18th ANNUAL RESEARCH WORKSHOP

Socio-economic Effects of Large-scale Gold Mining on Artisanal Miners in Tanzania: Experiences from Bulyanhulu Gold Fields

by

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Draft Report *GD10*

Presented at REPOA's 18th Annual Research Workshop
held at the Kunduchi Beach Hotel, Dar es Salaam, Tanzania;
April 3-4, 2013

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ACKNOWLEDGEMENTS

This study was conducted under the auspices of the Research on Poverty Alleviation (REPOA). The authors therefore are highly indebted to REPOA for financial support; without which this study could have not been possible. The research team is also grateful to Mr. Khamis Hassan for his assistance during data collection in the villages and to Mr. Mumina Mussa who used most of his time for coding and entering the data of this study into the Statistical Package for Social Sciences computer software for analysis. Special thanks are also extended to REPOA reviewers and participants of the REPOA's internal seminar presentation for the comments in the earlier draft of the report, and also to Prof. Adolfo Mascarenhas for reading the entire manuscript and providing useful comments. It is not easy to thank every individual, who, in one way or another provided support for this study. However, many thanks are extended to all individuals who tirelessly dedicated their time to provide useful information for the study: they include artisanal miners, smallholder farmers, village leaders, Resident Mines Officials in Kahama District, District Land Officer, District Planning Officer and officials at the Ministry of Energy and Minerals.

ABSTRACT

While large-scale foreign-based gold mining continues to dominate the mineral sector since 1990s, poverty in artisanal mining communities surrounding large-scale gold mining remains an issue of public outcry in Tanzania. This study involved 121 artisanal and 45 non-artisanal miners in examining socio-economic effects of large-scale gold mining on artisanal miners in the Bulyanhulu gold fields in Kahama District. Its three specific objectives were: to assess policy issues in mining and its implication on artisanal miners' social well-being; to assess socio-economic activities among artisanal miners before and after domination of large-scale gold mining in order to ascertain the dynamics; and to analyze contribution of large-scale gold mining to social service development. The study adopted cross-sectional research design in analyzing the current situation. While respondents for household survey were chosen through systematic simple random sampling, key informants were selected through purposive sampling technique. Both qualitative and quantitative data collection and analysis were involved in order to increase understanding of socio-economic effects. Quantitative data were summarized using Statistical Package for Social Sciences (SPSS) computer soft ware, whereas, qualitative data were analyzed using content analysis techniques. Dynamics of socio-economic activities were assessed using before and after domination of large-scale gold mining technique. In order to analyze contribution of large-scale gold mining to social service development, the contribution of large-scale gold mining was assessed in relation to other stakeholders' contribution.

Findings revealed the following: first there was a mismatch of national policy and mining laws regarding displacement and compensation of artisanal miners and the practice on the ground. This resulted into creating good environment for large-scale gold mining compared to artisanal mining. Second, although artisanal mining remained the mainstay of artisanal miners' livelihoods its contribution to the household income decreased after domination of large-scale gold mining. Diversification to other livelihood options was also limited. Third, unlike neo-liberal thinking, large-scale gold mining did not substantially contribute to social service development regarding contribution to the district budget, job creation and employment, water sources development, health care facilities and primary education development. Specifically, large-scale gold mining caused negative effects including decrease in household income accruing from artisanal mining, unsustainable employment opportunities, increased HIV and AIDS and Air Respiratory infections. These effects have exacerbated poor living standards in the study area. Therefore, concerted efforts are needed to switch the negative effects of large-scale gold mining into opportunities for improving living standards of the artisanal miners and the local people at large. The district and central government

level policy makers should also turn the mere policy statements to improve domestic-based small-scale gold mining by putting policy and laws into action. Small-scale gold mining dominated by domestic investors is sustainable compared to large-scale gold mining, which is largely dominated by foreign investors because most of the profit accruing from small-scale gold mining can be invested into local communities compared to large-scale gold mining, which can repatriate most of the profits. Finally, the study recommends further study to address the question ‘how can large-scale gold mining become an instrument for poverty reduction?’ Specifically, further study should focus on how to reverse the trend from negative to positive and sustainable socio-economic effects.

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LIST OF ACRONYMS

AFRODAD	African Forum and Network on Debt and Development
AIDS	Acquired Immunodeficiency Syndrome
ARI	Air Respiratory Infection
BGM	Bulyanhulu Gold Mine
CSRP	Corporate Social Responsibility Plan
FDI	Foreign Direct Investment
FGD	Focus Group Discussion
GDP	Gross Domestic Product
HIPC	Highly Indebted Poor Countries
HIV	Human Immunodeficiency Virus
IMF	International Monetary Fund
KDC	Kahama District Council
KEEP	Kahama Education Enhancement Project
KMCL	Kahama Mining Corporation Limited
LEAT	Lawyers Environmental Action Team of Tanzania
PEDP	Primary Education Development Plan
PML	Primary Mining Licence
REPOA	Research on Poverty Alleviation
RMO	Resident Mines Office
SPSS	Statistical Package for Social Sciences
STAMICO	State Mining Corporation
STI	Sexually Transmitted Infection
TB	Tuberculosis
TIC	Tanzania Investment Centre
URT	United Republic of Tanzania
VEO	Village Executive Officer
WB	World Bank
WEDECO	Water and Development Company Limited

1.0 INTRODUCTION

Since inception of the neo-liberal development thinking, the global development thinking has shifted from the public sector being sole controller of the mineral sector to viewing large-scale gold mining as an engine for private sector-led economic growth. This was a response to conditions of the World Bank (WB) and International Monetary Fund (IMF) for debt relief for Highly Indebted Poor Countries (HIPCs), which took place in the 1980s. Among concerns of large-scale gold mining are socio-economic effects on artisanal and small-scale miners in developing countries including Tanzania. For instance, displacement of artisanal miners from gold mining areas to pave way for large-scale mining is the most cited concern in literature. Yet, artisanal miners' social well-being depends on artisanal mining operations taking place in gold rich areas where artisanal miners are being displaced to pave way for large-scale mining. Following domination of large-scale gold mining in Tanzania and dependence of artisanal miners' livelihoods in artisanal mining, a pertinent question is then invoked; 'large-scale gold mining for whose benefit?'

The concept of artisanal mining differs slightly from the concept of small-scale mining though some scholars perceive them to be synonymous. For instance, Nyankweli (2012) defines artisanal and small-scale mining as mining operations for subsistence. This definition does not explicitly distinguish artisanal mining from small-scale mining. Nevertheless, Mwaipopo *et al.* (2004) and Fisher (2007) differentiate the two concepts by arguing that artisanal mining is poverty driven; often employ traditional, manual tools and low technologies. It is often considered illegal and can operate with or without licence. Small-scale mining on the other hand, employ some degree of mechanisation, licensed and organised in some form of mining associations. Furthermore, small scale mining can have legal claimed holdings. In addition, small-scale mining can use improved technologies including drilling machines, compressors, water pumps and most grind the gold ore by using ball-mills. Artisanal and small-scale mining are similar in that both are based on labour intensive mining and processing techniques with low per capita productivity; they both employ simple tools and require low capital investment (Mwaipopo *et al.,* 2004: Fisher, 2007).

1.1 Large-scale and Artisanal Mining in Tanzania

In the past three decades, large-scale operations in the mineral sector in Africa have become a widespread phenomenon. Following economic reforms of the 1980s and 1990s, Tanzania like other countries in the global south and Africa in particular opened up her mineral sector to large-scale foreign investment. This has resulted into increasing inflows of Foreign Direct Investments (FDI) in the country (URT, 2009a). Bulyanhulu gold fields have therefore become dominated by large-scale gold mining

operations. These gold fields encompass eight village settlements: Kakola, Bugarama, Ilogi, Buyange, Igwamanoni, Busindi, Busulwangili and Iyenze. Before the Bulyanhulu gold fields were rendered open to large-scale foreign investment, mining operations were under control of the state through the State Mining Corporation (STAMICO). In addition, artisanal and small-scale miners were dominant in these gold fields (Lissu, 2001). This suggests that livelihoods of artisanal and small-scale miners depended directly or indirectly on activities related to mining.

A recent report by Presidential Mining Review Committee of 2008 commonly known as the Bomani Committee reveals that Bulyanhulu gold fields have a reserve of about 411 tonnes of gold and large-scale gold mining was producing at a rate of 11.24 tonnes per annum. With this rate of gold production, the expected life span of the Bulyanhulu gold fields is 30 years since 2008, implying that there will be no more gold by 2038 except big trenches. Despite large-scale gold mining, the Bulyanhulu gold fields are also important source of livelihoods for artisanal and small-scale miners. Worldwide, livelihoods of about 80 to 100 million people directly or indirectly depend on artisanal mining (Hoadley and Limpitlaw, 2004; AngloGold Ashanti, 2008). In over 30 developing countries, the social well-being of about 13 to 20 Million people depend directly on artisanal and small-scale mining (Weber-Fahr *et al.,* 2001; Hentschel *et al.,* 2003; AngloGold Ashanti, 2008). Nevertheless, Tanzania has ambiguities as regards to regulations and rules governing participation of artisanal miners in the mining industry for the period between post-independence and before liberalization. For instance, during the second phase administration of President Mwinyi (between 1985 and 1995), the government allowed co-existence of artisanal miners and government interventions in gold mining operations. However, some government officials considered artisanal mining as an illegal business. Currently, the government struggles to formalize artisanal mining operations though efforts are still mere policy statements.

Despite these ambiguities, the government of Tanzania acknowledges that artisanal and small-scale mining have positive contribution to the economy (See for example Mining Acts of 1979; 1998; 2010). These were major minerals producers in the country for the period between 1987 and 1997 (Nyankweli, 2012). Inefficiency of the state in supporting and promoting the artisanal miners is one of the reasons for liberalization of the mineral sector in the 1980s. The process began during the second phase government of President Mwinyi and was finalized during the third government of President Mkapa (that is during 1995 to 2005). Issues related to liberalization of gold mining include displacement and the ensuing controversies in compensating artisanal miners (Kitula, 2006; Hilson and Banchirigah, 2009). In the Bulyanhulu gold fields, displacement affected about 75% out of two hundred artisanal miners who worked in the gold fields (LEAT, 2003).

Controversies in compensating artisanal miners arise because some land laws expected to facilitate compensation contradict with the prevalent mineral policy. Land Acts of the 1999 for example, contradict with the 2009 mineral policy on land compensation issues. While Land Acts explicitly mention the government as sole compensator when land is acquired from its right holder, the 2009 mineral policy stresses that compensation should be a large-scale investor's role. Furthermore, high royalty imposed by the 2010 Mining Act is yet to be effected. This means that large-scale gold mining investors continue to pay royalty of 3%. Employment opportunities generated by foreign investment in gold mining is another issue of concern. In 2007 for example, there were 8,000 formal employments in the mining industry of Tanzania, while artisanal mining employed about 500,000 people (Bourgouin, 2011). This study argues that increasing impetus for capital intensive large-scale gold mining disadvantages social well-being for artisanal miners and communities living in proximity to large-scale mining operations. Clearly, socio-economic effects of large-scale gold mining to artisanal miners are not known. This study delved to investigate socio-economic effects of large-scale gold mining on artisanal miners in the Bulyanhulu gold fields in the Kahama District.

1.2 Statement of the Problem

Large-scale gold mining operations have positive and or negative socio-economic effects depending on social capital development and policy framework in the host country (Johnson, 2006). On one hand, this generates benefits in a host country through foreign exports, royalties, tax contributions, as well as facilitating technology transfer (Mutemeri and Petersen, 2002). Secondly, it can create jobs and contribute to improving social and physical infrastructures (Hilson and Banchirigah, 2009). Negative effects include repatriation of profit and exclusion of local business, loss of income and networks for the displaced and environmental impact (Nyankweli, 2012). Before domination of large-scale mining in the mineral sector of Tanzania, artisanal and small-scale mining operations increased household income six times among artisanal miners in the Bulyanhulu gold fields (KMCL cited by LEAT, 2003). Some artisanal miners later improved to becoming mineral brokers. Other artisanal miners invested in more stable activities such as shops, restaurants and guest houses thus improving household social well-being.

Studies to assess performance and efficiency of large-scale investment in other sectors are many (see for example Gibbon, 1999; AFRODAD, 2007), but none have been carried out in the gold mining industry of Tanzania especially on the effects of large-scale gold mining on artisanal miners welfare. A related study by Fisher (2007) for example, concentrated on social exclusion and integration of artisanal mining operations into the national economies of Africa, Tanzania inclusive. Fisher concluded that large-scale mining has excluded artisanal miners from rights of

access to mineral resources and land. Kitula's study (2006) dwelt on environmental and socio-economic impacts of large-scale gold mining in mining areas of Geita District in Tanzania, but did not address its impact on artisanal miners' social well-being. In other words, Kitula's study did not uncover socio-economic effects of large-scale gold mining on artisanal miners. Therefore, little is empirically known about the socio-economic effects of large-scale gold mining on artisanal miners in the Bulyanhulu gold fields in the Kahama District. This study is a step towards addressing this knowledge gap.

1.3 Significance of the Study

Gold mining industry has of recent become a priority industry of growth and poverty reduction in Tanzania. Although, the government acknowledges the importance of artisanal and small-scale mining in reducing vulnerability and poverty, large-scale foreign investment dominates gold mining operations in the country (URT, 1997; 2005b). Further, the mineral sector minimally contributes to the nation's GDP. Following this mismatch and given the displacements of artisanal miners and its associated consequences, the social well-being of communities surrounding such large-scale foreign investments in mining has been an issue of public outcry. This study therefore, is timely, imperative and crucial for development planning, policy making as well as a contribution towards improving socio-economic status of artisanal miners in the country.

1.4 Objectives of the Study

The general objective of this study was to investigate socio-economic effects of large-scale gold mining on artisanal miners. Specifically, the study addressed three objectives as follows:

(i) Assessing policy issues in mining and its implication on artisanal miners' social well-being;

(ii) Assessing socio-economic activities among artisanal miners before and after domination of large-scale mining; and

(iii) Analyzing contribution of large-scale gold mining on social service development in artisanal mining communities.

1.5 Research Questions

The study was guided by the following research questions:

(i) How are policies at local and national level linked regarding large-scale gold mining and artisanal miners' social wellbeing?

(ii) What are positive and negative socio-economic effects of large-scale gold mining on artisanal miners in the Bulyanhulu gold fields?

(iii) Who is benefiting from large-scale gold mining in the Bulyanhulu gold fields?

2.0 LITERATURE REVIEW

2.1 Effects of Large-scale Mining: theoretical arguments

Literature reveals that there is no single theory, which adequately explains socio-economic effects of large-scale foreign investment particularly in host countries. Put differently, no single theory can be used to explain socio-economic effects of large-scale foreign investment in the mineral sector in the global south. It is theorized that while foreign direct investment in mining operations has both positive and negative effects in the global south it has positive economic effects in developed countries. When reporting about neo-liberal stance about socio-economic effects of large-scale mining, Mutemeri and Petersen (2002), Johnson (2006), Hilson and Banchirigah (2009) and Nyankweli (2012) argue that positive effects of large-scale mining include job creation, technology spill over and generation of royalties. Another positive effect is increasing income in local communities through stimulation of income generating activities and thus diversifying local economies. Income can also be generated in host countries through licensing fees.

Nevertheless, such positive effects depend on host country conditions such as human capital development, export conditions, policy framework and macroeconomic stability (Johnson, 2006). Negative effects on the other hand, are theorized to include: repatriation of profit by large-scale companies, loss of income for the displaced, and impact on the physical environment. Tanzania has experienced an increased mining production and consequent export in recent years following liberalization of the mineral sector. However, it is reported that such an improvement in mining production has had minimal contribution to the Gross Domestic Product (GDP), and it is not clear as to what are the socio-economic effects of large-scale gold mining on artisanal miners and on local communities living in the vicinities of large-scale gold mining areas.

2.2 History, Policy and Legal Issues in Gold Mining of Tanzania

In examining gold mining industry in Tanzania, it is useful to consider three historical epochs: pre-independence, post-independence and economic liberalization period. During pre-independence period, mining operations in the country were under control of colonial governments, the German and the British. Both large and small-scale foreign companies operated mining activities in places like Lupa (Mbeya), Sekenke (Singida) and the Lake Victoria gold fields in Mwanza and Shinyanga Regions. By 1938, gold mining alone employed about 32,000 people, and out of these 86% were Africans (Lissu, 2001). One salient feature in country's mining sector is that mineral export increased throughout the colonial period except the

period just before independence. A pertinent question however, is ‘did the increase in mineral export during colonial period helped improving social well-being of the communities surrounding gold mining?’

Post-independence socialist period on the other hand, saw the abandonment of private or companies mining operations in the country. The State Mining Corporation (STAMICO) controlled all mining operations especially during the 1970s. Noticeably, the industry experienced 52% decrease in mineral export from for example 1967 to 1989 (Nyankweli, 2012). Such decrease was associated with lack of capital, lack of expertise, lack of commitment and poor management of the mining industry.

The third period is economic liberalization, which occurred during 1980s until 1990s. During that period, Tanzania like other African countries opened up her mineral sector for foreign investment. Liberalization of the mining sector was largely guided by the mineral policy of 1997 and the mining Act of 1979. By 1998, another mining Act was promulgated. While the 1997 national mining policy explicitly stipulates a framework for spurring the development and exploitation of minerals and a framework for foreseeing large and small-scale prospecting and mining sector, on the other hand, the mining Acts stipulate all legal issues governing mining operations in Tanzania. This study argues that mining Acts in Tanzania create a good environment for large-scale foreign investment than they do for artisanal mining operations. For instance, the mining Act of 1998 impose a 100% foreign ownership of the mining industry, provide waivers for import duties on mining equipment including tax exemptions, and also impose low royalty of 3% for gold mineral based on net back value (Bourgouin, 2011). Thanks for the 2010 mining Act which imposes slightly higher royalty of 4% to be levied on the gross value of metallic minerals including gold.

While the 1979 Mining Act required applicants of mining license to present a plan for local procurement of goods and services, there was no such a requirement in the 1998 Mining Act. Similarly, the mineral policy of 2009 and the 2010 Mining Act lack that critical requirement. This study is of the view that local procurement strategy can help to improve local economies. Currently, Tanzania Investment Centre (TIC) foresees all investment issues in the country in order to attract more capital intensive large-scale foreign investment in mining operations. The current study argues that increasing foreign investment in gold mining operations discourages labour intensive artisanal mining. Some government officials have the notion that artisanal miners provide a window for steeling the gold mineral. This notion largely affects government’s support to artisanal miners in terms of technologies used, licensing and marketing issues.

Both the national mineral policy and mining Acts identify employment creation in mining industry as an issue of concern. It is reported that by 2007, large-scale foreign investment[1] in mining industry of Tanzania employed 8,000 people and between 89 and 97% were Tanzanians (Society for International Development, 2009). A major question however is; where are the artisanal miners? What and how do they benefit from large-scale gold mining? The policies and Acts cited are not very explicit on this issue.

Tanzania's mineral policy of 1997 was formulated during economic reform period, when the country transformed its socialist development philosophy to free market economy. It is as recent as in 2009, that the country reviewed its mineral policy to reflect more reality on the ground. The new policy upholds that the mineral sector can contribute considerably towards among other things: employment creation for Tanzanians particularly those displaced by large-scale mining operations. The sector can also contribute to social and economic infrastructure development, income generation, and foreign exchange earnings and can contribute to government revenues. The common feature for these two policy documents is that they both support creation of a good environment for foreign investment in gold mining industry. Yet, they do not uncover possible socio-economic effects of large-scale mining on artisanal miners.

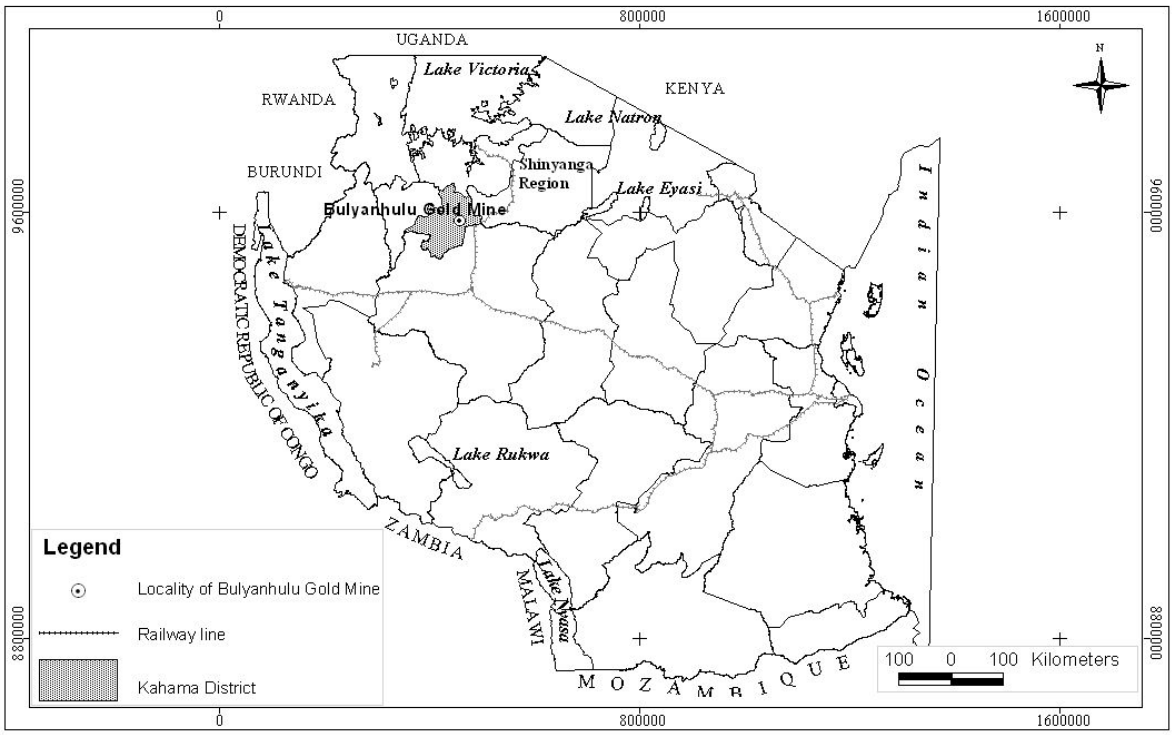
As reported elsewhere in this work, large-scale mining has resulted into displacement of local people including artisanal miners. From the human rights perspective, artisanal miners who have been displaced from gold rich mining areas need policy and legal support to ensure that they work in partnership with large-scale gold mining companies and that their social well-being is not jeopardized. One of the objectives of the 1997 mineral policy was alleviation of poverty especially on artisanal miners through transformation of the sub-sector by integrating artisanal mining into the rest of the economy. Transforming artisanal miners into more organised operations is the cornerstone of the 2009 mineral policy and the 2010 Mining Act. Simplified mineral trading licensing procedures and increasing number of licensed artisanal miners stipulated in the 2009 policy document and in the 2010 Mining Act are all important in order to regularize and formalize artisanal and small-scale miners. Other fundamental things reflected in policies and laws include: improving knowledge, skills, and awareness on legislation, access to information, finance and technology to artisanal and small-scale miners. However, as of now, given a considerable support by the government on large-scale gold mining, it is unclear what socio-economic effects, has the large-scale mining brought to the artisanal miner's social well-being.

[1] The six large-scale gold mining investments are: Geita Gold Mine, Bulyanhulu Gold Mine, North Mara Gold Mine, Golden Pride Gold Mine, Tulawaka and Buzwagi Gold Mine.

3.0 JUSTIFICATION FOR THE STUDY DISTRICT

This study was conducted in the Bulyanhulu gold fields in Bugarama ward. The area is found in Kahama District in Shinyanga Region. Data collection took place between August and November 2010 and also during November 2012. The Bulyanhulu gold fields encompass eight village settlements: Kakola, Bugarama, Ilogi, Buyange, Igwamanoni, Busindi, Busulwangili and Iyenze. The area is located 850 Kilometres Northwest of Dar es Salaam; 150 Kilometres Southwest of Mwanza City; 45 to 55 Kilometres South of Lake Victoria and 42 Kilometres South of Isaka.

Kahama District borders Shinyanga and Nzega Districts on the East, and Geita District on the North. The district further borders Bukombe District on the West and the Tabora District on its South. There are two large-scale gold mines in Kahama District: Bulyanhulu Gold Mine (BGM), which started production in 2001, and Buzwagi Gold Mine which started production in 2009. Bulyanhulu gold fields are known for artisanal mining operations since 1975. To that effect, a significant number of artisanal miners worked there before the fields were appropriated by large-scale gold mining operations. Despite domination of large-scale gold mining, the surrounding communities still economically depend partly on among others, artisanal mining operations. Location of the Kahama District in Tanzania is shown in Map 1.



Map 1: Map of Tanzania Showing Location of Kahama District

Lissu (2001) and Hinton (2005) reveal that before the Bulyanhulu gold fields were appropriated by large-scale gold mining, about two hundred thousand artisanal miners worked in the Bulyanhulu gold fields. During that period, the highest number of artisanal miners in the country was 1,500,000 (Nyankweli, 2012). Considering the number of artisanal miners in the area before liberalization compared with the total population in the Kahama District based on 1988 national censuses (Table 1), it can be seen that about 40% of the total population in the district were artisanal miners.

Kahama District is also the host of two large-scale gold mining companies: Bulyanhulu and Buzwagi gold mines. The study district was therefore chosen based on the fact that displacement resulting from large-scale gold mining in the area affected about two fifth of the population in the district. Since the Bulyanhulu gold fields had significant number of artisanal miners before liberalization of the mineral sector in Tanzania, it is perceived in this study that many artisanal miners were also affected by displacement in the district compared to other gold mining areas in the country. It is for these reasons that Kahama District was chosen for the study to investigate the socio-economic effects of large-scale gold mining on artisanal miners in the Bulyanhulu gold fields.

Table 1: Population Trends in Kahama District

Year	Population Size		Total	Sex Ratio
	Male	Female		
1988	244,885	254,553	499,438	96
2002	294,572	300,319	594,891	98

Source: URT, 2002. Population and Housing Census Volume II, Sex and Age Distribution; Dar es Salaam: National Bureau of Statistics.

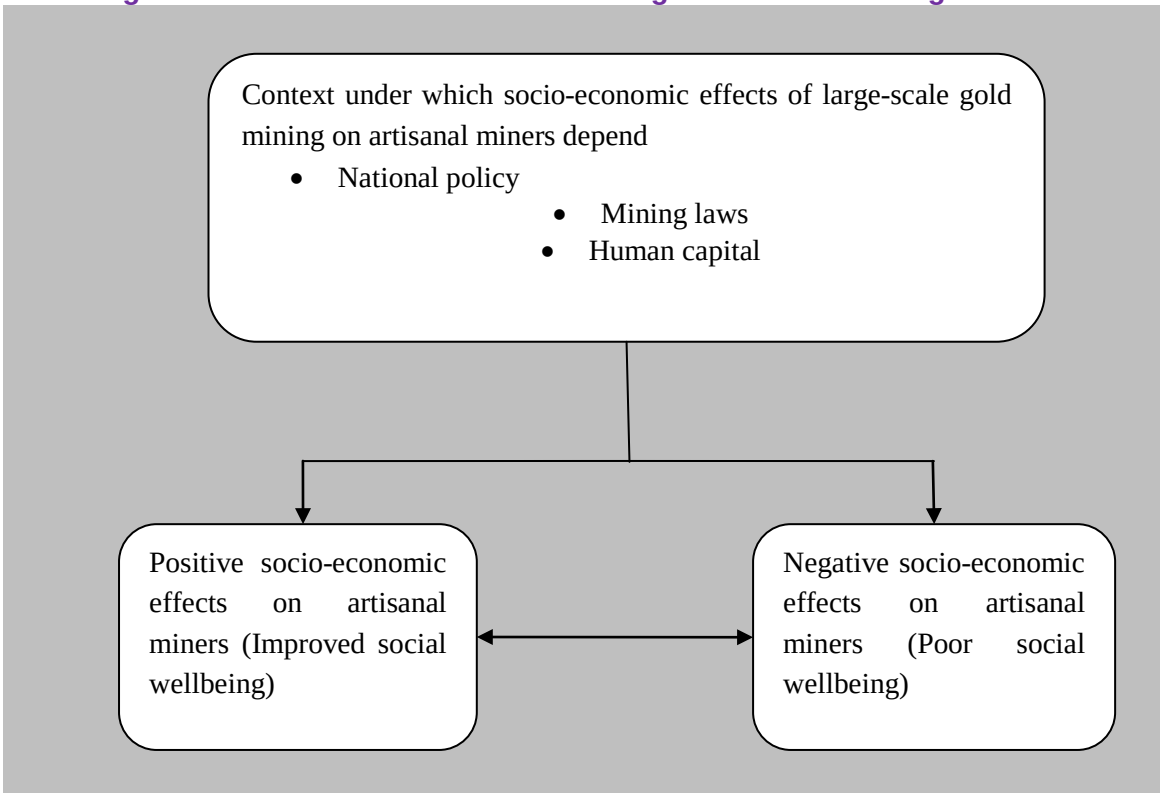
4.0 METHODOLOGY

4.1 Conceptual Framework

This study is based on the assumption that large-scale gold mining cannot only result into positive effects as put forth by the neo-liberal development thinkers, but also can result into negative socio-economic effects particularly regarding artisanal miners' social wellbeing. The concept of social wellbeing is used to mean a state of being away from poverty, unemployment, poor health care facilities, poor access to clean and safe drinking water, away from living in poor housing and away from none or access to poor quality of education. In this case, positive effects of large-scale gold mining can lead into improved social wellbeing. This include job creation; generation of royalties; increased income and stimulation of income generation activities by diversifying the local economies (Mutemeri and Peterson, 2002; Johnson, 2006; Hilson and Banchirigah, 2009). However, such positive effects do not trickle down automatically to the local people including artisanal miners, but, they depend on a framework and conditions for facilitating the benefits in host countries. For instance, access to employment created by large-scale gold mining depends on human capital development. This means that those who have technical skills to perform different jobs offered by large-scale gold mining are likely to access jobs compared to unskilled local people.

Second, the realization of positive effects accruing out of large-scale gold mining depends also on policy and legal frameworks to facilitate them (Johnson, 2006). This means that without responsive policy and legal framework to facilitate mutual benefits between host countries and large-scale gold mining; and also to turn negative effects into opportunities, large-scale gold mining can threaten the social wellbeing particularly among artisanal miners whose living directly or indirectly depend on artisanal mining. The study assumes that displacement of artisanal miners from gold rich mining areas to pave way for large-scale gold mining can cause negative socio-economic effects to artisanal miners. Negative socio-economic effects can translate into poor social well being. This implies that it can deepen poverty and exacerbate unemployment. Nonetheless, practical and responsive policy and legal framework in mining can convert negative socio-economic effects into positive effects. In this case large-scale gold mining can become an instrument for poverty reduction. Figure 1 presents conceptual framework indicating a context under which socio-economic effects of large-scale gold mining on artisanal miners depend.

Figure 1: Socio-economic Effects of Large-scale Gold Mining in Tanzania



Source: Authors'construct

4.2 Research Design and Methodological Approaches

The current study adopted cross-sectional and retrospective research design. Cross sectional research design enabled analysis of the current situation especially on incidence of displacement, important economic activities for the livelihoods, and income sources. The study also adopted retrospective research design in order to gain deeper insights about socio-economic effects on artisanal miners before domination of large-scale gold mining in the mineral sector. This design enabled to explore and analyse socio-economic effects before and after domination of large-scale gold mining such that respondents were required to think and report about their socio-economic situations between the two periods. In order to isolate socio-economic effects of large-scale mining, the study adopted analysis before and after domination. In cases where the data before domination were not available or difficult to get them, the contribution of large-scale foreign investment particularly the Bulyanhulu Gold Mine on social well-being of artisanal miners in relation to other actors was assessed.

The study also adopted exploratory sequential approach in collecting and analyzing data. In this approach qualitative and quantitative data were collected in different phases. Phase one concentrated on qualitative data collection and analysis as opposed to phase two, which built on phase one by quantifying some important

variables to measure incidence of displacement, important economic activities for the livelihoods, and income sources before and after domination of large-scale gold mining. In this case, the second phase was informed by the first phase. While the qualitative phase (the first phase in this case) was meant to shed light and also provide comprehensive qualitative information on socio-economic effects of large scale gold mining on artisanal miners, the second phase quantified some variables in order to establish incidences of responses. Results from the two phases are integrated together. This approach was chosen to help expand the scope and improve analytical power of the study as argued by Sandelowski (2000) and so increase understanding of socio-economic effects.

4.2.1 Sampling techniques

The sampling unit was the artisanal miners' household. Non artisanal miners were also involved in order to compare their social economic activities with those of artisanal miners. The study defined artisanal miners' household as one whose household head directly engaged in artisanal mining operations in addition to other socio-economic activities. Non artisanal miners on the other hand, were not directly dealing with mining operations but dealt with other socio-economic activities including farming. The study involved 121 artisanal miners and 45 non artisanal miners.

Systematic random sampling technique was used to select respondents. Key informants and villages involved in the study were selected using purposive sampling technique. Criteria for village selection were: availability of artisanal miners and accessibility to the villages. The process of selecting respondents began by preparing a list of artisanal miners' households with the help of Village Executive Officers (VEO). Selection interval was then established by taking total number of households in the village divided by determined sample size in that particular village. The first household was randomly selected in each village from within the interval size. Subsequent households were then chosen from the list after an interval size. To ensure that systematic random sampling did not hide anything, households were arranged without any meaningful pattern. This method was employed to ensure an equal probability to every artisanal miner household. Table 3 shows the selected respondents in each village. Instruments for data collection were structured questionnaire and checklist of items for discussion during focus group discussions (FGDs) and also during key informant interviews. Three Focus Group Discussions (FGDs) were conducted and involved 30 participants in the study villages except Ilogi. The study used brainstorming and pair-wise ranking to generate data during discussions in focus groups. Participants ranged between 9 and 11. Key informant interviews on the other hand, involved 17 participants including Resident Mining Officer, District Land Officer, and Planning Officer. Others included: village health

workers, head teachers, village elders, management of the Water and Development Company Limited (WEDECO), and management of the Multipurpose Cooperative Society Limited[2]. At the Ministry of Energy and Minerals key informants involved were 3 commissioners for lands. Table 2 presents number of key informants involved in the study.

Table 2: Number and Type of Key Informants Involved

Type of key informant	Number involved
Resident Mining Officer	1
District Land Officer	1
Planning Officer	1
Village Health Workers	2
Village Elders	2
Primary School Head teachers	5
Management of Water and Development Company	1
Management of Multipurpose Cooperative Society	1
Commissioners for Lands	3
Total	17

Table 3: Number of Selected Respondents per Village

Village name	Total No. of households	Total Number of HH directly involved in artisanal mining	Number of selected Respondents		Total No. of households selected
			Artisanal miners	Non-artisanal miners	
Ilogi	1209	21	6	9	15
Bugarama	1169	55	17	13	30
Kakola	3516	159	59	18	77
Busulwangili	543	139	39	5	44
Total	6437	374	121	45	166

This wide range of key informants was adopted in order to capture ideas and feelings from different stakeholders. Secondary data on the other hand, were generated through reviewing different sources of information including Resident Mining Office (RMO), District Planning Office, Village Government Offices, and from social service providers including primary schools, Bugarama Dispensary, Management of Water and Development Company (WEDECO) and Management of Multipurpose Cooperative Society Limited.

4.2.2 Data analysis

Statistical Package for Social Science (SPSS) was used to compute frequency distributions and descriptive statistics. On the other hand, content analysis was used to analyse qualitative data from FGDs and key informant interviews by, first,

[2] Responsible for promoting economic welfare through among other things, administering casual labour employment in the Bulyanhulu gold fields.

generating text from the notes obtained in the field and formulating patterns with regard to research objectives. Thereafter, the patterns and their implications were discussed. Quotes have been interwoven to strengthen the discussions. Data are presented by using tables and photos.

4.3 Problems Encountered in Conducting the Study

Two problems were encountered during the study. First, some areas of Busulwangiri village were very remote such that it was too difficult to reach them by using a vehicle. In other words, there were no passable roads in some parts of Busulwangili village. Researchers addressed this problem by using motorcycles and sometimes bicycles. The second problem was based on unwillingness of some respondents to participate in the study. This was observed particularly at Kakola centre. Respondents who were not ready to participate in the study stressed that some researchers had come and interviewed them several times, but no actions have been taken so far to address their issues related to artisanal mining activities. Nevertheless, their number was not considerable big enough to affect the sample size. Researchers addressed this problem by selecting other respondents from the sampling frame to ensure that an adequate sample size is maintained.

4.4 General Characteristics of the Selected Sample

Tables 4 to 7 present general characteristics of the selected sample. Over ninety percent of the respondents were male heads of households, while less than 10 percent were female heads of households with a mean age of 49 years. The youngest age group was 24 years while the oldest in the sample was 90 years. The majority belonged to the age group of 35-44 and 45-54 and collectively constituted about 60 percent of the total artisanal miners involved in the study (Table 5). This implies that artisanal mining activities involved both young people as well as older ones (Photo 1 and 2).

Photo 1: Young Artisanal Miners at Work

Photo 2: An Old Man Crushing the Rock

Further, more than half of the respondents held primary education level. Some had incomplete primary and secondary education. Some held tertiary education level. However, a few had absolutely no formal education (Table 5). This implies that majority of artisanal miners were primary education holders. About marital status, majority were married and a few were separated; widows or widowers and some had never been married (Table 5).

Findings also revealed that immigration was a common practice across all villages involved in the study. Majority of immigrants were reported at Kakola and Busulwangili villages (Table 6). This can be explained by the fact that Kakola is the biggest centre where different waged and self employment was taking place. These opportunities attracted immigrants to settle in this village. Secondly, Kakola village, which is about three Kilometres away from large-scale gold mining, is where a number of workers employed by the Bulyanhulu Gold Mine (BGM) live. On the other hand, many immigrants in Busulwangili village can be attributed to the presence of Busulwangili Gold Mine belonging to artisanal miners. Other characteristics of artisanal miners who participated in the study are presented in Table 7.

Based on household size as categorized by Mbonile (2008), three groups of households emerged on the selected sample. First, small household with one to three members; second, medium household with four to six members and third, large household with 7 members and above. The mean of artisanal miner's household size was 7.3 as opposed to 6.8 for those not engaged in mining activities. The combined mean was 7.2, which is higher than the national level household size of about 5 members. More than half of artisanal miners' respondents came from large households followed by medium households (Table 4). This is one of the characteristics of most Tanzania's rural households. Large household size increases resource scarcity and distribution complexities among household members resulting

into marginalisation of some members, given unequal power relations with regard to decision-making processes in rural Tanzania.

Table 4: Household Size of the Selected Sample (% in brackets)

Household Size	Artisanal Miner's (n=121)	Non-artisanal people (n=45)	Total (N=166)
Small household (1-3)	13(11)	6(13)	19(11)
Medium household (4-6)	40(33)	25(56)	65(39)
Large household (7 & above)	68(56)	14(31)	82(49)
Total	121(100)	45(100)	166(100)

Source: Survey data, 2010

Table 5: General Characteristics of the Selected Sample (N=166)

Sex of the household head	Artisanal miners (n=121)		Non-artisanal people (n=45)		Total (N=166)	
	Freq.	%	Freq.	%	Freq.	%
Marital status						
Male-headed	114	94	39	87	153	92
Female-headed	7	6	6	13	13	8
Respondent's age						
24-34	15	12	9	20	24	15
35-44	37	31	9	20	46	28
45-54	35	29	17	38	52	31
55-64	19	16	3	7	22	13
65+	15	12	7	15	22	13
Highest education level reached						
No formal education	19	15	8	18	27	16
Adult education	2	2	0	0	2	1
Not completed primary	13	10	3	7	16	10
Completed primary	72	60	29	64	101	61
Standard eight	7	6	0	0	7	4
Incomplete secondary	1	1	0	0	1	1
Completed secondary	5	4	4	9	9	5
Tertiary education	2	2	1	2	3	2
Marital status						
Married	104	86	36	80	140	84
Separated	8	7	7	16	15	9
Never married	4	3	2	4	6	4
Widow/widower	5	4	0	0	5	3

Source: Survey data, 2010

Table 6: Immigration in the Study Area

Village	Artisanal miners (n=121)				Non-artisanal people (n=45)			
	Born in the village		Immigrated into the village		Born in the village		Immigrated into the village	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Ilogi	3	6	3	4	4	16	5	25
Bugarama	4	9	13	18	8	32	5	25
Kakola	26	55	33	45	10	40	8	40
Busulwangili	14	30	25	33	3	12	2	10
Total	47	100	74	100	25	100	20	100

Source: Survey data, 2010

Table 7: Descriptive Statistics Showing Some Respondents' Characteristics

Variable	N	Minimum	Maximum	Mean	Std Dev.
Years of schooling of household heads	166	0	15	8.40	3.56
Age of household heads/respondents	166	24	90	48.61	13.45
Household size	166	1	18	7.30	3.59
Net No. of years lived in the village after immigration	95	1	57	21.80	10.22

Source: Survey data, 2010

5.0 FINDINGS

This part of the report presents and discusses socio-economic effects of large scale gold mining on artisanal miners in the Bulyanhulu gold fields in Kahama District. It is divided into nine sections which presents and discuss the following aspects: Section 5.1 presents policy and legal issues in artisanal mining operations. Section 5.2 presents effects of large scale gold mining on economic activities among artisanal miners. Section 5.3 presents effects of large scale gold mining on social service development. Findings are discussed in section 6.0 whereas; conclusion and emerging policy implications are presented in section 7.0. Section 8.0 is devoted to ways of disseminating the research results and finally, in section 9.0 the report charts out areas for further study.

5.1 Policy and Legal Issues in Artisanal Mining

Data on policy issues were collected through key informant interviews conducted at the local, district and at the national level. Some secondary data were collected from Resident Mines Office (RMO) in Kahama District. In analysing socio-economic effects of large scale gold mining on artisanal miners in the Bulyanhulu gold fields the study collected information concerning the context under which artisanal miners were operating. The areas of focus were policy issues on displacement and compensation of artisanal miners and strategies put in place to address the issues. Data from key informants are presented in Table 8.

Findings revealed that policy and legal framework in supporting artisanal mining exist at the national level to the district level. At the district level for example, the study found Resident Mines Office (RMO), which is responsible for legal issues including giving license to artisanal miners. Key informants also reported displacement of artisanal miners in the study area. Displacement was in form of eviction whereby, artisanal miners were removed by force to pave way for large-scale gold mining. However, all artisanal miners were not compensated. Currently, the Bulyanhulu gold fields are for large-scale gold mining and not for artisanal and small-scale mining though artisanal miners still work in the areas. In this case, artisanal mining in this area is regarded as an illegal business. Although artisanal miners lost areas for mining, there were no areas ear-marked for artisanal miners in the study area. In other words, there were no specific areas for artisanal mining operations. Agricultural and grazing areas were also lost to pave way for large scale gold mining. This had negative socio-economic effects on artisanal miners because artisanal mining, which is one of the major livelihood sources, had been disturbed by large scale gold mining operations.

Table 8: Policy Issues on Displacement and Compensation of Artisanal Miners

Variable	Policy and legal issues	Reality in the Bulyanhulu gold fields	Strategies to address the issue
Displacement of artisanal miners	Large scale gold mining displaces artisanal miners from gold rich areas	All of the artisanal miners were displaced by large scale gold mining	No strategies to address displacement of artisanal miners. No even areas ear-marked for artisanal and or small-scale mining[3]
Compensation of artisanal miners	According to the National Land Policy of 1995 and Land Act No. 5 of 1999, the land has value. Therefore, as stipulated in the Mining Act No. 14 of 2010, artisanal miners are entitled for compensation: first for their land; and second, for removing them from gold rich areas. The mineral right holder including large scale gold mining companies should submit a plan for relocation, compensation and resettlement before commencement of the project	All of the artisanal miners were not compensated in the Bulyanhulu gold fields	Compensation of the people including artisanal miners is coordinated at the district level. The Ministry of Energy and Minerals however, has the role to ensure that large scale company has a plan for relocation and compensation, before the project can be approved

Source: Key informant interviews, 2012

5.1.1 Large-scale mining and displacements

Table 9 presents survey data on displacement of artisanal miners and size of land lost. Findings revealed that more than half of the artisanal miners were displaced to pave way for large-scale gold mining. Majority were displaced at Ilogi, Bugarama and Busulwangili villages compared to Kakola village. Three reasons can largely explain this observation. First, displacement at Ilogi and Bugarama villages was due to establishment of settlement schemes built for workers of the large-scale private investor. At Busulwangili village on the other hand, displacement was much felt by respondents because the large-scale gold mining company was entitled to the village area to conduct gold exploration operations. Third, though it is now a legally established village, Kakola land was, until recently contested between the private investor and local people. While the large-scale investor claimed that Kakola was part

[3] Some areas in other places have been ear-marked for artisanal and small-scale mining: these areas include Nyarugusu in Geita, Londoni and Sambaru in Singida, Nyakunguru in Tarime, Mvomero in Morogoro and Kilindi in Tanga (Key informant at the Ministry of Energy and Minerals, 2012).

of land entitled to the large-scale mining company, villagers resisted this view. To that effect, displacement of the local people from Kakola village was too difficulty.

Table 9: Displacement of Artisanal Miners (% in brackets)

Variable	Village name				
	Ilogi (n=6)	Bugarama (n=17)	Kakola (n=59)	Busulwangili (n=39)	Total (N=121)
Displacements					
Displaced	4 (67)	12(71)	28(47)	26(67)	70(58)
Not displaced	2(33)	5(29)	31(53)	13(33)	51(42)
Land size lost (Acres) (mean = 0.8)					
0	6(100)	17(100)	46(78)	34	103(85)
1-5	0(0)	0(0)	7(12)	3	10(8)
6-10	0(0)	0(0)	4(7)	2	6(5)
11-15	0(0)	0(0)	2(3)	0	2(2)

Table 9 also indicates that majority of the respondents did not lose a piece of agricultural land. Less than 20 percent lost agricultural land to pave way for large-scale gold mining. This implies that majority of the people in the study area did not occupy agricultural land, but settled in the villages for artisanal mining operations. This implies that artisanal miners lost areas for mining, and also land for grazing as reported by key informants. Table 9 also reveals land losers at Kakola and Busulwangili villages, but not at Ilogi and Bugarama villages. Majority lost land size between one and five acres. The mean land size lost was 0.8 acres whereas minimum and maximum land size lost ranged between 0 and 15 acres respectively. Majority of the land losers were found at Kakola village. This can be explained by the fact that Kakola village is close to the large-scale gold mining areas compared to Busulwangili.

Table 10: Respondents' Responses on Number of Acres Owned in the Year 2010 (% in brackets)

Land size	Artisanal miners (n=121)	Non-artisanal people (n=45)	Total (N=166)
0	35(29)	3 (7)	38(23)

0.5-10	64(53)	35(78)	99(60)
11-20	12(10)	3(7)	15(9)
20 and above	10(8)	4(8)	14(8)
Total	121(100)	45(100)	166(100)

Table 10 reveals that more than half of the artisanal miners owned agricultural land size between half to ten acres. About one third had absolutely no land. Landlessness was attributed to displacement in order to pave way for large-scale gold mining operations. Results for artisanal miners were more or less similar to non-artisanal miners (Table 10). The mean of land size owned by artisanal miners and non-artisanal miners was five acres.

Table 11: Respondents' Responses on Land Acquisition Methods (% in brackets)

Variable	Artisanal miners (n=121)	Non-artisanal people (n=45)	Total (N=166)
Inheritance	19(16)	9(20)	28(17)
Purchase	27(22)	19(42)	46(28)
Purchase and inheritance	24(20)	5(11)	29(18)
Hiring	51(42)	12(27)	63(38)
Total	121(100)	45(100)	166(100)

As it is the case in other rural areas of Africa and Tanzania in particular, land acquisition methods were diverse in the Bulyanhulu gold fields as presented in Table 11. Close to half of the artisanal miners hired farming land. Two reasons can be attributed to this finding. First, as previously reported, some artisanal miners lost land to give way for large-scale gold mining operations. Second, some artisanal miners owned very small pieces of land than their household requirements. Therefore, they had to hire some land in order to meet household's needs. Other land acquisitions reported in the study area were: inheritance and purchase, implying that land acquisition methods were diverse in the study area.

5.2 Effects of Large-scale Mining on Economic Activities

Table 12 presents economic activities before and after domination of large-scale gold mining as reported during focus group discussions (FGDs) and during key informant interviews. Findings revealed that the Bulyanhulu gold fields were places where the livelihoods of artisanal miners directly and indirectly depended before the fields were dominated by large-scale mining. This suggests that artisanal mining was an important economic activity for the livelihoods of the artisanal miners. The fields were also a market place where local communities sold their goods and services mainly to artisanal miners who worked in the fields as reported by key informants. Selling of agricultural produce and petty business were also important economic activities. Pair-wise ranking conducted during FGDs on important economic activities demonstrated that artisanal mining was the most important activity for income generation before domination of large-scale gold mining (Table 12).

Table 12: Important Economic Activity before and after Domination of Large-scale Mining

Activity	Bugarama				Kakola				Busulwangili			
	Before		After		Before		After		Before		After	
	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank
Artisanal mining	4	1	0	5	4	1	0	5	3	1	3	1
Petty business	3	2	4	1	3	2	3	2	2	2	2	2
Vegetable gardening	2	3	3	2	2	3	1	4	-	-	-	-
Casual labour	0	5	1	4	0	5	1	3	-	-	-	-
Farming, selling crops and livestock products	1	4	2	3	1	4	4	1	1	3	1	3

Source: FGDs, 2010

Other activities reported were: petty business, farming activities, selling crops, livestock and waged employment through casual labour. For Kakola village, qualitative data through pair-wise ranking revealed a shift from artisanal mining being the most important socio-economic activity to farming, petty business, and casual labour in this order. Pair-wise ranking at Bugarama village demonstrated that petty business dominated the period after gold fields were dominated by large-scale gold mining. This can be explained by opportunities offered by the vibrant centre at Bugarama facilitated by newly established settlements for the employees of the

large-scale gold mining company, the Bulyanhulu Gold Mine (BGM) in this case. But on the other hand, the upsurge in petty business can be attributed to many people shunning artisanal mining as it does not provide the same economic returns as it used to be.

Pair-wise ranking held at Busulwangili village revealed a different scenario. In this village, there was no change regarding artisanal mining being fundamental economic activity before and after domination of large-scale gold mining. This can largely be explained by the fact that a year after 1996, artisanal mining activities emerged at Busulwangili village, and the government allowed these activities to continue. However, the challenge at Busulwangili was a high water table coupled with poor mining technologies that were employed by artisanal miners. Rising water constrained artisanal mining activities and in most cases artisanal miners had to abandon some pits and re-establish others. In so doing, a lot of time was lost with minimum economic returns.

Focus group discussions (FGDs) also revealed interactions between artisanal mining activities and petty business. For example, one participant summed up by saying that "…poor income from mining… poor petty business and vice versa…" The possible explanation for this income and petty business interaction is that income generated from artisanal mining activities can be re-invested into petty business at local level through buying and selling goods and services and so stimulating local economy within artisanal mining communities. This implies that artisanal mining and petty business are complementary or rather inseparable economic activities.

Table 13 presents survey data on economic activities before domination of large-scale gold mining in the Bulyanhulu gold fields. Findings revealed that before domination of large-scale gold mining about half of the selected artisanal miners engaged in mining operations as an important economic activity for their livelihoods. More than one third reported farming and selling food crops. Other economic activities reported were: petty business, selling cash crops, selling charcoal, waged employment in form of casual labour, keeping and selling livestock and their products.

About three quarter of non-artisanal miners reported farming and selling food crops as one of the most fundamental economic activity before domination of large-scale gold mining, followed by petty business. This is not surprising because the study conceived non-artisanal miners as those who did not engage directly in artisanal mining. It is therefore obvious that they depended on other livelihood strategies apart from artisanal mining for their survival.

There was significant association at 0.1 percent level of significance, between economic activities and being an artisanal miner or not being an artisanal miner before domination of large-scale gold mining (P = 0.001) (Table 13). This association portrayed that although artisanal miners reported mining and farming as important economic activities before domination of large-scale gold mining, people not engaged in artisanal mining activities reported farming and selling food crops as important economic activities. This implies that the most fundamental economic activity among artisanal miners before domination of large-scale gold mining in the Bulyanhulu gold fields was artisanal mining, followed by farming and selling food crops. These findings were in line with what was reported by key informants and also with what was reported during focus groups discussions (FGDs).

Table 13: Respondents' Responses on Economic Activities before Domination of Large-scale Mining (% in brackets)

Economic activities	Artisanal Miner's Households (n=121)	Non-artisanal Households (n=45)	Total (N=166)
Mining activities	59(49)	3(7)	62(37)
Selling charcoal	3(3)	0(0)	3(2)
Selling firewood	1(1)	0(0)	1(1)
Farming and selling food crops	39(32)	32(71)	71(43)
Selling livestock	1(1)	0(0)	1(1)
Keeping and selling livestock including livestock products	2(2)	1(2)	3(2)
Petty business	8(6)	7(16)	15(9)
Farming and selling cash crops	6(4)	2(4)	8(4)
Waged employment through casual labour	2(2)	0(0)	2(1)
Total	121(100)	45(100)	166(100)

Source: Survey data, 2010

Table 14 presents survey data on economic activities after domination of large-scale gold mining. One of the positive socio-economic effects expected by the study was that displacements could have stimulated diversification in economic activities as a way of making a living and reducing the effects of displacement after domination of large-scale gold mining. Findings revealed that more than half of artisanal miners reported farming and selling food and cash crops as important economic activities for their living. As reported during FGDs, this suggests a shift from artisanal mining to farming and other activities before and after domination of large-scale gold mining. These results are in line with the URT (2009) which reports that currently, majority in the Kahama District depend on farming and livestock keeping. Interestingly, both artisanal and non-artisanal miners reported faming and selling food stuff as important economic activities for the period after domination of large-scale gold mining. Further, interest on farming increased, while interest on artisanal mining operations reasonably declined (Table 14). As reported by key informants, the waning interest

on artisanal mining was attributed to among other factors to displacement from Bulyanhulu gold fields and lack of areas specifically earmarked for artisanal mining operations.

Table 14: Respondents' Responses on Economic Activities after Domination of Large-scale Mining (% in brackets)

Economic activities	Artisanal Miner's Households (n=121)	Non-artisanal people Households (n=45)	Total (N=166)
Mining and related activities	24(20)	0(0)	24(15)
Selling charcoal	3(3)	1(2)	4(2)
Selling firewood	1(1)	0(0)	2(1)
Farming and selling food crops	69(57)	30(67)	99(60)
Selling livestock	1(1)	1(2)	2(1)
Keeping and selling livestock including livestock products	10(8)	8(18)	18(11)
Petty business	1(1)	3(7)	4(2)
Farming and selling cash crops	8(6)	1(2)	9(5)
Waged employment through casual labour	4(3)	1(2)	5(3)
Total	121(100)	45(100)	166(100)

Source: Survey data, 2010

5.2.1 Effects of Large-scale mining on household income sources

The study determined various household income sources among respondents and their contributions to the household income before and after domination of large-scale gold mining. This was made possible through retrospective technique of asking questions, whereby respondents were required to mention the most important source of household income. Results are presented in Table 15. Findings revealed that about 94% of the household income came from artisanal mining activities before domination of large-scale gold mining. The percentage contribution dropped down to 63% after domination of large-scale mining. In addition, 94% of the household income among non artisanal miners came from farming and selling food crops and livestock. This contribution also dropped down to 84.8% after domination of large-scale gold mining (Table 15). As it was for artisanal miners, the contribution to household income from farming, selling crops, selling livestock and their products among non-artisanal miner's households decreased after domination of large-scale gold mining. This can be attributed to displacements to pave way for large-scale gold mining. It can also be due to other factors including climate change. Despite diversity of income sources, income contribution from non-farming sources apart from artisanal mining was too minimal before and after domination of large-scale gold mining.

Table 15: Percentage Contribution of Household Income Sources before and after Domination of Large-scale Mining (N=166)

Income sources	Artisanal miners (n=121)		Non-artisanal people (n=45)	
	Before	After	Before	After
Mining activities	93.70	63.20	0.00	0.00
Selling charcoal	0.01	0.00	0.00	0.00
Selling firewood	0.02	0.10	0.07	0.06
Selling food crops	0.40	15.60	0.30	10.70
Selling cash crops	0.70	8.40	0.40	2.10
Selling local beer	2.50	0.10	0.00	0.05
Farming & selling crops, livestock & their products	0.00	0.40	94.00	84.80
Petty business	0.30	10.30	5.00	2.10
Casual labour	0.60	1.50	0.30	0.03
Salary	0.00	0.00	0.03	0.00
Total	100	100	100.0	100

Source: Survey data, 2010

5.2.2 Effects of large-scale mining on job creation

Table 16 presents number of local people employed by large-scale gold mining. An interview with management of multipurpose co-operative Society, a co-operative, which had been established by the Bulyanhulu Gold Mine (BGM) for casual labour employment, revealed that 451 people living in villages surrounding the BGM accessed casual labour employment since June 2010 to September 2010 (Table 16). The duration for employment ranged from 3 to 6 months non-renewable and the remuneration per month was one hundred thousand Tanzanian shillings equivalents to about $60. Majority of casual labourers were employed in the mine's departments of community relations and security. The mine's department of housing and laundry was expected to employ 100 people in November 2010. More and more people could be employed in future.

Table 16: Casual Labour Employment in the Study Area

Department	Period by month			
	June	July	August	September
Geology	0	0	4	4
Process plant	0	0	16	16
Warehouse	0	0	5	4
Surface maintenance	0	0	6	6
Environment	4	4	10	13
Capital projects	0	0	55	66
Community relations	153	154	196	204
Security	137	137	147	138
Total	290	291	439	451

Source: IBUKA Multipurpose Co-operative Society, Bulyanhulu Gold Mine, 2010

5.3 Effects of Large-scale Gold Mining on Social Service Development

As reported elsewhere in this report, domination of large-scale gold mining in the mineral sector of Tanzania was done through opening up of the sector to large-scale gold mining, mainly foreign based. In the Bulyanhulu gold fields, large-scale gold mining put forth a number of promises with regard to contributing to social economic development. Promises included contribution in form of royalties to the Kahama District Council, job creation and employment, construction of water infrastructures, establishment of residential housing scheme, transformation of the Bugarama Dispensary into a health centre and classrooms construction.

5.3.1 Effects on the district budget

Socio-economic effects was assessed by, among other things, analyzing percentage contribution of large-scale gold mining companies mainly the Bulyanhulu Gold Mine (BGM) to the district budget in relation to government's contribution and contribution from other stakeholders[4]. Results are presented in Table 17. Basically, the Bulyanhulu Gold Mine (BGM) began its mining operations in the 2001. However, it did not contribute anything in form of royalty to the Kahama District budget for five years consecutively since 2001. In other words, contributions began in the 2006. Findings revealed that BGM's percentage contribution to the district budget was small compared to contributions from the government and other stakeholders. The contribution was also decreasing over the years (Table 17). Nevertheless, the district had no plan for re-investing part of this small royalty into villages surrounding the large scale gold mining for improving social well-being in artisanal mining communities.

Table 17: Percentage Contribution of the Bulyanhulu Gold Mine to the District Budget

Year	% Income source to the district budget			
	BGM	Tax payers	Central government	Other stakeholders
2001	0.0	7.0	75.5	17.5
2002	0.0	5.6	78.1	16.3
2003	0.0	4.4	77.2	18.4
2004	0.0	5.3	83.2	11.5
2005	0.0	1.0	85.4	13.6
2006	2.5	3.7	76.0	17.8
2007	1.8	1.2	86.0	11.0
2008	1.6	1.7	77.3	19.5

[4] Other stakeholders include: Primary Education Development Plan (PEDP), basket fund, Road fund, District Agricultural Development Investments Programme (DADIPS), Tanzania Commission for Aids (TACAIDS), Rural Water Supply and Sanitation Programme (RWSSP), Local Government Transport Programme (LGTP), Elizabeth Grassier Paediatric Aids Fund (EGPAF), District Agricultural Sector Investment Programme (DASIP).

Year	% Income source to the district budget			
	BGM	Tax payers	Central government	Other stakeholders
2009	1.5	1.7	78.0	18.9
2010	1.0	0.6	83.6	14.7

Source: Kahama District Planning Office

5.3.2 Effects on development of water sources

Table 18 and photos 3 to 6 present drinking water sources in the study area. Overall, findings revealed that majority of respondents in the study villages, accessed drinking water from shallow bore-hole wells. Key informants reported that bore-hole wells infrastructures were constructed by the government. A few, accessed drinking water from piped water put in place by the BGM through its Water and Development Company Limited (WEDECO); except in Busulwangili village where there was no piped water at all (Table 18 and 19). This can be explained by the fact that piped water infrastructures were constructed for the Bulyanhulu Gold Mine (BGM) workers at Ilogi and Bugarama villages not for all artisanal mining communities surrounding the Bulyanhulu Gold Mine BGM. Some however, accessed drinking water from unprotected sources (Table 18). These findings imply that BGM had not brought positive effects on improving sources of drinking water among artisanal miners.

Photo 3: Bore hole well in Kakola

Photo 4: Unprotected Water Source in Bugarama

Table 18: Sources of Drinking Water in the Study Villages

Village	Water source	Artisanal miners (n=121)		Non-artisanal people (n=45)		Total (N=166)	
		Frequency	Percent	Frequency	Percent	Frequency	Percent
Ilogi	Pipe water	3	50.0	4	44.4	7	46.7
	Bore well	3	50.0	4	44.4	7	46.7
	Unprotected	0	0.0	1	11.1	1	6.7
Bugarama	Pipe water	2	11.8	3	23.1	5	16.7
	Bore well	14	82.4	9	69.2	23	76.7
	Unprotected	1	5.9	1	7.7	2	6.7
Kakola	Pipe water	7	11.9	0	0.0	7	9.1
	Bore well	46	78.0	18	100.0	64	83.1
	Unprotected	6	10.2	0	0.0	6	7.8
Busulwangili	Pipe water	0	0.0	0	0.0	0	0.0
	Bore well	37	94.8	5	80.0	42	93.3
	Unprotected[5]	2	5.1	1	20.0	3	6.7
Total		121		45		166	

Source: Survey data, 2010

Table 19: Households accessing Water from WEDECO

Village	Total households	Households accessing piped water at home		Estimate households which can access water from Kiosk	% of households which can access piped water at home
		BGM permanent workers	Local households		
Bugarama	1169	263	115	300	9.8
Ilogi	1209	316	53	300	4.3
Kakola	3516	na	na	na	na
Busulwangili	543	0	0	0	0
Total	6437	579	168	600	14.1

Source: WEDECO, Bulyanhulu Gold Mine, 2010 na=not applicable

[5] Unprotected water sources included Rivers, Springs, natural water wells.

Photo 5: Water kiosk[6] in Ilogi

Photo 6: Bore hole well in Bugarama

Focus groups and key informants' discussions revealed that the construction of bore-hole wells (pumps) had nothing to do with large-scale gold mining because the wells were constructed by the government under the auspices of HESAWA projects. Nevertheless, only few were operational during the time of the study. Most of the wells had become defunct due to lack of maintenance. During the discussions, it was revealed that before domination of large-scale gold mining, the local people in Kakola village depended on a spring[7] from which drinking water was drawn throughout the year. The spring was believed to have clean drinking water. After domination of large-scale gold mining, the spring became part of the BGM and some FGD participants said it was back filled due to large-scale mining operations, and so

6 Water collection center; there were 4 at Bugarama and 3 centers at Ilogi

7 Some participants said the spring was back-filled by the large-scale mining company. However, some said the large-scale mining company confiscated it because it is under its complex but also is getting some drinking water from this source (FGDs at Kakola, 2010).

no longer provides water to the local people. What features out very clearly is that large-scale gold mining in the Bulyanhulu gold fields had destructed natural water sources in the study area from which local people including artisanal miners depended.

The Bulyanhulu Gold Mine (BGM) had availed one point of tap water near the gold mine where local people have access to. Nevertheless, this tap water does not supply water consistently. Sometimes water is unavailable and even when available it was not sufficient to cater for the population at Kakola village. The BGM itself accessed drinking water from Lake Victoria that was constructed by the company. Clearly, it is the BGM which benefited from this water project. Findings of this study is in line with the Kahama District Profile (2010), which reveals that majority of the people in the Kahama District get drinking water from shallow wells, springs and bore-hole pumps. Only 30% of Kahama town residents are connected to clean and safe water from Lake Victoria, translating into 12 villages[8] benefiting from the piped water constructed by the government (Kahama District Profile, 2010).

5.3.3 Effects on quality of housing

Table 20 presents survey data on type of housing. Findings revealed that majority of artisanal and non-artisanal miners lived in housing made of earth blocks, though majority had houses with corrugated iron sheets roofs. A significant number of respondents lived in thatched grass roofed houses (Table 20). Discussions during focus groups revealed that the housing condition was so even before domination of large-scale gold mining. Some key informants at Kakola village reported that houses in the village had developed some cracks due to large-scale mining operations. This implies that large-scale gold mining has had negative effects on housing in the study area. In this regard, what Bulyanhulu Gold Mine (BGM) has done was to establish a housing estate to cater only for the company's permanent employees. Artisanal miners did not benefit from this project anyhow.

Table 20: Respondents Responses on Type of Housing

Variable	Type of housing walls			Type of roofing		
	Purely earth blocks	Backed blocks	Wood and soil	Corrugated iron sheets	Thatched with grasses	Others
Artisanal miners (n=121)	87.6	10.7	1.7	53.7	44.6	1.7
Non-artisanal people (n=45)	80.0	20.0	0.0	66.7	33.3	0.0

Source: Survey data, 2010

[8] Mwamboku, Malilita, Kashishi, Mwashimbayi, Ngaya, Nyamididi, Mwanase, Mwakuhenga, Mwamandi, Nduku, Kinaga and Igun'hwa (Kahama District Profile, 2010).

5.3.4 Effects on health care facilities

In the four villages studied, there was only one public dispensary which was situated at Bugarama village, and one private dispensary within Bulyanhulu Gold Mine (BGM) complex. Other private dispensaries were found at Kakola centre, while private pharmacies were scattered all over across the villages. A public hospital was found in Kahama town, some 80 kilometres away from Bulyanhulu gold fields. Discussions during FGDs revealed that majority were able to access the public dispensary at Bugarama. Bulyanhulu private dispensary, which is located within BGM complex, was perceived to have good services. This was constructed for staff of the BGM though it does not in essence exclude the local people from accessing its services. A few respondents however reported during FGDs that local people practically failed to gain access to the dispensary services because of high fees required to gain services. For this reason, only the BGM employees benefited from the services offered by the said dispensary and not artisanal miners. BGM promised to up-grade Bugarama Dispensary into a health centre. Nevertheless, what was done was only rehabilitation of the dispensary buildings. Insufficient medications and other health facilities in relation to needs of the locals have remained unresolved health issues in the study area.

Photo 7: Bugarama Dispensary in Bugarama Village

Pair-wise ranking conducted during FGDs revealed that before domination of large-scale gold mining in the study area; diarrhoea was ranked as number one common disease that affected artisanal miners (Table 21). Other diseases were: Sexually Transmitted Infections (STIs), Malaria, Tuberculosis (TB), and Air Respiratory Diseases (ARIs) (Table 21). HIV/AIDS was not a health issue in the study area the period before domination of large-scale gold mining. Ranking also showed that after domination of large-scale gold mining, ARIs and Malaria featured as the most common diseases in the study area followed by HIV/AIDS (Table 21). HIV/AIDS and ARIs particularly coughing were reported to be associated with large-scale gold

mining in the area. Furthermore, it was reported that prostitution had increased with large-scale gold mining and consequently is HIV/AIDS. Increasing prostitution suggests distortion of social values in the study area. On the other hand, coughing was associated with large-scale mining operations, which spew earthly dust especially during dry periods. This means that increasing HIV/AIDS and Air Respiratory Diseases (ARIs) in the study area is a negative health effect resulting from large-scale gold mining in the Bulyanhulu gold fields.

Table 21: Pair-wise Ranking of Common Diseases in the Study Area

Disease	Before large-scale mining		After large-scale mining	
	Score	Rank	Score	Rank
Malaria	4	3	6	1
Diarrhoea	6	1	0	7
HIV/AIDS	0	7	4	3
Tuberculosis	3	4	2	4
ARI e.g. Coughing	2	5	6	1
STIs	5	2	1	6
Typhoid	1	6	2	4

Source: FGD at Bugarama Village, 2010

Findings on common diseases at Bugarama Dispensary in the past five years revealed that Malaria was the most common disease, followed by Air Respiratory Diseases (ARIs) (Table 22). These results are in line with what was reported during FGDs. Data for HIV/AIDS could not be obtained from the dispensary due to some unknown reasons. A closer look on Table 22 shows that the number of people affected by Malaria and other diseases was decreasing over time. However, the number of people affected by ARIs was increasing. As reported during FGDs, large-scale gold mining has had a considerable effect on the elevated patterns of ARIs in the study area.

Table 22: Trends of Common Diseases at Bugarama Dispensary: 2005-2009

Year	Number of People Affected with the Disease (age: 5 years and above)						
	TB	STIs	Eye infection	Diarrhoea	ARI	HIV/AIDS	Malaria
2005	101	94	293	363	967	-	3475
2006	102	89	126	192	915	-	2416
2007	121	16	95	88	231	-	673
2008	103	45	46	115	202	-	538
2009	81	75	48	158	305	-	888

Source: Bugarama Dispensary Kahama District, 2010

5.3.5 Effects on primary education infrastructure

The study assessed actors involved in classrooms construction and supply of books in five primary schools located within four villages in the study area in order to compare the contribution of the Bulyanhulu Gold Mine (BGM) in relation to other actors. Schools involved were: Kakola 'A', Kakola 'B', Kakola 'C', Bugarama and

Busulwangili. Data on classrooms construction and books supply are presented in Table 23 to Table 26. There were no data on classrooms construction and books supply at Bugarama primary school. For Kakola 'A' primary school, data on text books supply could not be obtained, and data on reference books were only available at Kakola 'C' primary school. Findings revealed that there were three actors who participated in construction of classrooms and books supply in primary schools within the study area for the past seven years. These were: Kahama District Council (KDC), Bulyanhulu Gold Mine (BGM), and CARE International in Tanzania.

Table 23: Textbooks Received at Kakola 'B' and Kakola 'C': 2004-2010

Year	Kakola 'B'		Kakola 'C'	
	Number of books received	Supplier	Number of books received	Supplier
2004	994	CARE	125	CARE and KDC
2005	-	-	82	CARE and KDC
2006	21	KDC	100	CARE and KDC
2007	16	KDC	354	CARE and KDC
2008	29	KDC	400	CARE and KDC
2009	34	KDC	314	CARE and KDC
2010	43	KDC	276	CARE and KDC

Source: Primary School Records at Kakola 'B' and 'C' for Various Years

The highest number of textbooks at Kakola 'B' was received from CARE International Tanzania in the 2004. This is explained by the fact that the Kahama Education Enhancement Project (KEEP) that was being implemented under CARE International Tanzania was at the prime of the project cycle. The project focused on enhancing education to the girl child, and books supply was one of fundamental interventions. For a five-year period since 2006 to 2010, the school received a significant amount of textbooks from the Kahama District Council (KDC). None of the textbooks were received from BGM at the time. At Kakola 'C', a significant quantity of text books were received from CARE International Tanzania for seven consecutive years since 2004 and from KDC. Like at Kakola 'B' primary school, the Bulyanhulu Gold Mine (BGM) did not provide any assistance in text books provision at Kakola 'C' primary school.

Table 24: Books Received at Busulwangili and Kakola 'C': 2004-2010

Year	Busulwangili		Kakola 'C'	
	Number of text books received	Supplier	Number of reference books received	Supplier
2004	-	-	50	CARE and KDC
2005	-	-	35	CARE and KDC
2006	-	-	70	CARE and KDC
2007	-	-	118	CARE and KDC
2008	45	KDC	90	CARE and KDC
2009	120	CARE	56	CARE and KDC
2010	40	KDC	127	CARE and KDC

Source: Primary School Records at Busulwangili and Kakola 'C' for Various Years

There was no data for received text books at Busulwangili primary school during 2004 to 2007. Between 2008 and 2010, the school received text books from Kahama District Council (KDC) and from CARE International (Table 24). As it was at Kakola 'B' and Kakola 'C' no text books were received from the BGM. In addition, reference books received at Kakola 'C' came from CARE International Tanzania and KDC implying that the BGM was not involved in text and reference books supply in the study area since 2004 to 2010.

Table 25: Classroom Construction Material Received at Busulwangili and Kakola 'A'

Year	Busulwangili			Kakola 'A'		
	Material supplied	Amount supplied	Supplier	Material supplied	Amount supplied	Supplier
2004	-	-	-	Cement bags	803	BGM
2005	Cement bags	120	BGM	Desks/cup board	2	CARE
2006	Cement bags	120	BGM	-	-	-
2007	Iron sheets	100	BGM	Desks	17	CARE
2008	-	-	-	-	-	-
2009	-	-	-	-	-	-
2010	-	-	-	-	-	-

Source: Primary School Records at Busulwangili and Kakola 'C' for Various Years

Table 25 and Table 26 reveal that classroom construction material contributed by BGM, CARE International Tanzania and Kahama District Council (KDC), were cement and corrugated iron sheets. Others were desks and cup boards. There were no other actors who contributed cement at Busulwangili for the period between 2004 and 2010 except BGM. While BGM supplied cement at Kakola 'A', CARE International Tanzania offered desks and cupboards. At Kakola 'C' on the other hand, BGM supplied corrugated iron sheets and cement, while CARE International Tanzania offered desks (Table 25). In addition to CARE International Tanzania, Kakola 'B' also received desks from KDC. Cement was received from BGM. This implies that in addition to Kahama District Council (KDC) and CARE International Tanzania, the Bulyanhulu Gold Mine was involved in classroom constructions. Key informants also reported participation of the local people in classroom constructions in terms of labour. Looking at what these actors offered in classroom constructions and supply of books in the study area it is argued that the BGM had not invested much on these interventions to produce positive socio-economic effect especially in primary education.

Table 26: Classroom Construction Material Received at Kakola 'C' and Kakola 'B'

Year	Kakola 'C'			Kakola 'B'		
	Material supplied	Amount supplied	Supplier	Material supplied	Amount supplied	Supplier
2004	Desks	30	CARE	Desks	50	CARE
2005	Cement bags	100	BGM	Cement bags	175	BGM
2006	-	-		-	-	-
2007	Cement bags	60	BGM	Cement bags	120	BGM
2008	-	-	-	-	-	-
2009	-	-	-	Desks	23	KDC
2010	Iron sheets	70	BGM	-	-	-

Source: Primary School Records at Kakola 'C' and Kakola 'B' for Various Years

Findings also revealed that new classrooms were constructed in each school in the past 6 to 10 years (Table 27). Although data on classroom construction was not obtained for Bugarama primary school, majority of classrooms constructed in the past 6 to 10 years were reported at Bugarama (Table 27). Key informants reported that it was the local people who were involved much in classroom constructions at Bugarama.

Table 27: Education Quantity and Quality Indicators in the Study Area

Primary School	Classrooms constructed for the past 6 to 10 years	Current number of pupils per classroom	Current Teacher/ Pupils ratio	Current Pupils/ textbook ratio
Kakola "A"	4	124	1:88	5:1
Kakola "B"	9	-	-	3:1
Busulwangili	4	111	1:147	5:1
Bugarama	19	80	1:80	3:1

Source: Primary Schools Records Accessed 2010

Table 27 also reveals that teacher-pupils ratio in the study area was higher than 1:45 targeted by the country by 2010. In addition, the number of pupils per classroom was also high in each school indicating that more classrooms were needed. Pupils-text book ratio was high at Kakola 'A' and Busulwangili than at Kakola 'B' and Bugarama primary schools (Table 27). High teacher-pupils ratio indicates that enrolment had increased, but not proportional to the number of teachers available in the schools. Increased enrolment had resulted from increased number of classrooms constructed by the local people in collaboration with Kahama District Council (KDC) through Primary Education Development Plan (PEDP), and CARE International Tanzania. Small contribution in construction of classrooms has also been received from the Bulyanhulu Gold Mine (BGM).

6.0 DISCUSSION

6.1 Policy, Legal Context and Artisanal Miners' Social Wellbeing

Tanzania is one of African countries which have adopted neo-liberal development thinking. The argument is that large-scale gold mining is an instrument for social development and that it can improve living standard in host countries particularly among the local people surrounding gold mining areas including artisanal miners. However, the context in terms of mineral policy and mining laws is not consistent with what is happening on the ground. In other words, the mechanism to make large-scale gold mining an instrument for improving living standards of the people is missing in the country. In the Bulyanhulu gold fields, all artisanal miners who worked in the areas were displaced to pave way for large-scale gold mining. This resulted into loss of areas for artisanal mining, loss of areas for agriculture and also loss of land for grazing livestock. Although the national land policy of 1995 and the land Acts of 1999, stress that land has value and that compensation is unavoidable in case of displacement for the public interest, there was no compensation for the displaced. Since artisanal miners' livelihoods depend on mining operations in addition to farming, the loss of land for mining, agriculture and grazing areas translates into negative impact on their living standards in particular and so exacerbating poverty.

Displacement in the Bulyanhulu gold fields was in form of involuntary eviction whereby, the government forcibly removed the local communities from the gold rich mining areas. According to the Resident Mines Office (RMO) based in Kahama District, it was reported that the government had ear-marked all of the Bulyanhulu gold fields for large-scale gold mining and that there are no places ear-marked for artisanal mining. Those artisanal miners who worked in the study area were regarded as illegal miners without legal entitlement to land. This suggests minimal efforts by the government to regularize and formalize artisanal miners in the study area. In other areas in the Kahama District, apart from the Bulyanhulu gold fields, the study noted from RMO records; increasing number of artisanal miners who were granted Primary Mining Licence (PML) from 0 in 2008 to 43 in 2012. According to the mining Act of 2010, PML is granted for 7 years renewable in the country. In Ethiopia and Zambia, licence to small-scale mining is granted for 10 years as reported by Hilson and Potter (2005). It is therefore important for the government of Tanzania to increase time for PML to 10 years renewable. This is a minimum period within which small-scale miners can gain profit from mining operations. The serious problem in the study area was that the total number of artisanal miners who can be formalized into small-scale mining was not known. There is no trustworthy statistics for artisanal miners even at the country level, though it is reported that 40 to 50% have no mining licences (Hilson and Maponga, 2004). Understanding their statistics and where they

do work is critical to formalization and partnership with large-scale gold mining especially during this period in which the mineral sector is increasing become dominated by large-scale gold mining.

Even in other places where Primary Mining Licence (PML) was granted to artisanal miners in a way to make them formal and transform into small-scale miners, no areas were ear-marked for them except their own initiatives. Records from the Resident Mines Office (RMO) in Kahama District revealed that land plots, which were granted licences for artisanal mining between 2009 and 2012 ranged from 0.2 to 9.9 hectares. Special licences for large-scale gold mining on the other hand, were granted large tracts of land compared to artisanal mining. Records from the Resident Mines Office (RMO) revealed that the Bulyanhulu Mine (BGM) and the Buzwagi Gold Mine (Pangea Minerals Limited) have been granted special mining licences for 5148 and 3532 hectares of land respectively. Small plots of land allocated for artisanal and small-scale mining was also one of concerns for the Bomani Commission in 2008 (URT, 2008). In Ghana, the plot of land to be granted a licence is 25 hectares for artisanal mining (Hilson and Potter, 2005). In addition, minimal efforts have been also done to ensure that artisanal miners have access to transparent marketing system and that they are supported in terms of access to credit and improved tools for mining. This contradicts the national mineral policy of 2009 which stresses on setting aside areas for and regularizing and transforming artisanal mining into formal small-scale gold mining operations for poverty reduction. A part from Bulyanhulu gold fields, displacement in gold mining areas has also been reported in Geita, Nzega, Tarime and Bukombe Districts in the country, and that it has contributed to impoverishment of the local people including artisanal miners in gold mining communities as also reported by Nambiza (2007). This is also a pressing issue of concern in artisanal gold mining communities of Ghana where large-scale gold mining had fuelled, marginalized and impoverished artisanal miners as reported by Hilson and Maponga (2004) and also by Hilson and Potter (2005). This suggests that efforts to reverse the trend are critical in order to cope with displacement and lack of artisanal mining areas to ensure sustainable livelihoods for the artisanal miners.

6.2 Large-scale Gold Mining and Dynamics in Livelihood Options

The domination of large-scale gold mining in the Bulyanhulu gold fields had profound negative socio-economic effects on artisanal miners. For instance, large-scale gold mining had decreased income accruing from artisanal mining by 31% due to lack of gold rich areas for artisanal miners. Artisanal mining is thus decreasing in its importance in terms of contribution to the household income, following domination of large-scale gold mining in the study area. The decrease in income from artisanal mining translates into increasing vulnerability and poverty and therefore, poor living

standards among artisanal miners. The poor living standard among artisanal miners was reflected by poor housing and inability to access clean and safe drinking water among the majority in the villages surrounding large-scale gold mining in the study area.

In a struggle to improve living standards, some artisanal miners shifted from artisanal mining to petty business after domination of large-scale gold mining. Nonetheless, petty business was affected by lack of capital, poor market and poor business skills in terms of record keeping, while farming was affected by multiple factors including drought, poor marketing of agricultural produce, too much dependence on a hand hoe and poor technologies used, and lack of access to agricultural inputs and education from agricultural extension officers. All these hindered livelihood diversification and so artisanal mining continued to be perceived as the mainstay for artisanal miners' social wellbeing in the study area even after domination of large-scale gold mining. However, artisanal miners had to move here and there seeking for the gold ore because gold rich areas were confiscated by large-scale gold mining operations.

Failure to diversify economic activities while artisanal mining is increasing become negatively affected by large-scale gold mining suggests socio-economic failure among artisanal miners. It will therefore be difficult for artisanal miners to move out of poverty trap unless concerted and deliberate political and economic decisions are made to reduce vulnerability and poverty through stimulation of formal and domestic small-scale mining. Remarkably, there are no alternative livelihoods to artisanal mining as reported by Siegel and Veiga (2010). Alternative livelihood approach, which focused on oil palm cultivation, cassava farming, poultry and grass-cutter and nail rearing, had failed in Ghana (Hilson and Banchirigah, 2009). The reason is that artisanal mining is poverty driven, but generate 3 to 5 times the income of other livelihoods (Siegel and Veiga, 2010) and thus no alternative livelihood to it. Artisanal mining will therefore persist because it is poverty driven even if it is given a negative image by the government of Tanzania and large-scale gold mining as is also reported in Brazil by Siegel and Veiga (2010). A practical thinking is to transform artisanal mining into formalized domestic based small-scale mining.

Artisanal miners were not able to access permanent employment from large-scale gold mining company, particularly from the Bulyanhulu Gold Mine (BGM), as theorized by the neo-liberal thinkers. This can be explained by lack of enough education and requisite skills among artisanal miners because majority, as reported in this study were primary school leavers. In other words, the human capital among artisanal miners and local communities in general was not well developed to suit large-scale gold mining requirement. This is supported by the findings reported by Hilson and Potter (2005) that artisanal mining in Ghana is dominated by primary

school leavers who cannot access public sector employment. In addition, as reported by Hilson and Banchirigah (2009), large-scale gold mining is highly mechanized that requires a well developed human capital. Based on this line of thinking, large-scale gold mining does not require human labour force, which could be drawn from artisanal mining communities where human capital is not well developed. Therefore, artisanal miners were able to access casual labour offered by large-scale mining compared to permanent employment.

Access to casual labour offered by large-scale gold mining in the study area looks like a positive effect to artisanal miners and also to other local people surrounding large-scale gold mining. Yet, casual labour is not sustainable because large-scale gold mining cannot employ all of the artisanal miners available. Secondly, the remuneration for casual labour, which in this case was not more than Tanzania Shillings 100, 000 equivalents to about $60 per month is too minimal to help artisanal miners improve their living standards and also address the decrease of household income accruing from artisanal mining operations. Despite availability of casual labour from large-scale gold mining operations, about 88% of the artisanal miners were living in poor housing made of purely earth bricks. Further, about 45% were living in poor housing thatched with grasses. This suggests that the income from casual labour was inadequate to improve social wellbeing. In addition, arrangements for casual labour employment did not exceed 6 months non renewable. This means that once one has accessed casual labour employment for the period of 3 or 6 months s/he will not be eligible for employment any more until other local people in the community have accessed employment. Being non-renewable implies that casual labour is not sustainable and therefore it is not a credit for large-scale gold mining.

Based on total population as noted from village records, study villages had 29,150 inhabitants. Comparing the number of those who accessed casual labour employment from June to September 2010 and entire population in the study villages, it was revealed that only 1.5% benefited from casual labour employment created by large-scale gold mining. Nonetheless, key informants reported that before domination of large-scale gold mining one small-scale miner could employ about 40 artisanal miners. This suggests that small-scale gold mining is better than large-scale gold mining in terms of creating employment opportunities among artisanal miners. Jobs created by small-scale miners were also sustainable compared to jobs created by large-scale gold mining in the sense that the arrangement for employment was permanent.

Some writers for example, the Society for International Development (2009) reveals that majority of permanent employees in the large-scale gold mining in the Bulyanhulu gold fields are Tanzanians. The current study however, is of the view that

majority of Tanzanians who can access permanent employment from large-scale gold mining come from outside artisanal mining communities. Since large-scale gold mining, like artisanal mining are located within typical village environment, which lack most of the social services, its permanent employees do not establish permanent residences in the villages and thus have little to do with artisanal miners' social economic well-being. In other words, large-scale mining permanent employees repatriate most of the profit to other areas in the country where they have permanent residences.

During discussions in focus groups, the study revealed that large-scale mining company particularly the Bulyanhulu Gold Mine (BGM) procures goods and services outside artisanal mining areas and even outside the Kahama District. This translates into creating employment opportunities outside artisanal mining communities thus negatively affecting artisanal miners' social well-being and the local economies at large. This is happening because unlike the Mining Act of 1979, which required mineral holder rights to present a plan for local procurement of goods and services, the 1998 and 2010 Mining Acts of Tanzania lack procurement mechanism for the large-scale foreign investors to purchase their goods and services within artisanal mining communities to improve local economies.

6.3 Contribution of Large-scale Gold Mining to Social Service Development

Large-scale gold mining company had not contributed considerably to the district budget in order to improve social service development including health care services, good quality in education, clean and safe drinking water. The study noted small and decreasing annual royalty given by the Bulyanhulu Gold Mine (BGM) to the Kahama District Council compared to contributions from the government and other development partners. There have been positive legal changes regarding royalties, which is supposed to be paid by large-scale gold mining investors at the national level in the country. While the 1979 Mining Act did not mention anything about royalty in the mineral sector, the 1998 imposed low royalties to be levied on the net value of minerals at a rate of 3% for metallic minerals including gold, copper and silver, and 5% for diamond. The current Mining Act, No. 14 of 2010 had made slight improvement by enforcing a bit higher royalties to be levied on the gross value of minerals produced by large-scale mining company at a rate of 4% for metallic minerals including gold, copper and silver; 5% for Uranium, gemstone and Diamond (URT, 2010a). This small improvement on the other hand, did not feature out for royalty (a tax on production) paid at the district council level and so revealing mismatch of legal issues in mining between the national level and district council level.

The effects of large-scale gold mining on social service development was somewhat mixed with positive and negative ones. For instance, piped water accessed at home was a contribution of large-scale gold mining in the study area. This looks like a positive effect; however, about 14% of local households had access to piped water at home. These were mainly permanent workers employed in large-scale gold mining who lived in Bugarama and Ilogi villages. Majority accessed drinking water from bore-hole-wells, which were constructed by the government in collaboration with other development partners. On the other hand, large-scale gold mining was perceived to have caused negative effects on water sources because it back filled natural water sources though unprotected, but perceived to have clean drinking water particularly at Kakola village. On health care facilities, large-scale mining resulted into construction of a dispensary within the Bulyanhulu Gold Mine (BGM) compound. Though it did not exclude the local people for the service, high cost was an impending factor and that did not help the local people including artisanal miners. Large-scale gold mining was also acknowledged to support rehabilitation of the Bugarama Dispensary. It also supported the dispensary in terms of medications and provided counselling and testing of HIV and AIDS at Kakola village. Large-scale gold mining in addition to CARE International in Tanzania and Kahama District Council (KDC) had also contributed to primary education development in terms of classroom constructions and books supplies. This had resulted into pupils' textbook ratio of 3:1 at Kakola 'B' and Bugarama primary schools less than the ratio at the national level which stands at 4:1. At Kakola 'A' and Busulwangili primary schools the pupils' text book ratio stood at 5:1 higher than the ratio at the national level. However, the major actors in primary education mentioned during focus group discussions were CARE International in Tanzania and Kahama District Council (KDC).

Notwithstanding some positive effects in the health sector, large-scale gold mining had increased incidence of Air Respiratory Infections (ARIs) and HIV and AIDS prevalence. This had negative implication on social wellbeing at the household level and had unavoidably diverted resources from development based interventions to issues related to curbing new cases of the diseases. Increased HIV and AIDS infections in mining areas are also reported in other African countries. For instance, mines in southern Africa report 50% of HIV/AIDS infections among their work force (Weber-Fahr *et al.,* 2001). These infections are above the national average in southern Africa. In mining areas of Mali (West Africa) increased AIDS prevalence is also accelerated by large-scale mining (Drakenberg, 2010).

7.0 CONCLUSIONS AND EMERGING POLICY IMPLICATIONS

This study investigated socio-economic effects of large-scale gold mining on artisanal miners. Its focus was on policy and legal context under which large-scale and artisanal mining were operating that could lead into effects on artisanal miners. The second focus was on change in economic activities after domination of large-scale gold mining. Finally, the study analyzed contribution of large-scale gold mining on social service development in relation to other development actors. Based on the findings and discussion of this study it can be concluded that there is a mismatch between the national mineral policy and the mining laws at the national level and the actual practice on the ground. The national mineral policy and mining acts have remained mere statements in documents without supporting the local people and artisanal miners in particular in addressing social well being following domination of large-scale gold mining operations. On the other hand, the policy and mining laws are not responsive to the artisanal mining as they do for large-scale gold mining. Improvements in legal issues that had occurred in the mineral sector favours largely large-scale gold mining than they do for artisanal and small-scale mining operations. The current mining act no. 14 of 2010 for example waives taxes to encourage large-scale foreign investment in the mineral sector including import duties on mining equipment and tax exemptions. Nevertheless, artisanal mining continues to be seen as illegal and the source of revenues loss in the mineral sector. Therefore, the playing ground for artisanal mining and large-scale gold mining is unfair with large-scale mining supported more compared to artisanal mining operations.

Even if large-scale gold mining is favoured by the mining laws and the mineral policy, it had failed to bring about positive socio-economic effects to artisanal miners and the communities surrounding large-scale gold mining as theorized by the neo-liberal development thinkers. For instance, large-scale gold mining had resulted into decrease in household income due to lack of artisanal mining areas, lack of areas for agriculture and also lack of grazing areas for livestock due to displacement in gold mining. Lack of compensation and resettlement strategies had exacerbated the problem. The casual labour created by large-scale gold mining is also not sustainable because it is not permanent and not re-newable and also hardly employs as many artisanal miners compared to employment opportunities created by small-scale gold mining operations operated before domination of large-scale gold mining. As a result, the living standards in terms of housing continued to be poor because majority of artisanal miners were living in houses purely made of earth bricks thatched with grasses. The problem was more serious because there was lack of diversification of livelihood strategies including household income sources. Despite these concerns, artisanal miners continue to perceive artisanal mining as a mainstay

of their social wellbeing suggesting that concerted efforts are critical in transforming artisanal mining operations into domestic based formal small-scale mining. This can create more jobs to the local people, can increase household income and also can help to address repatriation of the profit accruing from mining and thus reducing vulnerability and poverty.

Based on this conclusion, the government should not blame artisanal miners that they are illegal and source of revenues loss in the mineral sector, but it is its fault by failing to put in place an environment, which can maximize revenues collection from this sub-sector and re-invest part of the revenue into the local people in mining areas to reduce vulnerability and poverty. One of the strategies is to support group formation and registration by transforming informal artisanal miners into formal domestic-based small-scale miners accompanied by a good marketing system to ensure that the profit produced from small-scale mining is monitored and taxed for social economic development. In addition to revenues, small-scale mining is labour intensive and so it provides considerable impact on employment of the local people. For example, it employs about 13 million people worldwide compared to large-scale mining, which provides direct employment for 2 to 3 million people worldwide (Weber-Fahr *et al.,* 2001). In China, employment provided by legal artisanal and small-scale mining has raised living standards of the local people and also has reduced rural-urban migration (Shen and Gunson, 2006). Correct compensation and resettlement strategies before commencement of large-scale gold mining is important to minimize negative socio-economic effects, but this should not be an alternative livelihood to the land lost for artisanal mining, land lost for agriculture and areas lost for grazing livestock. Resettlement strategies have remained mere statements in the mineral policy. Therefore, the government should allocate enough land for small-scale mining and agriculture for the displaced. The displaced should also be given good quality houses. These issues should be part of the contract signed by the government and large-scale mining investors before commencement of the mining project. Such strategies have been successful in Zambia, Botswana and Ghana as reported by the Bomani Commission (URT, 2008). Alternatively, the displaced should have a share for their land in large-scale gold mining. This is only possible if land rights holding and acquisitions for the village and general lands are revised, as of now, all land is a public property vested under the President's trustee on behalf of all people in the country.

On contribution to social service development, large-scale gold mining had resulted into supplying piped water to a small segment of the population in the study area. It had also resulted into construction of a dispensary within the Bulyanhulu Gold Mine (BGM) compound. Nonetheless, a few segment of the local people could access piped water at home. Also a few could afford the high cost at the dispensary. Large-scale gold mining had also stimulated HIV and AIDS infections as well as Air

Respiratory Infections (ARIs) in the study area. Its contribution in school construction and books supply in primary education was also not substantially high compared to the government and other development partners' contributions. Further, annual royalty paid by large-scale gold mining company; the Bulyanhulu Gold Mine (BGM) at the district level, was not only small compared to the government's contribution but also was decreasing over the years without any impact to the district budget.

Therefore, in order to increase positive effects of large-scale gold mining to the local communities, large-scale gold mining should present to the central government their Corporate Social Responsibility Plan (CSRP) before commencement of the project. This should also be evaluated by the district council to see if it is a practical idea and should be agreed before commencement of the project. Further, the district council in collaboration with the central government should put in place a monitoring system in order to ensure that the CSRP is appropriately implemented for social wellbeing development. In addition, the annual royalty (a tax on production) paid at the district level need to be increased by 50% from the current amount of about $200 million per annum. At least 10% of this royalty need to be re-invested back into artisanal mining communities surrounding large-scale gold mining for social wellbeing development.

8.0 DISSEMINATION OF RESEARCH RESULTS

Research findings of this study are expected to be published by the Research on Poverty Alleviation (REPOA). In this case REPOA will disseminate the results in its usual way. Second, results can be presented at the district level and stakeholders will be district officials, others will come from the villages where the study was conducted. Third, results can also be published in domestic or international journals for dissemination to the academic community.

9.0 SUGGESTED FURTHER RESEARCH

Further study is needed to investigate how to turn the negative effects of large-scale gold mining into opportunities for improving living standards of the artisanal miners and the local people at large. In other words, the investigation should focus on how to make large-scale gold mining an instrument for poverty reduction in artisanal mining communities through enhancing a win-win situation. Second, understanding artisanal miners' statistics and where they do work is also critical for formalization and partnership development with large-scale gold mining especially during this period in which the mineral sector is increasing become dominated by large-scale gold mining. The statistics should include the number of artisanal miners working in the sub-sector, the place where they are working and their gender and age composition throughout the country.

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APPENDICES

Appendix 1: BGM Contribution to the district budget (in TAS): 2001-2010

Year	Royalty from BGM	Income from taxes in the district	Income from central government	Income from other stakeholders	
				Source	Amount
2001	0	164,562,786.78	1,798,534.983.4	PEDP	203,163,104.04
				Basket Fund	122,407,640.00
				Road fund	90,698,207.02
				DADIPS	0
				TACAIDS	0
				RWSSP	0
				LGTP	0
				EGPAF	0
2002	0	208,164,567.00	2,876,678,876.6	PEDP	243,456,164.04
				Basket Fund	222,345,780.00
				Road fund	134,908,276.02
				DADIPS	0
				TACAIDS	0
				RWSSP	0
				LGTP	0
				EGPAF	0
2003	0	210,889,462.31	3,663,933,784.3	PEDP	413,367,160.23
				Basket Fund	332,489,880.00
				Road fund	128,109,327.02
				DADIPS	0
				TACAIDS	0
				RWSSP	0
				LGTP	0
				EGPAF	0
2004	0	10,561,494.31	1,669,908,138.00	PEDP	135,005.800
				Basket Fund	166,244.940
				Road fund	24,957,364.00
				DADIPS	0
				TACAIDS	0
				RWSSP	0
				LGTP	0
2005	0	53,927,950.71	4,922,955,328.88	PEDP	277,770,000
				Basket Fund	332,489,900
				Road fund	129,346,737.35
				DADIPS	49,462,397.00
				TACAIDS	0
				RWSSP	0
				LGTP	0
				EGPAF	0
2006	332,895,758.47	332,895,758.47	6,823,930,062.41	PEDP	336,591,610.00
				Basket Fund	392,336,000.00

Year	Royalty from BGM	Income from taxes in the district	Income from central government	Income from other stakeholders	
				Source	Amount
				Road fund	177,874,468.00
				DADIPS	46,800,000.00
				TACAIDS	92,846,000.00
				RWSSP	334,405,289.00
				LGTP	0
				EGPAF	112,228,686.49
2007	232,002,540.00	151,715,127.57	11,276,975,613.83	PEDP	208,191,818.00
				Basket Fund	761,748,750.00
				Road fund	190,291,362.00
				DADIPS	46,800,000.00
				TACAIDS	49,365,000.00
				RWSSP	0
				LGTP	39,199,981.90
				EGPAF	156,159,926.45
2008	268,000.000.00	271,733,142.76	12,780,773,360.72	PEDP	45,370,500.00
				Basket Fund	1,034,224,000
				Road fund	309,683,381.60
				DADIPS	75,469,320.00
				TACAIDS	429,263,544.00
				RWSSP	887,380,000.00
				LGTP	98,297.000
				MMAM	154,026,822.04
				EGPAF	378,441,456.32
2009	260,000.098.00	284,061,403.79	13,346,376,150.15	PEDP	181,482,000.00
				Basket Fund	1,132,341,000.00
				Road fund	376,740,000.00
				DADIPS	90,741,000.00
				TACAIDS	123,173,000.00
				RWSSP	292,506,050,00
				LGTP	200,000.000
				DASIP	293,223,500.00
				MMAM	355,789,232.04
				EGPAF	184,425,400.000
2010	269,785,138.75	155,117,000.00	21,584,824,176.18	PEDP	181,482,000.00
				Basket Fund	1,152,281,000.00
				Road fund	383,740,000.00
				DADIPS	50,003,333.00
				TACAIDS	171,428,000
				RWSSP	99,954,000
				LGTP	297,600.000
				DASIP	640,790,000
				MMAM	534,685,000
				EGPAF	287,716,600.00