

**STRATEGIC PRACTICES INFLUENCING THE IMPLEMENTATION  
OF SMALL-SCALE MINING PROJECTS IN KENYA: A CASE OF  
ARTISAN MINERS IN TAITA TAVETA COUNTY**

**BY**

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**DECLARATION**

This research project report is my original work and has not been submitted to any other university or institution of higher learning for any award or degree.

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## **DEDICATION**

This research work is dedicated to my parents Mr. Kenga Sulubu Zuma and Mrs. Jumwa Kenga Sulubu for their moral support, understanding and encouragement during the time I was studying this course.

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## ACRONYMS AND ABBREVIATIONS

<b>ASM</b>	Artisanal and Small-Scale Mining
<b>ASMs</b>	Artisanal and Small-Scale Miners
<b>CBO</b>	Community-Based Organization
<b>EMCA</b>	Environmental Management and Co-ordination Act
<b>EIA</b>	Environmental Impact Assessment
<b>ILO</b>	International Labour Organization
<b>Ksh.</b>	Kenya shilling
<b>KWS</b>	Kenya Wildlife Service
<b>LSM</b>	Large-Scale Mining
<b>LSMs</b>	Large-Scale Miners
<b>NEMA</b>	National Environmental Management Authority
<b>NGO</b>	Non-governmental Organization
<b>SML</b>	Special Mining Lease
<b>SSM</b>	Small-Scale Mining
<b>SSMs</b>	Small-Scale Miners
<b>UNDP</b>	United Nations Development Program
<b>USA</b>	United States of America
<b>WHO</b>	World Health Organization

## ABSTRACT

Although artisan and small scale mining operations are small, they have a significant impact on the economy of developing economies. It is estimated that within sub-Saharan Africa, artisan and small scale mining produces gold and gemstones worth about \$2.1 billion. In Kenya, 60% of all mineral export earnings (\$49 million) in 1992 to 1997 were from artisan and small scale mining operations. Due to the importance of this sector, this research found it necessary to do a study on the strategies that have been effective in relation to the continual existence of this sector. The research therefore sought to examine the strategies for effective implementation of small-scale mining projects in Kenya. The study was guided by four objectives that included: to examine the extent to which cost leadership strategy influences the implementation of small-scale mining projects in Kenya; to establish how community participation strategy influences the implementation of small-scale mining projects in Kenya; to examine the influence of modern technology adoption strategy on the implementation of small-scale mining projects in Kenya; and, to establish the effects of access to credit and finance as a strategy in the implementation of small-scale mining projects in Kenya. The study adopted a descriptive research design. The target population was 280 respondents from the registered mines in Taita Taveta and 13 employees in the county in charge of mining. A sample size of 164 respondents was obtained, calculated by Yamane formula of 1967, and a population census was done on all the employees of the county equating to 177 respondents. Primary data was collected using structured questionnaires consisting of both closed and open-ended questions. The research used content validity as a measure of the degree to which the data collected using the questionnaire represented the objectives of the study. The data collected was keyed and analyzed by simple descriptive analysis using Statistical Package for Social Scientists (SPSS) version 21.0 software. The data was then presented through frequency tables and narrative analysis. The response rate was 50.5% positive, meaning that 90 questionnaires were fully filled and returned for the study. The general trend of the results indicate that: 76.4% of the respondents agreed on the fact that cost leadership strategy influence the performance of small-scale miners in Kenya, 77.2% of the respondents agreed with the idea that community involvement/participation strategy influences the performance of small-scale miners in Kenya, 74% of the respondents agreed with the idea that the modern technology adoption strategy has an influence on the performance of small-scale miners in Kenya, and 66% of the respondents agreed with the idea that access to credit and finance as a strategy has been effective in the performance of small-scale miners in Kenya. Alternative hypothesis was adopted after the values of the calculated chi-square were noted to be higher than the critical values. Finally, various future studies were suggested including a study being done to examine the influence of the mining bill of 2014 on the performance of artisan miners in the county; a case of artisan miners in Taita Taveta county.

**Key words:** *artisan mining, small scale mining, projects implementation, cost leadership strategy, community participation strategy, modern technology adoption strategy, credit and financing strategy.*

## **CHAPTER ONE: INTRODUCTION**

### **1.1 Background to the Study**

Due to the importance of the artisan mining projects in poor countries in Africa and Asia (as both an economic activity and source of employment), a number of governments have adopted a number of strategies that are aimed at helping protect the activities of the artisan miners and enhance sustainability of such activities. In Africa and Asia, there are four basic types of minerals extracted by artisan miners which are precious and semi-precious minerals, particularly gold and metallic minerals such as copper; industrial minerals such as limestone; construction materials like kaolins and clays (Adler et al. 2013).

Various studies have shown that activities of artisan mining are a source of a living in Asian countries. UNEP(2015) shows that the artisanal and small-scale gold mining sector based in Ecuador, Mongolia, Peru, Tanzania and Uganda are vital in economic development. Equally, UNEP (2015) shows that Artisanal and Small-scale Gold Mining (ASGM) is one of the oldest methods of mineral extraction in Ecuador having emerged in the early 1970s in Southern Ecuador and has been credited for creating jobs to the local poor more specifically the women. This was due to the rising international gold prices and the rise in unemployment resulting from the bankruptcy of the Compañía Industrial Minera Asociada (CIMA).The South American Development Company (SADCO) had conducted explorations and some developments for mining between 1904 up to 1950s after which its mining rights were transferred to CIMA. In the 1970s, CIMA became bankrupt and the miners had to struggle to remain in the mining operations. This new phenomenon generated a series of conflicts with government authorities who questioned the legality of the operations. Nevertheless, the miners organized themselves into small groups producing roughly 42.5 tons of gold. In the 1980s, the artisanal and small-scale mining expanded to Nambija in the Amazon and to Ponce Enriquez on the Southwestern parts of the Andes. The miners were organized into cooperatives and became an important economic actor with the government and mining companies in the region. Thus the artisan mining projects spread well in the country due to

the presence of strategies like sharing of production and operation costs through organized cooperative societies hence the cost leadership strategy (USGS, 2016).

South Africa is in record for developing better mechanisms in implementing the artisanal and small scale mining projects across among the various African states where artisan mining is a source of living for the majority poor (UNIDO, 2013a). Ledwaba (2017) noted that Artisanal and small-scale mining (ASM) projects in South Africa were accorded with official recognition by the government from 1994 onwards. The Reconstruction and Development Programme (RDP) recognized the sector as a key player in social and economic development for the historically disadvantaged South Africans (HDSAs). Having recognized the ASM sector, the government introduced several interventions and support structures to strengthen the development of ASM, to encourage participation of HDSAs, and to respond to challenges facing the sector (Ledwaba, 2017). The government then developed policy requirements or rather strategies to support the growth of the ASM sector through the White Paper on Minerals and Mining Policy (1998). These policies/strategies were organized into five groups which included: access to mineral rights, access to finance, access to the markets, technology and institutional support. These policy strategies that were deemed important for the growth of the ASM sector by the White Paper on Minerals and Mining Policy (1998) were developed, integrated and reviewed which led to improved performance of the sector in South Africa (Dlambulo and Motsie, 2014).

The Artisan mining projects are very common in Tanzania; although their operations were recently reinforced when their current government reviewed the old laws regarding the mining sector and came up with new mining policies (Mwaipopo, Mutagwaba and Nyange, 2017). According to Mwaipopo, Mutagwaba and Nyange (2017), this new policy provides guidelines that are meant to add value by improving the operations in the artisan and small scale mining industry. Dlambulo and Motsie (2014) note that the implementation of the ASM projects has considerable potential to reduce poverty and ASM communities are relatively doing better in terms of poverty levels reduction than other communities. In addition, apart from being a source of wealth creation, asset accumulation and investment, ASM projects have the potential to increase people's livelihood security and the reduction to of

vulnerability to various dangers like diseases. As a result, the government has come up with interventions to enhance sustainability of the ASM projects. According to the Government of Tanzania (2017), the government has taken significant steps in promoting the ASM sector which include reviewing of mining policy and legislation, acquisition of mineral rights and the right to renew, transfer and mortgage their mineral rights; simplification of mineral trading licensing procedures and other measures.

In Kenya, artisanal miners are mostly in the Nyanza, western and partly in coast region where minerals like gold, gemstones and building stones/sand are being exploited. This is supported by numerous reports like the Republic of Kenya (2014b). The report notes that, Kenya is well known for the production of gemstone mining and the small-scale (artisanal) miners dominate the industry. Small scale mining accounts Artisanal mining accounts for over 60% of annual gemstone production in Kenya with women and youth playing a major role in the artisanal mining. Available statistics indicate that, in 2013 Kenya had a production of 14.9 tonnes of Ruby corundum (8.86 tonnes in 2001) and 61.4 tonnes of gemstones (compared to 73.3 tonnes in 2001). Due to overexploitation and poor environmental control measures, the Republic of Kenya report indicates that there has been a decline in Kenya's gemstone mining industry and only the traditional players continue to dominate this industry(Republic of Kenya, 2014b).

The UNDP (2015) study shows that in the Taita Taveta County, the artisanal and small-scale miners who prospect for the minerals end up being violently evicted from the mines by powerful and well-connected large-scale prospectors who claim legal ownership of the land when mineral deposits are discovered. Conflicts between small-scale gemstone miners and large scale gemstones miners arise because most of the land in the lower zones of Taita-Taveta County is not demarcated or officially allocated. The issue of land in coast province generally is a challenge given that almost 89.1% of the locals don't own title deeds hence do not have control of their pieces of land.

Anyona and Rop (2015) contend that, most artisanal mining in Taita Taveta is rudimentary in nature; the miners mainly use easily available explosives to break down the rocks in search of gemstones and precious metals. This has negative health and environmental consequences.

Besides these issues, the markets for gemstones are not well established as few dealers and brokers control the entire process. As a result, the small-scale artisanal miners in Taita Taveta have limited market powers as there is a big black market selling gemstones. Worse still, the miners also lack the technical know-how and the capacity to correctly value the gemstones and its products. According to OECD (2013), there are many benefits accruing from the extractive industry which estimated to be billions of shillings. However, there are no defined strategies, nor clear policy, regulatory and legislative framework to adequately address the issues of royalties and benefit sharing between the investors, communities, the county and national governments. The issue of resources royalties has remained a huge part of the debate regarding the transformation of the industry.

According to a UNDP (2015) report that focused on economic and job creation potential of artisanal and small-scale mining in Taita Taveta County, there are some strategies that have been adopted by the Kenyan government that have been recommended to the artisan miners so that they can benefit from their activities to help revive the mining industry. Key among the strategies that have been outlined include: the government legislation that definitely attaches itself to the passed mining bill of 2014, the environmental sustainability, and, health and safety issue. The UNDP (2015) report therefore emphasizes the need for Kenya to have all the artisan miners to be involved in the adoption, implementation and continuous integration of the various proposed strategies that can help them utilize the environment in a sustainable manner as they conduct their small scale and artisan mining operations.

## **1.2 Statement of problem**

Hilson and Adu-Darko (2014) have noted that artisan mining projects have the capacity of creating jobs and improving the living standards if they are well managed and coordinated. The artisan mining jobs have since 1970's for example been the main source of minerals that have been earning foreign currency for Ecuador and other developing countries in Asia and sub-Saharan Africa. According to OECD (2013), countries like Peru have had about 20% of their net national minerals meant for export coming from the artisan mining projects implemented in the various rural mines. Peru for example is credited for having better minerals output from the artisan activities since the national government, local government

and local leadership advocated for a number of strategic practices that were seconded by various foreign agencies. These strategies have been in operation for a long time and have been improved over time and range from the adoption of technology, access to financial support (credit), community involvement and legislation. This is a clear indication that the adoption of these various strategic practices by the artisan miners is directly proportional to the mines output; worth studying.

Nina and Lynda (2014) observed that almost 10 percent of the minerals traded in Kenya per year are from the artisan miners. These miners are mostly found in Migori, Kakamega, Embu, Taita Taveta, Kitui and Kisii County. However, a study by OECD (2013) has shown that despite the fact that artisan mining activities in Kenya have a significant contribution to the nation's gross income, the sector has not been accorded the weight it deserved like their counterparts who run large mining projects. The most ignored area of concern is that of developing specific strategies for the artisan mining projects and later on checking the effectiveness of these strategic practices despite the fact that the government has always invested large amounts of money that are intended to revolutionize the mining projects in Kenya. According to GOK(2014) Kenya passed a mining bill in 2014 to address mining since it considers it important of which the artisan mining projects were recognized; though previously they were considered illegal. Despite the fact that the Mining bill was passed and outlined a number of mining policies and strategies that should streamline the mining industry, the artisan miners have been considered to be the least beneficiaries of these policies; a need for such a study. Also, a number of strategies in the Mining bill of 2014 have not separated the artisan mining projects form large scale projects, leaving a deficit of differentiation and specification; which calls for such a study.

Another setback that is facing the artisan mining projects in the country unlike the large scale mining projects, a number of scholars and researchers have not thrown much weight in researching on the activities of the artisan miners and the strategies they have adopted that ensures their performance. The few research available include that of Nina and Lynda (2014) that found out that artisan miners in Kenya and Zimbabwe have not adopted competitive advantage strategies effectively hence they fall behind their counterparts in Tanzania,



Malawi and Ghana in the levels of mines production. The researchers have shown that in Kenya, the artisans have not empowered themselves by use of group savings and loaning as done in Tanzania and Malawi. Also, the research shows that there is cheap technology that can be adopted by artisan miners since the governments have heavily invested in technology but the artisan miners do not exploit these strategies. This gives room for this study to be conducted. Due to such short falls, this study was carried out. The study therefore was carried out with the aim of examining the strategic practices influencing the implementation of small-scale mining projects in Kenya: a case of artisan mining projects in Taita Taveta County.

### **1.3 Purpose of the Study**

The purpose of this study was to examine the strategic practices influencing the implementation of small-scale mining projects in Kenya: a case of artisan mining projects in Taita Taveta County.

### **1.4 Objectives of the Study**

The study was guided by the following objectives:

- i. To examine the extent to which cost leadership strategy influences the implementation of small-scale mining projects in Kenya.
- ii. To establish how community participation influences the implementation of small-scale mining projects in Kenya.
- iii. To establish how modern technology adoption influence the implementation of small-scale mining projects in Kenya.
- iv. To establish the influence of access to credit and finance on the implementation of small-scale mining projects in Kenya.

## 1.5 Research Questions

The study answered the following research questions:

- i. To what extent does cost leadership strategy influence the implementation of small-scale mining projects in Kenya?
- ii. To what extent does community participation influence the implementation of small-scale mining projects in Kenya?
- iii. To what extent does modern technology adoption influence the implementation of small-scale mining projects in Kenya?
- iv. To what extent does access to credit and finance influence the implementation of small-scale mining projects in Kenya?

## 1.6 Research Hypothesis

The study tested following hypotheses:

- i. **H<sub>0</sub>**: cost leadership strategy doesn't have a significant influence on the implementation of small-scale mining projects in Kenya.  
**H<sub>1</sub>**: cost leadership strategy has a significant influence on the implementation of small-scale mining projects in Kenya.
- ii. **H<sub>0</sub>**: community participation doesn't have a significant influence on the implementation of small-scale mining projects in Kenya.  
**H<sub>1</sub>**: community participation has a significant influence on the implementation of small-scale mining projects in Kenya.
- iii. **H<sub>0</sub>**: modern technology adoption doesn't have a significant influence on the implementation of small-scale mining projects in Kenya.  
**H<sub>1</sub>**: modern technology adoption has a significant influence on the implementation of small-scale mining projects in Kenya.
- iv. **H<sub>0</sub>**: access to credit and finance doesn't have a significant influence on the implementation of small-scale mining projects in Kenya.

**H<sub>1</sub>**: access to credit and finance has a significant influence on the implementation of small-scale mining projects in Kenya.

### **1.7 Significance of the Study**

This research is expected to benefit the individuals and groups involved in artisan mining in the Taita Taveta County. These groups of people shall get relevant information that shall enable them adopt and embrace better strategies that shall help them increase their production and income base. In addition the work will benefit government departments engaged in the mining sector since they shall be able to get various strategies that can be adopted to better the lives of the artisans and the local communities in general. Finally, the study is expected to generate relevant information that shall benefit future researchers and scholars in the area of artisan mining. This shall include individual students, scholars and consultants interested in this study area.

### **1.8 Assumptions of the Study**

The research was carried out with the assumption that cost leadership strategy, community participation strategy, modern technology adoption strategy, and access to credit and financial resources are known among the artisan miners and have an influence in their activities. During the field study, this assumption held. Also, it was carried out with the assumption that the respondents could faithfully give the information sought for without bias and subjectivity. During the field study, this assumption held.

### **1.9 Limitations of the Study**

The study was faced with two major limitations. The target population in field was sparsely distributed forcing the researcher to travel to various parts of the county; some of the parts that were very difficult to access due to the impassable nature of the roads. However this was overcome by the researcher contacting registered groups or recognized artisans who have operated in the area for the last five years. Also, the distance from Malindi to Taita Taveta proved to be a challenge. However the researcher used trained data collectors and opinion

leaders to administer a section of the questionnaires, leading to guaranteed response from the targeted respondents.

### **1.10 Delimitation of the Study**

The study delimited itself by limiting its area of study to the Taita Taveta County and specifically sought data from the artisan miners who were only registered with the county department in charge of mining and natural resources management. It also delimited itself by using a questionnaire as the only tool for data collection and this was applied to the artisan miners who were only registered with the county government.

### **1.11 Definitions of Significant Terms**

**Artisan Mining**-is the extraction of valuable minerals in small scale by use of crude technology.

**Community Participation**- is the involvement of the local community in various levels of projects implementation.

**Cost leadership**-This refers to the lowest cost of operation in the industry. Cost leadership is often driven by company efficiency, size, scale, scope and cumulative experience (learning curve).

**Credit and Finance Strategy**-Organizations use this strategy to position their financial accounts in a way that they have enough amounts for operations and have sufficient powers to borrow for improved business operations.

**Technology Strategy**-This refers to the application of modern methods in minerals exploration, extraction, processing, marketing, environmental management and regeneration.

### **1.12 Organization of the Study**

The study is organized into five sections comprising of chapter one, chapter two, chapter three, chapter four and five as follows:

Chapter one provides an introduction of the study. It covers background of the study, the problem statement, the objectives of the study, the research questions, the research hypothesis, significance of the study, limitations of the study, delimitation of the study and the assumptions adopted in this study. In addition it covers the definition of significant terms used.

Chapter two presented the literature reviewed. This includes the definition of the various concepts related to strategic practices of effective mining, the literature review, theoretical framework, conceptual framework, literature gaps and its summary.

Chapter three presents the study methodology employed to acquire data and how it was analyzed. This include but not limited to the research design, sampling techniques, data sources and type, data collection techniques, and material analysis and presentation.

Chapter four contains data analysis and interpretation while chapter five is made up of the summary of the findings, discussions, conclusions and recommendations made.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

This chapter presents theories, empirical review and conceptual framework. First, the theoretical framework underpinning of the study are presented and discussed. This is then followed by the empirical literature along the hypothesized relationship.

#### **2.2 Measures of Artisan and Small Scale Projects Performance**

Several researchers suggest increase in the quality of minerals produced as the most important performance measure in artisan mining. For example, Gupta, Evenett and Jenny (2012) argue that the increased production of minerals translates to more income; meaning that the amount of money generated is the major indicator of artisans' performance. Nina and Lynda (2014) assert that the amount of minerals produced can be a better measure of artisan miners' performance. This was concluded after observing working approaches within the artisanal and small scale miners in five African countries whereby Ghana, Zambia, Angola, Kenya and Tanzania were included. Hinton et al(2003b)recommend that strategies like cost leadership, differentiation and government support should always be the drivers of mining since these strategies can improve the miners' output by helping the ASM achieve maximum production at low costs and access their market base at ease.

In their comparative study, Hilson and Garforth (2013)specifically found out that Tanzania, Ghana and Angola were doing relatively better in minerals production bases form the artisan mining projects as compared to Zambia since the artisan miners had adopted various strategies or approaches that have helped them increase their minerals productivity; consequently increasing the income generated. This means that successful artisan projects implementation performance is greatly dependent on the quantity of minerals that the artisans are able to produce and sell to the market. ICMM (2014a) concludes that artisan miners can achieve better mineral quantities output if they are considered by various bodies in strategy implementation and continuous upgrading of their methods, styles and techniques of minerals production, process and marketing.

### **2.3 Strategic Practices and Implementation of Artisan and small scale Mining Projects**

According to Abhishek (2015), a strategy is basically the direction or scope that a firm or individual person takes on a long-term with the intention of realizing an advantage for the firm by configuring its resources within the ever dynamic business environment, so as to remain relevant in the market. For this reason, artisan miners like any other firm may achieve maximum benefits in their operations when they adopt suitable strategies that suit their future needs. Strategies when adopted have specific achievements to the firms. Some of the achievements include giving direction to the firm, expanding the market or scope of an organization, mobilizing and increasing resources, providing a conducive environment and informing stakeholders on the performance of an organization(Rop, 2009).

MEM (2014) notes that if mining laws, regulation and strategies are designed, implemented and continuously improved, the miners stand to benefit from their operations whilst protecting their environment. In 2004 to 2008, with the support of a World Bank grant, the development of a comprehensive, strategic, long-term sector plan, the Kosovo Mining Development Strategy was implemented and it managed to improve its production of the minerals and other non-processed minerals like sand up to the tune of 67% between 2009 and 2014. Majority of the beneficiary of this strategy were the artisan miners who previously operated in deplorable conditions that exposed them to various health risks besides poor gains.

In his study, Rop(2009) recommended that the success of the mining sector in the world shall depend on putting much in not only the large scale miners but also in the small scale artisanal miners. According to him, in countries like Africa and Asian continent where poverty has forced the poor to resort into exploiting land for valuable minerals, the governments should develop policies and provide incentives like give funds, advance technology, training, offer better leadership among other incentives as strategies that are aimed at improving the lives of the artisan miners and the economy of these crumpling communities.

#### **2.3.1 Cost Leadership Strategy and the Implementation of Small-Scale Mining Projects**

Cost leadership is a concept developed by Michael Porter and it has widely been used in business strategy. It describes a way to establish the competitive advantage in a business; be

it a large scale firm/enterprise or small scale firm like the artisan mines. Cost leadership, in basic words, refers to the lowest cost of operation in the industry. The cost leadership is often driven by company efficiency, size, scale, scope and cumulative experience of the large scale or small scale firm. A cost leadership strategy aims to exploit scale of production, well defined scope and other economies (e.g. the existence of a good purchasing strategy) producing highly standardized products to the customers using high technology (Gavin, 1993).

In a study conducted by Anderson (2014), it was observed that artisan miners in Zimbabwe , Kenya, SA, Ghana and Nigeria, and found out that with the exception of Kenya and Zimbabwe, the other three countries are recording increased productivity levels of minerals as a result of the adoption of the cost leadership idea. Amoah (2012) argue that, in Ghana and South Africa, the small scale miners have been able to form amalgamations that have seen common leadership leading to cutting of costs of operations hence realizing economies of scale. Amoah (2012) therefore made recommendations that many cost leaders can rely on economies of scale to achieve efficiency in countries like Kenya and other countries where the artisan miners are active in operations.

Aryee, Ntibery and Atorkui (2014) argues that, cost leadership is a strategy used by artisan miners in Ghana in order to reduce their cost of operation within their market niche. The use of this strategy is basically aimed at gaining an advantage over competitors by reducing operation costs below that of others in the same industry. In their work that has focused on the trends in the small-scale mining of precious minerals in Ghana, they made observations that when artisan miners invested in common leadership that operated in a structured format at low costs, they were able to increase their mineral scale of production by 11% annually since 2010 to 2015 December. This has been argued to be similar in other countries like Angola, South African and DRC. Hartman (ed.) did a study called SME society for mining, metallurgy, and exploration and he has confirmed a very strong relationship between the performance of artisan miners and the adoption of the cost leadership strategy. According to him, miners who adopted the strategy in Kenya's western region, in Tanzania's eastern



districts and Uganda's southern districts had their production levels increase by 35 to 55 percent. The study also indicates that when artisan miners just like well-established miners tend to come together under well-structured leadership, there is more production recorded since the costs of management are distributed and shared equally by the member artisanal miners.

Amoah (2012) did a study in Malawi and Tanzania and argued that, economies of scale have been created among the artisan miners by having the cost of production of minerals and services decreased. This is true due to the fact that common mining groups or miners have been able to increase their scale of production due to adoption of the cost leadership strategies. Amoah (2012) argues that, when cost leaders become large companies, it can give them sufficient market power to push for or demand price concession. Therefore, artisan miners in Tanzania and Malawi are said to have recently adopted the cost leadership strategy whereby technology, management, productions and processing of some mines is shared in what is called mining groups in Kenya. Mutemi, Rugami and Ngigi (2014) observed in their study that there were a number of recommendations on a number of strategies that should be adopted by these small scale mining firms or groups in Kenya. This includes: cost leadership strategy, investment in human resources competences and response, competitor actions, maintaining customer loyalty and product differentiation. In this regard, if the cost leadership is adopted by the artisan miners, they are likely to achieve efficiency from the cost leaders and this makes them well positioned to withstand price competition from rivals; hence ensuring their sustainability.

In his study, Abhishek (2015) notes that cost leadership strategies are very viable for large firms with the chance to enjoy economies of scale from large production volumes, an experience also shared by small firms or groups. In this regard, artisan miners in Taita Taveta can also be cost leaders so long as they embrace cost leadership. Adler *et al* (2013) supports the role of cost leadership in the small scale firms. They observe that artisan miners benefit from cost leadership strategy when they operate in low cost areas and attract price-sensitive customers when it offers a rapid turnover and employs staff on minimum wage costs.

### **2.3.2 Community Participation Strategy and the Implementation of Small-Scale Mining Projects**

Community participation and involvement as a strategy can help improve the performance of both the local communities and the miners just like the large scale companies do (Okoth, 2013). Nevertheless, a number of researchers have argued that the artisan miners don't involve better workforce like the large mining companies in Kenya and the rest of Africa. According to studies done by Bannock Consulting Ltd (2014), in contrast to large-scale mining operations that employ predominantly men who tend to work for long enjoy to have numerous rights in the African community, ASM activities often involve several household members including women, youth and children who are not empowered to hold many decisions. Bannock Consulting therefore observes that, if artisan miners involve carefully identified members of the community at various levels, it is possible to record more benefits having improved production that is not characterized with numerous challenges like family conflicts and resources.

According to OECD (2013), the Kenyan miners have appreciated the importance of local communities in provision of physical resources that entail: land, natural resources, and environmental services. This also extends to productive equipment to make use of these services, infrastructure such as safe and secure shelter, water supply and sanitation, education, energy, transport, communications human resources and also locally produced goods and services. In the event that local inhabitants of a given place where resources occur naturally are involved in the selection of resource sites, the people with property rights are approached and the local labour utilized, the artisan miners can increase their productivity.

Okoth (2013) did a study on the effects of ASM to the community members and why such community members must be involved in every step of minerals extraction in Migori and Kakamega counties where gold is mined. He found out that, ASM operations tend to stimulate demand for locally produced goods and services, tools, equipment, housing, and various types of infrastructure. Therefore, community participation in the ASM activities is one such strategy that can lead to attaining sustainability of the activities of the artisan miners. According to Cook and Healy (2012), when artisan miners involve the local

communities through community consultation, dialogue and participation in various operations like land acquisition, mining sites setup, transportation routes establishment and resources sharing, improved performance is likely to be recorded. Buxton (2013) did a study on the importance of community involvement in areas where natural resources are found out that community participation has an influence of the performance of mining projects. According to him, there is a need to have community participate effectively since this is geared towards eliminating the conflicts between the communities that provide labour, land as a resource and other factors of production.

Bannock Consulting Ltd (2014) argues that permitting community participation in all the cases of artisan mines in all parts of Kenya including in Taita Taveta's county, the community participation strategy can effectively lead to improved performance of the mines and general improvement on the lives of the locals. Summing up the community involvements strategy in Kenya's mining industry; there must be well coordinated and structured rules and regulations from both the central and county governments on how the communities should be brought on board so that they can benefit from mining operations within their areas.

### **2.3.3 Technology Strategy and the Implementation of Small-Scale Mining Projects in Kenya**

According to studies by almost all the government bodies dealing with mining across the world they have attached improved performance of miners to the adoption and use of modern technology (MEM, 2014). MEM (2014) report indicates that in Kosovo the government empowered the artisan miners and invested over \$ 5 million in enabling them access the modern tools of mining, modern machines for processing some of the minerals and modern methods of siting the minerals after it came out of the civil war. In effect, the revenue from the artisans' mines increased. This is an argument that has been supported by scholars like Aryee, Ntibery and Atorkui (2014) who argue that, technology/modern methods of identifying the ground position of minerals like gold deposits in Ghana, modern methods in processing the mineral ores without necessarily having to use much chemicals, adoption of modern methods in marketing the minerals and many other adopted technology by artisans

has resulted to making the country be one of the standing African economies that has been exporting minerals from the artisans; Moreover the artisan miners have been noted to offer stiff competition to the large scale mining companies.

According to Hilson and McQuilken (2014) on their study on the role of technology in artisan mining in Nigeria, Angola, Ghana, South Africa and some countries in Asia, there is a marked improvement in levels of production where modern technology is transferred from large scale mining firms to the small scale mining firms. In addition, the practice ensures there is enhanced safety for the workforce and the environment. In a separate study by Hilson and McQuilken (2014) that covered 672 artisan miners in Ghana, South Africa, Zimbabwe, Madagascar and Kenya in Africa indicated that a number of technologies and practices used by large-scale mining firms can be downsized to smaller scale firms. This practice has benefited many artisan miners around the world, particularly in South Africa resulting to improved exploration of mineral deposits allowing the artisans to produce almost 16.4 percent of the annual gold sold from the country.

A report by ICMM (2014b) has emphasized on the importance of firms investing in embracing new skills and technology that can put them at a competitive advantages over their rivals (large scale companies in Kenya). Large-scale mining companies like the Base Titanium operating in Kenya's Kwale County can provide valuable lessons to the artisan miners on technology use; which may enhance productivity. However, it is regrettable that artisanal and small-scale miners may not always be willing or may not be having the capacity to adopt new technologies and practices in Kenya (Hinton et al. 2003b), and new technologies are more likely to be adopted by artisanal and small-scale miners if they are of increased or comparable level of simplicity, where it provides for quick recovery of minerals, and can result into immediate financial gain (Hinton et al. 2003b).

According to Rivers(2013),the use of mercury by small scale miners in Kenya and Ghana was having adverse effects on the environment, resulted to waste in production and affected the small scale miners' health. It was therefore the recommendation of the report to adopt and promote affordable and user friendly technology by the artisan miners in Mbeere, Taita,

Migori, Kakamega and Migori mining centres. According to the report, miners need to be encouraged to adopt affordable, efficient and cleaner technologies through practical demonstration regarding the benefits for abandoning the traditional techniques to the cleaner ones. Okoth (2013) adds that the benefits have to be associated with monetary since artisan miners usually prefer short term or quick gain in their operations.

However, a report by the UNEP (2016) suggests that, before the mining bill was passed in Kenya, small scale miners had difficulties in adopting cleaner technology since it was expensive and sometimes the miners resisted it because it was always focused on long term effects. Most programmes for promotion of efficient and cleaner technologies came through aid programmes only promoted by development and donor agencies; making it hard for the miners to view these programmes as part of them. In a summary UNDP (2015) observes that technology as a strategy of environmental degradation check has not been well adopted in Kenya with over 78% of the artisans in Migori still using traditional technology in drilling, crushing, grinding, sizing, floatation and gravity concentration, whereas 72.1% of the artisans miners use crude technology in Mbeere and Embu, and the majority of the miners at Taita Taveta (87.21%) preferring to use cure technology. In essence, this has left the artisan miners with disadvantages for lacking the enabling techniques that can give them the chance to compete with their fellow African countries.

#### **2.3.4 Access to Credit Strategy and Implementation of Small-Scale Mining Projects in Kenya**

Many organizations use the credit and finance strategy to position their financial accounts such that they have enough amounts for operations but at the same time have sufficient powers to borrow for improved business operations. A study done by Buxton (2013) suggest that if artisan miners adopt a strategy where they raise securities, savings and confidences that can enable them access credit from various sources, grants and government loans, they can improve their output/production by over 75% in five folds in Asia and by 65% in five folds in Kenya. This findings are supported by Cook and Healy (2012) which found out that, artisan miners in Ghana and parts of Malawi who embraced the use of village savings and

loaning advanced by bodies like: the AKAM Foundation; World Bank; AfDB; and UNDP, recorded improved minerals production by almost 61.2 tonnes per 7 months.

One great challenge facing artisan miners as opposed to large mining companies in Kenya is the absence of a well structured financing avenue (World Bank, 2012a). The lack of security and the illegal nature of gemstone miners in Taita Taveta deny them the chance to access credit from banks or seed companies; which affects their efforts to expand and consolidate their gains (AfDB, 2016). A report by the Republic of Kenya (2014b) in a Kenya gazette indicates that the land owners in Taita are disadvantaged in accessing credit from banks and other financing institutions to run their economic operations because majority of them don't have title deed that can be held as security/collateral to secure a loan or any other form of financing. In consequence, small scale miners have remained with limited opportunities of accessing capital for their activities.

In an ILO survey of 2009 on small-scale miners in Mbeere, Arusha, Shinyanga, and Migori district identified access to credit as impediment to the successful development of the sector (ILO, 2009). According to Spiegel (2012b), the following are some good examples of limitations that have faced artisan miners in the country in relation to access to credit since 1992: There has been no defined drafted small-scale mining lending policy; No established loans targeted to specific needs of small-scale mining projects; The government has never offered to grant the small-scale miners finances in addition to there being no established equity-based financing to promote joint-ventures; No providence of amount of loan based on actual requirements following an assessment by mining experts from the government; and No established hire/purchase schemes that are available to accommodate the small-scale miners to access and acquire equipment through affordable installment payment modalities.

## **2.4 Theoretical Framework**

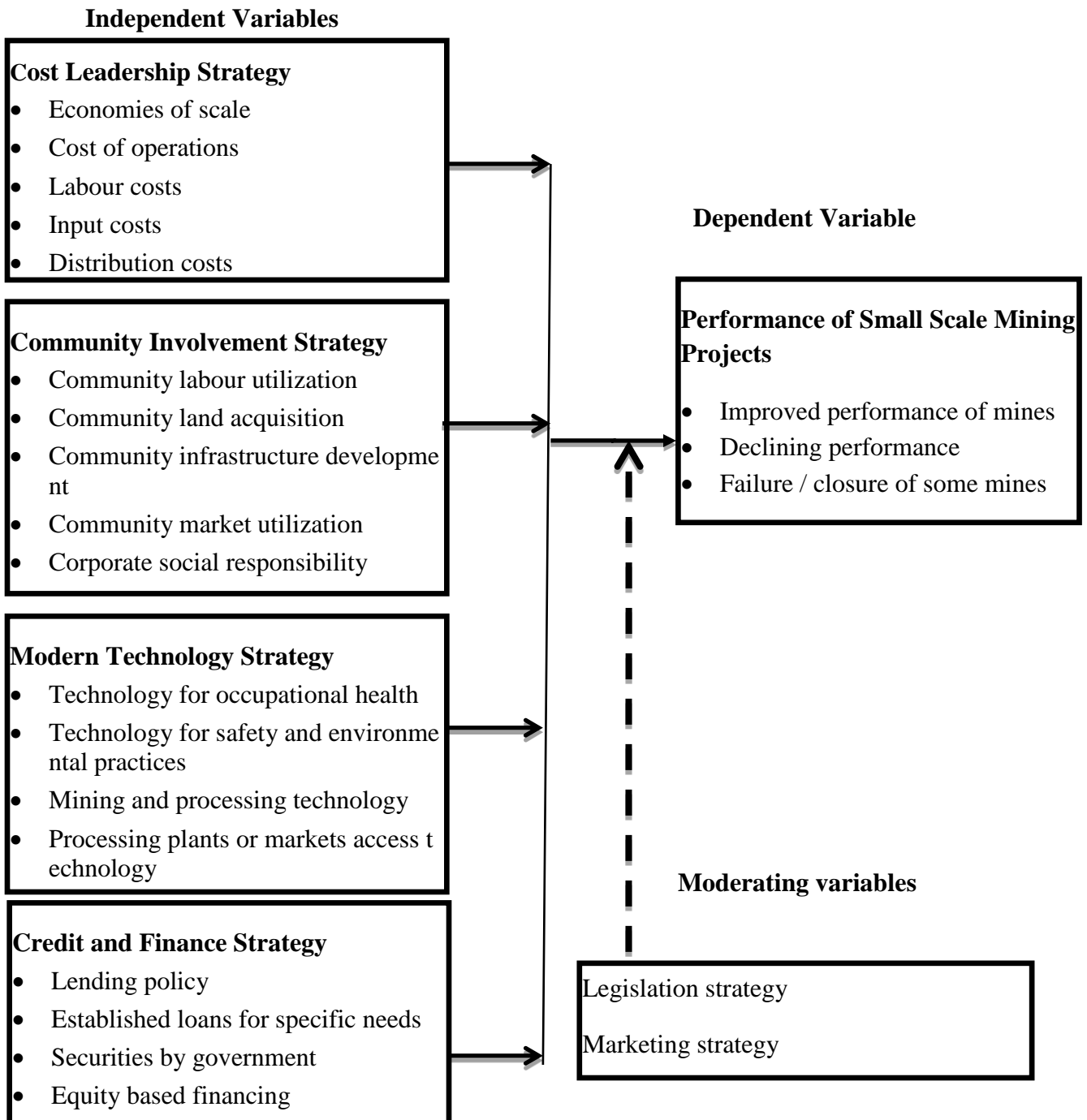
This research study is basically guided by the Porter's generic strategies Model which is well elaborated by Barwise and Meehan (2004). This theory by Porter (1980, 1985) avers that some of the most basic choices faced by firms include the nature of the markets that the company would serve and how the competition in that particular market is like. Porter's theory specifically focuses on strategic competitive advantages that will put a firm above its

competitors. Competitive strategies focus on ways in which a firm may attain an advantageous position that it can possibly claim in its industry (Pearson, 1999). Advantage can be looked at as the profit or continuity of operation of a given firm, project or organization.

The profit of a company is basically a factor of the difference between its revenues and costs (where revenue in project planning and implementation refers to the time, money and human resources or rather inputs that are aimed at project's success). High profitability thus is achieved through maintaining the lowest costs or the highest prices of the products as compared to that of the competitors (Barwise and Meehan, 2004). Porter used the terms 'cost leadership' and 'differentiation', wherein the latter is the way in which the firms can realize a price premium. Studies conducted by Hall (1980) show that, artisan and small scale mining firms may achieve competitive advantages by differentiating their products and services from their competitors and by way of offering them at low costs. Small scale miners may also need to target their products by a broad target. This will permit covering most of the marketplace, or they can choose to focus on small target in the market (Lynch, 2003). According to Porter (1985), there are three generic strategies that firms may pursue to achieve competitive advantage which are cost leadership, differentiation, and focus.

## 2.5 Conceptual Framework

The diagram below represents the independent and dependent variable that combined to make to the conceptual framework. Also it has shown the intervening variables.



**Figure 1: Conceptual Framework**



In the conceptual framework, the researcher has outlined a number of variables. On the left hand side are the independent variables that include: cost leadership, community participation, modern technology, credit and finance. These variables have been accompanied by a number of indicators. On the other side there is the dependent variable that is, performance of small scale mining projects. This is accompanied by its indicators. Finally the moderating variables have been included. Moderating variables are those variables that influence the implementation of artisan projects but their literature has not been included in the study.

## 2.6 Knowledge Gap

This section outlines the literature that has been reviewed and areas that have not been dealt with.

**Table 2.1 Knowledge Gap**

	<b>Researcher</b>	<b>Focus</b>	<b>Finding</b>	<b>Knowledge gap</b>
<b>1</b>	Amoah (2012)	Cost leadership strategy: its relevance in helping sand miners to maximize profits.	Cost leadership strategy helps in creating economies of scale among artisan miners; it helps in reducing the operation costs; and it helps in identifying niche markets for products.	The study focused on artisan miners in the sand harvesting industry in Ghana. Sand is not as valuable as gemstone minerals are and Ghana is relatively different in several ways from Kenya where this study shall be carried out. This study therefore addressed gemstone mining and how cost leadership has influenced the mining of this precious stone.
<b>2</b>	Abhishek Kumar	Cost leadership strategy, performance	Cost leadership strategy can help small firm	The study focused on strategies employed to

	Sadhu. (2015)	of small scale firms	achieve economies of scale and reduce the expenses they could use in management operations since the duties are shared by specialized people.	mitigate poor performance on general small scale enterprises in India; this study focuses the artisan miners in Kenya and the study intends to focus at a glance the implementation of artisan mining projects as a whole and not those ones performing poorly only.
<b>3</b>	OECD (2013)	Relationship between Community Participation Strategy and the performance of gold artisan miners in Migori county	The relationship between community involvement and utilization of natural resources	The study focused on community involvement in natural resources exploitation and has just mentioned artisan miners in Kenya without differentiating the value and nature of minerals mined by these artisan miners. This particular study has specifically addressed the natural resource mined in Taita Taveta (gemstones) and has tried to show how this community participation influenced their mining.
<b>4</b>	Hilson and McQuilken (2014)	Technology as a strategy of improving performance	Artisan miners can gain benefits by embracing technology in exploration, processing	The study focused on the role of technology in artisan mining in Nigeria, Angola, Ghana, SA and some

			and marketing of minerals and reducing operational costs.	countries in Asia. These countries have different social economic characteristics as artisan miners in Kenya's Taita Taveta county. Therefore this study has tried to show how technology is adopted and used in Taita Taveta by the artisan miners who have relatively low knowledge on technology use.
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## 2.7 Summary of the Chapter

This chapter has outlined the concepts of strategic practices and implementation of artisan mining projects, the study has also included the literature review, the theory, conceptual framework and later on the literature gap

## **CHAPTER THREE:**

### **RESEARCH METHODOLOGY**

#### **3.1 Introduction**

This chapter presents the study methodology. It includes research design, population of the study, sample design, data collection instruments, pilot testing, validity and reliability, data analysis and ethical consideration.

#### **3.2 Research Design**

This study adopted a descriptive survey research design. This design was preferred for this study and seen as the most suitable as it brings out information on attitudes which would be difficult to measure using observational techniques from the artisan mining projects in Taita Taveta County. According to Mugenda and Mugenda (2003), descriptive survey research is suitable where a population is sparsely scattered, and where attitudes of the respondents are to be captured.

#### **3.3 Target Population**

According to the report posted by the department in charge of mining and natural resources management of Taita Taveta County, there are approximately 280 recognized small scale miners operating in the various parts of the county. Therefore, the target population was 280 artisan miners and the 13 (7 environmental protection officers, 6 natural resources management advisors) employees working in the department of mining at Taita Taveta County thus making the total population of 293.

**Table 3.1 Target Population**

<b>Area</b>	<b>Population</b>	<b>Percentage</b>
Small scale miners	280	95%
Ministry of mining employees	13	5%
<b>Total</b>	<b>293</b>	<b>100%</b>

### 3.4 Sample Size and Sampling Procedure

Purposive sampling was applied in this study. The aim of this purposeful sampling was; to reach those respondents who were relevant to the study and had the ability to read and write since a questionnaire was used to collect data. Sampling was done on the artisan miners while a population census was done among the county employees in charge of mining and environmental management. For this study therefore, the sample size of the artisan miners was given by the Yamane formula of 1976 as shown below:

$$n = \frac{N}{1 + N(e)^2}$$

n = Desired sample size when population is less than 10,000.

e= sampling error

N = Population size

At 95% confidence level, the sampling error is 0.05. Therefore the desired sample is:

$$N = \frac{280}{1 + 280(0.05)^2} = 164$$

Therefore 164 artisan miners were considered and 13 (7 environmental protection officers, 6 natural resources management advisors) county employees in charge on environmental management and natural resources regeneration equating to 177 respondents.

### **3.5 Data Collection Instrument**

Primary data was collected using structured administered questionnaires consisting of both closed and open-ended questions. Administration of the questionnaire was conducted on selected artisan miners. The questionnaire was administered through ‘drop and pick later method’ and in some incidences where the respondents were educated but not accessible, service was by e-mail. In situations where the miners had relatively low knowledge on some strategies, research assistants explained to them for better in-depth understanding. The researcher trained the research assistants five days before the actual fieldwork.

#### **3.5.1 Piloting of the Instrument**

The researcher subjected the questionnaire to 10 artisan miners in the sand mining in Kwale County. The respondents that had been approached for piloting of the study in Kwale had similar characteristics traits to those of the artisan and small scale miners in Taita Taveta County. The piloting was done by drop and pick immediately process.

#### **3.5.2 Validity of the Research Instrument**

Hsieh and Shannon (2005) refer to validity as the quality that a procedure or instrument or a tool used in research is accurate, correct, true and meaningful. The research used content validity as a measure of the degree to which the data collected using the questionnaire represented the objectives of the study. The instrument was therefore verified by the research experts from NGOs and fellow students who had defended their master’s projects and two university lecturers.

#### **3.5.3 Reliability of the Research Instrument**

Mugenda (2003) says that reliability is concerned with estimates of the degree to which a research instrument yields consistent results after repeated trials. In this study, reliability was determined by a test-retest administered to 10 subjects not included in the sample. Inputs from invaluable sources were obtained during the study that was useful in modifying the questionnaire to the required standard. Cronbach alpha is the basic formula for determining the reliability based on internal consistency (Kim and Cha, 2002). The standard minimum value of alpha of 0.8 is recommended Gupta (2004) as the minimum level for item loadings. Higher alpha coefficient values means there is consistency among the items in measuring the

concept of interest. Therefore, using the Cronbach formula, a value of alpha of 0.8 was considered as a minimum measure of the instrument's reliability.

### **3.6 Data Collection Procedure**

In this study, a questionnaire was used to collect primary data. The questionnaire was prepared taking account of a review of literature about effective strategies for artisan mining projects implementation. The researcher sought permission from the county government of minerals and natural resources management of Taita Taveta County. The researcher also got a letter of introduction from the University of Nairobi; introducing him to the respondents and other relevant bodies and leadership organs. After securing an appointment with the sampled respondents including the county employees, the researcher carried out the data collection exercise. 6 local research assistants who understood the local language well were trained and involved in the interviewing process for easy translation and clarification of the information.

### **3.7 Data Analysis**

The questionnaires were received and sorted out to separate those fully completed and thus valid for the study against those not duly completed. Data processing was carried out through editing, coding and classification. Data collected was analyzed using both quantitative and qualitative methods with the help of (SPSS) version 21.0. The correlation between the independent variable and the dependent variables was tested by the use of Chi-square test.

### **3.8 Ethical Considerations**

The national and also the county government authorities were duly informed prior to the study to avoid suspicions and resistance from the community members. Consent was sought from the respondents whose participation in this study was voluntary. The information they provided was treated with utmost confidentiality. Privacy and dignity of the respondents was considered during the research. Names of the respondents were not exposed and codes were used instead.

### 3.9 Operationalization of the variables

This section presents the various objectives under the study, the independent variables, their indicators that are to be measured, the measuring scale and the type of analysis used.

**Table 3.2 Operationalization Table**

Objective	Independent Variable	Indicators	Scale	Types of analysis
i. To examine the extent to which cost leadership strategy influences the implementation of small-scale mining projects in Kenya.	Cost Leadership Strategy	<ul style="list-style-type: none"> <li>• Economies of scale</li> <li>• Cost of operations</li> <li>• Labour costs</li> <li>• Input costs</li> <li>• Distribution costs</li> </ul>	Ordinal Scale	Descriptive
ii. To establish how community involvement/participation strategy influences the implementation of small-scale mining projects in Kenya.	Community Involvement Strategy	<ul style="list-style-type: none"> <li>• Community labour utilization</li> <li>• Community land acquisition</li> <li>• Community infrastructure development</li> <li>• Community market utilization</li> <li>• Corporate social responsibility</li> </ul>	Ordinal Scale	Descriptive



<p>iii. To examine the influence of modern technology adoption strategy on the implementation of Small-scale mining projects in Kenya.</p>	<p>Modern Technology Strategy</p>	<ul style="list-style-type: none"> <li>• Technology for occupational health</li> <li>• Technology for safety and environmental practices</li> <li>• Mining and processing technology</li> <li>• Processing plants or markets access technology</li> </ul>	<p>Ordinal Scale</p>	<p>Descriptive</p>
<p>iv. To establish the effects of access to credit and finance as a strategy in the implementation of small-scale mining projects in Kenya.</p>	<p>Credit and Finance Strategy</p>	<ul style="list-style-type: none"> <li>• Lending policy</li> <li>• Established loans for specific needs</li> <li>• Securities by government</li> <li>• Equity based financing</li> </ul>	<p>Ordinal scale</p>	<p>Descriptive</p>

## **CHAPTER FOUR**

### **DATA ANALYSIS, PRESENTATION AND INTERPRETATION**

#### **4.1 Introduction**

The data that was collected from the field was keyed and analyzed by simple descriptive analysis using Statistical Package for Social Scientists (SPSS) version 21.0 software. The data was then presented through frequency tables and narrative analysis. The results were then presented in different sub-sections that focus on the objectives of the study and the items questioned in the questionnaire.

#### **4.2 Questionnaire Return Rate**

In the study, questionnaires were administered to 177 respondents. The response rate was 50.85% positive; meaning that 90 questionnaires were fully filled and returned and were useful for the study. The relatively low response rate was attributed to the fact that the artisan miners are scattered, the researcher is in formal employment which is demanding and the contact time with the respondents was very limited. However, Mugenda and Mugenda notes that, a response from the field that is over 50% of the respondents can be used for data analysis in a social research.

#### **4.3 Demographic characteristics of the respondents**

The study wanted to find out the bio data of respondents, age and levels of education as shown in table 4.1:

**Table 4.1 Demographic Characteristics of Respondents**

<b>Variable</b>	<b>Frequency</b>	<b>Percent (%)</b>
<b>Gender</b>		
Male	50	55.56%
Female	40	44.44%
<b>Age of respondents</b>		
18-30 Years	18	20%
31 - 40 Years	36	40%
41 - 50 years	18	20%
51- 60 years	16	18 %
Over 61 years	2	2%
<b>Education Levels</b>		
Secondary certificate	27	30%
Diploma/certificate	9	10%
Bachelors' degree	9	10%
Post graduate	5	5.6%
Other levels of education	40	44.4%
<b>Total:</b>	<b>90</b>	<b>100%</b>

Responses from the field indicated that, the male respondents were the majority at 55.55% while the female made only 44.46%. Also, majority of the respondents who participated in the study were of ages below 40 years who made 60% of the total population, this was followed by those with ages between 41 - 50 years who comprised of 20% of the total population, 51- 60 years at 18% and over 61 years at 2%. From the study, it is evident that the youths and the energetic people in their mid-ages are the dominant artisans since the activity is labour intensive. Finally, from the field responses, those respondents with other levels of education dominated the study at 44.4%. This was followed by those respondents with secondary education at 30%, those with diploma and degree tied at 10% each and those with postgraduate closed the age at 5.6%.

#### **4.4 Cost Leadership Strategic Practice and its Influence on the Implementation of Artisan Mining Projects**

Respondents were asked whether they thought that the cost leadership strategy (a situation where they come together and operate together under one leadership to reduce operation costs) has been applied effectively by the artisan miners in Taita Taveta County and the responses were as follows:

**Table 4.2 Cost Leadership Strategic Practice and the Implementation of Artisan Mining Projects**

<b>Response</b>	<b>Frequency</b>	<b>Percentage</b>
Yes	45	50%
No	45	50%
<b>Total</b>	<b>90</b>	<b>100%</b>

From the field responses, 50% of the respondents argued that the cost leadership strategy has been applied and has been effective while the remaining half that made 50% of the population went against. When asked to provide support to their answer in an open ended question, those who supported the idea argued that, from their areas of operations, they have formed groups whereby there is central leadership that deals with marketing, financial resources mobilization, policies formulation and interpretation. Moreover, transportation issues, new mining sites acquisition, general health management of the miners and legal protection of the miners were noted to be issues that would be effectively addressed jointly by cost leadership strategy. On the other hand, those who did not support the idea argued that, each miner and mining firm is out to compete and make profits. Therefore the idea of having common leadership aimed at reducing the operation costs may not be possible, since each miner or firm has different amount of resources invested into the mining activity in various points. Also, the miners are scattered; making it difficult to come to consensus of common leadership.

Respondents were given a series of statements in relation to cost leadership strategy and the implementation of artisan mining projects in Taita Taveta County. They were expected to rate the extent to which they agreed or disagreed with these statements that were rated on a scale of measure, where: 1=strongly disagree, 2=disagree, 3= weakly agree, Agree =4 strongly Agree =5. The means were computed to indicate the extent of support on a scale and this was equated to a percentage score and its subsequent equivalence.

**Table 4.3 Extent of Influence of the Cost Leadership Strategic Practice on Artisan Mining Projects Implementation**

<b>Statement</b>	<b>Average</b>	<b>Percentage</b>	<b>Equivalence</b>
<b>Cost Leadership Strategy</b>			
Artisan miners have effectively adopted the concept of economies of scale in their daily work.	3.7	74	Agree
The artisans have effectively adopted the cost leadership strategy to check on cost of operations.	4.1	82	Agree
Labour costs have been effectively reduced due to adoption of cost leadership strategy.	3.6	72	Agree
Input costs are effectively managed due to the integration of the cost leadership strategy by artisan miners.	4.0	80	Agree
Distribution costs have been reduced due to cost leadership strategy adoption.	3.7	74	Agree
<b>Average rating</b>	<b>3.87</b>	<b>76.4</b>	<b>Agree</b>

Rating on a likert scale indicate that in relation to the first objective that touched on cost leadership strategy, a score of 3.7 was computed for the idea that artisan miners have effectively adopted the concept of economies of scale in their daily work. This was equated to agree on a scale with a percentage score of 74%. The second statement that read, the artisans have effectively adopted the cost leadership strategy to check on cost of operations,

attracted a mean of 4.1 translating to an equivalence of agree on a percentage of 82%.The statement that read, labour costs have been effectively reduced due to adoption of cost leadership strategy recorded a mean score of 3.6 being an equivalence of agree on a score of 72%. Moreover, the statement that read input costs are effectively managed due to the integration of the cost leadership strategy by artisan miners attracted a score of 4.0 which was equated to agree and translated to 80%. Finally, the statement that read, distribution costs have been reduced due to cost leadership strategy adoption attracted a score of 3.7 which was equated to agree and recorded to 74%. Generally, it is evident that 76.4% of the respondents agreed with the idea that cost leadership strategy influence the implementation of small-scale mining projects Taita Taveta County.

H<sub>1</sub>: cost leadership strategy has a significant influence on the implementation of small-scale mining projects in Kenya.

H<sub>0</sub>: cost leadership strategy does not have a significant influence on the implementation of small-scale mining projects in Kenya.

**Table 4.4 Hypothesis Testing for the Influence of Cost Leadership Strategy on the Implementation of Small-Scale Mining Projects**

**Observed values**

Likert Rating	1(strongly disagree)	2 (disagree)	3 (fairly agree)	4 (agree)	5(strongly agree)
Mean observed trend	6	7	11	47	19

**Calculated values:**

<b>f</b>	<b>f<sub>e</sub></b>	<b>(f- f<sub>e</sub>)</b>	<b>(f- f<sub>e</sub>)<sup>2</sup></b>	<b>(f- f<sub>e</sub>)<sup>2</sup>/ f<sub>e</sub></b>
6	18	-12	144	8.0
7	18	-11	121	6.72
11	18	-7	49	2.72
47	18	29	841	46.72
19	18	1	1	0.05

$$\sum (f- f_e)^2 / f_e = 64.21$$

$$\chi^2_c = 64.21 > \chi^2_{0.05} = 9.488 \text{ at 4 degrees of freedom and 5\% level of confidence.}$$

Since the calculated chi-square value of 64.21 is greater than the critical chi-square value at 5% level of confidence, we accept the alternative hypothesis. Thus, cost leadership strategy has a significant influence on the implementation of small-scale mining projects in Kenya.

#### **4.5 Community Participation Strategic Practice and its role in the Implementation of Artisan Mining Projects**

Respondents were asked a number of questions in relation to community involvement strategic practice and its influence on the implementation of artisan mining projects and results given as follows.

Respondents were asked whether they supported the idea that community involvement/participation strategy has been effectively adopted by the artisan miners in Taita Taveta County and the responses were as follows:

**Table 4.5 Community Participation Strategic Practice and its role in Implementation of Artisan Mining Projects**

<b>Response</b>	<b>Frequency</b>	<b>Percentage</b>
Yes	54	60%
No	36	40%
<b>Total</b>	<b>90</b>	<b>100%</b>

From the field responses, 60% of the respondents agreed that community participation strategy has been effectively adopted by the artisan miners in Taita Taveta County. The remaining 40% of the respondents did not support the idea. When asked to support their answer, those who supported the idea argued that, the community has been involved in providing cheap labour, providing land for the mine plants, infrastructure development and marketing of some products from the mines to the locals.

Respondents were given a series of statements in relation to community involvement strategic practice and the implementation of artisan mining projects in Taita Taveta County. They were expected to rate the extent to which they agreed or disagreed with these statements that were rated on a scale of measure, where: 1=strongly disagree, 2=disagree, 3= weakly agree, Agree =4 strongly Agree =5. The means were computed to indicate the extent



of support on a scale and this was equated to a percentage score and its subsequent equivalence.

**Table 4.6 Extent of Influence of the Community Involvement Strategic Practice on Artisan Mining Projects Implementation**

<b>Statement</b>	<b>Average</b>	<b>Percentage</b>	<b>Equivalence</b>
Community labour utilization is a concept used by the artisans in order to involve the local communities.	4.4	88	Agree
The community has been involved in the various artisan activities by community land provision through well-structured avenues.	4.2	84	Agree
Community infrastructure development has been effectively done by the artisan miners as one way of bringing the community on board.	3.6	72	Agree
Community market utilization has been a concept adopted in artisan mining as a strategy of bringing the local community on board	3.5	70	Agree
Corporate social responsibility has been well implemented by the artisan activities.	3.6	72	Agree
<b>Average rating</b>	<b>3.86</b>	<b>77.2</b>	<b>Agree</b>

From the results above, in relation to community participation strategy, a score of 4.4 was computed for the idea that read, community labour utilization is a concept used by the artisans in order to involve the local communities. This was equated to agree with a percentage score of 88%. The second statement that read, the community has been involved in the various artisan activities by community land provision through well-structured avenues attracted a mean of 4.2 which translated to an equivalence of agree and a percentage of 84%. The third statement that read, community infrastructure development has been effectively done by the artisan miners as one way of bringing the community on board attracted a mean score of 3.6 with an equivalence of agree and a percentage score of 72%. As per the fourth

statement that read, community market utilization has been a concept adopted in artisan mining as a strategy of bringing the local community on board attracted a mean score of 3.5 with an equivalence of agree and a percentage score of 70%. The final statement that read, corporate social responsibility has been well implemented by the artisan activities attracted a mean score of 3.6 with an equivalence of agree and a percentage score of 72%. Generally, 77.2% of the respondents agreed with the idea that community involvement/participation strategy influences the performance of small-scale miners in Kenya.

H<sub>1</sub>: community involvement strategy has a significant influence on the implementation of small-scale mining projects in Kenya.

H<sub>0</sub>: community involvement strategy does not have a significant influence on the implementation of small-scale mining projects in Kenya.

**Table 4.7 Hypothesis Testing on the Influence of Community Participation Strategy on the Implementation of Small-Scale Mining Projects**

**Observed values**

Likert Rating	1 (strongly disagree)	2 (disagree)	3 (fairly agree)	4 (agree)	5 (strongly agree)
Mean observed trend	2	5	30	40	13

**Calculated values:**

<b>f</b>	<b>f<sub>e</sub></b>	<b>(f- f<sub>e</sub>)</b>	<b>(f- f<sub>e</sub>)<sup>2</sup></b>	<b>((f- f<sub>e</sub>))<sup>2</sup>/ f<sub>e</sub></b>
2	18	-16	256	14.22
5	18	-13	169	9.39
30	18	12	144	8.0
40	18	22	484	26.89
13	18	-5	25	1.39

$$\sum ((f- f_e))^2 / f_e = 59.89$$

$\chi^2_c = 59.89 > \chi^2_{0.05} = 9.488$  at 4 degrees of freedom and 5% level of confidence.

Since the calculated chi-square value of 59.89 is greater than the critical chi-square value at 5% level of confidence, we accept the alternative hypothesis. Thus, community involvement/participation strategy has a significant influence on the implementation of small-scale mining projects in Kenya.

#### **4.6 The Influence of Modern Technology Strategic Practice on the Implementation of Artisan Mining Projects**

Respondents were asked a series of questions in relation to modern technology adoption among the artisan miners and its influence on the mining projects implementation and a number of responses were arrived at as shown in the tables below:

Respondents were asked whether they thought that the modern technology strategy has been effectively applied by the artisan miners in Taita Taveta County and the responses were as follows:

**Table: 4.8 Modern Technologies Strategic Practice and its Influence on Implementation of Artisan Mining Projects**

<b>Response</b>	<b>Frequency</b>	<b>Percentage</b>
Yes	50	55.6%
No	40	44.4%
<b>Total</b>	<b>90</b>	<b>100%</b>

From the field results, 55.6% of the respondents seemed to support the idea that modern technology strategy has been effectively applied by the artisan miners in Taita Taveta County while the remaining 40% did not support the idea. However, when asked to give examples of areas where technology has helped them in improving their activities, only 40% of the respondents said that technology has helped them in extracting the stones, marketing and in money transfers while the rest seemed not to be aware of the exact places where technology has played a role.

Respondents were given a series of statements in relation modern technology strategic practice and the implementation of artisan mining projects in Taita Taveta County. They were expected to rate the extent to which they agreed or disagreed with these statements that were rated on a scale of measure, where: 1=strongly disagree, 2=disagree, 3= weakly agree, Agree =4 strongly Agree =5. The means were computed to indicate the extent of support on a scale and this was equated to a percentage score and its subsequent equivalence.

**Table 4.9 Extent of Influence of the Modern Technology Strategic Practice on Artisan Mining Projects Implementation**

<b>Statement</b>	<b>Average</b>	<b>Percentage</b>	<b>Equivalence</b>
Technology for occupational health has been adopted by artisan miners effectively.	3.8	76	Agree
Technology for safety and environmental practices has been adopted by artisan miners effectively.	3.6	72	Agree
Mining and processing technology has been adopted by artisan miners effectively.	3.5	70	Agree
Processing plants or markets access technology has been adopted by artisan miners effectively.	3.9	78	Agree
<b>Average rating</b>	<b>3.7</b>	<b>74</b>	<b>Agree</b>

On the influence of modern technology adoption strategy and the performance of small-scale miners in Kenya, a score of 3.8 was computed for the idea that read, technology for occupational health has been adopted by artisan miners effectively. This was equated to agree with a percentage score of 76%. The second statement that read, technology for safety and environmental practices has been adopted by artisan miners effectively attracted a mean of 3.6 which translated to an equivalence of agree and a percentage of 72%. The statement that read, mining and processing technology has been adopted by artisan miners effectively attracted a mean score of 3.5 with an equivalence of agree and a percentage score of 70%. Finally, the statement that read, processing plants or markets access technology has been adopted by artisan miners effectively attracted a score of 3.9 which was equated to agree and translated to 78%. Generally, 74% of the respondents agreed with the idea that the modern technology adoption strategy has an influence on the performance of small-scale miners in Kenya.

H<sub>1</sub>: modern technology adoption strategy has a significant influence on the implementation of small-scale mining projects in Kenya.

H<sub>0</sub>: modern technology adoption strategy does not have a significant influence on the performance of small-scale miners in Kenya.

**Table 4.10 Testing of the Hypothesis on the Influence of Modern Technology Strategy on the Implementation of Small-Scale Mining Projects**

**Observed values**

Likert Rating	1(strongly disagree)	2 (disagree)	3 (fairly agree)	4 (agree)	5(strongly agree)
Mean observed trend	13	11	40	17	9

**Calculated values:**

f	f <sub>e</sub>	(f - f <sub>e</sub> )	(f - f <sub>e</sub> ) <sup>2</sup>	((f - f <sub>e</sub> ) <sup>2</sup> /f <sub>e</sub> )
13	18	-5	25	1.39
11	18	-7	49	2.72
40	18	22	484	26.89
17	18	-1	1	0.05
9	18	-9	81	4.5

$$\sum ((f - f_e)^2 / f_e) = 35.55$$

$\chi^2_c = 98.22 > \chi^2_{\alpha, 0.05} = 9.488$  at 4 degrees of freedom and 5% level of confidence.

Since the calculated chi-square value of 35.55 is greater than the critical chi-square value at 5% level of confidence, we accept the alternative hypothesis. Thus, modern technology adoption strategy influences the implementation of small-scale mining projects in Kenya.

#### **4.7 The Influence of Credit and Finance Strategic Practice on the Implementation of Artisan Mining Projects**

Respondents were asked a number of questions in relation to finance and credit strategic practice and the implementation of artisan mining projects and responses were arrived at as shown below:

Respondents were asked whether they thought that the credit and finance strategy has been effectively applied by the artisan miners in Taita Taveta County and the responses were as follows:.

**Table: 4.11 Credit and Finance Strategic Practice and the Implementation of Artisan Mining Projects**

<b>Response</b>	<b>Frequency</b>	<b>Percentage</b>
Yes	81	90%
No	9	10%
<b>Total</b>	<b>90</b>	<b>100%</b>

From the field results, 90% of the respondents supported the idea that credit and finance strategy has been effective among the artisan miners in Taita Taveta County while the remaining 10% who were represented by 9 respondents argued that the credit and financing strategy is not common among them. When asked to support their responses, 90% of the respondents argued that the national govern, county government and local bodies like some NGOs have partnered with some financial institutions like banks and created sources of finances that are aimed at bettering the lives of the local miners; more specifically the

women. At times this is given as grants, loans or at times given as empowerment money that could be repaid immediately the miners makes profits.

Respondents were given a series of statements in relation to credit and finance strategy. They were expected to rate the extent to which they agreed or disagreed with these statements that were rated on a scale of measure, where: 1=strongly disagree, 2=disagree, 3= weakly agree, Agree =4 strongly Agree =5. The means were computed to indicate the extent of support on a scale and this was equated to a percentage score and its subsequent equivalence.

**Table 4.12 Extent of Influence of the Credit and Finance Strategic Practice on the Implementation of Artisan Mining Projects**

<b>Statement</b>	<b>Average</b>	<b>Percentage</b>	<b>Equivalence</b>
Lending policy has been defined for the artisan miners by the government.	3.8	76	Agree
Established loans for specific needs for the artisan miners have been provided to miners.	3.4	68	Weakly agree
Securities by government have been availed to enable artisans' access credit for their work.	3.6	72	Agree
Equity based financing has been an integral part in artisan mining	2.4	48%	Disagree
<b>Average rating</b>	<b>3.3</b>	<b>66</b>	<b>Weakly agree</b>

From the responses, a score of 3.8 was computed for the idea that read, lending policy has been defined for the artisan miners by the government. This was equated to agree with a percentage score of 76%. The second statement that read, established loans for specific needs for the artisan miners have been provided to miners attracted a mean of 3.4 which translated



to an equivalence of weakly agree and a percentage of 68%. In relation to the third statement that read, securities by government have been availed to enable artisans' access credit and financial assistance for their work attracted a mean score of 3.6 with an equivalence of agree and a percentage score of 72%. Finally, on the statement that read, equity based financing has been an integral part in artisan mining attracted a score of 2.4 which was equated to disagree and translated to 48%. Generally, 66% of the respondents weakly agreed with the idea that access to credit and finance as a strategy has been effective and a success in the performance of small-scale miners in Kenya.

H<sub>1</sub>: access to credit and finance strategy has a significant influence on the implementation of small-scale mining projects in Kenya.

H<sub>0</sub>: access to credit and finance strategy does not have a significant influence on the implementation of small-scale mining projects in Kenya.

**Table 4.13 Hypothesis Testing for the Influence of Access to Credit and Finance Strategy on the Implementation of Small-Scale Mining Projects**

**Observed values**

Likert Rating	1(strongly disagree)	2 (disagree)	3 (fairly agree)	4 (agree)	5(strongly agree)
Mean observed trend	13	11	40	17	9

**Calculated values:**

<b>f</b>	<b>f<sub>e</sub></b>	<b>(f- f<sub>e</sub>)</b>	<b>(f- f<sub>e</sub>)<sup>2</sup></b>	<b>((f- f<sub>e</sub>))<sup>2</sup>/</b>
2	18	-16	256	
14.22				
2	18	-16	256	
14.22				
4	18	-14	196	
10.89				
40	18	22	484	
26.89				
42	18	24	576	
32.00				
<hr/>				
$\sum ((f- f_e))^2 / f_e = 98.22$				

$\chi^2_c = 98.22 > \chi^2_{0.05} = 9.488$  at 4 degrees of freedom and 5% level of confidence.

Since the calculated chi-square value of 98.22 is greater than the critical chi-square value at 5% level of confidence, we accept the alternative hypothesis. Thus, access to credit and finance strategy influences the implementation of small-scale mining projects in Kenya.

## **CHAPTER FIVE**

### **SUMMARY OF FINDINGS, DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS**

#### **5.1 Introduction**

This chapter presents the summary of the study findings, discussions, conclusions and recommendation of the research. In addition, the chapter also contains suggestions of related studies that may be carried out in the future by researchers who would be interested in this subject.

#### **5.2 Summary of findings**

This study aimed at finding out the strategies that have been adopted by the ASM and how these strategies are influencing their performance in Kenya with a specific focus to artisan miners in Taita Taveta County. From the analysis and review of the research data and additional data gathered through questionnaires completed by the respondents, a number of issues became apparent as shown in chapter four above.

The objective that sought to examine the extent to which cost leadership strategy influences the implementation of small-scale mining projects in Kenya, had response as follows: 50% of the respondents argued that the cost leadership strategy has been applied and has been effective while the remaining half that made 50% of the population disagreed. On a rating scale, a score of 3.7 was computed for the idea that artisan miners have effectively adopted the concept of economies of scale in their daily work. This was equated to agree on a scale with a percentage score of 74%. Generally, 76.4% of the respondents agreed with the idea that cost leadership strategy influence the performance of small-scale miners in Kenya. Since the calculated chi-square value of 64.21 is greater than the critical chi-square value at 5% level of confidence, the alternative hypothesis was accepted.

The objective which sought to establish how community participation strategy influences the implementation of small-scale mining projects in Kenya indicated that, 60% of the respondents argued that community participation strategy has been effectively adopted by the artisan miners in Taita Taveta County. Those who supported the idea argued that, the

community has been involved in labour provision, providing land for the mine plants, infrastructure development and marketing of some products from the mines to the locals. On a rating scale, a score of 4.4 was computed for the idea that read, community labour utilization is a concept used by the artisans in order to involve the local communities. This translated to agree with a percentage score of 88%. Generally, 77.2% of the respondents agreed with the idea that community involvement/participation strategy influences the performance of small-scale miners in Kenya. Considering that the calculated chi-square value of 59.89 was greater than the critical chi-square value at 5% level of confidence, the alternative hypothesis was accepted.

The objectives ought to examine the influence of modern technology adoption strategy on the implementation of small-scale mining projects in Kenya indicated that, 55.6% of the respondents supported the idea that modern technology strategy has been effectively applied by the artisan miners in Taita Taveta County while the remaining 40% did not support the idea. On a rating scale, a score of 3.8 was calculated for the idea that read, technology for occupational health has been adopted by artisan miners effectively. This translated to agree with a score of 76%. Generally, 74% of the respondents agreed that modern technology adoption strategy has influenced the performance of small-scale miners in Kenya. Since the calculated chi-square value of 98.22 is greater than the critical chi-square value at 5% level of confidence, the alternative hypothesis was accepted.

Finally, the objectives ought to establish the effects of access to credit and finance as a strategy in the implementation of small-scale mining projects in Kenya indicated that, 90% of the respondents supported the idea that credit and finance strategy has been effective among the artisan miners in Taita Taveta County whereas the remaining 10% who were represented by 9 respondents disagreed stating that the credit and financing strategy is not common among them. Supporting their responses, 90% of the respondents argued that the national government, county government and local bodies like some NGOs and other development agencies partnered with some financial institutions like banks and created sources of finances aimed at improving the lives of the local miners; more particularly the women. Generally, 66% of the respondents weakly agreed that access to credit and finance as a strategy has been

effective in the performance of small-scale miners in Kenya considering that the calculated chi-square value of 35.55 is greater than the critical chi-square value at 5% level of confidence, the alternative hypothesis was accepted.

### **5.3 Discussions of the Study Findings**

From the results of the study, the various strategies greatly influence the implementation of small-scale mining projects in Kenya's Taita Taveta County. This is confirmed from the discussions and the score values gotten from the Chi-square tests. The first objective that sought to examine the extent to which cost leadership strategy influences the performance of small-scale miners in Kenya, 50% of the respondents argued that the cost leadership strategy has been applied and has been effective. Generally, 76.4% of the respondents agreed that cost leadership strategy influence the performance of small-scale miners in Kenya. Anderson (2014) observes that artisan miners in Zimbabwe and Kenya can be successful like the large mining companies in SA, Ghana and Nigeria if they adopt the cost leadership strategy. This strategy shall enable the miners to be able to form amalgamations with common leadership leading to cutting of costs of operations and economies of scale. In this study, Anderson notes that many cost leaders rely on economies of scale to achieve efficiency. Economies of scale are created when the cost of goods and services decreases as a firm is able to increase its scale of production. Most companies experience some economics of scale initially; and the small scale miners are not an exception.

The objective which sought to establish how community participation strategy influences the implementation of small-scale mining projects in Kenya indicated that, 60% of the respondents argued that community participation strategy has been effectively adopted by the artisan miners in Taita Taveta County. Generally, 77.2% of the respondents agreed that community participation strategy influences the performance of small-scale miners in Kenya. A study done by UNEP (2012) suggest that an engaged and empowered community is one in which individuals and organizations apply their skills and resources increase their influence over the determinants of a healthy and profitable mining environment, address minerals priorities and meet their respective mining needs. For effective community participation to be realized, a good understanding of the communities or the groups and individuals the firms

work with is imperative. Firms need to get to know their needs, priorities, capacity and any barriers that the community faces in its endeavor to participate before launching any interventions. Community participation also requires skills that recognize individuals' life experiences are not homogeneous. Enabling, mediating and advocacy, the ability to listen, empathize and respond are critical for community participation strategies.

The objective was seeking to examine the influence of modern technology adoption strategy on the implementation of small-scale mining projects in Kenya, 55.6% of the respondents supported the idea that modern technology strategy has been effectively applied by the artisan miners whereas, the remaining 44% disagreed. Generally, 74% of the respondents agreed that modern technology adoption strategy impacts on the performance of small-scale miners in Kenya. Hilson and McQuilken (2014) notes that there is a need for technology transfer from large scale mining companies in the sub-Saharan Africa to the artisanal and small scale miners as a strategy of improving the operations of the artisans. The report of their studies that interviewed over 672 artisan miners in Ghana, SA, Zimbabwe, Madagascar and Kenya showed that a number of technologies and practices used by large-scale mining operations can be transferred effectively to smaller scale operations. Also, ICMM (2014b) notes that, Large-scale mining companies like the Base Titanium operating in Kenya's Kwale County for example can provide technical assistance to artisanal and small-scale miners, this may be mutually beneficial in cases where a large-scale mining company's reputation is influenced by the presence of artisanal and small-scale miners like the sand miners along the Diani beach in Kenya's coast.

Finally, the objective that sought to establish the effects of access to credit and finance as a strategy in the implementation of small-scale mining projects in Kenya indicated that, 90% of the respondents supported the fact that credit and finance strategy has been effective among the artisan miners in Taita Taveta County with the remaining 10% disagreeing that the credit and financing strategy is not common to them. Moreover, 66% of the respondents weakly agreed that access to credit and finance as a strategy has been effective in the performance of small-scale miners in Kenya. According to Rop (2009); In Kenya, artisan miners are faced with the challenge of lack of properly structured financing avenues. The absence of security

and the illegal nature of gemstone miners in Taita Taveta deny the artisan miners the opportunity to access credit from banks or seed companies. The land owners in Taita are equally disadvantaged as majority of the locals don't own title deeds. In effect, they lack security/collateral to secure loans or any other form of financing; leaving the miners vulnerable and with limited opportunities of capital for their activities. In an ILO survey of 2009 on small-scale miners in Mbeere, Arusha, Shinyanga, and Migori districts, it was identified that access to credit is a major impediment to the successful development of the small scale mining industry.

#### **5.4 Conclusions**

Based on the findings from the field, the researcher concludes that cost leadership strategy has an influence on the implementation of small-scale mining projects in Taita Taveta County. This is evident especially where the miners have come together and formed groups that are headed by individuals who perform specialized tasks like marketing of the mines, sourcing for finances, and identifying better methods of operating. The researcher also concludes that community participation is a strategy that has been embraced by small scale miners in Taita Taveta County with great influence on the performance of artisan miners in the county. This is evident when the miners use the local labour, sell their products to the local market, development infrastructure and the community is consulted in land acquisition issues.

Moreover, the researcher concludes that, modern technology has been integrated and adopted by small scale miners as a strategy of improving the performance of their businesses. This technology has been adopted in gemstones extraction, processing and marketing; although it has not been adopted by all the miners and has not been implemented at advanced stages. Finally, the researcher concludes that the credit sources and financing strategy has been adopted by a number of artisan miners in the sense that, a good number of the miners have benefited from policies and the lending that has been advanced by the national, county governments and other development partners in the region. In addition, the financing strategy is one of the major factors that influence the artisans' activities in the county with over 50%

of the respondents arguing that they have not enjoyed much financing from any possible source, hence affecting their operations.

### **5.5 Recommendations**

Based on the findings of the study the researcher recommends that: The various miners operating in the country and Taita Taveta County should be informed and sensitized on the importance of adopting strategies that may reduce their operations costs and achieve economies of scale. This can be achieved by having structured leadership that brings together various miners and activities at low costs. The researcher also recommends that the local community should be involved in gemstones exploration, site planning, site management, environmental protection, extraction, marketing and many more. This shall allow maximum utilization of the resources while the future generation is taken care of. The community participation strategy shall also help limit the risks of conflicts that may arise between the various groups; leading to maximization of benefits from the gemstone mining activities.

The researcher also recommends that the government, the various agencies like the NGOs and development partners should help the artisan miners in acquiring modern technology that is environmental friendly and technology that favors the locals in terms of lucrativeness from the mines. Finally, the researcher recommends for proper sources of finances, proper credit facilities, proper laws and policies targeting the financing of artisan miners and set aside funds by both the national and county government that are aimed at developing and improving the small scale mining industry.

### **5.6 Suggestions for Further Research**

- i. This study was carried out in one county only. A similar study could be carried out in the other neighbouring counties like Kwale and Kajiado where artisan miners exist.
- ii. A study can be done to examine the influence of the mining bill of 2014 on the performance of artisan miners in the county; a case of artisan miners in Taita Taveta county.



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**APPENDICES**

**APPENDIX I: Letter of Transmittal - Self Introduction**

**TSUMA VELLASCO NDARO**

**0722123659**

**Dear participant,**

My name is Tsuma Vellasco Ndaro and I am a student undertaking a postgraduate degree in Project Planning and Management. To fulfill the completion of this course, I am carrying out a study examining the strategic practices influencing the implementation of small-scale mining projects in Kenya: a case of artisan mining in Taita Taveta County. I am inviting you to participate in this research study by completing the attached questionnaire and answer the questions sincerely.

If you choose to participate in this research, please answer all questions as honestly as possible. Participation is strictly voluntary and you may decline to participate at any time. The data collected will be for academic purposes only.

Thank you.

Yours faithfully

.....

Sign .....



**APPENDIX II: Research Questionnaire**

**Section A:**

**Background Information of the Respondents (Tick whichever appropriate)**

1. Your gender:

Male [ ]                      Female [ ]

2. Your age bracket

18-30yrs [ ]    31 - 40 Years [ ]        41 - 50 years [ ]    51- 60 years [ ]    Over 61 years [ ]

3. What is your highest education level?

Secondary certificate [ ]    Diploma/certificate [ ]    Bachelors' degree [ ]

Post graduate [ ]    others [ ]

**Section B: Questions as per the Literature Discussed**

**I. Open ended questions and nominal scale rated questions**

1. Do you think that the cost leadership strategy (a situation where you come together and operate together under one leadership to reduce operation costs) has been applied effectively by the artisan miners in Taita Taveta County?

Yes ( )              No ( )

Why? (Support your answer by giving examples)

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2 .Do you support the idea that community participation strategy has been effectively adopted by the artisan miners in Taita Taveta County?

Yes ( )      No ( )

Why? (Support your answer by giving examples)

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3. Do you think that modern technology strategy has been effectively applied by the artisan miners in Taita Taveta County?

Yes ( )      No ( )

Why? (Support your answer by giving examples)

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4. Do you think that credit and finance strategy has been effectively applied by the artisan miners in Taita Taveta County?

Yes ( )      No ( )

Why? (Support your answer by giving examples)

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**II. Measuring the various strategies on an ordinal scale (likert scale).**

5. Please indicate the extent to which you agree or disagree with the following in reference to effectiveness of various strategies implementation by artisan miners in Taita Taveta County by ticking (√) in the appropriate space. SA-Strongly Agree, A-Agree, N-Neutral,

D- Disagree, SD-Strongly Disagree

<b>Statement</b>	<b>SD 1</b>	<b>D 2</b>	<b>N 3</b>	<b>A 4</b>	<b>SA 5</b>
<b>Cost Leadership Strategy</b>					
Artisan miners have effectively adopted the concept of economies of scale in their daily work.					
The artisans have effectively adopted the cost leadership strategy to check on cost of operations.					
Labour costs have been effectively reduced due to adoption of cost leadership strategy.					
Input costs are effectively managed due to the integration of the cost leadership strategy by artisan miners.					
Distribution costs have been reduced due to cost leadership strategy adoption.					
<b>Community Involvement Strategy</b>					
Community labour utilization is a concept used by the artisans in order to involve the local communities.					

The community has been involved in the various artisan activities by community land provision through well-structured avenues.					
Community infrastructure development has been effectively done by the artisan miners as one way of bringing the community on board.					
Community market utilization has been a concept adopted in artisan mining as a strategy of bringing the local community on board					
Corporate social responsibility has been well implemented by the artisan activities.					
<b>Modern Technology Strategy</b>					
Technology for occupational health has been adopted by artisan miners effectively.					
Technology for safety and environmental practices has been adopted by artisan miners effectively.					
Mining and processing technology has been adopted by artisan miners effectively.					
Processing plants or markets access technology has been adopted by artisan miners effectively.					
<b>Credit and Finance Strategy</b>					
Lending policy has been defined for the artisan miners by the government.					

Established loans for specific needs for the artisan miners have been provided to miners.					
Securities by government have been availed to enable artisans' access credit for their work.					
Equity based financing has been an integral part in artisan mining					