, the authors provide recommendations to maximise socio-economic benefits deriving from the quarrying venture, as well as ways of minimising environmental effects of the mining activity.

### Rationale for the Research Undertaking

The reasons that has informed this study is the desire by local communities to exploit available resources to their advantage. This is on the backdrop of a devastating poverty circle that has engulfed most rural communities, especially given the economic challenges facing the country of Zimbabwe. The unpredictable rainfall patterns culminating from climate change have exacerbated the poverty situation, resulting in diminishing agricultural output. The devastating poverty levels in most rural areas, including Nyamuzuwe has been the attendant high unemployment levels due to the closure of most companies in urban areas, which left many people unemployed, thereby pushing the national unemployment levels at about 85%. Therefore the exploitation of black granite quarry provided an alternative employment and source of livelihood, especially for the local community.

## Gap in literature and contributions of the Study to Existing Knowledge

Though there is a lot of literature worldwide on the subject, enough has not been done in terms of research on the socio-economic and environmental impacts of black granite quarrying on local communities. It is therefore important to undertake this study to add to the existing literature on socio-economic and environmental impacts of mining on local communities and also serves as a valuable source of information on the subject in Zimbabwe as a whole and the Nyamuzuwe Ward 3 in particular, thereby filling the knowledge gap left behind by other researchers.

## Research Methodology

In the quest to investigate the socio-economic and environmental impacts of black granite quarrying on local communities, the researcher used close-ended questions to generate quantifiable information, in relation to the socio-demographic characteristics of the stone workers, the economic and environmental impacts of the activity. In addition, to acquire the relevant information for the study, the researcher used primary sources of data which are interviews, questionnaires, focus group discussions and observation. The physical proximity of the respondents and their livelihood during primary data collection allowed the researcher to access both verbal and non-verbal information which had not been documented elsewhere.

The researcher used interviews as an instrument to acquire information relevant to the study from various mineworkers. Through the use of semi-structured interviews the researcher, engaged forty (40) respondents through the same set of open-ended and close-ended questions for comparative purposes and also to reduce variation of the information.

Focus Group Discussions were also used in the process of data collection in this study. In this study, the responses from Focus Group Discussions were used to develop questions on the semi-structured interviews. This is in relation to Limb and Dwyer, (2001) and Hancock, (1998) who recommend the importance of group discussions in penetrating a community and at the same time allowing respondents to express their feelings about the issue under investigation.

In this study, which seeks to explore the socio-economic and environmental impacts of black granite quarrying on local communities in Nyamuzuwe Ward 3, Mutoko District, questionnaires were used to obtain data from company officials, local people, mine workers, community leaders, Environmental Management Agency (EMA) and Mutoko Rural District Council (RDC) staff.

Observation was important because it provided background information about the environment where the study was taken. In addition to interviews, focus group discussions and questionnaires information, issue which is non-verbal was accessed through observation. In this study observation was more suitable, because the workers continued with their activities normally without their awareness that they were being observed.

## Target Groups

This research targeted a large number of people which include officials of the company, mine workers, people from the local community, EMA workers, and RDC and community leaders.

## Sampling Techniques

Before primary data collection a reconnaissance in the study area was carried in order to establish and confirm the most viable sampling techniques. Based on the research questions the study had to address and give the different respondents the platform to provide information using non-probability sampling methods. In this study random sampling was used to select the population for the study since everyone has the equal chance of being selected.

## Results and Discussion

The results of the study were extracted from the different data collection instruments. From the data collected, mining activities have both negative and positive socio-economic and environmental impacts. The chapter highlights the socio-economic and the environmental impacts on local communities in Nyamuzuwe Ward 3 emanating from black granite extraction. The information contained in this chapter was obtained from the field through the interaction between the researcher and the stone company, Mutoko Rural District Council workers, Environmental Management Agency, local leaders and the communities surrounding the quarrying activity. In addition, the local health workers in the communities provided the information especially on injuries and HIV/AIDS prevalence in the area. The information in this chapter was gathered through the use of questionnaires, personal observation and interviews. Thus, in this chapter the researcher discusses the results under economic, social and environmental impacts respectively. Insights and perceptions of various stakeholders on the mining activity in their area were given.

## Nature of Quarrying

From the survey, the company officials and mine workers admitted that the company employs both surface and underground methods of mining in the extraction of stones. Through the interviews eighty-seven (87) percent of the mineworkers and company officials revealed that explosives are used to detach large blocks of stones. In support of this Redmond (2005) stated that in quarrying drill holes are put down to the depth to which it is required to break the rock and then partly filled with some explosives that is discharged by the usual methods of blasting. In addition, to that ninety-three (93) percent of the local communities also revealed that the mining activity is associated with noise and vibration and air pollution reflecting the use of heavy machines. In the questionnaires, they revealed that the mining activity uses dynamites, heavy noisy equipment and heavy vehicles in extraction and transportation.

## Economic Benefits of Black Granite Quarrying on Local Communities

From the survey, one hundred and seventy (170) respondents out of the total sampled population of 185 populations admitted that mining created employment for the localities with just 15 respondents failing to acknowledge the fact. According to the respondents, a major economic benefit brought about by black granite quarrying in Nyamuzuwe Ward 3 is that of employment creation. In support of that Aboagye (1986) and Lubell, (1991) confirmed that large scale stone extraction provided formal employment to the rural and migrant population. The Natural Stone Export Company has a total work force of about 85 mine workers. Eighty (80) percent are from within the district, with the remaining twenty (20) percent coming from other parts of the country. Seventy percent of those workers coming from within Nyamuzuwe Ward 3 lived within a 3 kilometer radius from the quarry site. This clearly shows that most of the job opportunities have been taken up by people from within the district, and more specifically, by those near the quarry sites.

During the interviews, the researcher observed that some of the income generated from being employed at quarry mine was used for improving or renovating houses structures. Labonne et al; (1999) concur that black granite quarrying is a source of income for housing improvement to the poorest, the less educated, migrant and landless population in remote areas. The married and the widows in the communities admitted that income has been used to replace pole and daga houses with more modern houses made of brick and asbestos or metal roofing sheets. Some of it has been used to construct pit latrines and protected wells. Sixty-eight (68) percent of the primary and secondary educated respondents admitted that this has significantly improved the hygiene standards of the people, standards which often upgrade rural societies, thereby improving the living conditions of the people.

During the study the researcher also noted that, besides employment creation, another economic benefit from black granite quarrying is that Mutoko District Council gets revenue from quarrying companies in the form of a development levy. In support of that Baah (2005), stated that mineral extraction in the world provided a token to the localities that can be channeled towards the development of the area. Through the interviews, the Rural District Council and company official respondents revealed that for every ton of black granite mined out and transported to Harare, the council gets US \$15 as development levy.

Through the use of personal observation and interviews, it was revealed that black granite quarrying has also stimulated some vending activities at quarry sites. Vendors from various villages of the ward come to sell varied food and clothing items. Other vendors have even established some tuck shops. Such activities broaden the income base of the people, thereby, helping reduce poverty levels. Seventy percent of the interviewed women villagers said that they were involved in various vending activities at the quarry sites. In support of this fact Campbell and Williams (1999), stated that mining

stimulates economic benefits to the communities surrounding the sector through vending hence upgrading the standards of living among the local people.

### **Economic Costs of Black Granite Quarrying on Local Communities**

Although mining have promoted economic benefits in many areas in the world and the area under study, it also has economic costs. A greater number of respondents on local communities complained about the impact of black granite quarrying on the water table. Baah (2005) supported this fact by illustrating that the major factor militating against the quarry industry in respective operational areas includes the lowering of water table. The excavation and blasting of the black granite in some areas has resulted in the lowering of water tables as extensive underground granite stretches, which had acted as aquifers, are blasted away. Considering the fact that about sixty-three (63) percent of the interviewed villagers relied on horticulture for income generation, thus as result of this some areas have been devastated economically as gardening wells have dried up. According to respondents through the interviews, they admitted that poverty in the area has been exacerbated by the mining activity.

Through the use of focus group discussions and interviews, seventy-five percent of women admitted that black granite quarrying has also removed the able-bodied men from the fields to the quarry sites, thereby creating labour bottlenecks for peasant agriculture. This in turn affects food security and potential for rural on-farm income generation. This has left women and children to tend the fields and thus, in many cases, further reducing traditionally low yields. Three quarters of women respondents revealed that income from black granite quarrying is not always able to offset the reduced agricultural yields thereby, in such instances, compromising food security. Sixty seven (67) percent of interviewed villagers confirmed that black granite quarrying had compromised labour supply on the fields. This leaves women, children, and the elderly, often referred to as vulnerable groups, to take charge of the responsibility of producing food, with obvious consequences on food security for affected families.

### **Social Benefits of Black Granite Quarrying on Local Communities**

The operations of Natural Stone Export Company in Nyamuzuwe Ward 3 have brought about social benefits to the local communities. From the views of the target population obtained through questionnaires, focus group discussions and interviews reflected that mining has brought social benefits to the area under study. Among the social benefits is that of infrastructural development. Through the questionnaires, eighty-five (85) percent of the sampled population confirmed that Natural Stone Export Company has built classroom blocks at some schools. Such actions complement government efforts to provide education to all children. Moreso, the community leaders and local people in interviews pointed that a cattle dipping facility has also been constructed in the area by the company, thereby improving livestock health. In support of the fact above Abugre and Akabzaa (1998), stated that black granite quarrying promotes infrastructural development (such as housing, hotels and car parks), entertainment venues, parklands and recreational facilities in areas under mining operations.

One hundred and seventy-one respondents out of the sampled population admitted through the interviews that quarrying companies also occasionally provide free transport to take ill villagers to Mutoko General Hospital. Such a service is crucial as there are no emergency health services in these areas. Free transportation is sometimes offered to farmers for the transport of their horticultural produce to the market. This increases profit margins as transport costs are eliminated. In addition, among the one hundred and twenty (120) local populations sampled, eighty (80) respondents admitted that food handouts are also occasionally given to villagers, especially during drought years. This is seconded by Lubell (1991), who stated that mining companies provides safety nets to local communities in times of hardships.

### **Social Costs of Black Granite Quarrying on Local Communities**

In Nyamuzuwe Ward 3, black granite quarrying has also brought about social costs. The respondents through interviews admitted that black granite quarrying has led to increase in prostitution around quarry sites involving quarry workers, vendors, and villagers. HIV/AIDS prevalence has reportedly increased with the establishment and expansion of quarrying operations in these areas. In support of this fact, Churchyard et al; (2000) stated that mining sector is affected by worldwide epidemic of HIV/AIDS this is due to the nature of industry which promotes migration especially among males. An increase in HIV/AIDS orphans and single mothers in the areas reflects high mortality rate resulting from the diseases. Some of the quarry workers come from as far as Harare, Mutare, and Masvingo and would have left behind their families. Fifty three (53) percent of the interviewed workers coming from outside Mutoko District were married and left their spouses behind. Such spousal separation exposes the people to infidelity, there enhancing the spread of HIV/AIDS.

The community leaders in the interviews admitted that quarrying has created employment opportunities for many people but they blamed this also, inadvertently translated into a social cost for the communities. They said because of the unskilled nature of most of the labour force, some school pupils have opted to drop out of school, hoping to find employment at the quarries once they turn eighteen. School dropout cases have reportedly increased in schools around quarrying activity. For example, forty-five (45) percent of dropouts at Kowo Secondary School were attributed to the

problem of quarrying. Since unskilled labor attracts low wages, the cycle of poverty in these areas will further be perpetuated as the dropouts' children are also likely to do the same. To make matters worse, such lowly paid jobs will also be based on a finite resource. In support of the fact Kessler (1994) stated that while some of the quarrying companies have helped by building schools, they are, albeit unintentionally, also disrupting the same schools through dropouts in many mining areas in Zimbabwe.

As the researcher interacted with mine workers through interviews, they revealed work-related injuries, illnesses and deaths resulting from black granite quarrying. Eaton (1994), in support of this fact confirmed that mining activities in Africa are in most cases causes injuries and deaths as they lack appropriate monitoring and health related clothing. The physical nature of the work involved, coupled with poor workplace health and safety standards, have worsened the situation. Some workers have been reported maimed, others are now chronically ill, while some have died. Considering the fact that compensation to such workers is reportedly insignificant, the social implications for the dependants of affected workers are easily discernible. The mine respondents admitted that injured and ill workers are no longer able to look after their families, while other families have lost sole breadwinners, thereby widening the margin of poverty for such families.

### **Environmental Costs of Black Granite Quarrying on Local Communities**

The mining operations in Nyamuzuwe Ward 3, Mutoko District are marred by a legacy of environmental costs. Through the use of questionnaires and Focus Group Discussions, several biophysical costs, were identified while no single biophysical benefit could be traced. A seventy-five (75) percent of the respondents confirmed that quarrying activities have led to habitat destruction for various organisms. In addition, the establishment and expansion of the quarries have led to the disappearing of leopards and hyenas in the area as mountains are extracted. The respondents from the local communities revealed that the high-decibel noise pollution from blasting has driven away these animals. On the other hand, baboons and monkeys, which can better adapt to human-dominated environments, have had their numbers steadily decrease. According to the community traditional leaders the domination of baboons and monkeys, and the disappearance of leopards and hyenas, is likely to trigger other unforeseen ecological chain reactions such as droughts.

Through the use of questionnaires in data collection, seventy-five (75) percent of the respondents out of sampled populations revealed that the processes of road construction, clearing of working sites, and blasting and transportation of material have all resulted in the loosening up of soil, leading to increased erosion. In support of this Wyss (2003), stated that the major factors militating against the quarry industry in their operational areas include erosion, ground vibration, flying rocks, dust pollution and audible noise. The above processes, coupled with the destruction of vegetation along mountain slopes, have also led to slope instability, thereby resulting in such geomorphological processes, such as rock falls and mudflows, processes which were not common to these areas. The mass movements and soil erosion have contributed immensely to the siltation of river systems and dams, which are a backbone for horticulture. Some of the materials have also buried prime agricultural land. This evidence seconds what has been found on by other researchers on mining and environment degradation.

In addition, through personal observation the researcher noted a lot of waste that is generated during the cutting of rock into right sizes and shapes. The views of local people in questionnaires revealed that boulders that do not meet the desired requirements and those of poor quality are often dumped at quarry sites. Other sites have been abandoned due to low grade black granite rock. In most cases, no rehabilitation work has been carried out, with abandoned sites being characterized by scattered boulders, open pits, and waste dumps. For example, one of the quarrying companies, BOZIMO, has since left the areas it used to work on without any rehabilitation. This clearly supports the views of other researchers that mining leads to land pollution.

Most of the respondents (108 respondents out of 120 sampled populations) admitted that black granite quarrying produces high-decibel noise pollution from frequent blasting, which produces reverberations that can be felt 20-30 kilometers away. This has also been reported to have caused the cracking of houses and other infrastructure in nearby areas. This also includes some of the classroom blocks that have been donated by some of the quarrying companies. This was supported by observation as method that was used in this study.

### **Emerging Trends**

The community leaders greatly admitted that black granite quarrying have brought about socio-economic benefits to the area such as employment creation, road construction, construction of school blocks and dip tanks. Though it has brought socio-economic benefits, they are outweighed by negative impacts. The community leaders confirmed that they have lost their productive lands, vegetation, wildlife, good health, and safe water for drinking. Such a population illustrated that they have been disadvantaged by the mining company although they are the owners of the extracted resource.

The youth in the area admitted that black granite quarrying created employment for the locals though to a lesser extent. In addition, to that they have recognized infrastructural development brought about by the mining company in their area. However, the youth revealed that negative impacts outweigh the benefits. They revealed that they have remained poor as

many of the jobs are taken by outsiders, lost their productive lands, good health, vegetation, wildlife and they are paid low salaries. Therefore they concluded that mining in their area have brought about extreme poverty to the local communities.

Women in the area revealed that mining have stimulated vending, created employment and income generation to them. They also appreciated infrastructural development such as roads, construction of school blocks and dip tank brought about by the mining company in the area. However, the women largely blamed the mining activity for leading to negative environmental and socio-economic impacts to the communities surrounding the mining activity. Mining has exacerbated the poverty levels in the area as people are failing to put food on the table.

EMA and RDC also come to the conclusion that mining operations in the district has promoted high levels of poverty in the area. They revealed that only very few benefits are being accrued from the vibrant mining activity in the District. They stated that negative impacts have outweighed the positive effects reflecting that the company is exploiting resources for their benefit thereby disadvantaging the local communities.

## Conclusion

From the discussions on socio-economic and environmental effects of black granite quarrying in Nyamuzuwe Ward 3, it can be noted that there are both negative and positive impacts. After an investigation into the problem as pertains in Nyamuzuwe and its surroundings, the area of operation of Natural Stone Export Company, it has been realized that mining activities has brought about both benefits and costs to Nyamuzuwe Ward 3. The benefits include employment creation, infrastructural development, and revenue generation for the Mutoko Rural District Council. The costs of black granite quarrying to Nyamuzuwe include the lowering of water tables, creation of labor bottlenecks for peasant agriculture, and encroachment onto agricultural land. School dropouts have also been induced; while HIV/AIDS prevalence has reportedly increased since the establishment and expansion of the various quarrying companies. There are also incidences of pollution of varied kinds (that is, air, land, noise and water) to the environment. All of the major streams and rivers in the area have been polluted by the mining activity. The combined effects environmental pollution has culminated into health problems with high prevalence of diseases such as respiratory tract infections and skin diseases endemic in the area.

## Recommendations

After a meticulous study and analysis of the problem and all its ramifications as indicated in the preceding chapters, the following recommendations are made to address the socio-economic and environmental problems created by the mining operations.

Firstly, it is recommended that the companies operating in mining activities should share their earnings with the local communities, in line with the obligation of social responsibility. The local shares will promote a sustained social, economic and even infrastructure benefits to the surrounding communities. Secondly, the Environmental Management Agency (EMA) should review its environmental management policy to ensure that socio-economic and the environmental effects of mining activities in the area are reduced to the barest minimum. The Company tries as much as possible to employ and release toxic chemicals and other materials in their operations provided the amounts fall within EMA specifications without actually considering the adverse environmental and health effects on the people. It is therefore recommended that health considerations and sustainability of the environment should be prioritized before methods of operations are devised. Thirdly, there is need for the rehabilitation of the environment, through the application and implementation of stringent and rigorous measure of re-afforestation, resettlement of affected communities and other measures aimed at restoring degraded lands to its original state after mining activities should be intensified by the Company. These will not only reduce the negative environmental and health impacts on the people but also land would be available particularly to farmers for agricultural purposes. In addition, employment opportunities will receive a significant boost so as to trim down the high rate of unemployment in the Ward.

**Lastly, but not the least**, all the quarrying companies should be mandated to carry out full Environmental Impact Assessments and third-party environmental compliance audits before commencement of operation. This should include coming up with environmental management plans, including mine closure plans and post closure plans as required by the recently passed Environmental Management Act. The environmental management plans of the quarrying companies should closely be monitored by the Environmental Management Agency in order to ensure that set environmental targets, including the rehabilitation of quarried areas, are met. Performance bonds could be introduced by the Environmental Management Agency in order to ensure environmental security. Quarrying companies failing to perform according to the set of environmental standards will forfeit their money, which will then be used to correct their environmental externalities or, alternatively, they will have their mining rights terminated. This will act as an imperative for environmental protection among the quarrying companies.

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