

**GENDER RELATIONS AND WOMEN'S ECONOMIC EMPOWERMENT IN
ARTISANAL GEMSTONE MINING IN TAITA TAVETA COUNTY, KENYA.**

BY:

RUTH WAIRIMU WAIGANJO

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Nairobi, in Partial Fulfilment of the Requirements for the Award of the Degree of
Master of Arts in Development Studies, University of Nairobi.**

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Faculty/School/Institute: Institute for Development Studies

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This project has been submitted for examination to the university with our approval as university supervisors.

Signature.....

Date.....

Prof. Winnie Mitullah

Supervisor

University of Nairobi

P.O Box 30197 Nairobi

Signature.....

Date.....

Prof. Mohamud Jama

Supervisor

University of Nairobi

P.O Box 30197 Nairobi

ACRONYMS

AGM	Artisanal Gemstone Mining
AG	Artisanal Gemstone
ASM	Artisanal or Small Scale Mining
CBO	Community Based Organizations
DRC	Democratic Republic of Congo
FDGk	Focus Discussion Groups in Kamtonga mines
FDGmcBo	Focus Discussion Groups in Mkuki CBO mines
GDP	Gross Domestic Product
ICRW	International Centre for Research on Women
IGAD	Intergovernmental Authority on Development
ILO	International Labour Organization
KI	Key Informants
KII	Key Informant Interview
LEO	Leveraging Economic Opportunities
MPRDA	Mineral and Petroleum Resources Development Act
NICs	Newly Industrialised Countries
SME	Small Medium Enterprise
UN Women	United Nations Women
WHO	World Health Organization

DEDICATION

To My Dearest and Loving Family, thank you for your continued support, patience, love and encouragement throughout my study period.

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ABSTRACT

Women are involved in artisanal gemstone mining in an increased number as a way of improving their livelihoods. Gender relations has played an important role in determining the status of female miners at the production activities thus having an impact on their economic potential. This study was therefore guided by the following research objectives: to analyse the characteristics of gemstone artisanal miners, examine the gender roles at different stages of artisanal gemstone mining, investigate gender interactions which affect women's empowerment in gemstone artisanal production processes and examine other factors affecting women's economic empowerment in Artisanal gemstone mining.

This study was framed on access theory that argues that individual's ability to resources is dependent on a range of social relationships that can constrain or enable people to benefit from ownership, power over and the agency to make decisions. The study employed a combination of qualitative and quantitative research methods. The study sample was 50 artisanal gemstone miners, 27 female respondents and 23 male respondents from five mines in Mwatate area, Taita Taveta County, Kenya. The sample was drawn using snowballing. A statistical Package for Social Science (SPSS) was used and data collected coded and analysed using descriptive statistics to generate frequency distribution tables and percentages. To show relationships, bi-variate analysis involving cross tabulation was done.

From the findings, older individuals are the main participants with a high level of illiteracy in the sector. Majority of the miners have been attracted to this sector due to lack of a formal education, influence by family and friends and nearness of the mines to their homes. There are six main gemstone production phases that follow each other systematically for an effective gemstone production. The phases include exploration, extraction, separation and sorting, washing, grading and marketing. Gender representation and gender roles and responsibilities vary in different production phases. Women's economic empowerment is determined by gender interactions at different phases. Gender relations vary at different forms of mining. Gender discrimination as a result of gender interactions is the major factor affecting women's economic empowerment. Cultural norms, unequal roles and responsibilities, extreme sexism, income disparities are the main contributors to gender discrimination at different production phases. The main factors analysed that contribute to women's economic empowerment are; gender equality measures, access to finance, power to control resources, formal trainings and formation of women associations. Gender relations is a very critical concept in terms of how it affects women's economic empowerment. These relations are inevitable as they occur in all production processes. From the findings, gender relations can either empower or disempower female miners. Gender interactions can boost women's economic empowerment if there exists equality and unity at the mines. Positive change would be strongly impacted if it starts with the behaviours and attitudes of the miners.

CHAPTER ONE

1.1 Background of the research study

1.1.1 Gender Relations

Gender relations at workplaces are either robust or weak at organizational and individual level depending on the work environment. Unequal gender relations therefore lead individuals on different paths that hinder dialogue, integration of different work experiences, exchange of skills and knowledge resulting in organizational and individual changes (Abrahamsson, 2012). The mining sector is socially organized in a way that imposes unequal relationships between men and women which has led to the subordination of women within the sector (Lahiri-Dutt & Macintyre, 2006). Mining narratives related to gender relations have made women invisible and devalued their efforts with respect to their mining work (Lahiri-Dutt, 2013). Mining is also associated with complex processes such as cultural norms and societal processes on the notion of masculinity and femininity. There is gender segregation in the mines that has played an important role in organization and production activities within the mining sector.

Increased participation of women in Australian mining industries arose from extractive industrial boom that required diversification of workforce, through inclusion of indigenous people, to address widespread skill shortages and gender mainstreaming programs that protected women in the mines. These programs initiated provision of an enabling environment for women to reduce gender discrimination at the mines that arose from male employers who excluded female miners from management and operational decisions, promotions and trainings. There were also income variations between genders on the same job levels. (Fair Work Act Review, 2012)

According to Amutabi & Lutta-Mukhebi (2001), gender relations at the mining sector in Kenya can be attributed to the traditional social system that has disempowered women's status as opposed to men through their lack of land rights and the power to control mining pits. Women are seen in large numbers in informal mining as opposed to formal mining due to flexibility in the informal sectors. In the formal sectors, most female miners work at administrative positions as managers, secretaries and technical positions and the effects of gender relations on them is not as paramount as those working in informal mining sectors. The formal mining industries have adjusted to the legal framework for gender equality

embedded in the constitution of Kenya (2010) and the Employment Act of 2007 in their programs by reducing cases of gender stereotyping and gender discrimination (Omolo, 2014).

In the informal mining sector in Kenya, different points of gender interactions vary within mineral production phases thus women in artisanal mining face numerous challenges, especially from their male counterparts. Changes in traditional gender roles have resulted to work related interactions between women and men in artisanal mining besides household interactions that were overseen few decades ago. These relationships have created power dynamics resulting to income disparities, unfair ownership of resources and unequal decision-making processes between the genders at the gemstone production processes at the mines. (Anyona & Rop, 2015a). These interactions have affected women's economic empowerment at the workplace resulting in increased poverty levels among independent women struggling for their families and fear of women participating in artisanal mining in different areas as a source of income.

1.1.2 Artisanal Mining

Artisanal mining has existed since the earliest days of human civilization as a method of mineral recovery before the industrial revolution and it is still practiced in emerging economies (Labonne, 1996). It involves mining of precious stones and metals as well as industrial minerals and base metals (Fraser Institute, 2016). It is difficult to collect accurate information on the numbers of artisanal gemstone mining due to its informal and unregulated nature, migration and seasonality. World Bank posits that there exists around 100 million artisanal and small-scale miners spread across 80 countries worldwide. (World Bank, 2013). In Kenya, there is an estimated number of 800,000 miners dependent on artisanal and small scale mining. There are about 70,000 artisanal and small scale miners in the gold and gemstone mining. The gemstone sector employs 30,000 artisanal and small scale miners. (Pact World, 2018). Artisanal miners account to over 60% of annual gemstone production in Kenya, while women and youth play major roles in the mines (Anyona & Rop, 2015a).

There exists no current statistical data on the number of artisanal miners worldwide. Therefore, World Bank has collaborated with Pact to develop an online platform, DELVE, that will relay data contributed by various stakeholders on artisanal employment statistics by gender and national revenue commodity contribution by country.

Artisanal mining is broadly understood as a mining activity that is labour intensive, entails low mechanization and poor technology. It is one major contributor to national income and a

development pillar that has resulted to poverty reduction in developing countries, especially among rural dwellers. Artisanal mineral extraction for a majority of miners is based on a continuation of traditional modes of life, resulting to seasonal jobs or permanent employment and joblessness due to hard economic changes (Lahiri-Dutt, 2008).

Artisanal mining in Kenya has been male dominated sector, although women are also continually getting attracted to the sector. The main reasons that have attracted women in artisanal mining include: a way of reducing poverty levels at the rural households, which is highly attributed to loss of agricultural lands and low agricultural productivity due to severe climatic change and ease of tools and equipment used at the artisanal mining sites that have proved to be handled by women compared to high intensity mechanization and technology employed in large and small scale mining that is a challenge to women pit miners.(Rop B. K., 2015). This sector has diversified the local economy in some rural regions where there is marginal infrastructural development.

1.2 Problem Statement

Artisanal women miners throughout the world have showed great potential to improve their livelihoods particularly in relation to providing for their families. However, they are struggling with numerous challenges related to the nature of their interactions within and outside the mining sector. Artisanal women in Taita Taveta County have been denied the opportunity to access and control resources, which include the ability to own mining spaces, have fair wages and participation in decision-making processes at the mines. These challenges are associated with the points of interactions with their male counterparts during gemstone production processes that hinder economic empowerment of the women miners in terms of improving their economic welfare.

Gender interactions at the gemstone production processes in Taita Taveta County is evident throughout all production phases. The few women involved at the exploration stage are excluded from negotiations after the discovery of the deposits hence lack control and ownership of the mining spaces. At the extraction phase, few women participate but since men control the mining pits, women have less power on the decisions made during the extraction process. In separation and sorting as well as washing phase, decisions on how to sort and separate is controlled by men and yet women are majority participants in these two phases since most gemstones are found on the riverbanks and shallow mines. In the grading

phase, a number of both women and men interact depending on the technicality of the grading methods. Men control decisions on ways of adding value to the gemstones.

In the final phase, packaging and marketing, both genders are crucial in this production processing in terms of decisions determining mineral prices that gives the male miner an upper hand. Income disparities are evident after the sales of the gemstones and the artisanal male miners receive the larger share of the incomes awarding women less pay. In all these phases, it is evident that gender inequality emanates from gender relations at the production processes at the mining sites that disempowers women miners resulting in low remunerations given to female miners that cannot sustain their economic needs and high dropouts of artisanal women miners who find it difficult to cope with the challenging relationships with their male counterparts which in turn affects the economic welfare of families.

There are many gaps in knowledge gaps about gender relations and women economic empowerment in artisanal gemstone mining, scholars have not clearly stated appropriate mechanisms that address existing tensions in gender relations affecting women's economic empowerment, except policy suggestions on gender mainstreaming, laws on sexual harassment and inclusion of women in artisanal mining sector. Data on challenges facing female miners in gemstone mining in Taita Taveta County is readily available but there are knowledge gaps on what can be done to regularize tensions in gender interactions in relation to economic empowerment among women gemstone artisans in Taita Taveta County. This study seeks to address existing tensions between the two genders at the mines and how these tensions affect the economic empowerment of the artisanal women miners. The study also contributes to what can be done to regularize tensions between the two genders to economically empower female miners in gemstone mining to provide and sustain their families. The study will also help other researchers to acknowledge that gender relations is a key factor in determining the success of women in the mining industry which has been a male dominating industry.

1.3 Research Questions

This study examines gender relations that exist at the production processes of artisanal gemstone mining and its influence on women's economic empowerment in Taita Taveta County. The overall research question is: How do gender relations in production processes affect women's economic empowerment in Artisanal gemstone mining?

Specific questions include the following:

1. What are the characteristics of gemstone artisanal miners?
2. What are the gender roles at different phases of Artisanal gemstone mining?
3. How do gender interactions in production processes affect women's economic empowerment in Artisanal gemstone mining?
4. What factors influence women's economic empowerment in Artisanal gemstone mining?

1.4 Objectives of the research study

The main objective of the study is to examine gender relations in production processes affecting women's economic empowerment in Artisanal gemstone mining.

The specific objectives include, to:

1. Analyse the characteristics of gemstone artisanal miners.
2. Examine the gender roles at different stages of artisanal gemstone mining.
3. Investigate gender interactions which affect women's empowerment in gemstone artisanal production processes.
4. Examine other factors affecting women's economic empowerment in Artisanal gemstone mining.

1.5 Justification of the study

In September 2004, World Bank Group's Extractive Industries Review showed that extractive industries are major contributors to sustainable development when all participants are involved equally and related projects are preserved for the next generations. (Fraser Institute, 2016). Artisanal mining sector has proved to contribute to economic development and poverty reduction in developing countries through creation of job opportunities to the citizens. Estimate (2009), opined that economic empowerment of women artisans at the mining sector is tapped through realizing their efforts and contributing to raise their living conditions through reducing inequalities at the mines and equally involving all participants thus resulting in fairer ownership of resources at all production levels.

This study is relevant due to an increasing number of women in artisanal gemstone mining in Kenya. At the extraction and production of most minerals, gemstone mining is not laborious compared to stone quarrying and gold extraction hence the sector is more attractive to women. Taita Taveta County has one of the vast gemstones mines in the country and has

equally high poverty index. The county depends on mining as an alternative source of livelihood, apart from agriculture, hence attracting a huge workforce from the rural dwellers. The increasing number of women in artisanal gemstone mining in Taita Taveta County is driven by the need to improve their livelihoods; hence, this has increased competition with the artisanal men in the sector. Gender interactions has therefore increased, yielding gender inequalities at the mines in relation to decision making processes, ownership of resources and even income disparities that were not evident previously as the sector was male dominated.

Previous studies have attempted to explain general challenges affecting women's economic empowerment at the artisanal level but have failed to provide an in depth analysis on gender relations and its effects on the economic empowerment of female artisans. Therefore, this study will examine characteristics of artisanal gemstones miners, the roles they play in the sector, gender interactions and its relation to women's economic empowerment at the production process of artisanal gemstone mining and the factors that contribute to women's economic empowerment in artisanal gemstone mining. Secondly, the findings of the research study could act as a springboard for further research. Lastly, the research will yield information that could provide useful feedback to implementers, policy makers to learn that gender relations at the artisanal level is important in the economic empowerment of artisanal women miners.

1.6 Definitions of Concepts

Gender

It is a social construct that define roles and behaviours of different sexes that are acceptable in a particular society, beyond their biological attributes (Omolo 2014). In this study, gender is operationalized as individuals with different behaviours and attitudes at the artisanal mining sector.

Gender roles

These are a set of expectations associated with the perception of masculinity and femininity given by the society and are bound to change over time (Viacil 1996). In this study, gender roles are different responsibilities and duties associated with the artisanal male or female miner at the mining site which are either societal given or depends on the structural organization of the artisanal gemstone sector.

Gender relations

These are social and economic relationships that exist in any family, community or workplace between males and females. (Seeds Theatre Group Inc, 2017). These relations do not only define power parity between men and women at home and work, but parities in ideas, abilities, attitudes, personal traits and behaviour patterns, which are not uniform across societies (Omolo, 2014; Agarwal, 1997). In this study, gender relations are interactions at the production processes between the artisanal female and male miner and how the working relations influence the ability to freely decide, control and engage at the mines.

Gemstone(s)

It is a type of mineral that exists in natural form, but vary in terms of beauty, durability, rarity, portability and physical properties and are used for various purposes (Yehuda & Shay). In this study, gemstones are the main minerals mined by the artisanal miners in Taita Taveta County as a way of improving their incomes.

Artisanal mining

It is a type of mining method that uses pure traditional labour and basic recovery and processing techniques (Rop, 2015). In this study, artisanal mining involves exploration, extraction, separating and sorting, washing, polishing and selling of gemstones, which is dependent on rumours, tradition and geology. (Rop, 2015)

Economic Empowerment

Empowerment creates joint action for reducing societal inequities by creating more access to land, labour and markets. Economic empowerment is the ability of men and women to participate in the economy and benefit from development processes in ways that recognise their contributions in order to negotiate fairer distribution of their efforts. (Eyben, 2008). In this study, economic empowerment is the dependent variable that is measured by women's participation in artisanal gemstone mining sector, inclusion in decision-making processes in the sector and the power to control over resources, resources being ability to own mining spaces and fair wages.

Production process

This is a set of actions at each phase of the value chain in a sector or a business. In this study, production processes are activities done by both genders at the gemstone artisanal production, hence, gender roles and interactions play a major part in these production processes.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This section provides an empirical literature theoretical framework and conceptual framework for the research study. The first part focuses on theoretical literature that inform this study followed by empirical literature, by drawing from previous arguments and findings, in an attempt to explain the phenomenon of artisanal mining. The last section provides a conceptual framework that guides the study.

2.2 Theoretical Framework

2.2.1 Theory of Access

Access theory emerged from the shortcomings of labour theory of property which holds that property originates from efforts of labour upon natural resources and that human beings have equal rights to use natural resources as sanctioned by natural law. (Locke, 1960). Access theory was also developed by Ribot & Peluso (2009), it argues that rights are not enough to own resources but it is the human ability that determines access, ownership and the power to control resources. It further explains that individual's ability to resources is dependent on a range of social relationships that can constrain or enable people to benefit from ownership, power over and the agency to make decisions. (Ribot & Peluso, 2009).

Freidich Hegel further justified this theory and argued that rights to property gives human beings a sense of self-actualization by respecting human agency and that humans cannot attain freedom without the right to own private property. (Hegel, 1967). Access theory focuses on bundles of power rather than rights which is evident in property theory. The theory of access holds that institutions and processes force certain individuals to take advantage of other people's ability to access resources. (Ribot & Peluso, 2003). In this study, access is essential to economic empowerment of women's ability to influence market systems as the systems are shaped by rules that dictate how people behave towards one another.

The theory focuses on a web of powers exercised through various mechanisms, processes and social relations that affects people's ability to benefit from resources. This results to a subset of individuals having the power to control access while others are forced to maintain their access through those with the powers to control the resources. Bell (1998) argues that access relations changes over time depending on individual's or group's position and power within

various social relationships. According to Foucault (1978), some people have more power in some relationships than others.

The theory divides access into access control and access maintenance which are social positions. The former is the ability to decide on other's access by facilitating the direction of action and regulating free action of those that are powerless. (Rangan 1997). Maintenance of access means reimbursing resources or powers to be able to use that particular resource. (Barry 1993). To maintain access, the subordinate actors are forced to depend on those that control access in order to derive their own benefits. Individuals that have access have less power than those who control resources and women tend to have access and not control. In this study, women maintain access in artisanal mining which is dependent on their male counterparts who control access of resources and can either dis-empower or empower the women by raising or devaluating their participation in the sector.

Ribot & Peluso (2003) explains that there are two factors that determine gaining, controlling and maintaining access. The first factor is the right based access which is endorsed by formal or informal institutions. Individuals that are sanctioned by law or customs to control access are the resource owners having powers over the resources. Blaikie (1985) expounded that structural and relational access mechanisms are the second factors that determine the process of controlling and maintaining access to resources. They include; capital, technology, knowledge, authority markets, knowledge, social identities and social relations. According to Peluso & Vandergeest (2001), social identities includes age, race, gender, status and religion, access through these social identities in a market system affects distribution of benefits of the resources resulting in income disparities and power imbalances. Menzie (1986) and Thompson (1991) supports this notion and states that access is controlled and maintained by social identities in different production processes at the market system, therefore, cases of inclusion and exclusion in decision making processes, control and power over the resources is dependent on the identity.

Similar to social identity, social relations are central in advocating for those that have the powers within social-economic contexts that shape people's capabilities to benefit from resources. Social relations influence access which may in turn raise disparities with the powerless or complement those that maintain access.(Ribot & Peluso, 2003). Lack of access to the markets reduces women's participation in the system and thus access theory advocates

for access analysis that shapes distribution of benefits, incentives and the equity of resources, it serves beyond property and other forms of rights resulting to changes among those that maintain and those with the power to control the resources. This theory is essential to this study as it emphasizes that if individuals have access they then have the power to control and participate in decisions associated with resources. Social relations such as gender relations can influence access hence relate to economic empowerment of women in artisanal mining sector. Women's economic empowerment is regulated by both institutions and relational mechanisms and this can be increased if gender equality is established.

2.3 Empirical Literature Review

2.3.1 An Overview of Artisanal Mining

Artisanal mining is a self-organizing social system that enables individuals to earn a living directly unlike large and small-scale mining that are profit motivated. Artisanal mining has continued to attract individuals and communities to participate in it due to diverse motives that include both push and pull factors. (Fraser Institute, 2016). Increased participation in artisanal mining in Africa has been a way to supplement agricultural income owing to decline of agriculture in African rural regions. Labonne (1996) observed that in the Great Lakes region, including Angola and Zambia, mining of the precious stones, such as diamonds, gold and gemstones, is considered a quick way of making money to supplement traditional earnings by the artisanal miners.

Artisanal mining is classified into four types including seasonal, permanent, rush and shock push miners (Gyan-Baffour, 2003). Seasonal artisanal mining is meant to supplement livelihoods as a source of employment in agricultural off-season and involves occasional migration of miners from one site to another in search of minerals. Permanent artisanal mining employs miners who have settled in regions or sites with well-established mineral resources. Rush type artisanal mining arise from a belief that expected income exceeds by far current actual income of the people hence miners seek employment in the sector. Lastly, shock push miners comprise of individuals driven by poverty or recovering from previous job loss, conflicts or natural disasters who are out to eke a living from the mines.

Organization in the artisanal mining sector is very complex, however, this complexity is varied. Mining flourished throughout Asia but was relatively artisanal and small scale in nature. (Lahiri-Dutt & Burke, 2011). The organization of artisanal and small-scale miners

improves their governability as well as protecting the artisanal miners. The federal Department of Foreign Affairs in Latin America (2015) conducted a research and observed that artisanal gold miners in Peru were organized into large local associations before the enactment of the law to enhance their formality and for protection from unfavorable government policies. In Mongolia case, artisanal miners are organized in smaller groups, which exist as local partnerships or parallel groups to address issues that commonly affects them. In large-scale mining, however, economy of scale is achieved through mechanization unlike artisanal miners in Asia who release economy of scale through their respective associations. The Federal Department of Foreign Affairs in Latin America further observed that, artisanal gold miners operate in larger groups such as Peruvian and Bolivian Cooperatives that produce beyond subsistence economy and engage directly with international markets. Contrary to this, PACT (2010) found out that artisanal gold miner in Democratic Republic of Congo struggle to form associations due to their migratory nature and perpetual conflicts between artisanal miners.

In general, open access of minerals is the first production factor of artisanal miners, however, it is characterized by access by all and sundry, over exploration at every site, and congestion (Federal Department of Foreign Affairs, 2015). Artisanal miners also extract deposits under a common property regime where the common pool resource is seen as a private good to an outsider and as a common good to the insiders. The second production factor is labour with many labourers working in artisanal mining fields compared to large and small-scale mining areas. High labour intensity in artisanal mining results to low productivity due to presence of less minerals due to the nature of tools and equipment used by the artisans. In a number of studies, (Mambi 2011, IGAD 2013 and Sivi-Njonjo, 2015), artisanal mining in many developing countries are complicated by legal requirements that impose heavy taxation on the minerals and hinder business or company registration, while other artisanal miners continue facing bureaucratic impediments, operational, financial and marketing challenges, including weak training and management skills, poor technology, unhealthy and unsafe working conditions and inadequate basic infrastructures.

Historically, artisanal mining was deemed illegal and disorganized, but these views have changed. In South Africa, the Mineral and Petroleum Resources Development Act (MPRDA) Act 28 of 2002 put in place structures that safeguard the interests of artisanal miners through provision of licenses thus making them legal (DebrahI, Watson, & QuansahII, 2014). Artisanal mining is legal under the Democratic Republic of Congo of 2002 mining code, but

its impact is not evident among miners (PACT, 2010) since artisanal miners that is, both the traders and producers are heavily taxed on the minerals they produce resulting to low registration as a way of evading heavy taxation. In Kenya, the Mining Act No.12 of 2016, introduced an online platform through the ministry of mining which has enabled artisanal miners to register through licensing for mining. This means that artisanal mining is only legal if the artisanal miners hold valid licenses from the government.

2.3.2 Women in Artisanal Mining

The history of early industrial mining was a dangerous and hazardous job that created a myth of masculinity. (Lahiri-Dutt, 2007). However, today the sector has continued to attract large numbers of women who want to improve their livelihoods, as opposed to the 1940s when a few women worked in the sector (Wilson 1961, cited in Holcombe 2004).

Hinton, et al., (2003) in their work found out that participation of women in artisanal mining globally is ascribed to a number of factors, including increase of household income, loss of agricultural lands, migration of the skilled male miners to large scale mines, shift of gender roles due to evolving societal norms, unemployment and the need to supplement agricultural incomes, but these reasons vary from one region to the other. Mambi (2011) noted that in Tanzania, women join artisanal and small-scale mining due to deterioration of subsistence farming, unemployment, high inflation rate, high birth rate and extended families.

The nature of participation by women also vary from one region to the other, both in term of work intensity and roles. Other studies, (Aspinall, 2001 and Beinhoff, 1998) found out that, 80 percent of women artisans in Indonesia separate and wash the gold containing sediments using pans, crush ores, while others work as operators and mine owners. According to Anyona & Rop (2015a), women in artisanal mining constitute 3 to 5 percent in Taita Taveta County participating in all gemstone production processes. They also act as service providers to the mining areas. Jerez (2001) in his study observed that female miners do not only work as negotiators who sell the minerals but also conduct shift roles alongside their male counterparts for commissions based on mineral outputs in Bolivia. In support of this, Akabsaa & Darimani (2001) in their study found out that women in Tarkwa mining region in Ghana are also involved in mining, processing and marketing phases.

In spite of the gains women have registered in the sector, they are also faced with numerous challenges, such as political, economic, social and health issues, which occur differently. In some areas, the market for gemstones remains unpredictable for women artisans, others work for longer period at the peril of their families, while some suffer injuries and stress at mines due to prolonged working hours and harsh environmental challenges. A study by USAID (2000) used in depth interviews, focus group discussions, experimental design to analyse the health risks associated with artisanal gold miners in Siguiiri. The study findings concluded that most women artisans suffer from various ailments due to intensive nature of the work, exposure to chemicals such as mercury among gold miners, and inhalation of fine particles, including silicon dust that has resulted to silicosis.

In the 1970s, indigenous women working in the mining sector in Australia were excluded from the negotiation table, while the relationship between the indigenous male and female miners was harsh due to personal behavioural and cultural factors. According to Ditomaso (1989) men in the mining sectors feared and resented competition from women, hence they attempted to secure their dominant positions. There was also uneven relationship between male employers and women miners since sexuality was a means to control women either through sexual harassment or sexual discrimination. In other context in Africa, artisanal women face gender discrimination due to prevailing cultural norms, unequal pay compared to their male counterparts. These women are also excluded from key decision-making processes, including processing of land titles for unspecified political reasons, and trading of final products (Hinton, Veiga, & Veiga, 2003).

Gender discrimination in the mining sector in South Africa has also been an issue in the current debates. Women miners were excluded from the incentives gained from the mining sector while high-income wages were largely captured by their male counterparts. (Botha 2016). In 1997, the South African government introduced the Mining Charter that removed labour restrictions and different campaigns were formed to ensure gender equality at the mines by removing gender discrimination. In 2003, the Broad-Based Black Economic Empowerment Act 53 of 2003 promoted socio-economic empowerment of the women miners that were excluded from the mining sector. The mining charter in 2010 further addressed gender imbalances to promote women's employment in the sector by maintaining that women should hold equal positions, participate in mining decision processes and equivalent pay to

that of men. According to Doret (2016), the mining legal policies on gender equality and economic empowerment in South Africa have helped to reduce employment relations at the mines but there are still gender inequality gaps related to promotions and bonuses at the mining sites in rural mining areas that have affected participation of rural women miners in the sector.

Existing policies and regulatory frameworks are applied differently across mining regions, although the organizations have continued to urge policy makers to support increased women involvement since women's potential in the sector remains untapped. According to Barry (1996), the World Bank pushed governments to endorse women's participation as miners and operators. For the same reason, UN Women has formulated gender-mainstreaming instruments to protect and promote women's involvement in the extractive industries. It has promoted capacity building and awareness creation to enable women's representation and participation in artisanal mining in Malawi, Tanzania, and Mozambique. In Zimbabwe, however, the agency provided policy recommendations for legal and policy environments that enhance women's participation in artisanal and small-scale mining. On the other hand, Southern African Development Community Protocol on Mining of 1997 advocated for the entry of women in the extractive industries, including gold and diamond. Within SADC, some countries have established women's mining and advocacy bodies, such as Tanzanian and Zambian Women Miners Associations, the Southern African Development Community Women in Mining Trust, which intervene on all issues affecting women in the mining sector (UN Women, 2014). In Malaysia, the government introduced a special policy that support women by issuing licenses to artisanal women who use wooden pans in tin tailings to recover low value metal (Cope, 2000).

2.3.3 Characteristics of Artisanal Miners

A study by Omolo (2014) points to age as a significant determinant both for male and female labour force participation in mines. Omia (2015) in his findings, concluded that majority (75%) of artisanal miners in Mui Basin, Kitui County, were aged over 21 years since most of them have families to fend for and also have more knowledge and experience on coal mining activities in the area.

Omia (2015) used marital status as an important variable in profiling artisanal miners in Kitui County. The study's findings indicated that 49.8 per cent of the miners were married while 47.3 per cent were single. Married and single men are more attracted to the sector as a way of

providing for their families. Married women are less likely to participate in the mining sector as they are not permitted by their husbands grounding them to household roles while most of the female artisans are either cohabiting, single, divorced or separated struggling to secure livelihood from the nearest mines.

On the educational level, a study by Anyona & Rop (2015) observed that most of the artisans have little or no education while educational levels of the artisanal female miners are lower than for the male miners and the women lack requisite mining skills compared to those working in large scale mines in Taita Taveta County. In support of this, Amankwah & Anim-Sackey (2003) also found out that some female gold artisans in Ghana lack education and technical knowledge which inhibits them from fully engaging in full spectrum of activities and processes of the mining process. Hayes & Perks (2012) conducted a study in Democratic Republic of Congo and found out that most of the female artisans have an easy entry of artisanal mining compared to other sectors due to no formal education.

Artisanal miners are frequently migrants as they move from one site to another in search of minerals. Some of the factors that contribute to this nature are associated with practical, economic and social factors. Lahiri-Dutt (2008) study observed that, migration among artisanal miners is part of survival strategies in cases of socio-economic distress, political crisis, natural disasters, non-farming seasons and landlessness in South Asia. Lahiri-Dutt & Insouvanh (2010) study showed that artisanal tin miners in Ban Moua Khay, Ban Nahi and Khammuane provinces migrated to mines that were in proximity to their village. In Democratic Republic of Congo, women involved in artisanal diamond mining are attracted to mines that are near their homes due to flexibility of balancing working in mines and household roles (Hayes & Perks, 2012).

Artisanal miners in developing countries are characterized by poverty that increases their participation in this sector. Anyona & Rop (2015) used in-depth interviews to analyze the profile of artisanal miners, the study findings showed that artisanal gemstone miners expressed a very high optimism that they will one day strike wealth. The study noted that the miners have undivided attention to their work and would never consider abandoning it even under hostile conditions. The study further observed that due to financial constraints, most artisanal miners work under some land lord who supplies food, water and shelter to them in exchange of a large share of the mineral excavated. These desperate circumstances they work under expose their vulnerabilities, making them an easy target for exploitation. In most

cases, the artisans make huge profits from the gemstones sold but the male artisans indulge in excessive leisure without investments, they then return to mines when there is no more money, repeating the same poverty cycle. Labonne (1993) also argues that many women in Africa and South-East Asia are attracted to gemstone and gold mining as a way to support their families since their husbands spend the household income leisurely increasing their poverty levels.

Most African governments, regard artisanal miners as illegal miners who have not formally registered with their respective governments to secure the nature of their employment. In his report, Mambi (2011) observed that two factors that hinder formalization of the artisanal miners in Tanzania are financial constraints to acquire mining licences and unclear regulatory and policy framework from the government. The report further suggested that artisanal miners may be attracted to formalize and register their operations if they are given incentives and advantages to do so.

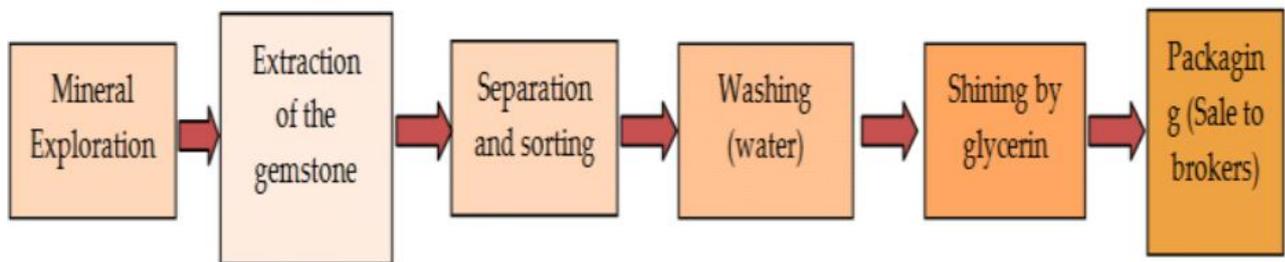
In terms of the different types of artisanal gemstone mining, Lahiri-Dutt & Insouvanh (2010), observed that most of the artisanal miners work in family labour units in Lao comprising of women and men, boys and girls and other times elderly men and women. In most cases the entire family is involved in one or more phases of tin production process. The study further noted that in such situations the man is the main decision maker. In Taita Taveta County, a study by Anyona & Rop, (2015) noted that most artisans mine by having access to mining pits through associations. These associations also protect them from exploitation from predatory brokers, politicians and large scale miners. In support of this, Kambani (2003) observed that, in Ndola Rural mines in Zambia, there are a number of artisanal women associations being developed to overcome legal, policy and social-cultural barriers as a way of advancing women within the mining sector.

In terms of the nature of tools and equipments used, artisanal mining involves operating using rudimentary tools and equipment for gemstone extraction and production that involves working under a number of unhealthy and unfriendly environmental conditions. (Anyona & Rop, 2015a).

2.3.4 Gender Relations in Artisanal Gemstone Production Processes on Women's Economic Empowerment

Gender interactions can result in unequal treatment of one gender over the other based on the existing societal norms. These norms affect the way men and women interact resulting in unbalanced relationships at the workplace, including the mining sector (Omolo, 2014). Gemstones mines are present across many countries and regions, such as Brazil, Zambia, East Africa, Madagascar, India, Sri Lanka and South East Asia, which share similar geological environments that are conducive to gemstone formation. According to Rop & Anyona (2015a), artisanal gemstone mining is divided into six phases: exploration, extraction, separation and sorting, washing, polishing and grading and packaging and marketing as shown in Figure 2.1.

Figure 2.1: Production process in artisanal gemstone mining in Taita Taveta



Source: (Anyona and Rop, 2015)

Gender roles vary in different production levels in different communities. Female participation in artisanal gemstone mining involves direct or indirect roles. Direct participation requires primary engagement in gemstone mining operations, while indirect participation involves provision of auxiliary services in the mining sites such as cooking and sex work as evident in Zambia and Taita Taveta in Kenya. (Gunson & Jian 2001; Rop, 2015).

The first phase in artisanal gemstone mining is exploration, which involves prospecting minerals through rudimentary methods such as opportunism, rumours, observation and luck. This phase has no gender specific roles since all artisanal miners play a key part. There exists immerse interactions as both genders are involved in all the activities. Gender relations come into play which affects women's empowerment. According to Doret (2016), she interviewed artisanal women in copper and phosphate mines and found out that these women's first entry in the mining sector encountered gender relations challenges, such as constant opposition

from some of the male counterparts, harsh jokes and harassment, while they struggled to be accepted by their male colleagues. In his study, Rop, (2015) observed that in Taita Taveta County, very few or no female artisans are allowed in prospecting by their male colleagues. The few women that are allowed to participate in this phase are not involved in negotiations after the discovery of gemstone deposits hence lack control and ownership of mining spaces. At this phase the few women may be discouraged to continue with the whole production process but those that remain struggle to maintain the relations at the mines.

Extraction of gemstones constitutes the second phase, which involves digging up the mineral from the source. The presence of gemstones is determined by alluvial deposits which are found on the surface, or followed by subsequent underground digging of soil with low or no alluvial deposits. In the early 1960's, occurrence of the emerald gemstones was common in areas with alluvial deposits in rural Ndola, Zambia. These areas were characterised by low population of people involved in the mining sector, but overtime the number of artisanal miners has increased making it difficult to find gemstones on the surface (Kambani, 2003). A study conducted by Unninayar (2015) found out that at the extraction phase, artisanal gemstone miners in Sri Lanka's Kalu Ganga and Abanganga river systems, use long handled hoes to dredge up the gemstone gravel to retrieve gemstones, ranging from 1cm to 10 cm in size, on the riverbanks.

On gender roles, Anyona & Rop (2015a) noted that male miners in artisanal gemstone mining use tools such as shovels, hammers, chisels and explosives to break down the rocks that block the paths inside the tunnels while women use buckets to remove wasted soil from the entrances of the mining pits. In terms of the impact of gender relations to women's economic empowerment, Lahiri-Dutt & Macintyre (2006) observed that in Kagem mines in Zambia, mining pits are controlled by men and this gives them the power to control the extraction process.

Most of the artisanal women are involved in clearing mining waste and tailing, few women that are involved in digging up the mining pits to extract the mineral deposits have less power on the decisions made regarding the process and the benefits shared since they lack control over the mining pits. A study by Hayes & Perks, (2012) observed that in copper and gold mines of Southern Katanga and Northern Oriental Province respectively in Democratic Republic of Congo, artisanal female miners are prohibited from entering the mining pits since their presence will allegedly make the minerals 'disappear'.

Separation and sorting of the gemstones is the third phase in artisanal gemstone mining that involves most women and few men. The work is seen as easy, repetitive and not appropriate for men thus women are the main participants in this phase. (Anyona & Rop, 2015). In Sri-Lanka there exists artisanal gemstone river mining that does not involve both the exploration and extraction phase, women use baskets, hands or pans for sorting by sieving the soil from precious stones. Sorting does not only mean separating the gemstones from soils or rocks but valuing the quality of the mineral by overseeing that the gemstones are smooth, clear or have cracks (Mghanga, 2011). A study by Hinton & Veiga, (2003) found out that in the emeralds mines of Campos Verdes in Brazil, women are in charge of sorting the emeralds while men inspect the sorted emeralds to select the good stones. The female miners have no decisions on how to sort the gemstones since it is done by their male counterparts.

Washing is the fourth phase that involves washing away dust from the gemstones. Gender roles and responsibilities vary as most of the female miners are involved in washing of the gemstones which is done in groups of both women and children as washing is perceived to be easy as few men watch the process in Asia. (Lahiri-Dutt, 2008). The findings further noted that washing is not an easy process as it is perceived, as women walk long distances to fetch water to conduct the activities. In terms of gender relations, the study's findings observed that gender relations still play part even though few men are involved, women are majority participants but men control the phase. Women have no voice on the best strategies to be implemented that enables easy access of water to avoid walking long distances in search of water.

Grading is the fifth phase in artisanal gemstone mining. It involves polishing using the oiling treatment, heating method, dyeing, exposure to x-ray and application of pigment. Gender roles and responsibilities in this phase vary from one community to another. Rop (2015) observed that in this phase in Taita Taveta artisans leave the gemstones to dry then polish the stones with glycerine which is mostly done by women and few men. Unninayar (2015) carried out a study *on Gemstone Mining in Sri Lanka* and found out that grading is the primary method used to colour gemstones, which is artificially enhanced, while most artisans use traditional methods to heat gemstones under controlled conditions for three to six hours which is equally done by men and women. The study's findings also noted that decisions on the best colour that suits the gemstones is controlled by men, and women are locked out. In

terms of an impact to gender relations on women's empowerment, a report by UNDP (2015) indicated that female artisans are involved in this phase but using simpler and less technical grading methods such as the oil treatment and dyeing but have no power in deciding the techniques that could artificially enhance the gemstones in ways that can improve the clarity and colour of the gemstones to widen the market.

Packaging and marketing of gemstone is the final phase in the artisanal gemstone production process. This is a crucial process since it requires skilled labourers who are able to package and sell the gemstones to brokers. Gemstones are not bulky so they do not require much labour in packaging. In a few occasions, women are involved in packaging and most men are involved in selling the gemstones since they have networks with the brokers.(IFC, 2009). A study conducted by Unninayar (2015) observed that, a few women involved in trading the gemstones in Sri Lanka are not allowed to sell the gems without the presence of their male counterparts. The artisanal male miners determine the prices of the gemstones in the local market without negotiating with their female colleagues as most male miners have the perception that 'mining which is a societal status, is not a place for women'. Female artisans work in the same harsh conditions at the production processes with other male counterparts but they do not receive equal compensation after the sell. Exclusion undermine women's participation in decision making processes concerning the profits made when the minerals are sold and this undermines their role as principle breadwinners in female headed households (Insouvanh, 2012).

2.3.5 Factors that determine Women's Economic Empowerment in Artisanal Mining

Women Economic Empowerment is a contributing factor to gender equality, poverty reduction and growth. This means that women have the ability to succeed and the power to make economic decisions (Sida, 2015). Markel & Jones (2014) work posits that inclusive market development empowers the marginalized and that gender equality is a pre-requisite to women's empowerment thus enhancing inclusion in the market system. The report further states that enhanced access, power and agency are key indicators of empowerment.

There exists formal and informal institutions that determine the nature of gender interactions at the mining sites. The formal institutions consists of policies and laws while the informal insitutions entails cultural and social norms and values. Cultural and social norms entails prohibitions and expectations on whether or not women can be included in public spaces. Gender interactions formed are mostly controlled by cultural and social values, behavior and

attitudes that either disempower or maintain gender equality at the market system. These interactions control decisions, ownership and control of public resources that could undermine or encourage women's economic empowerment at the markets systems. (Markel & Jones, 2014). In South Asia, Lahiri-Dutt (2008) found out that the traditional social system deprives women the control of mining pits and only allows them to access them through the male counterparts.

Access is enhanced when a woman has the ability to acquire economic resources such as opportunities and resources that can raise her economic status. It is then enhanced when the women miner has control over the resources accessed. Amutabi & Lutta-Mukhebi (2001) study noted that artisanal women have access to resources but do not have the power over the mining sites in Mukibira mines in Vihiga County. The study further noted that female miners can only access mining pits through their male counterparts but cannot manage the resources. This disempowers the women resulting in low production which in turn affect their incomes. In support to this, Wethmann (2009) observed that a few women own gold mining pits in Burkina Faso but the pits are controlled by their male spouses. Wethmann emphasizes that if the women can have both access to and control of gold mining pits, they can invest even more with the incomes they make from the mines and reduce their indulgence in the black market economy hence empowering them positively.

Krimbu, (nd) observed that one of the main issues facing artisanal women miners in Wau-Bulolo in Papua New Guinea is lack of direct access to gold trading markets. The artisanal male miners control the gold mines thus leading to income disparities between the genders since the women have no control over the negotiations that takes place in the trading markets.

Lack of access to markets reduces women's participation in the mining sector in the region which affects their economic benefits. According to Amutabi & Lutta-Mukhebi, (2001), access and ownership of mining spaces are key factors in empowering artisanal female miners. The authors conducted a study and noted that women are disempowered by the traditional structures that favour men in allocation and control of resources. Contrary to this, Heemskerk (2013) observed that Mongolia's socialist tradition highly supports gender equity in organization of artisanal gold mining. The artisanal miners equally benefit from their work in the sector. Both genders work in underground tunnels in search of gold and fully protect each other to reduce cases of accidents at the tunnels. This has led to increased participation

of women in the sector resulting into high production of minerals that benefits them economically.

ICRW (2011) states that agency is the other main indicator that measures women's economic empowerment. Agency is enhanced when the women have the capacity to make decisions and act on opportunities that increases economic development. According to Markel & Jones (2014) agency is essential to women's economic empowerment as it enhances women's ability to influence markets systems that the women interact with on a daily basis but are shaped by rules that dictate how people behave towards one another and how they interact with their male counterparts within a market system. Agency describes the woman's 'voice' which means that she has the power to act on opportunities through making decisions at various levels.

Negotiations and participation in the market systems is ascribed to women's agency that leads to better access to resources that empowers women's economic status. Both formal and informal gendered rules can interact to empower women economically through promoting agency and prohibiting gender discrimination, sexual harassment at the work place situations. Labonne (1996) noted that in artisanal mining, women work under the same miserable conditions as men but are not equally compensated thus they fail to attain the same decision making positions as their male colleagues. In support of this, Hinton (2011) also observed that more than 70 per cent of salt miners in Katwe Kabatooro Town Council, Uganda are women who participate in all production processes of salt mining but have minimal decision making powers which is deeply rooted in gender relations at the mines that create gender inequalities.

Hinton & Lahiri-Dutt (nd), used an easy-to-use tool kit for evaluating and understanding men's and women's differentiated access to resources and participation at all phases associated with artisanal and small-scale mining. The tool kit was piloted in Tanzania, Zimbabwe and Uganda on access, ownership and control of resources and the power to make decisions at the artisanal value chain level. This was done using questionnaires, focus group discussions and in depth interviews. The questionnaires focussed on how decisions are made concerning where to mine, who controls the gender roles at the different points of the value chain and who makes decisions on how profits are shared. The main responses from the pilot concluded that the artisanal male miners decide on where to mine, distribute roles and also make decisions on how the profits are shared while the artisanal female miners depend on the decisions made by their male counterparts. The study

recommended that gender equality is necessary at all production levels associated with artisanal mining as it leads to high production and reduced cases of poverty when women are involved.

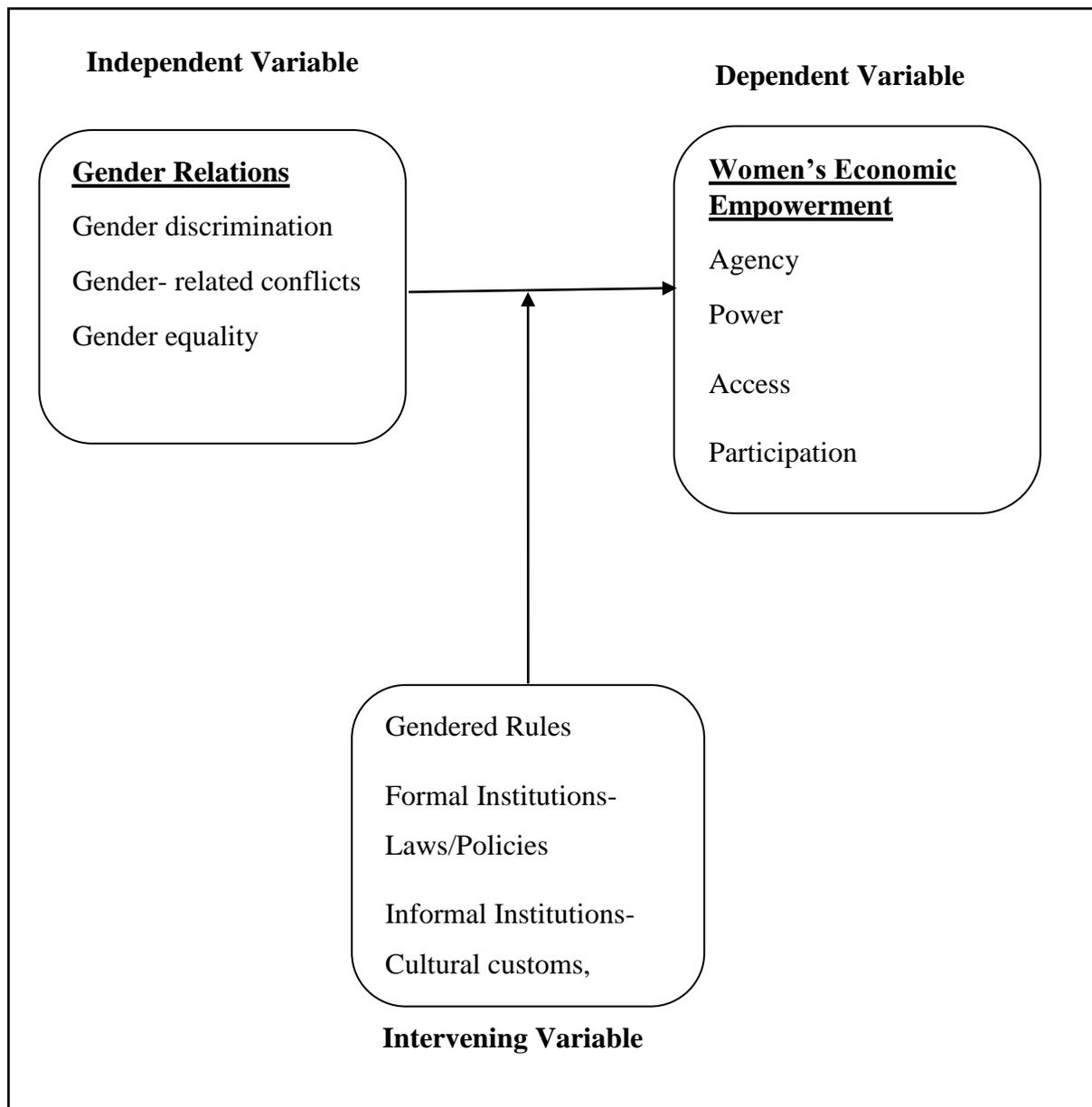
2.4 Conceptual Framework

The study was framed within the theory of access that linked the impact of gender relations to women's economic empowerment as shown in figure 2.2 below. The independent variable was gender relations. In this study, gender relations determine whether a woman has the ability to acquire economic resources such as mining pits and opportunities to raise their economic status. The factors identified with gender relations include: gender discrimination, gender-related conflicts and gender equality. The indicators associated with gender discrimination were: exclusion, women subordination, unequal roles and responsibilities, decision-making disparities and income disparities. Gender related conflicts identified from the study were: stealing from each other, conflicts over resources such as mining spaces. Indicators of gender equality especially at the family were: equal economic participation and support in all production phases.

The dependent variable was women's economic empowerment. The factors to women's empowerment were: access, power and agency. According to this study, access simply means the right to own resources such as mining pits and tools and equipment used at the production processes. Power over resources is identified with equal management of resources and participation of activities involved in all production phases regardless of the nature of work involved. The study identifies agency as the capacity to make choices or decisions involved in all the production phases that are respected.

The mediating variable between gender relations and women's economic empowerment were: Formal or informal institutions. These institutions control the social relationships that exist in different communities or societies. In this study, gender relations in artisanal gemstone mining are governed by opinions, behaviours, attitudes that are socially constructed or by cultural norms and customs that have either hindered or empowered women to access or have power over mining pits in artisanal mining. Below is a conceptual diagram to help in the analysis of gender relations and its impact on women's economic empowerment.

Figure 2.2 Conceptual Framework



(Author's conceptualization)

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter provides a description of the methodology used in the study. It begins with a description of the study site followed by an overview of the research design in the second section. It then proceeds to explain population and sampling procedure, data collection methods and the sources. The last section describes data processing and analysis employed in the research.

3.2 Study Site

The study site was located in Taita Taveta County which lies within the Mozambique Belt. The belt consists of high-grade metamorphic rocks. The county covers an area of 17,083.9km² lies on the South-Western part of Kenya's coast. It is 200km Northwest of Mombasa and 360 km southeast of Nairobi. (Anyona & Rop, 2015b). Taita Taveta County borders Makueni, Kitui and Tana River counties to the North, Kilifi and Kwale counties to the East, Republic of Tanzania to the South west. The population of the county is 284,657 persons in 2009 with population densities ranging from 3 persons per km² to more than 800 persons per km². (Anyona & Rop, 2015b). Population of the male persons is 51 per cent while the females are 49% (KNBS, 2016). The county has four constituencies namely, Wundanyi which has the largest urban population having 21.9 per cent of the county's population, Taveta constituency has a population of approximately 6.9 per cent, Voi being the third sub-county with a population of 6.02% and Mwatate which is the capital town having a population of 1.95 per cent (CRA, 2011).

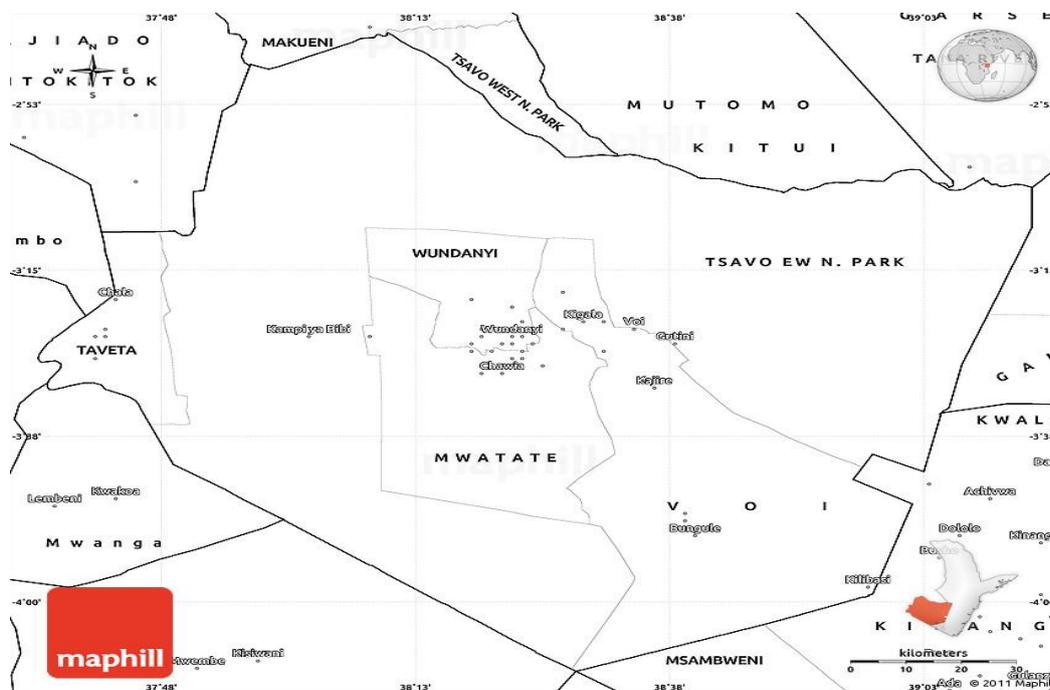
According to Taita Taveta County Government (2013), county's labour force increased from 166,942 in 2013 to 179,604 in 2017, while agriculture, livestock and mining subsectors are the largest employers and contributors of income to most households in the county. Out of the population aged 15 to 64 years, 29.2 per cent of this population is in wage employment, while unemployment rate stands at 45 percent. The labour force for those seeking wage employment constitute of 48 per cent female and 52 per cent male. There are over 3,810 and 7890 self-employed persons in urban and rural areas respectively. Urban residents operate small to medium scale business and a few in micro (jua kali) business, while the rural residents engage in subsistence and small-scale agriculture and mining.

Mining in Taita Taveta County involves gemstone mining at 74 per cent, stone mining at 20 per cent and sand and other mining at 6 per cent. (Rop, 2015). Gemstone mining is categorized in three types, that is, large-scale, artisanal and small scale mining, which vary in size of the mining area, quantity and quality of machinery and the labour employed (Mghanga, 2011).

Artisanal mining is the largest mining sector in the county that has employed not only residents within the county but also neighboring counties. Artisanal gemstone mining compared to agriculture and infrastructure acts as a supplementary economic activity for financial and social independence in many communities that plays an important role in sustaining the livelihood of the population. (Rop, 2015). It has proved to provide employment to retrenched workers and the unemployed youth and women.

The main artisanal gemstone mining areas are Mwatate and Kasigau constituencies. Mwatate town is the main trading centre for gemstones in Taita Taveta County. The study covered Mwatate constituency as the main area for the research as illustrated in Figure 3.1 below.

Figure 3.1: Location map of the study area



Source: Maphill (n.d)

3.3 Research Design

The study used mixed methods, a combination of qualitative and quantitative research methods. The researcher's main purpose for using mixed methods was to attain an in-depth understanding of the research problem under investigation. The main qualitative methods comprised of key informant's interviews, focus group discussions and direct observation, while quantitative method included coded closed and open-ended questions. The study further used a cross sectional survey design to collect and interpret data of the population under study. The main purpose of the researcher in using the cross sectional survey was to effectively examine different points of gender interactions in different production levels and its relation to artisanal women's empowerment. The study targeted artisanal gemstone miners in Mwatate region in Taita Taveta County and took three weeks to implement.

3.4 Population and Sampling

During the study, it was a challenge identifying artisanal gemstone miners in Mwatate sub-county for the study. The study projected to use a large sample of 150 respondents to achieve the objectives of the study but managed to use a sample of 50 respondents, which was not the initial goal. From the population of artisanal gemstone miners in Mwatate area, the study used a sample of 50 respondents, 27 female respondents and 23 male respondents from different mines in Mwatate area. This was done using snowball sampling whereby the researcher relied on the initial respondents to refer to the next respondents who are involved in artisanal gemstone mining. The researcher then used proportional sampling by drawing the sampling frame from a list derived after snowballing, which was then followed by simple random sampling by selecting where women are dominant in the production processes. The five mines visited were namely; Mkuki Mines, Chunga Unga Mines, Chawia Mines, Kamtonga mines and Mkuki CBO mines.

The main purpose of using snowball sampling was to reach populations that were difficult to sample due to lack of statistical data from the county government that shows the number of artisanal miners and their localities. Secondly, the process was cost-efficient and simple for the researcher due to the networks given by the initial respondents. Thirdly, gemstones are very valuable and need to be protected hence there was high rates of insecurity among the miners and the researcher had to be introduced to a miner by individuals that are known to them to be able to conduct the research with ease without being suspected to be a criminal.

Some of the main challenges encountered while using the snowball sampling method was representativeness of the sample was not guaranteed, as the researcher had no idea of the distribution of the sample in the region. Secondly, there was sampling bias as the initial respondents nominated miners that they know well and this led to respondents sharing the same characteristics thus representing a subgroup of the entire population.

3.4.1 Key Informants

Having mapped out key informants (KI), the researcher contacted the KI through emailing them to request for a meeting. The emails were followed with calls to help schedule meetings. The key informants were selected based on their expertise on the phenomenon to be investigated. They include: Director of ministry of mines, County Deputy Governor, County Chief Officer of Ministry of lands and mines, representatives of artisanal women and men associations, gemstone dealer and regional geologist.

3.5 Data Collection Methods and Sources

The researcher developed a data needs table highlighting the type of data to be gathered, sources and instruments for the research questions. (Appendix 6). The data collection exercise was conducted between 29th August to 18th September 2017 and an additional on 25th September for a follow up interview with one of the key informant who had requested for the date. During fieldwork, the researcher visited five mines in Mwatate namely; Mkuki Mines, Chunga Unga Mines, Chawia Mines, Kamtonga mines and Mkuki CBO mines.

The researcher sampled 50 respondents, 27 female respondents and 23 male respondents in the five mines and interviewed six key respondents, five in Taita Taveta County and one in Nairobi County. Five observations were conducted at different time intervals in the five mines. Lastly, the researcher conducted two women focus group discussions in Mkuki CBO mines and Kamtonga mines. The two FGDs had seven female respondents and six female respondents respectively.

The study used different data collection techniques. One of the technique was note taking which was done during the key informant interviews, focus group discussions and direct observation survey. Field notes were reviewed by the researcher to help prepare for the next day. The other data collection tool was direct observation, it was used to note gender roles at different artisanal gemstone phases, types of tools and equipment used by the artisanal gemstone miners, the main points of interactions between genders at different production levels and nature of gender relations at artisanal gemstone production phases. Audio

recording was the third data collection technique used, it was useful during focus group discussions and key informant interviews as a back-up technique to help the researcher to transcribe later in cases where the researcher was unable to take full notes. Focus Group Discussions and marking the codes for the coded questions in the questionnaire were the other data collection techniques used in the study.

3.6 Data Analysis

The research generated both qualitative and quantitative data. The qualitative data was transcribed, coded and analysed using thematic analysis for common themes emerging from empirical review. Detailed description and analysis of the data was based on demographic characteristics and mining characteristics. The quantitative data was key in examining gender roles and responsibilities, how gender relations affects women's economic empowerment. The data collected was keyed in SPSS 21.0 for analysis. Univariate and bivariate analysis was generated from the SPSS application.

Univariate analysis was done for nominal, ratio and ordinal data collected from the field. To show relationship between gender and education level, number of years in AGM and AGM skills, Gender and different forms of AGM, gender roles and responsibilities in different production phases, bi-variate analysis involving cross tabulation was done. Analysed data is presented using tables, figures and cross tabulations in chapter four (4) of this research project.

CHAPTER 4

FINDINGS AND DISCUSSION

4.1 Introduction

This chapter presents findings and discussion of the study based on research questions in chapter one. The study targeted artisanal gemstone miners in Mwatate sub-county in Taita Taveta County. The main objective of the study was to investigate the impact of gender relations to women's economic empowerment in different production processes in artisanal gemstone mining. To arrive at this objective, the study sought to: analyse the characteristics of artisanal gemstone miners, examine the gender roles at different stages of artisanal gemstone mining, establish the effect of gender relations on women's economic empowerment in artisanal gemstone production processes and to explain the factors affecting women's economic empowerment in artisanal gemstone mining.

Gender composition of artisanal gemstone miners was important for the study in explaining gender relations existing at different production processes in the sector. During the study, the researcher visited five main mining areas with a high number of women miners. Gender of the respondents was recorded and analysed using simple descriptive analysis. A majority (54.0%) of the respondents were female miners while 46 per cent were male miners. The main objective of the research was to investigate the effects of gender relations on women's economic empowerment therefore, focusing more on women at different production processes. The study does not show that women are more than men in the mining sector but it was important for the study to focus more on the female miners than the male miners to get a better understanding of how these interactions with their male counterparts have influenced their economic empowerment.

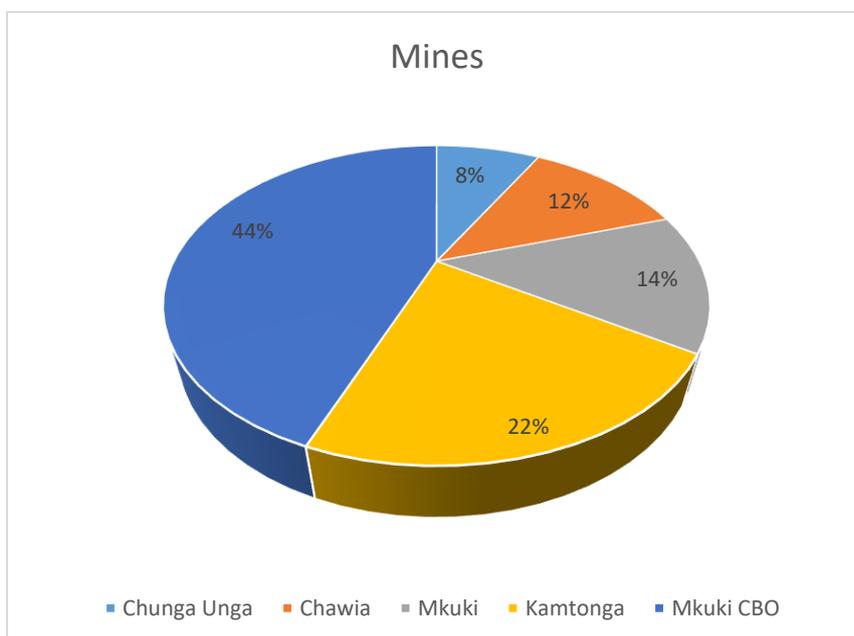
4.2 General Characteristics

4.2.1 Demographic characteristics

The demographic characteristics of the respondents that were investigated include: age, marital status, religion, main household provider, household size, presence of children/number of children, education level and household income. It was important to investigate these characteristics as previous studies have highlighted them as critical and influential in determining artisanal gemstone mining participation in the labour market. Therefore, this study sought to examine how the demographic characteristics of the artisans influence their access to the sector.

The study focused on five different mining areas with a higher number of female miners and found out that these areas have a unique contribution to the study. Chart 4.1 shows that majority (44%) of the respondents were from Mkuki Community Based Organization (CBO) mines followed by 22 per cent from Kamtonga mines while 8 per cent were from Chunga Unga mines. Artisanal gemstone miners from Mkuki Community Based Organization area mine under an association that gives the miners a well-organized mining structure while majority of miners from Chawia and Kamtonga areas mine under family units and majority of miners from Kamtonga and Mkuki mines work independently.

Chart 4.1: Mines



Source (Field survey data, 2017)

4.2.1.1 Age of the respondents

The study show that age was a key determinant of labour force participation in artisanal gemstone mining as the older age group form huge percentages in the sector. Table 4.1 shows that majority (70%) of the respondents were aged above 36 years while 6 per cent were below 25 years. The youngest miner was 20 years old while the eldest miner was 75 years. The median age of the miners was 55 years with the mean age at 42.32 years. Most artisans in this study, are older individuals having more skills and experience which are key requisites in the sector since they have a higher number of dependants to support.

Table 4.1: Age of the respondents

Age	Number=50	Percentage
<=25 Years	3	6.0
26 to 35 Years	12	24.0
36 to 45 Years	18	36.0
46 to 55 Years	11	22.0
56 to 65 Years	3	6.0
Above 65 Years	3	6.0
Total	50	100.0

Source (Field survey data, 2017)

In other informal employment sectors, youth are the majority participants at the work force, contrary to this, this study shows that the higher the age the greater the probability of participating in this sector. This also contradicts what an earlier study by Omia (2015) had highlighted that majority (67.3%) of the coal miners in Kitui were aged between 21-35 years of age while 32 per cent of coal miners were aged below 21 years.

4.2.1.2 Marital status

Marital status was another key demographic factor in the study as it gives the male and female miners the decision-making platforms on ownership of property, control over resources and the freedom to act on the household income. Table 4.2 shows that out of the study sample of 50, majority of the respondents (62%) were married while 14 per cent of the respondents were single. Most of the miners in the sector are either married or single miners, attracted to the sector due to various reasons such as provision for the household, savings or investments for the future financial needs of their families

Table 4.2: Marital status

Marital status	Number=50	Percentage
Single	7	14.0
Married	31	62.0
Divorced	1	2.0
Widowed	7	14.0
Separated	4	8.0
Total	50	100.0

Source (Field survey data, 2017)

The study further analysed the relationship between marital status and female miners. Out of 27 female respondents, majority (59%) were married while 41 per cent were single, divorced, widowed or separated. Married female artisans in gemstone mining in Mwatate area survive easily in the sector than single, divorced, separated and widowed female miners. This is because a married female miner has an upper hand of protection by the husband due to insecurities attached to the sector. The rest of the female miners find it hard to adopt and end up leaving the sector or finding a suitor at the mining areas. KII#3 noted that married female miners have a higher survival risk than the rest of the female miners.

4.2.1.3 Religion

Religion was a major platform to women’s participation in artisanal gemstone mining since some religions have different thoughts on women’s participation in some economic platforms especially the mining sector. Out of 50 respondents, 23 per cent were protestants and another 23 per cent were catholics while 3 per cent were muslims. One of the respondent was an atheist as shown in Table 4.3. With the small sample, respondents from the Islamic religion stated that the religion prohibits both female and male miners to work together inside the same mining tunnels. This limits interactions between women and men at the extraction phase as female miners are not allowed to extract.

Table 4.3: Religion

Religion	Number=50	Percentage
Protestant	23	46.0
Catholic	23	46.0
Muslim	3	6.0
Atheist	1	2.0
Total	50	100.0

Source (Field survey data, 2017)

4.2.1.4 Household Provider

Female miners have the economic potential to contribute to stability, progress and sustainable development for their households. Table 4.4 shows that 30 per cent stated female as the main household provider while 20 per cent stated the male as the main household provider. In the study, female miners play a major role in helping the family adjust to new changes and challenges as well as preserving family health and nutrition. The study found out that female miners invest their incomes for the growth of their households since family is their main

priority while majority of the male miners do not economically support their families as they spend their incomes on leisure.

Table 4.4: Household Provider

Household Head	Number=50	Percentage
Female Head	15	30.0
Male Head	10	20.0
Both Genders	25	50.0
Total	50	100.0

Source (Field survey data, 2017)

4.2.1.5 Household Members

Poverty levels is one major characteristic observed with a large household size. Artisanal gemstone mining has a high number of people dependant on this sector hence increasing the households' financial needs. The study found out that 50 per cent of the households in artisanal gemstone mining had above six members as showed in Table 4.5 below. Household dependants are both nuclear and extended families. Artisanal gemstone mining can be developed with effective strategies to support the miners and their families. This therefore, forces the miners to work extra hard to provide for their large families. For some artisanal miners, income generated from the sector is insufficient to support their families resulting to these artisans involving themselves in other income generating activities due to high financial dependency.

Table 4.5: Household Size

Household Size	Number=50	Percentage
1 to 5	25	50.0
6 to10	21	42.0
Above 10	4	8.0
Total	50	100.0

Source (Field survey data, 2017)

4.2.1.6 Number of children

Most of the artisans have a high number of children that depend on them for financial support. Out of 50 respondents, 44 respondents had children while the rest had no children with majority (59.1%) having above three children per family as shown in Table 4.6 below. This gives the miners a huge responsibility to offer basic support such as food and education to their children.

Table 4.6: Number of Children

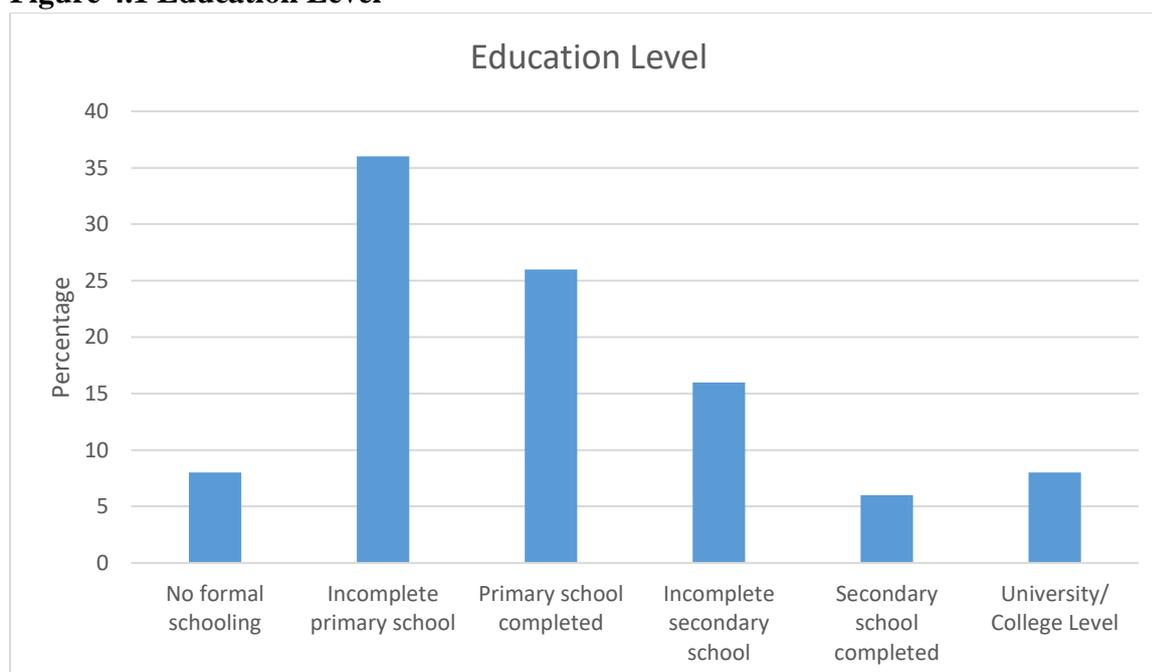
Number of Children	Number=50	Percentage
1 to 3	18	40.9
4 to 6	19	43.2
Above 6	7	15.9
Total	44	100.0

Source (Field survey data, 2017)

4.2.1.7 Education Level

Education level of the miners was a key indicator to the study in identifying the relationship between education and participation of the miners in the sector. There is a high level of illiteracy among the artisanal gemstone miners with majority (36%) have not completed primary education as illustrated in Figure 4.1. This supports an earlier study by, Anyona & Rop (2015) which noted that artisanal miners in Taita Taveta county have little or no education. High levels of literacy is not a prerequisite to either the entry or success in the sector. The main factors considered, as the key indicators in terms of success in the sector is the experience, informal skills and knowledge that they acquire from each other.

Figure 4.1 Education Level



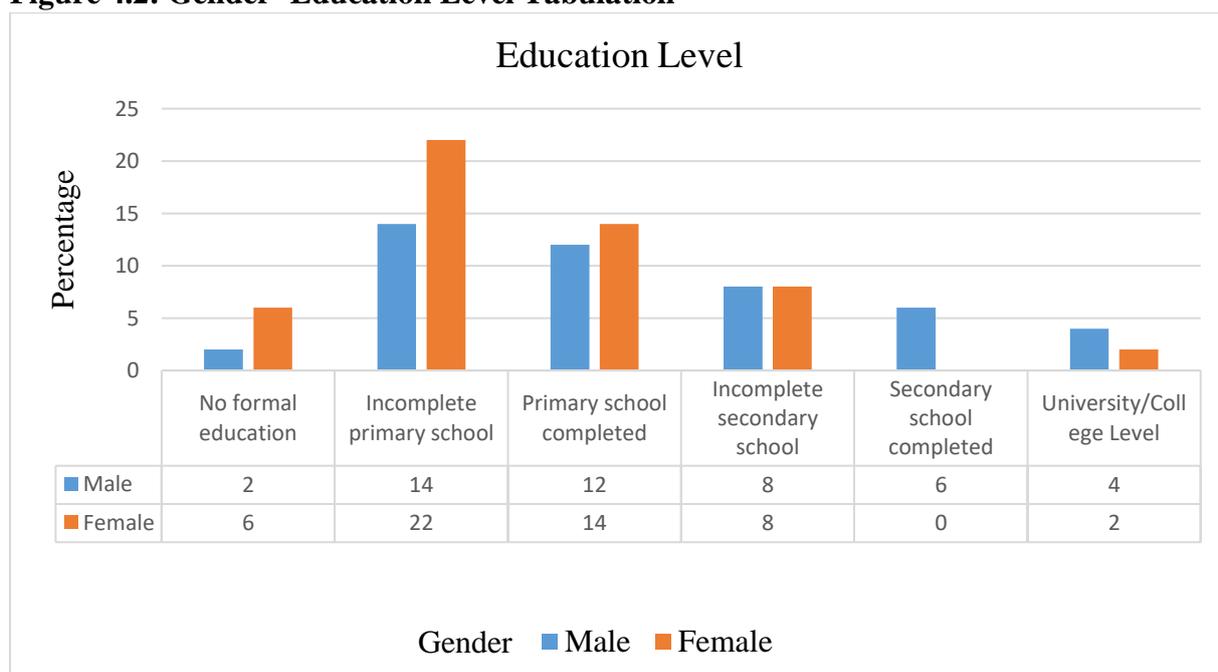
Source (Field survey data, 2017)

Formal skills and knowledge would be of much help especially for the young age group venturing in the sector so that they can be equipped with advanced knowledge on gemstone production processes. High levels of illiteracy among artisanal gemstone miners has negatively impacted the structure and the organization of the sector. One of the key informants argued that high levels of illiteracy is also the key driver for nature of interactions and the hindrance to growth and development as quoted below:

Lack of education is the main factor that has delayed growth and development of the sector from artisanal to small-scale mining. It has also hindered women miners to benefit from the sector due to their traditional African mentality, which view men as the only participants in the mining discouraging women from joining the sector. Gender discrimination, which is manifested in the interactions at the mines, is a main consequence of high levels of illiteracy. (KII6)

Further analysis of the relationship between gender and level of education was done in the study. Cross tabulation results as shown in Figure 4.2 shows that illiteracy levels among the female miners is higher compared to their male counterparts, as they dominate both no formal education and incomplete primary education at 6 and 22 per cent consecutively. This conforms to an earlier study by Amankwah & Anim-Sackey (2003) which noted that most women working in mines lack education.

Figure 4.2: Gender- Education Level Tabulation



Source (Field survey data, 2017)

4.2.1.8 Household Income

Household income was a key characteristic of the study to investigate the financial value of artisanal gemstone mining to the miners in terms of financial support to their large household size with the growing Kenyan economy. Most of the artisanal gemstone miners earn above Ksh.25,000 a month while a few others earn below Ksh. 5,000 a month and are not able to support and sustain their large families as shown in Table 4.7. Incomes generated from this sector have helped the miners to save and invest in education, properties and other income generating activities such as business and agriculture.

Table 4.7: Average Monthly Income

Average Monthly Income	Frequency	Percent
Below 5000	8	16.0
5000-10000	6	12.0
10000-15000	1	2.0
15000-20000	2	4.0
20000-25000	1	2.0
Above 25000	32	64.0
Total	50	100.0

Source (Field survey data, 2017)

Due to the high living standards, the miners are involved in other income generating activities to supplement their mining incomes. The study further examined other income diversifying activities in addition to artisanal gemstone mining to increase household incomes of the miners. The miners are involved in both formal and informal activities. Some of the formal sector activities noted were carpentry, masonry and agricultural activities mainly for subsistence consumption while the informal activities were shop ownership, food vending and bodaboda operation.

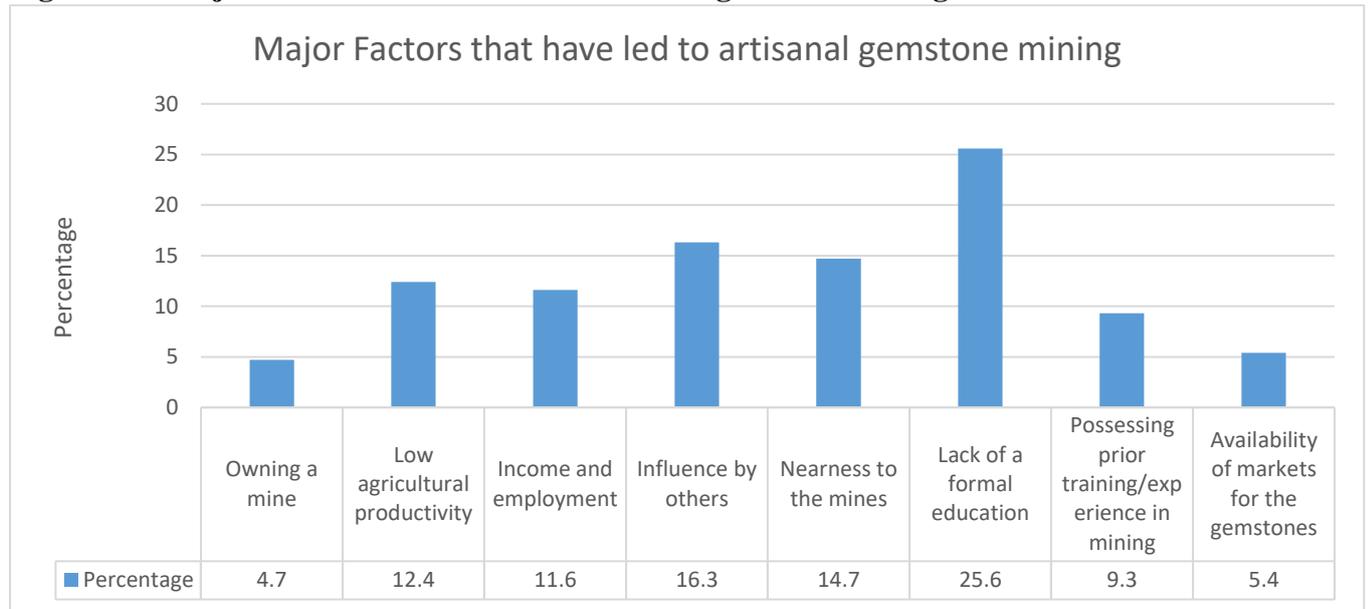
4.3 Mining Characteristics

The study examined factors contributing to artisanal gemstone mining and not to other types of gemstone mining such as small-scale and large-scale mining. The main factor was lack of formal education, which is not a pre-requisite in artisanal gemstone mining unlike in other types of gemstone mining whereby formal education is a key entry in the sectors. It was important for the study to also investigate other mining characteristics such as: duration in artisanal gemstone mining, forms of artisanal gemstone mining, ownership of a mining claim and a mining permit to understand the organization of the sector.

4.3.1 Factors contributing to artisanal gemstone mining

Artisanal mining is largely for illiterate citizens in Mwatate region. Artisanal gemstone mining is a growing sector and a main source of wealth creation in Taita Taveta County as it has employed a large number of illiterate individuals. It has also played a key role in poverty alleviation and rural development as a way of complementing other income activities such as farming due to immense droughts. The study sought to investigate main factors that attract artisanal gemstone miners to gemstone mining. Majority of the respondents (25.6%) stated that lack of formal education forced them to the sector, while 16.3 per cent were influenced by family and friends. Other factors included nearness of the mining pits and source of income and employment as shown in Figure 4.3. The study's findings supports a previous study by Rop (2015) that showed that, majority of the people in Taita Taveta county are either attracted to artisanal gemstone mining due to lack of an alternative source of livelihood or high illiteracy levels that limits their potential for formal employment in rural areas. Such individuals opt for gemstone mining as the only possible solution to earn a living.

Figure 4.3: Major factors that have led to artisanal gemstone mining



Source (Field survey data, 2017)

There has been an increased number of women opting to participate in artisanal gemstone mining as a way of improving their households. The study further sought to understand major factors attracting women to the sector. Cross tabulation results show that, majority of the women at 28.8 per cent were attracted to the sector due to lack of a formal education, followed by 15.1 per cent who stated that they were attracted to the sector due to nearness of mines to their homes as shown in Table 4.8. The flexible nature of AGM has enabled the married female miners to help their spouses generate an income for the family while balancing household chores. The study’s findings support previous studies by Lahiri-Dutt & Insouvanh (2010) and Hayes & Perks (2012) that found out that female artisans in tin mining in Ban MouaKhay and those in diamond mining in Democratic Republic of Congo are attracted to mining due to nearness to their homes and related work flexibility in the sector.

Table 4.8: Major factors that have led to artisanal gemstone mining

Three Major factors that have led to artisanal gemstone mining	Gender				Total Frequency	Total Percent
	Male	Percent	Female	Percent		
Owning a mine	2	3.6	4	5.5	6	4.7%
Low agricultural productivity	7	12.5	9	12.3	16	12.4%
Income and employment	7	12.5	8	11	15	11.6%
Influence by others	11	19.6	10	13.7	21	16.3%
Nearness of mines	8	14.3	11	15.1	19	14.7%
Lack of formal education/ High illiteracy levels	12	21.4	21	28.8	33	25.6%
Possessing prior training/ experience in mining	5	9	7	9.6	12	9.3%
Availability of markets for gemstones	4	7.1	3	4	7	5.4%
Total	56	100	73	100	129	100%

Source (Field survey data, 2017)

Artisanal female miners have also participated in gemstone mining due to presence of simple tools and equipment that can be accommodated by the women compared to small and large-scale sectors that use heavy machinery that are a challenge to women in terms of handling. Environmental challenges such as drought have affected farming and livestock keeping in the area. Most women in Mwatate sub-county were involved in livestock keeping but the absence of rains pushed them to mining. KII#2 noted that some female miners were pushed to the sector because their spouses came back home without an income after leisurely spending the money.

4.3.2 Duration in Artisanal Gemstone mining

Artisanal miners have a local understanding of geological formations in which gemstones occur through a mix of tradition and observation, which is perfected over a period of time. The study found out that majority (56%) of the miners had 1 to 5 years of experience while 44 per cent of the miners had over 6 years of experience. Two of the respondents from the study had been engaged in the sector for less than one year as shown in Table 4.9. Unlike other industries that foresee formal education as a major drive to employment, artisanal gemstone mining values experience as the major drive in the sector due to acquisition of local knowledge and skills over time.

Table 4.9: Number of Years in Artisanal Gemstone Mining

Number of years in Artisanal Gemstone mining	Frequency	Percent
1 to 5	28	56.0
6 to 10	11	22.0
11 to 15	2	4.0
16 to 20	3	6.0
21 to 25	3	6.0
31 to 35	1	2.0
36 to 40	2	4.0
Total	50	100.0

Source (Field survey data, 2017)

The more experience one has in this sector, the more skills and informal knowledge one acquires. The study further investigated if the miners have gained skills and knowledge based on their years of experience. Cross tabulation results in Table 4.10 shows that out of 50 respondents, 2 of the respondents with less than a year of experience have not acquired adequate informal skills in the sector while the rest of the respondents with more than a year of experience have gained adequate informal skills needed at different production phases.

Table 4.10: Number of years in AGM- AGM skills Cross tabulation

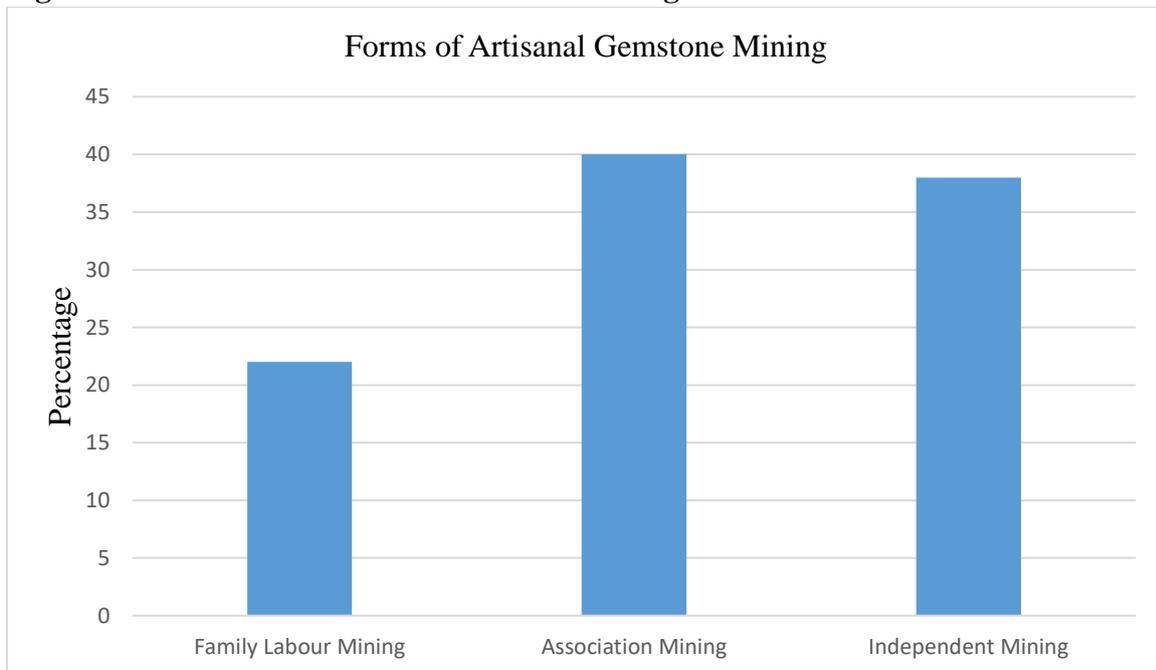
Number of years in Artisanal Gemstone Mining	Do you have any artisanal gemstone mining skills?		Total
	Yes	No	
1 to 5	26	2	28
6 to 10	11	0	11
11 to 15	2	0	2
16 to 20	3	0	3
21 to 25	3	0	3
31 to 35	1	0	1
36 to 40	2	0	2
Total	48	2	50

Source (Field survey data, 2017)

4.3.3 Forms of Artisanal Gemstone Mining

The study sought to investigate the various forms of artisanal gemstone mining in order to understand the nature of gender relations in different forms of artisanal gemstone mining. Artisanal gemstone mining takes place in various forms: individually, under group units, family units or associations. The study found out that majority (40%) of the artisans in the area mine under associations, 38 per cent mine independently while 22% of the miners mine under family units as illustrated in Figure 4.4. This supports an earlier study by Anyona & Rop (2015) that most artisanal gemstone miners in Taita Taveta county, form associations to protect themselves from the external factors that affect the sector. Artisans who mine under associations, groups or family units mine under a common consent that helps them mine effectively under a well-organized structure.

Figure 4.4: Forms of Artisanal Gemstone Mining



Source (Field survey data, 2017)

There is a major difference between mining in groups and associations in artisanal gemstone mining. An association is a legal institution in the community that comprises of different groups while groups can either be under an association or operate as informal entities. According to KII#4, most artisans form associations that organize and govern the activities involved in the sector, while others, mine in groups to help each other in different productions phases. Majority of the artisans prefer mining under associations to have an access to licencing permits. An example of an association existing in the area of study is

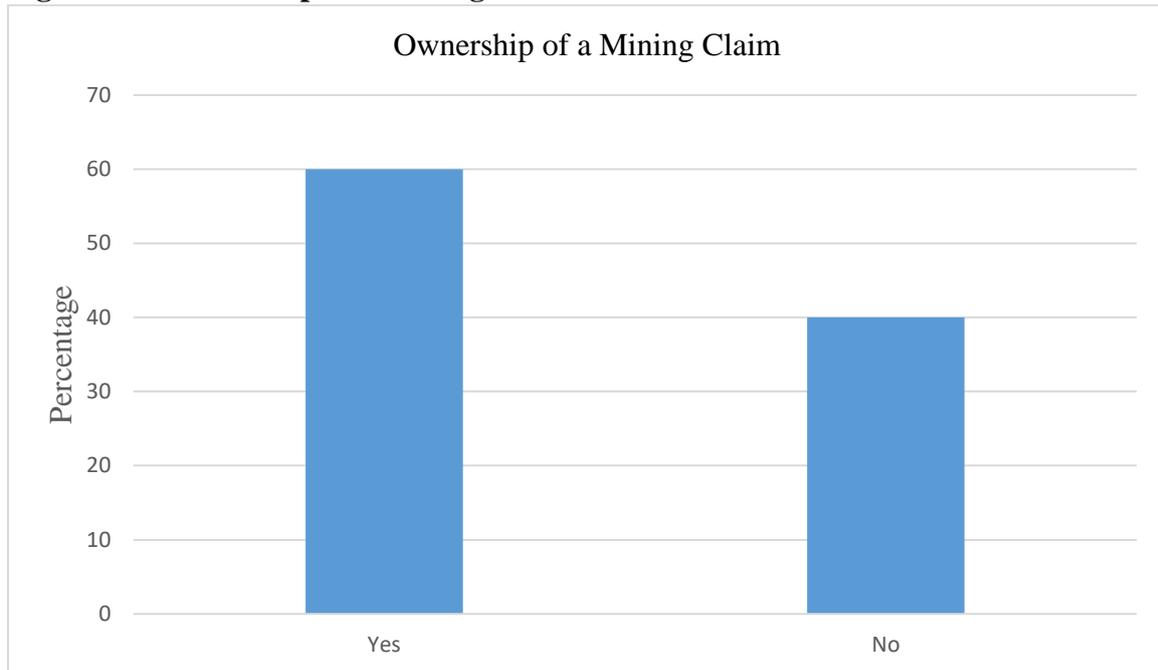
Chawia Minerals Company. The company is an association commonly referred to as Mkuki Community Based Organization (MKCBO) by the miners. The artisans mining under MCBO mine under a common consent, they pay Ksh. 5000 yearly for a mining claim. The association protects the miners from harsh political and economic insecurities involved at different production phases. The association has also set strict rules and regulations that govern the miners. One of the outstanding rules is on the protection of female miners. The rule warns against defilement of female mines at the mining sites, stating that any male miner that defiles a female miner is banned from the mines.

Most of the female miners mine under associations to protect themselves from the harsh sector that discriminates them. The female miners that mine under family units stated that family units have also protected them from gender discrimination unlike mining in groups where they experienced income disparities at the marketing phase. One of the outstanding aspect observed with miners under family units is gender support.

4.3.4 Ownership of a Mining Claim

A mining claim is a main resource of artisanal gemstone mining as it gives the miners the decision-making platform to control production processes and utilize incomes gained. Artisanal gemstone mining is not an easy venture, mine owners require a lot of financial capital to sustain them and their employees during the process. The study examined ownership of mining claims among the miners and found out that majority (60%) of the respondents own mining claims while 40 per cent do not own mining claims as shown in Figure 4.5. Most miners in Mwatate region own mining claims while those without the claims are employed. Most of the miners with mining claims have rented the claims paying Ksh. 5000 per year to the association. Mine owners without the financial capability to sustain themselves during the production processes partner with guarantors who supplies them with food, water and temporary housing while mining.

Figure 4.5: Ownership of a Mining Claim

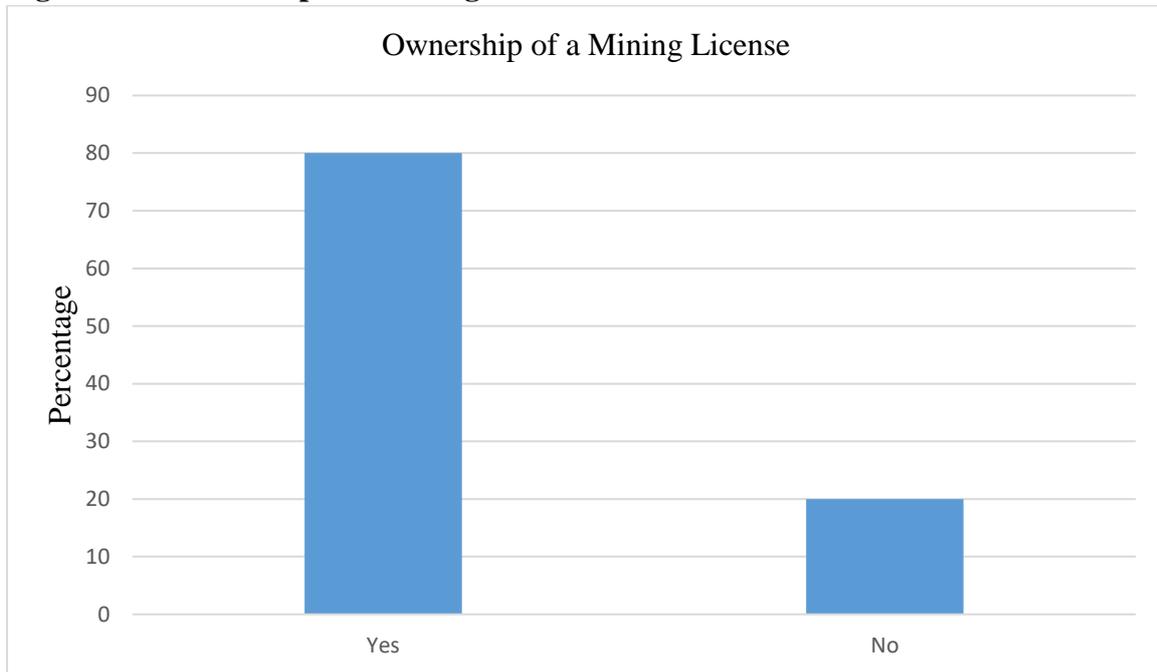


Source (Field survey data, 2017)

4.3.5 Ownership of a Mining Licence

Artisanal gemstone mining has been termed as an illegal act for the last few decades as most of the miners do not have the necessary mining permits. Acquisition of mining permits has been a challenge to most of the artisans in terms of the cost of the permits and its environmental nature of mining. Artisanal gemstone production process especially at the extraction phase degrades the land, which lowers the chances of procuring a mining permit from National Environmental Management Authority (NEMA). The study found out that out of 30 respondents owning mining claims, majority (80%) of the artisans own mining permits while 20 per cent have no mining permits as illustrated in Figure 4.6. The miners have sought to mine under associations that cater for yearly general mining permit for all the miners as well as supervising mining activities to reduce land degradation. Those without licences explained that it is expensive to acquire a licence and hence they opt to mine illegally in their own lands.

Figure 4.6: Ownership of a mining Licence

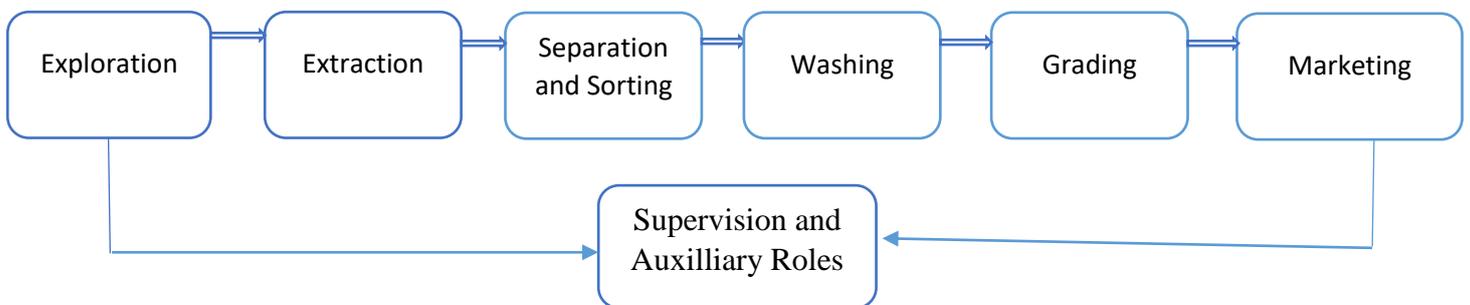


Source (Field survey data, 2017)

4.4 Artisanal Gemstone Production Phases

Artisanal gemstone mining has six production phases occurring systematically that involves direct participation of the miners and one indirect phase that supports the six direct phases. The direct phases are exploration, extraction, separation and sorting, washing, grading and marketing while supervision and indirect roles is a cross-cutting phase as shown in diagram 4.1. The study’s analysis supports Anyona & Rop (2015a) whose study also outlined six direct phases involved in artisanal gemstone mining, namely mineral exploration, extraction of the gemstone, separation and sorting, washing, shining by glycerine and marketing.

Diagram 4.1: Gemstone Value Chain



Source: (Field survey data, 2017)

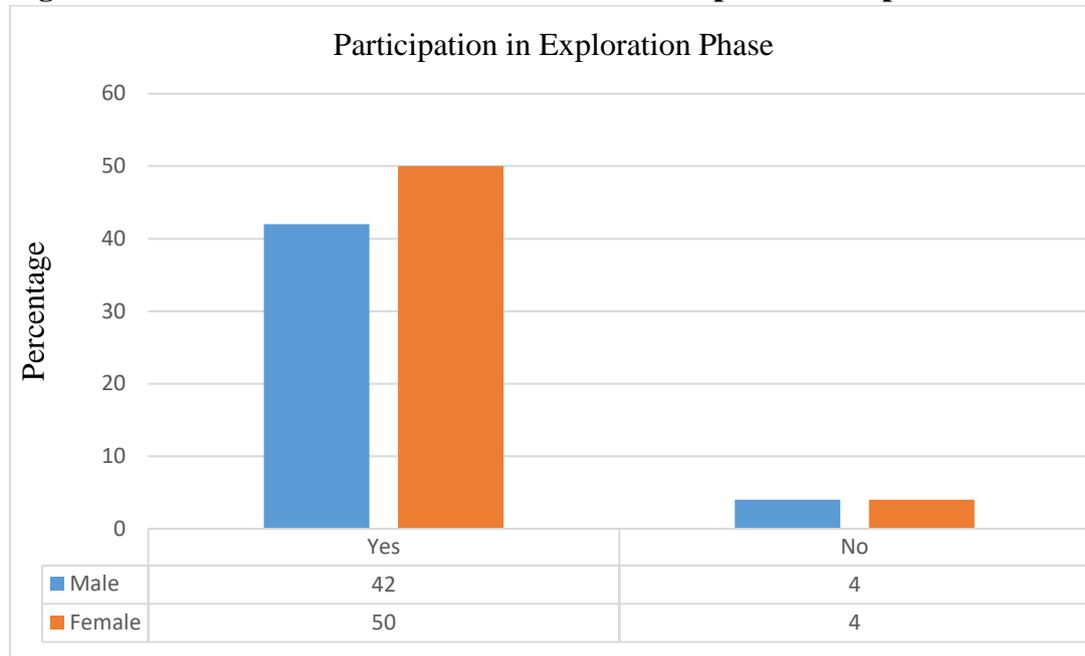
Supervision involves overseeing the production processes which is mainly done by the mine owners or guarantors who are not directly engaged in mining activities or individuals that are formal employees employed by the association to oversee the whole production process in order to report any threats that could occur at the mines. Indirect roles involves trading food and water which is mostly done by women who are directly engaged in mining activities and also few women who are not participants in mining activities.

4.4.1 Gender Roles and Responsibilities at Different Production Phases

Gender goes beyond biological distinction as it constitutes roles and responsibilities at the production processes associated with the male or female miner, which are either societally ascribed or depends on the structural organization of the group, association or a family unit. Gender roles lead to gender bias as one gender is favoured more than the other gender.

At the exploration phase, female miners are the main participants since the nature of work involved is tiring and takes a lot of time and women tend to be patient, which helps them endure the process. According to the study, when gender is cross tabulated against participation at the exploration phase, majority (50%) of the participants at the exploration phase are female miners while male participants are at 42 per cent as illustrated in Figure 4.7. There are no gender specific roles and responsibilities in this phase as both genders have similar roles and responsibilities in following and identifying the alluvial deposits on the surface. Both genders sift the red soil using a sieve to find paths that leads to alluvial deposits of the gemstones.

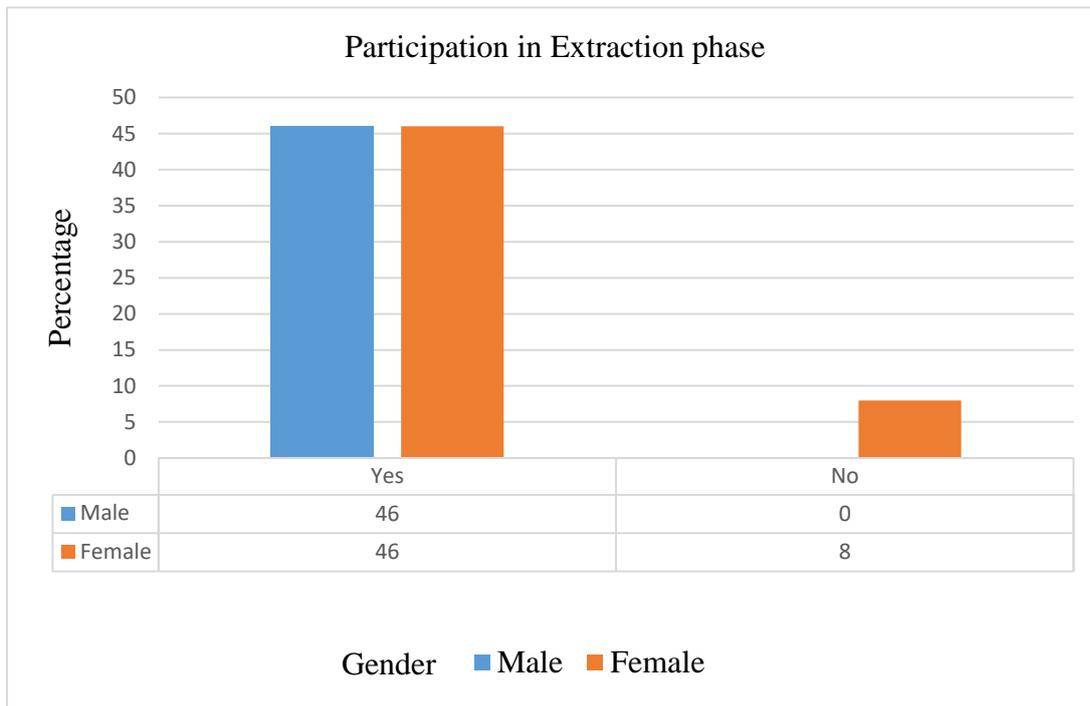
Figure 4.7: Cross Tabulation of Gender and Participation in Exploration Phase



Source (Field survey data, 2017)

At the extraction phase, underground excavation of tunnels is done to help follow paths that may lead to presence of gemstones. The process is done manually using chisels, hammers and dynamite explosives to break down rocks that block the tunnel paths. Tunnels dug out in some cases go beyond 100 metres underground with diameters that can allow crouching of the miners as they go inside the tunnels. Wasted soil and rocks are removed manually using buckets or shovels. Both genders are equally represented at this phase. A cross tabulation of gender against participation at the extraction phase revealed that both genders are equally represented as shown on Figure 4.8. However, gender roles and responsibilities vary as the male miners’ role is digging up the tunnels and breaking the rocks that block the paths. A few of the female miners participate in this similar role as their male counterparts but majority of the women manually remove wasted soil and rocks at the entrances of the mining tunnels using buckets or shovels.

Figure 4.8: Cross Tabulation of Gender and Participation in Extraction Phase

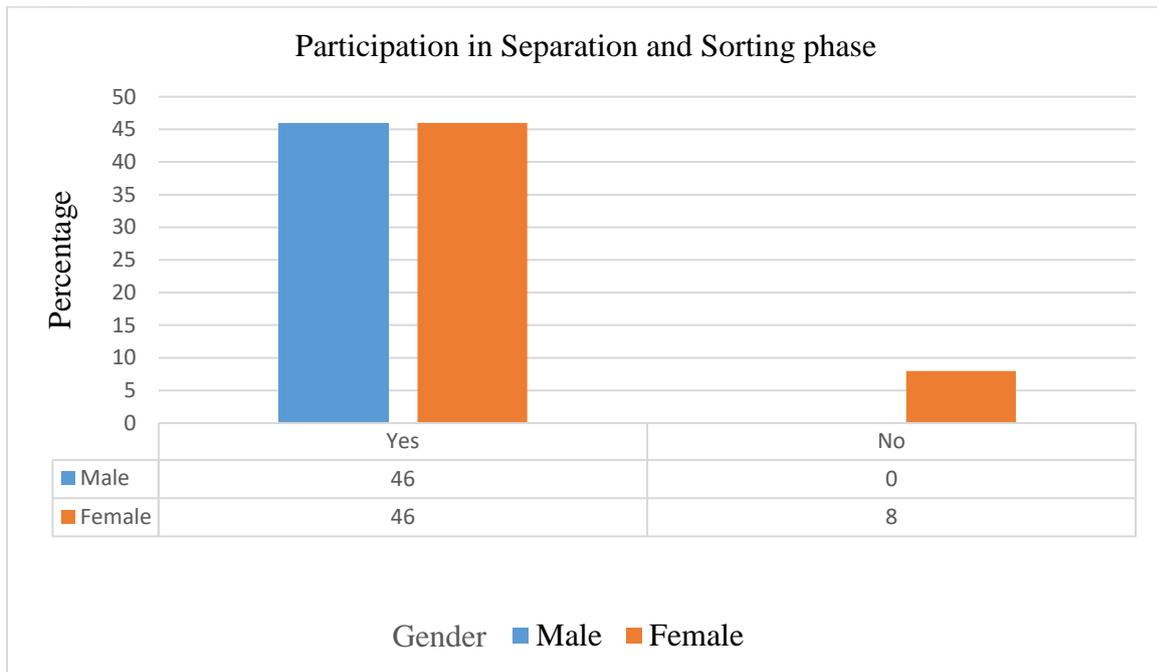


Source (Field survey data, 2017)

The female miners that do not participate in this phase are not permitted to enter the mining tunnels due to some cultural beliefs that exclude married women from working with male miners in enclosed areas. In other cases, a few female miners do not participate in the extraction phase so as to avoid direct interactions with their male counterparts inside the mining tunnels.

The next phase is separating and sorting, separating involves cutting the gemstones from its pegmatite, which is its carrier while sorting is grouping the gemstones based on quality. In terms of participation, both genders are equally represented. A cross tabulation of gender against participation at the separation and sorting phase on Figure 4.9 show that both genders are equally represented. However, gender roles and responsibilities vary. The male miners separate the gemstones from its pegmatite while the female miners’ sort the cut gemstones based on clarity. The female respondents that do not participate in the process have either no skills to separate or sort the gemstones or the process is done by the owner of the mine.

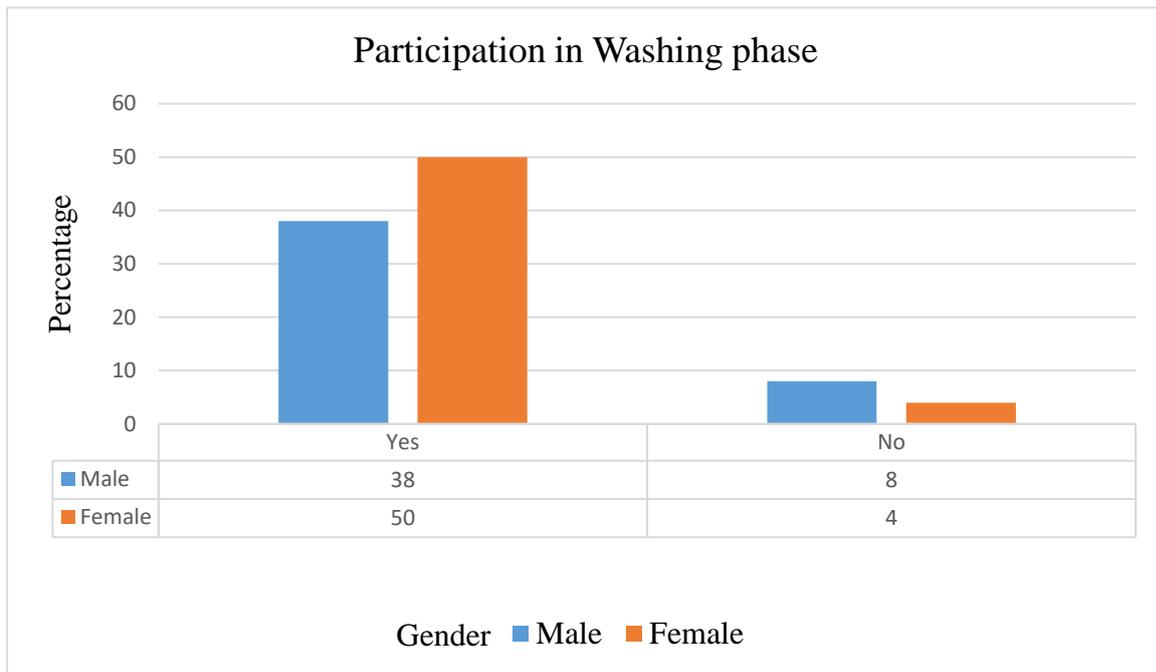
Figure 4.9: Cross Tabulation of Gender and Participation in Separation and Sorting Phase



Source (Field survey data, 2017)

Washing phase simply involves washing away dust from the gemstones to move to the grading phase. Female miners are the main participants in this phase. A cross tabulation of gender and participation at the washing phase reveals that majority (50%) of the participants are female miners as illustrated in Figure 4.10. Female role includes; transporting water to the mines to wash the gemstones while the male miners’ role is to either oversee the process or help the women to wash the gemstones. The miners that do not participate in this phase extract clear gemstones that do not require washing.

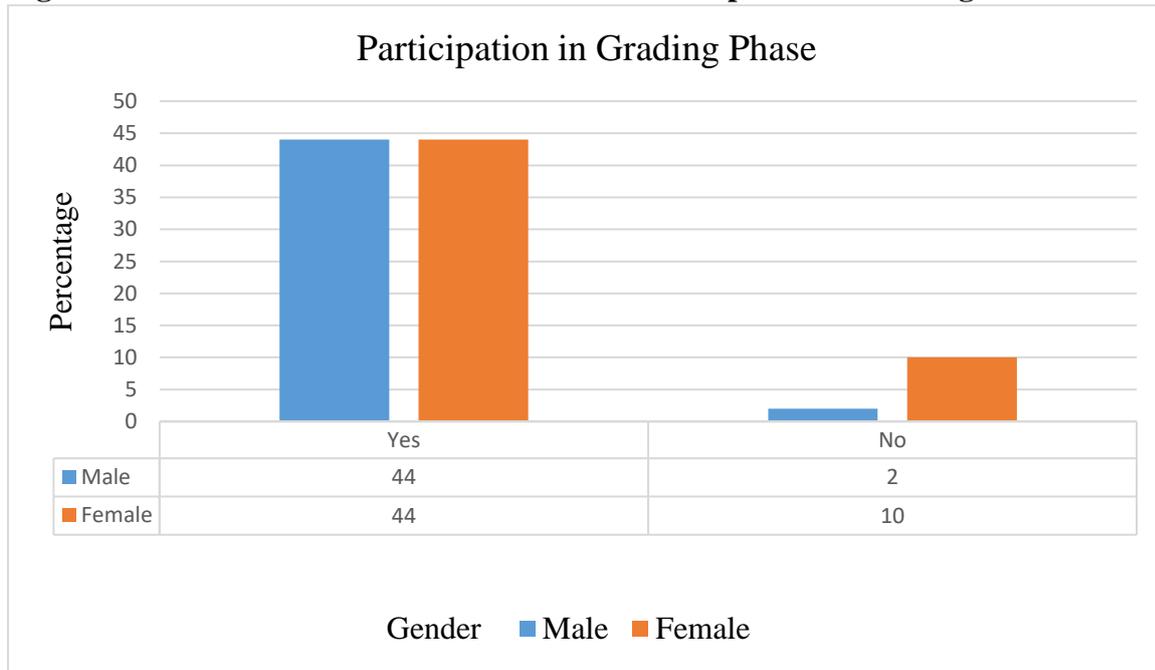
Figure 4.10: Cross Tabulation of Gender and Participation in Washing Phase



Source (Field survey data, 2017)

Grading phase involves shinning/polishing the natural gemstones using either glycerine or certain traditional leaves. Acid and heat treatment is done to improve the quality of the gemstones that have not occurred naturally. Artisans in Taita Taveta County use acid treatment while those at South Asian countries like Sri-lanka use heating treatment. Both genders are equally represented in this phase. A cross tabulation of gender and participation analysis found out that both genders are represented equally at this phase as shown on Figure 4.11. However, male and female miners have different roles and responsibilities at this phase. Male miners grade gemstones that have not occurred naturally using acid to improve colour, clarity or to remove rust while majority of the female miners polish natural gemstones without rust using oil treatment or traditional leaves for clarity. The miners who are not involved in this phase, extract clear gemstones that do not require grading to improve the clarity or colour.

Figure 4.11: Cross Tabulation of Gender and Participation in Grading Phase

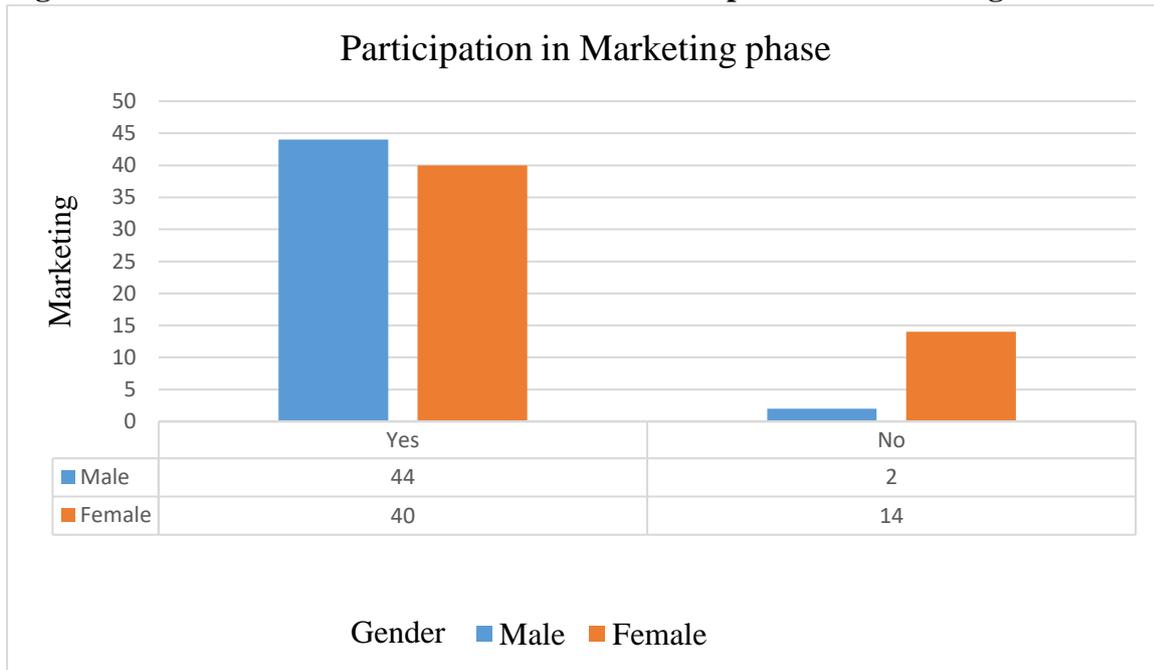


Source (Field survey data, 2017)

Marketing phase involves trading the gemstones to local brokers within the mines or to markets outside the mines. There are three types of gemstones in the market, the natural , synthetic and treated gemstones that vary in prices. The most valued gemstones are the natural occurring gemstones followed by the synthetic gemstones followed by treated gemstones. Most of the artisans prefer selling the gemstones to local brokers around the mines while few of the miners trade gemstones in Mwatate, Voi, Mombasa and Nairobi markets.

Male miners are the main participants at the marketing phase. A cross tabulation of gender against participation in the marketing phase revealed that majority (44%) of the male miners are the main participants as shown on Figure 4.12. However, gender roles and responsibilities vary depending on different forms of artisanal gemstone mining. Female miners that own mines or work under family units help their male counterparts to negotiate gemstones prices with the local brokers. Those that work under groups or associations can either negotiate the prices in the presence of a male miner or participate in setting a price tag for the gemstones, which will be later sold by their male counterparts. KII#5 noted that the female miners that are not involved in this process are represented by their male counterparts while the male miners that are not involved in this phase are represented by their employers.

Figure 4.12: Cross Tabulation of Gender and Participation in Marketing Phase



Source (Field survey data, 2017)

4.4.2 Gender Relations and Women’s Economic Empowerment in Artisanal gemstone mining

For the last decades, artisanal gemstone mining has been a male dominated industry but for the past few years, women have joined the sector in large numbers. This has resulted to existence of gender interactions at different production phases in artisanal gemstone mining. Gender relations show unequal treatment of one gender over the other based on societal norms and attributes that shape the miners’ behaviours that affect the way both genders socially interact. These relationships have also equally supported and empowered both genders when effective strategies such as gender equality measures are put in place. The study sought to investigate gender relations in artisanal gemstone mining. The results show that the nature of gender relations depends on whether one is employed, works under a family unit or owns a mine, which also determines women’s economic empowerment.

4.4.2.1 Exploration Phase

There exists gender relations due to several interactions at the exploration phase. Both genders communicate and share effective strategies on effective production. The miners share information and ideas on prospect areas with alluvial deposits which they first dig up and then follow underground mining which is the next phase. The findings revealed that there exists gender issues that arise from these interactions that affects women’s economic empowerment. Gender discrimination and cultural taboos were the main gender issues arising at the mines

that hinder women’s economic empowerment. Majority of the respondents (78%) stated that gender discrimination is one of the main issues experienced during their interactions followed by cultural values (8%) that affect women’s economic empowerment as shown on Table 4.11.

Gender relations at this phase, have been supportive for the female miners working under family units or with benevolent male mine owners. However, for some of the female miners under group units, fear working with their male counterparts thus creating minimal interactions between the genders. This fear is attributed to the fact that their male counterparts control all the processes and disregard their ideas undermining their effective potential of prospecting.

Table 4.11 : Gender Issues during Exploration Phase

Gender issues experienced during Exploration Phase	Frequency	Percent
None	5	10.0
Gender discrimination	39	78.0
Cultural values	4	8.0
Women incompetence	1	2.0
Insecurity at the mining sites	1	2.0
Total	50	100.0

Source (Field survey data, 2017)

The main form of gender discrimination pointed out in this phase was women subordination as a vital implication to gender inequality in freedom and power expression. This has affected access, power and agency, as female miners owning mines have access to resources but have no power over these resources. This finding is in line with Rop (2015) study which also noted that women have no control of land and are therefore not involved in negotiations after the discovery of deposits.

Power has been identified by literature to have an influence of control. The study found out that the male miners control the paths to follow for the identification of alluvial deposits of the gemstones therefore women are left powerless. The female miners already have the skills needed at this phase but their ideas and knowledge are disregarded hence creating gender-related conflicts. Power over resources initiates the right to make decisions which builds confidence in women to embrace the sector and work hard to be successful in the sector. Access to resources goes hand in hand with power over resources to effectively empower the

female miners. The findings further revealed that there exist decision-making disparities, as the female miners have no voice in decision-making platforms related to prospecting.

Cultural values have shaped the attitudes and behaviour of the miners hindering women’s full participation. Some married female miners are prohibited by culture to prospect with male miners, and therefore have no power of participation with the other gender.

The female miners that experience no gender issues are those that work in family units. Gender relationships at this phase are respectful and the miners work in unity. This has helped the women miners build up confidence at the mines. Female miners working under family units have experienced both access and control over the mining pits, giving them an economic boost. The female miners are able to take charge even when their male counterparts are present. KII#6 noted that some of the female miners under family units lead paths to be followed to identify the alluvial deposits.

4.4.2.2 Extraction Phase

This phase involves underground mining since gemstone mineralization tends to occur deeper and deeper in the ground. Gender interactions are intense since the phase takes a longer period of time in production and all miners are expected to participate in this phase. The main point of gender interactions is also communicating and sharing of information and ideas on effective strategies for extraction. The miners communicate on best paths to follow while digging up tunnels inside the mines and the best explosives to use to crack the hard rocks. Gender discrimination (42%) and cultural norms (46%) are the main emerging gender issues in these interactions as shown on Table 4.12. These factors affect women’s economic empowerment and performance in the sector.

Table 4.12: Gender issues experienced during Extraction Phase

Gender issues experienced during extraction Phase	Frequency	Percent
None	4	8.0
Gender discrimination	21	42.0
Cultural values and norms	23	46.0
Conflicts between genders	2	4.0
Total	50	100.0

Source (Field survey data, 2017)

Informal institutions such as cultural values play a vital role in shaping certain decisions in the society. During this phase, when a woman is in her menstrual cycle she is not allowed to work inside the mines since it is believed that, the season is uncleansed and that it would make the gemstones disappear from the mines. This cultural norm has to be respected by the residents in the area. It is a form of cultural discrimination because, extraction is the main phase in AGM, when one is absent from this phase, income disparities will be reflected at the marketing phase.

The main form of gender discrimination witnessed in this phase is unequal roles and responsibilities that results to unequal decision-making powers regarding activities performed at the phase. The miner with the most valued responsibility will always undermine the one with the less valued responsibility. In most cases, the female miners do not choose their roles as their male counterparts give them selective roles, which is a form of discrimination based on feminity that assumes that women cannot do tough or hard tasks involved in the phase. Male miners prohibit women from mining inside the tunnels allocating them, the role of removing soil from the tunnels at the entrances of the mines.

The other forms of gender discrimination are: extreme sexism such as rape and sexual harassment, over control of the process by the male miners, disregarding ideas and decisions from the female miners and lack of male support. The study observed that most female mine owners are more skilled in extraction more than their male employees but their knowledge is undermined as the women are forced to follow wrong paths while extracting just because their male counterparts decided that the group should follow the same paths. Eventually, the miners end up wasting time and resources in extraction using inappropriate paths; while the right paths that were earlier identified by the female miners are ignored. This results to these women feeling unvalued having no voice in giving out ideas that benefit the process.

Most of the female miners working under family units have husbands that support and allow them to extract inside the mining tunnels hence having access to control and act on opportunities that arise during the process. Most of the male miners encourage their wives to extract to increase productivity that improves their household incomes.

4.4.2.3 Separation and Sorting Phase

Miners at this phase, work in the same settings with different roles and responsibilities hence existence of gender interactions. The miners share skills and knowledge on how to effectively separate the gemstones from their pegmatites without breaking the gemstones. The miners decide on measures to consider while sorting such as clarity, shape/cut, colour, carat and luster. The sorted gemstones that do not meet the quality or the colour needed are either graded to improve the value or sold at a lower price. Unequal roles and responsibilities is the main gender issue as a result of gender relations existing at this phase. The findings show that unequal roles and responsibilities at 78 per cent was the main gender issue followed by 10 per cent of the respondents that pointed to lack of gemstone production knowledge among women miners as shown in Table 4.13.

Table 4.13: Gender issues experienced during Separating and Sorting Phase

Gender issues experienced during Separating and Sorting Phase	Frequency	Percent
None	6	12.0
Unequal roles and responsibilities	39	78.0
Lack of gemstone production knowledge among women miners	5	10.0
Total	50	100.0

Source (Field survey data, 2017)

Due to unequal roles and responsibilities, the female miners are excluded from the separating phase and this affects their knowledge in understanding how to separate the gemstones from its pegmatite, since for one to learn one must practice. The women either act as witnesses during the initiation then given selective roles to sort the gemstones based on the agreed characteristics that determine a valuable gemstone. According to KII#2, the male miners in the group approve the most valuable gemstones from a set of various gemstones. The male miners with more experience do not share the expertise with their female counterparts but tend to do so with their male counterparts. KII#4 noted that for the female miners that are allowed to separate the gemstones have no knowledge on separation so they end up scratching the gemstones while separating lowering its value. The rest of the miners then blame the women for destroying the gemstones.

4.4.2.4 Washing Phase

This is an optional phase for some of the miners since they extract clear gemstones that do not require washing after separation and sorting. However, for those that participate in this phase, it is the easiest stage with minimal gender interactions compared to other phases. The main points of gender interactions is discussions on sources of water and the roles and responsibilities of the genders especially for those that work in groups. The study observed that unlike other production phases there exist unity and harmony between the genders since majority of the direct participants are women that cooperate with each other while the male miners observe the process. As much as this phase is said to be the simplest phase, the positive ambiances in existence has boosted confidence for the female miners. KII#4 noted that conflicts between genders is brought by unavailability of water, some of the miners stealing some of the gemstones while washing but this has reduced compared to the past since the phase is done together as a group for transparency.

4.4.2.5 Grading Phase

Gender interactions are also present in this phase, the main point of gender interactions is communicating on the best methods to use to grade gemstones with or without rust. For the gemstones with rust, the miners share information and ideas on the best acids to use and how to effectively grade the gemstones to improve colour, luster and clarity without reducing the carat of the gemstones. The gemstones without rust are polished with different methods decided by the miners to improve the quality of the gemstones such as using the oil treatment. As a result of the interactions, unequal roles and responsibilities (66%) is the main gender issue as shown on Table 4.14.

Table 4.14: Gender Issues experienced during Grading Phase

Gender issues experienced during grading	Frequency	Percent
None	15	30.0
Unequal roles and responsibilities	33	66.0
Conflicts between genders	2	4.0
Total	50	100.0

Source (Field survey data, 2017)

Unequal roles and responsibilities results to women’s exclusion from some of the main advanced grading methods such as use of acid and over control of decisions by the male miners. Most female miners have no effective skills on grading gemstones using acids, which is the most effective method to improve the quality. Lack of these skills and knowledge is attributed to lack of direct involvement. KII#3 noted that when the female miners observe the process, they also have no power to make decisions regarding the process.

4.4.2.6 Marketing Phase

The main points of interactions is exchanging information on an effective trading process such as market prices per carat, types of gemstones incorporated in the markets, best markets to be engaged in and also how to share the proceeds among the miners. Income disparities (73.1%) arise from gender interactions in this phase especially at the group levels, followed by gender conflicts (11.5%) as shown in Table 4.15. The female miners that work under family units’ respect support and guide each other throughout the process. Conflicts tend to arise at the marketing phase in family units but the miners are able to reconcile.

Table 4.15: Gender issues experienced during marketing

Gender issues experienced during marketing	Frequency	Percent
None	8	15.4
Income disparities	38	73.1
Gender conflicts	6	11.5
Total	52	100.0

Source (Field survey data, 2017)

The female miners that trade the gemstones are women that own mines, work in family units or those with good negotiating skills. The other group of women participate in decisions regarding setting price tags on the gemstones to sell to the brokers. Unfair distribution of proceeds between genders is experienced more when a female miner is employed by either a male owner or work under a group of both genders. Majority of the female miners are given less pay compared to incomes received by their male counterparts during distribution of profits. During the times, the female miners are in their menstrual days, they are banned from the mines as these days are marked as leave days that are not considered during distribution of profits.

KII#6 noted that gender related conflicts exist due to income disparities thus resulting to most of the female miners leaving the sector. This affects women's economic levels, as they have to look for other income diversifying activities to fill in their income gaps. The female brokers that only trade gemstones but do not participate in other production phases are also discriminated by the male miners. The study observed that at the markets, the male miners prefer selling gemstones to male brokers rather than female brokers and this affects the women's incomes. The study's findings correspond to that of Rop (2015) who stated that male miners have networks for selling gemstones since they have links to brokers who are predominantly male and hence get the lion's share of the benefits.

4.4.3 Factors determining women's economic empowerment in Artisanal gemstone mining

Artisanal gemstone mining has been a male dominating sector for the past few decades but there has been changes in the sector as women have joined the sector in large numbers as a way of improving their household incomes. This has resulted to gender interactions at all production processes. The study examined factors determining women's economic empowerment in the sector, the findings showed that, factors such as control over mining claims, formal gemstone trainings, access to finance, formation of women's associations, equal roles and responsibilities and equal gender remunerations were the main measures to boosting women's economic empowerment. The study further found out that these factors result to equal access, power and the capacity to make choices that influence their economic success.

The main factors contributing to women's economic empowerment at the exploration phase were formal trainings (41%) followed by power to control mining claims (14.8%) to have decision-making platforms over the resources by giving innovative ideas as shown on Table 4.16. Formal trainings on prospecting empower the female miners economically as a way of reducing high dependency rates among the female miners on their male counterparts for informal training. There are various formal gemstone trainings offered by the county government that could boost and develop women's mining skills. Most of the female miners are not aware of these trainings but through effective communication from the county government, this would spread to most of the female miners.

Table 4.16: Measures in Exploration to improve women miners situation

Measures in Exploration to improve women miners situation	Frequency	Percent
No answer	2	3.3
Formal trainings on prospecting	25	41.0
Control over mining claims	9	14.8
Formation of women mining associations/groups	7	11.5
Beefing up security for women in mines during prospecting	6	9.8
Access to tools and equipments	3	4.9
Instilling patience in regards to the work intensity	4	6.6
One form of taxation for the whole process	1	1.6
Increased support by male counterparts	4	6.5
Total	61	100.0

Source (Field survey data, 2017)

KII#2 explained that the empowerment trainings provided to the artisanal gemstone miners by the county government include: leadership skills, geology of gems, structure of gemstones and identification, value addition, appraisal and marketing, mines and safety and financial sustainability training.

Female miners should have control over the mining claims for effective prospecting. These women will decide on paths to follow to find alluvial deposits of gemstones on the land. Female miners should work under associations that strengthen their labour force. Associations being social entities provide technical support that would increase women's economic productivity at the exploration phase. Associations will also act as social entities that protect their rights and choices in cases where their male counterparts over control them. Female miners should not solely work in mines with majority of male miners but join mines with a number of women participants so that they are able to defend each other against male miners that limit their capacity to make decisions that helps them earn their respect during this production phase. KII#3 noted that female miners that jointly work together are motivated and more courageous than the female miners that solely work with male miners.

Extraction is the main phase since it takes a longer period in production than the other phases resulting to intense gender interactions. Gender equality measures (39.4%) and access to finance (36.6%) were the main measures that improve women miner’s situation at the extraction phase as shown on Table 4.17. Equal roles and responsibilities, equal pay leave days and strict rules on sexual harassment and sexism are the main gender equality measures that will empower the female miners.

Table 4.17: Measures in Extraction to improve women miner’s situation

Measures in Extraction to improve women miners’ situation	Frequency	Percent
Gender equality measures	28	39.4
Access to finance	26	36.6
Training by geologists on extraction	7	9.9
Formation of women mining associations/groups	8	11.3
Mentorship from successful female miners to change the negative mentality instilled by the new female miners	2	2.8
Total	71	100.0

Source (Field survey data, 2017)

Unequal roles and responsibilities among genders is a major form of gender discrimination witnessed at the mines. Equal roles and responsibilities between genders gives female miners equal decision making processes as their male counterparts on resources needed, paths to be followed while extracting the gemstones and other innovative ideas during extraction. KII#4 noted that female artisans should be given the same roles and responsibilities as their male counterparts despite the work intensity. The study believes that some cultural norms existing in Taita Taveta County cannot be changed such as absence of female miners inside mining tunnels during their menstrual cycle or banned interactions between genders inside the mining tunnels. These cultural norms have deeply controlled the lives of these miners, as they believe that when women mine when they are in their menstrual cycle the gemstones will disappear inside the mining tunnels or shift deeper inside the mines. To manage these cultural beliefs, the miners should enact a strict rule on equal leave paydays especially on days when the female miners are not allowed to extract due to the menstrual cycle. The female miners should then compensate for these days that they are not allowed inside the mining tunnels by

working extra hard on other production phases such as separating and sorting, grading and marketing to show their value in the sector.

KII#6 stated that due to strict cultural norms that control participation of female miners at the extraction phase, female miners could focus more on adding value on the graded gemstones to widen their markets thus supplementing their incomes.

Despite cultural norms and values, there exists cases of extreme sexism inside the mining tunnels such as sexual harassment and rape cases witnessed in mines at Kamtonga and Chunga Unga areas that have demoralised a number of female miners resulting to these women leaving the sector. In order to reduce these rape cases, female miners should join associations that protect them against these rape crimes. KII#4 explained that there has been several rape cases that have affected female miners in some mines, which have been reported to the police service in Mwatate region, but there have been no responses to tackle these cases thus increasing the number of rape crimes.

Access to finance is key to women's economic empowerment as this phase demands a lot of inputs for production. Majority of financial institutions have viewed artisanal gemstone mining as a risky business to venture into, in terms of giving loans and insurance. This informed by the view that artisanal gemstone miners are illegal miners that are incapable of paying back the loans. This study found out that these financial institutions lack a proper understanding of the sector in terms of its strengths and opportunities since artisanal gemstone mining is a rich sector that can effectively contribute to the country's GDP.

These financial loans may not be necessarily given in terms of money but as non-monetary items such as excavators, oxygen generators, drills and jig separators, which are mechanized tools and equipment that will enable female miners to increase their productivity. KII#4 stated that female miners should change from being artisanal due to the nature of rudimentary tools and equipment they use that are unproductive to using highly mechanized tools such as compressors for extraction as it will help ease the tedious work involved during extraction.

At the separation and sorting phase, there exists unequal roles and responsibilities between genders that have resulted to limited knowledge among the female miners on ways to separate the gemstones affecting their economic potential. Majority (57.1%) of the

respondents suggested formal trainings on separation and sorting as the main measure while 26.8 per cent suggested access to finance as shown on Table 4.18.

Table 4.18: Measures in separation and sorting to improve women miners' situation

Measures in separation and sorting to improve women miners' situation	Frequency	Percent
No answer	2	3.6
Formal trainings on separation and sorting	32	57.1
Access to finance	15	26.8
Working under mining associations	7	12.5
Total	56	100.0

Source (Field survey data, 2017)

Female miners should be allowed to participate in both separating and sorting activities and should not be restricted to only the sorting phase. Unequal role and responsibilities has resulted to lack of knowledge on how to separate the gemstone from its pegmatite since the female miners are assigned the sorting role, which is also controlled by the male miners. Female miners relying on the indigenous knowledge that their male counterparts possess have no control over the process. Formal trainings can boost their participation in this phase by helping them understand an effective criterion of selecting gemstones that are accepted in the markets. These trainings will empower the women by giving them the power to control the activities and a voice in decision-making processes. Access to finances in terms of ability to acquire loans from commercial banks and micro finance institutions will help them own tools and equipments such as knockers and gloves that will highly ease the work and enable women work in a healthy environment.

At the washing phase, female miners are the main participants. Due to harsh environmental nature of the study's region, there exists lack of water, which is a challenge to female miners. Provision of water is an effective measure to boost the production at this phase. Water is a necessity not only for human consumption but is majorly used in this gemstone production phase. Most miners wash the extracted gemstones after separating and sorting while some miners wash them before separating to soften the gemstones while cutting them from their pegmatite. The female miners walk long distances to fetch water then come back to the mines to continue with the process. In most cases, the male miners skip the process when the female

miners take too long to come back with water and they proceed to the grading phase excluding the participation of these women. KII#4 suggested that the county government should provide water close to the mines at affordable prices. This will reduce the time wasted fetching water in areas that are more than 10 kilometres away from the mines as it is a main measure to empower the women in this stage.

Grading phase is a key phase especially for the female miners for economic growth and development. The study examined measures used to improve women miners' situation. Majority (66.0%) suggested value addition trainings while 15.1 per cent pointed to access of finances to acquire effective tools and equipment needed at this phase as illustrated in Table 4.19. Female miners can decide to either grade the gemstones and then trade or add value to these graded gemstones by using them in artistic activities.

Table 4.19: Measures in Grading used to improve women miners' situation

Measures in Grading used to improve women miners' situation	Frequency	Percent
No answer	10	18.9
Access to finance	8	15.1
Value addition trainings on grading	35	66.0
Total	53	100.0

Source (Field survey data, 2017)

Formal trainings to female miners on advanced value addition methods such as use of acid, polishing and heat treatment will empower women with effective knowledge and skills. The female miners will have the power to choose variety of methods depending on the nature of the gemstones for successful grading. Women are known to be diverse with innovative ideas on beauty, fashion and art, this phase gives them the opportunity to add value to the graded gemstones for artistic purposes instead of selling the raw product to increase their household incomes. KII#6 further explained that some gemstones do not occur naturally and have to be graded using acid or heating to improve the product, the value of this type of gemstones decreases thus lowering the price value. Female miners can use this opportunity by using these gemstones to enrich works in art such as paintings and carvings instead of selling the raw product. These formal trainings should also train the female miners on the health issues associated with use of chemicals to grade. There has been several injuries caused by the

chemicals used by the female miners that participate in this process. These programs should as well, give options on the best protective gears to use to avoid physical injuries affecting the female miners.

Marketing has also involved majority of female brokers who are not directly involved in other production phases. Artisanal gemstone mining is one key mining sector with unregulated market system with a number of illegal brokers that negatively affect the success of female miners. Regulation of market structures and policies (74.6%), followed by training on valuation and pricing (20.6%) were the main measures suggested to improve the economic status of the female miners as shown on Table 4.20.

Table 4.20: Measures in marketing used to improve women miners’ situation

Measures in marketing used to improve women miners’ situation	Frequency	Percent
No answer	2	3.2
Regulation of markets structures and policies	47	74.6
Training on gemstone valuation and pricing	13	20.6
Improving road infrastructure	1	1.6
Total	63	100.0

Source (Field survey data, 2017)

Regulation of market structures and policies helps to control income disparities, reduce the high number of unlicensed brokers that illegally rob gemstones from female miners and control gemstone carat prices to reduce fluctuations that occur over time and insecurities. One main market policy that governs equal proceeds between the genders at the mines can be having regular transparency and accountability meetings before trading the gemstones to have an overview of the profits to be gained and how to equally distribute the profits equally. Setting up legal markets near the mines will help female miners feel secure while trading near their mines. The female miners will no longer depend on their male counterparts to trade gemstones on their behalf thus reducing gender related income disparities. Markets that are far from the mines should also have equal fees for security for all the miners regardless of the gender.

The global market is changing and so should the market for artisanal gemstone mining. The study found out that artisanal gemstone mining lacks the trendy marketing strategies used in industries. Government and private institutions should not only invest in formal trainings on gemstone valuation and pricing but also educate the female miners on digital marketing strategies such as websites, business Instagram pages, face book business pages and WhatsApp marketing. These trainings open business opportunities for female miners both locally and internationally.

4.5 Discussion on the findings of the study

From the findings of this study, artisanal gemstone miners are older individuals with great experience on local knowledge for effective production. These individuals have high illiteracy levels. However, the illiteracy level tend not to be a hindrance to participation in the sector, and could probably be the reason for ending up in the sector. Experience and acquisition of local knowledge are the main success factors in this sector as majority of the artisans have more than six years of experience. Artisanal gemstone miners have large families that depend on this sector and the incomes generated from this sector cannot sustain these families due to the high demand of household needs. These artisans therefore increase their productions during high seasons and use the incomes gained to invest in other income generating activities to supplement incomes from the mining sector. Unlike a previous study by Anyona & Rop (2015a) that stated that one major characteristic of artisanal gemstone miners is their illegal nature. This study contradicts the findings and notes that most of the artisans owning mining claims have permits. They do not have individual permits but they join associations that provide a general permit for all members since acquiring an individual permit from the local government is expensive for the miners.

The findings reveal existence of relationship between gender relations and women's economic empowerment in artisanal gemstone mining. Gender relations are inevitable as male and female miners have to interact when participating in artisanal gemstone production processes. Gender relations is a key concept that can boost women's economic empowerment when there is support and unity from the male miners but this has not been the case from the study as these relations have largely affected women's growth and development. Female miners are present in all production processes but gender relations existing at the mines control their levels of participation. On the issue of gender roles and responsibilities, there exists unequal roles and responsibilities between the genders especially at the extraction,

separation and sorting phase and grading phase. The effects of gender relations to women's economic empowerment vary in different types of artisanal gemstone mining. At the family units, the relations are supportive and this has majorly influenced the economic potential of the female miners. Female miners at the association, group and individual levels have not experienced positive ambiances from gender relations. The main issues affecting women's economic empowerment arising from these relationships are women subordination, extreme sexism, lack of control over their mining claims, unequal roles and responsibilities and income disparities. These issues have hindered the power of female miners to make decisions related to activities involved in all phases.

Since gender relations cannot be ignored, the study sought for measures that can help control the negative impacts these relations have on women's economic empowerment. Gender equality measures such as equal access and opportunities, equal roles, responsibilities, and equal proceeds are the main factors controlling gender relations while formal trainings and access to finance are other external factors that can help women to advance in the sector.

The study is framed on the theory of access. This theory is developed from property theory that focusses on power rather than rights. Ribot & Peluso (2009) argue that rights are not enough to own resources but access as the ability to benefit from things. The findings supports this great insight that rights is not enough and that power gives individuals control over resources and decision-making platforms related to the resources. Ribot & Peluso (2009) further stated that there are two types of access; access to control and maintain access. Access to control is when dominate actors control the direction of action of the resources while maintenance of access is when subordinate actors are forced to depend on those that control access. Social relationships are among the key mechanisms that determine control and maintenance of access.

The findings supports access theory noting that gender relationships as social relationships determine the ability of female miners to benefit from the resources in artisanal gemstone mining. The findings further note that gender relations has led to domination of male miners in artisanal gemstone production processes leaving female miners powerless to either control or make decisions related to activities in the production processes. However, the theory does not give a clear conceptualization of power, is power created through negotiations or possessed by an individual. The theory has not also explained how access improves individual's capabilities.

The findings have advanced the theory to understand the concept of power. Power between genders is negotiated. Gender relations can uplift the economic status of the female miners if the relationships are bound by equal access, power and decision making processes. The findings further explain the benefits of access mechanisms; gender relationships based on equality gives female miners equal control of resources, equal roles and responsibilities and equal gender remunerations.

CHAPTER 5

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary of Findings

The study used access theory to examine effects of gender relations in production processes to women's economic empowerment in artisanal gemstone mining. Access theory proposes that power is exercised through various social relationships that enable or constrain people to benefit from resources. Rights is not enough to own resources but it is the human ability that determines access, ownership and the power to control resources. (Ribot & Peluso 2009). The study use access to natural resources, power to not only access but to control the resources, agency and participation. Analysis of the data revealed that female miners participate in production phases, have the right to own resources and a high number of female miners own mines but have no power over these resources. Lack of power to act on opportunities and the authority to make decisions in different production phases, which is highly attributed to gender discrimination and cultural values has affected women's confidence, strengths and made them weak in managing their own resources.

The main objective of the study was to examine the effects of gender relations to women's economic empowerment in artisanal gemstone mining. In order to address the main objective, the specific objectives were to: analyse the characteristics of gemstone artisanal miners, examine the gender roles at different stages of artisanal gemstone mining, investigate gender interactions, which affect women's empowerment in gemstone artisanal production processes and examine other factors affecting women's economic empowerment in artisanal gemstone mining. The study used both qualitative and quantitative methods to attain a deeper understanding of the research objectives. Snowball sampling was used, the researcher relied on the primary respondents to refer the next respondents involved in artisanal gemstone mining. Simple random sampling was then used by selecting where women are dominant in the production processes. The study used a sample of 50 respondents, 27 female respondents and 23 male respondents. Five different mining areas were selected with majority of female miners. The mining areas were: Mkuki, Mkuki CBO, Kamtonga, Chawia and Chunga Unga mines. Majority (44%) of the respondents were from Mkuki Community Based Organization (CBO) working under an association followed by Kamtonga mines with 22 per cent of artisanal gemstone miners working under family units.

5.1.1 Characteristics of gemstone artisanal miners

The study sought to analyse both the general and the mining characteristics of the sampled miners in the five mines in Mwatate sub-location. The general characteristics investigated include: age, marital status, religion, household head, household size, number of children, education level and household income. In terms of age, majority of the miners at 70 percent were above 36 years with a few miners below the 35 youth's age bracket. This shows that artisanal gemstone mining has older individuals with more experience on local knowledge for effective production, which is a contrast to other employment sectors such as the jua kali sector that majorly employs the youth.

In terms of marital status, majority of the miners at 62 per cent were married and had families that depend on them for financial provision. The results further showed that 30 per cent had females as the main household provider while 20 per cent had males as the main household provider. Women tend to give priority to their own families compared to men. Male miners are known to spend money on leisure such as drinking too much alcohol and abandoning family needs.

Due to various religious restrictions on mining, the study examined the religion of the participants and found out that 6 per cent of the respondents were from the Islamic religion. The miners belonging to this religion are prohibited from interacting with the other gender inside the mines. The female miners are not allowed to participate in the extraction phase that encourages interactions with the male counterparts but are allowed to participate in other production phases.

In regard to education, there is a high level of illiteracy among the artisanal gemstone miners since only 6 per cent of the respondents have completed secondary school. Recruitment in this sector is not based on high education achievements as seen in other industries. The success of this sector is dependent on traditional skills and knowledge gained in the industry.

Based on the contribution of artisanal gemstone mining in household incomes, most of the miners (64%) earn above Ksh.25, 000 to support their large families. In cases where these incomes do not meet the needs of the family, the miners are involved in other income diversifying activities such as farming for household consumption, part time formal employment, businesses such as shop ownership and food vending to supplement their mining earnings for saving and investment for demanding family needs.

The study examined various mining characteristics such as: factors that pushed the miners to the sector, duration in artisanal gemstone mining, forms of artisanal gemstone mining, ownership of a mining claim and licence. On the characteristic on the major factors that have led miners to artisanal gemstone mining, the study found out that majority of the miners have been attracted to this sector due to lack of a formal education, influence by family and friends and nearness of the mines to their homes. Nearness of mines to their own homes was a major contribution by miners under family units. The main factors that pushed women to this sector were: lack of a formal education and nearness of mines to their homes. Nearness of mines to their homes enable the female miners to balance household chores and mining activities.

The findings show that artisanal gemstone mining is divided into four types: individual units, group units, family units and associations. Miners under groups, associations and family units mine under a common consent while individual miners work under different consents. Majority of the miners in this study at 40 per cent work under an association that protects and governs their activities.

On the issue of owning mining claims, the study found out that 60 per cent of the respondents own mining claims while 40 per cent do not own mining claims. The miners without mining claims are employed. Miners without the financial capacity to sustain themselves and their employees during the production processes collaborate with guarantors that supports them with finances since artisanal gemstone mining requires a lot of financial capital for production inputs such as tools and equipments, food, water and temporary housing. The 60 per cent that own mining claims majority (80%) own mining permits. Acquiring a mining licence is expensive to most individual miners and this forces them to illegally mine in their own lands. Majority of the miners with a permit work under an association that provides yearly general mining licence for all the miners

5.1.2 Gender roles at different stages of artisanal gemstone mining

These phases follow each other systematically for an effective production. The phases are exploration, extraction, separation and sorting, washing, grading and marketing. Roles and responsibilities at different phases results to gender interactions with a link to women's economic empowerment. Gender representation and gender roles and responsibilities vary in different production phases.

At the exploration phase, majority (50%) of the participants are female miners since this phase requires careful exploration of alluvial deposits that is bound by a lot of patience and women tend to be patient, which helps them endure the process. There are no specific gender roles as both genders are involved in similar roles and responsibilities as they jointly follow and identify paths that show evidence of alluvial deposits.

Gender representation at the extraction phase is equal but genders have varying roles and responsibilities. The male miners manually dig up the tunnels that go beyond 100 metres underground with diameters using chisels, hammers and dynamite explosives to break down rocks that block the paths inside the tunnels while women manually remove wasted soil and rocks from the entrances of the tunnels using buckets or shovels.

At the separation and sorting phase, there also exists equal gender representation but gender roles vary. The male miners separate the gemstones from the pegmatite while female miners sort the gemstones based on carat weight, clarity, size colour and rarity.

At the washing phase, majority (50%) of the participants are female miners. The main roles of the female miners, is to fetch water from nearby towns and carry the water back to the mines to wash the gemstones while the male miners observe the process.

At the grading phase, there is also equal representation of both genders but with varying roles and responsibilities. The male miners' grade gemstones that do not occur naturally using chemicals such as acids to improve quality while the female miners' polish natural gemstones without rust using glycine or specific traditional leaves to improve clarity.

At the marketing phase, majority (44%) of the participants are male miners. Male miners trade the gemstones to local brokers while most of the female miners are involved in setting a price tag for the gemstones.

5.1.3 Gender interactions which affect women's empowerment in gemstone artisanal production processes

There exists gender interactions at all production phases but different forms of artisanal gemstone mining portray different gender relations. Gender relations at the family units in all production phases are productive since they support the economic potential of female miners. Gender relations at the association, group or individual levels contribute to gender discrimination that affects the participation of women in the sector. The study found out that a high number of female miners working under family units have proved to accelerate their economic empowerment at all production processes as they receive support from their husbands/male counterparts. Female miners that are either employed or own their own mines working independently or under associations/groups have a different view of gender relationships existing at the mines. These relationships undermine their economic potential thus forcing them to leave the sector.

At the exploration phase, the results showed that the main gender issues arising from gender interactions affecting women's empowerment were: gender discrimination at 78 per cent and cultural taboos at 8 per cent. The main form of gender discrimination experienced is women subordination affecting freedom of expression and the power to control resources.

At the extraction phase, cultural norms, values, and gender discrimination hinder women's full participation as a result of gender relations. The main experiences of gender discrimination were: unequal roles and responsibilities and extreme sexism. Unequal roles and responsibilities between genders cause lack of decision-making processes among the female miners in relation to the activities performed during extraction.

At the separation and sorting phase, unequal roles and responsibilities at 78 per cent was the main gender issue. Female miners are excluded from the separation phase given selective role of sorting the gemstones, which causes lack of knowledge to separate the gemstones.

Contrary to other production phases, at the washing phase there exists minimal gender interactions since majority of the miners are female miners and this result to minimal gender issues. The main issue facing the female miners is lack of water.

At the grading phase, the main gender issue was also unequal roles and responsibilities at 66 per cent. Female miners are assigned selective roles of polishing gemstones without rust but excluded from the main role of grading gemstones with acids. This limits their chances of

economic growth and development in terms of using the synthetic gemstones for other economic purposes.

At the marketing phase, income disparities is the main form of gender issue experienced from the interactions. Female miners are given low pay compared to their male counterparts and this force them to supplement their low incomes with other income generating activities.

5.1.4 Factors affecting women's economic empowerment in artisanal gemstone mining

The main factors analysed were gender equality measures, access to finance, power to control resources, formal trainings and formation of women associations. At the exploration phase, the main measures used to improve women miners' situation were: formal trainings and power to control mining claims and formation of women's associations. Female miners have access to these mining pits but have no decision making power over the activities.

At the extraction phase, the main measures considered to control the success of women's production is gender equality strategies, access to finance and formation of women mining associations. The main gender equality strategies that can empower women are equal access and opportunities, roles and responsibilities and decision-making processes. Access to loans helps the female miners to acquire mining tools and equipment such as excavators and oxygen generators that will increase production.

At the separation and sorting, the study found out that the main measures that empowers female miners are formal trainings and access to finances. Formal trainings are important for the female miners in terms of having the power to make decisions and equal access and control over the production.

At the washing phase, there are minimal gender issues affecting women's economic empowerment but lack of water is the main challenge hindering women's economic potential. The government should provide water at affordable rates close to the mines since it is the main resource that drives this phase.

At the grading phase, female miners have a great potential in terms of expanding their opportunities that helps to increase their household incomes. Female miners can choose to use the graded gemstones for other economic purposes such as beauty, fashion, painting and carvings instead of selling the raw synthesized gemstones. Value addition trainings are important for the women to fulfil these tasks.

At the marketing phase, market policies made at the artisanal level on the issue of accountability and transparency gives both genders the platform to jointly discuss how the profits were made and shared.

5.2 Conclusions

In conclusion, this study reinforces the theory of access, which proposes access to natural resources, power over these resources and sense of self-actualization by respecting human agency. According to the study, gender relations is a very critical concept in terms of how it affects women's economic empowerment. These relations are inevitable as they occur in all production processes. The study observed that gender relations can either empower or disempower female miners. Important to note is that gender interactions can boost women's economic empowerment if there exists equality and unity at the mines. Positive change would be strongly impacted if it starts with the behaviours and attitudes of the miners.

5.3 Recommendations

The study found out that use of rudimentary tools and equipment by the miners takes a longer period of time especially at the extraction phase, which is more expensive in terms of the labour and inputs used. The study recommends that the sector needs to be upgraded to use of mechanised tools and equipment such as excavators, oxygen generators, drills and jig separators to increase the productivity of the miners. The study also suggests that the county government of Taita Taveta County should invest more in the sector as it will financially support the county by raising its GDP.

The study also found out that most miners lack individual mining permits and hence depend on associations. Lack of individual permits is based on the nature of mining during the extraction phase that degrades the land hence limits chances of procuring mining permits from National Environmental Management Authority (NEMA). The study recommends artisanal gemstone miners to examine measures that can help reduce environmental degradation during extraction to increase chances of procuring mining permits.

The findings show that artisanal gemstone mining is curbed with unregulated market system such as illegal brokers that undermine the sector. The study suggests that the county government should have a policy that controls price fluctuation of the gemstone, which has affected the miners and also distribute trading licences to local brokers for identification to trace the culprits that affect the sector.

The study observed that most female miners work under associations. The study recommends that the associations should not only protect the female miners against external factors such as insecurities and gender discrimination but also help them advance in the sector through provision of mentorship programs. The women associations can refer new female miners to women mentors that have succeeded in the sector.

The study recommends that the county government of Taita Taveta should map out potential artisanal gemstone miners for the benefit of future researchers that are interested in doing a study on artisanal gemstone mining for them to have a listing of miners for ease of sampling and conducting research.

5.4 Areas for further Research

The findings show that family mining units support female miners. The female miners have the power to control resources and decision-making platforms related to gemstone production process even in the presence of their male counterparts unlike in association, group and individual mining. The study recommends further research to be undertaken to establish the role of family mining to economic success of women in artisanal gemstone mining.

The study observed that there is a gap between access to finance and artisanal gemstone mining. Financial institutions fear giving loans to artisanal gemstone miners since the sector has a high financial risk due to its instability nature. The study recommends further research on measures for the management of credit risk in artisanal gemstone mining.

Artisanal gemstone mining is a rich sector that can give miners high financial returns if it is well organized. The study observed that at the marketing phase, the miners rely only on the local brokers that buy gemstones from them at lower prices. The local brokers then trade the same gemstones at a higher profit with international markets. The study recommends further research on the role of digital marketing in artisanal gemstone mining.

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APPENDICES

Appendix 1: Key Informants Interview Guide

Section A: General Information

1. Name of the respondent	
2. Date of the Interview	
3. Organization (If any)	
4. Job description	
5. Contact (Optional)	

Section B: General Questions to all Key Informants

6. How can you describe women's engagement in economic activities in Taita Taveta?
7. How has artisanal gemstone mining improved the incomes of the miners in Taita Taveta County?
8. Which parts of Taita Taveta County has a large number of artisanal gemstone miners?
9. What factors have pushed women to artisanal gemstone mining in Taita Taveta County?
10. Apart from gemstone mining, what other mining sectors are artisanal women miners involved in Taita Taveta County?
11. What are the main challenges that face artisanal gemstone miners in Taita Taveta County?
12. What measures do you think can be put in place to increase support for the artisanal gemstone miners in Taita Taveta County?
13. What programs do you think can be put in place to increase support for the artisanal gemstone miners in Taita Taveta County?
14. What measures do you think have hindered the inclusion of women in artisanal gemstone mining in Taita Taveta County?

15. What measures at different artisanal gemstone production phases do you think have hindered women to benefit from the mining sector in Taita Taveta County?
16. What programs do you think can be put in place to help the women miners to benefit from artisanal gemstone mining in Taita Taveta County?

Section C: Specific questions to the Key Informants Guide

Guide 1: Director of Ministry of Mines

17. How has the extractive industries sector contributed to the growth and development of miners in Kenya?
18. Which are the main extractive industries sectors that have employed a large number of miners in Kenya?
19. What is your view on the contribution of gemstone mining to the economic growth and development of Taita Taveta County?

Guide 2: Deputy County Governor

20. Do you provide training on mining to the artisanal gemstone miners in Taita Taveta County?
21. What is the proportion of men to women miners that have attended the trainings in Taita Taveta County?
22. Which empowerment programs do you offer to the artisanal gemstone miners in Taita Taveta County?
23. How has the empowerment programs impacted women in artisanal gemstone mining in Taita Taveta County?

Guide 3: Ministry of Lands and Mines, County Chief Officer

24. What is the proportion of men to women miners involved in artisanal gemstone mining in Taita Taveta County?
25. Has the government provided licences to artisanal gemstone miners in Taita Taveta County?
26. What is the proportion of men to women that have acquired mining licences from the government in Taita Taveta County?
27. What is the proportion of men to women leasing mining claims from the government in Taita Taveta County?

28. What strategies has the government put in place to ensure that artisanal women miners have the right to own mining claims in Taita Taveta County?

Guide 4: Representatives of Artisanal Women and Men association groups

29. How has artisanal gemstone mining improved women's incomes in Taita Taveta County?
30. What are the gender roles and responsibilities involved at different phases in artisanal gemstone production process?
31. How has gender relations at different production processes influenced women's economic growth and development in artisanal gemstone mining?
32. What is the nature of relationships between the artisanal gemstone male miners and women miners?
33. How do you maintain relationships between the genders at different production phases in artisanal gemstone mining?
34. Has gender become an enabler or a discriminator among the artisanal gemstone miners in Taita Taveta County?

Guide 5: Gemstone Dealer

35. What is the proportion of men to women dealers that are you involved with in Taita Taveta County?
36. Do you offer loans to artisanal gemstone miners in Taita Taveta County?
37. If you do, what is the proportion of men to women that have received the loans?
38. What is the proportion of men to women artisanal gemstone miners that have benefited from the loans in Taita Taveta County?
39. How much do you buy gemstones from the women and men artisanal gemstone miners in Taita Taveta County?
40. Do you offer gemstone production trainings to the artisanal miners in Taita Taveta County?
41. What is the proportion of men to women that have been trained and their outcomes?

Guide 6: Regional Geologist

42. What phases seem to be easier for women compared to those for men in artisanal gemstone mining?

43. What is the proportion of men to women that have experience and mining skills in artisanal gemstone mining in Taita Taveta County?
44. How does gender differences manifest in different stages of artisanal gemstone production process?

Appendix 2: Questionnaire

Hello, my name is Ruth Waiganjo, an M.A student at the Institute for Development Studies (IDS), University of Nairobi. I am carrying out a research on *Gender Relations and Women's Economic Empowerment in Gemstone Artisanal Mining in Taita Taveta County, Kenya*.

I would highly appreciate your time spent on answering the following questions. The accuracy of the information provided will be important for the success of this study. The information provided will be used for academic purposes and will therefore be treated with utmost confidentiality. Thank you in advance for your participation.

Section A: GENERAL INFORMATION OF THE RESPONDENT

1. Name of respondent (Optional)
2. Gender
 - i. Male []
 - ii. Female []
3. Marital status
 - i. Single []
 - ii. Married []
 - iii. Divorced []
 - iv. Widowed []
 - v. Separated []
4. Age
5. Religion
 - i. Protestant []
 - ii. Catholic []
 - iii. Muslim []
 - iv. Other (Please specify).....
6. Level of Education
 - i. No formal schooling []
 - ii. Incomplete primary school []
 - iii. Primary school completed []
 - iv. Incomplete secondary school []

- v. Secondary school completed []
- vi. A level []
- vii. University Level []
- viii. Tertiary []

7. Do you have any other skills?

- i. Yes []
- ii. No []

If yes, please specify.

.....

Section B: Characteristics of Artisanal Gemstone Miners

8. Who provides for the household?

- i. Mother []
- ii. Father []
- iii. Mother and Father []
- iv. Other (Please specify).....

9. What is the total number of household members?

10. Do you have any children?

- i. Yes []
- ii. No []

If yes, how many

11. For how many years have you been involved in artisanal gemstone mining?

- i. Less than one (1) year []
- ii. More than one (1) year []

If more than one year, (Please specify the exact number of years).....

12. Do you have any artisanal gemstone mining skills?

- i. Yes []
- ii. No []

13. What type of artisanal gemstone mining contract are you engaged in?

- i. Permanent []
- ii. Temporary []

- iii. Seasonal []
- iv. Other (Please specify).....

14. What type of artisanal gemstone mining are you involved in?

- i. Family labour mining []
- ii. Independent mining []
- iii. Association mining []
- iv. Other (Please specify).....

15. Apart from mining, what other income diversifying activities are you involved in?

- i. Informal sector activities [], please specify
- ii. Formal sector activities [], please specify
- iii. Private sector activities [], please specify
- iv. Other (Please specify).....

16. What are the three major factors that drove you to artisanal gemstone mining?

- i.
- ii.
- iii.

17. Has artisanal gemstone mining improved your household income?

- i. Yes []
- ii. No []

18. How much do you earn per sale in a month from artisanal gemstone mining?

- i. Below 5000 []
- ii. 5000-10000 []
- iii. 10000-15000 []
- iv. 15000-20000 []
- v. 20000-25000 []
- vi. Above 25000 []

19. Do you own a mining claim?

- i. Yes []
- ii. No []
- iii. If No, please elaborate your answer.....

20. If you own a mining claim, do you have a mining licence from the government?

- i. Yes []
- ii. No []
- iii. If No, please elaborate your answer.....

.....

Section C: Gender Relations in Artisanal Gemstone Production Processes on Women’s Economic Empowerment

21. Which phases are involved in artisanal gemstone production process?

- i. Exploration []
- ii. Extraction []
- iii. Separation and Sorting []
- iv. Washing []
- v. Grading []
- vi. Packaging and Marketing []
- vii. Other (Please specify).....

22. Which artisanal gemstone production phases are you involved in?

- i. Exploration []
- ii. Extraction []
- iii. Separation and Sorting []
- iv. Washing []
- v. Grading []
- vi. Packaging and Marketing []
- vii. Other (Please specify).....

23. How do men and women interact in each of the following artisanal gemstone production phases at the mines?

- i. Exploration
.....
.....
- ii. Extraction
.....
.....
- iii. Separation and Sorting

.....
.....

iv. Washing

.....
.....

v. Grading

.....
.....

vi. Packaging and Marketing

.....
.....

vii. Other

(Please

specify).....

.....

24. What gender issues have you experienced in each of the following artisanal gemstone production phases?

i. Exploration

.....
.....

ii. Extraction

.....
.....

iii. Separation and Sorting

.....
.....

iv. Washing

.....
.....

v. Grading

.....
.....

vi. Packaging and Marketing

.....
.....

vii. Other (Please specify).....

.....

25. Apart from gender issues, what other issues have you encountered in each of the following artisanal gemstone production phases?

i. Exploration
.....
.....

ii. Extraction
.....
.....

iii. Separation and Sorting
.....
.....

iv. Washing
.....
.....

v. Grading
.....
.....

vi. Packaging and Marketing
.....
.....

vii. Other (Please specify).....

.....

26. If you work under an association or a group, please explain how the profits from the sale of the gemstones are distributed among members?

.....
.....

27. If you work under an association or a group, do you think income is equally distributed across gender for equal work?

- i. Yes []
- ii. No []

Please elaborate your answer.....
.....

28. If no, to question 26, what measures do you think can be put in place to ensure fair distribution of incomes among all artisanal gemstone miners?.....
.....
.....

Section D: Factors affecting women’s Economic Empowerment in Artisanal Gemstone mining

29. In which production phases of artisanal gemstone mining do you have the ability to access required resources (e.g. tools and equipments) for effective participation and exploitation of opportunities?

- i. Exploration []
- ii. Extraction []
- iii. Separation and Sorting []
- iv. Washing []
- v. Grading []
- vi. Packaging and Marketing []
- vii. Other (Please specify).....
- viii. None of the above []

If none, please elaborate your answer
.....

30. Does your male counterparts provide any form of support for example financial, material and moral support?

a. Financial Support

- i. Yes []
- ii. No []

iii. Please elaborate your answer.....

.....

b. Material Support

- i. Yes []
- ii. No []
- iii. Please elaborate your answer.....

.....

c. Moral Support

- i. Yes []
- ii. No []
- iii. Please elaborate your answer.....

.....

31. What issues do you think have hindered women at different artisanal gemstone production phases to benefit from the mining sector?

- i. Exploration
.....
.....
- ii. Extraction
.....
.....
- iii. Separation and Sorting
.....
.....
- iv. Washing
.....
.....
- v. Grading
.....
.....
- vi. Packaging and Marketing
.....
.....
- vii. Other (Please specify).....

.....
32. What measures do you think can be used at different artisanal gemstone production phases to help women miners benefit from the mining sector?

i. Exploration

.....
.....

ii. Extraction

.....
.....

iii. Separation and Sorting

.....
.....

iv. Washing

.....
.....

v. Grading

.....
.....

vi. Packaging and Marketing

.....
.....

vii. Other (Please specify).....

.....

Appendix 3: Focus Group Discussion Guide
Section A: General Information

1. No. of Discussants	
2. Geographical Location	
3. Date of the focus group discussion	

Section B: Gender Relations and Women’s Economic Empowerment in Gemstone Artisanal Mining

4. Factors that drive women and men to artisanal gemstone mining in Taita Taveta County.
5. Acquisition of artisanal gemstone mining skills.

6. Women's roles and responsibilities at different production phases of artisanal gemstone mining.
7. Benefits of artisanal gemstone mining to livelihoods.
8. Gender related issues that arise in different production phases of artisanal gemstone mining.
9. Nature of women and men relationships in different artisanal gemstone production phases?
10. Forms of support given by the men miners at the mines?
11. Measures that hinder women miners to prosper in artisanal gemstone mining.
12. Measures that can be put in place to enable women prosper in artisanal gemstone mining.
13. Programs that can be put in place by the government to support artisanal gemstone women miners.

Appendix 4: Direct Observation Guide

1. Date	
2. Time of Day	
3. Hours of direct observation	
4. Point of observation	
5. Gender	

6. What tools and equipment are used by the artisanal gemstone miners?
7. Do the artisanal gemstone miners have protective gears?
8. What phases are involved in artisanal gemstone mining?
9. What gender roles are evident at different phases of gemstone artisanal mining?
10. Are women involved in all stages of artisanal gemstone production processes?
11. What are the main points of interactions between gender at different production levels?
12. How do gender differences manifest in different phases of artisanal gemstone production processes?
13. Who controls the different stages in the artisanal gemstone production value chain?
14. Any other observations?

Appendix 5: Key Informants to the study

No.	Key Informants	Importance to the study
KII#1	Director of Ministry of Mines	Contribution of extractive industries sector to the miners in Kenya.
KII#2	County Deputy Governor's Office, Gemologist	Challenges faced by artisanal gemstone women miners. Women Economic Empowerment programs and measures that can contribute to the success of artisanal gemstone women miners in Taita Taveta county.

KII#3	Ministry of Lands and Mines, County Chief Officer	Nature of artisanal gemstone mining. Challenges faced by artisanal gemstone miners. Strategies put in place to help artisanal gemstone women miners benefit from the sector.
KII#4	Representatives of Artisanal Women and Men association groups	Gender roles at different production phases in artisanal gemstone mining. Nature of relationships between genders at different artisanal gemstone production phases. Benefits of working with both genders at different artisanal gemstone production phases. Challenges faced through working with both genders at different artisanal gemstone production phases.
KII#5	Gemstone Dealer	Market strategies used by artisanal gemstone dealers. Proportion of artisanal men to women miners at gemstone markets.
KII#6	Regional Geologist	Gender issues experienced at different stages of artisanal gemstone production process, nature of artisanal and economic viability and empowerment for women.

Source: Author

Appendix 6: Data Needs Table

Research Questions	Data Needs	Type of Data	Source(s)	Instruments
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What are the characteristics of artisanal gemstone miners?	Age Marital status Religion Income Household headship Number of children Level of education Mining experience(years) Mining skills	Numerical Quantifiable Nominal Quantifiable Nominal Interval Quantifiable Nominal Interval Ordinal Interval Quantifiable Nominal	AG miners	Questionnaire
What are the gender roles at different stages of artisanal gemstone mining?	Exploration Extraction Separation and sorting Washing Grading Packaging and marketing	Qualitative and Quantitative	AG miners	Questionnaire, Observation guide, Interview guide
How do gender interactions in production processes affect women's economic empowerment artisanal gemstone mining?	Income disparities Access and Ownership of resources Control over production processes Participation in decision making processes at the production levels	Qualitative and Quantitative	Survey Questionnaires	Questionnaire, Observation guide, Focus Group discussions, Interview guide
What factors influence women's economic	Access Agency Power	Qualitative and Quantitative	Survey questionnaires	Questionnaire, Focus Group discussions,

empowerment in artisanal gemstone mining?	Gendered Rules			Interview guide
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Source: Author