WOMEN PARTICIPATION IN ARTISANAL AND SMALL-SCALE MINING IN TAITA TAVETA COUNTY, KENYA

DAVID MUGO THIONG'O

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Women Participation in Artisanal and Small-Scale Mining in Taita Taveta County, Kenya

David Mugo Thiong'o

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DECLARATION

This thesis is my original work and has never been presented for degree in any other university

Signature……. Date …….

David Mugo Thiong'o

This thesis has been submitted for examination with our approval as university supervisors

Signature……Date …….

Prof. Florence Ondieki-Mwaura

JKUAT, Kenya

Signature……. Date …….

Dr Miriam W. Oiro Omolo, PhD

Africa Policy Research Institute, Kenya

DEDICATION

This thesis is dedicated to the memory of my beloved father, Mugo Mathaai, who believed on equality and determination, he fought a good fight. It is your shining example that I try to emulate in all that I do. To my Mom 27 years since dad departed you have been so kind and supportive, I cherish you Mama.

To my spouse Anne who has been encouraging and supportive throughout my career and my Sons Wesley, Adrian and Myles who bring me back to the reality of balancing family and career.

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ABBREVIATIONS AND ACRONYMS

ASM	Artisanal and Small-scale Mining
CLO	Customary Landowners
DAWN	Development Alternatives with Women for a New Era
DfID	Department for International Development
GAD	Gender and Development
GDP	Gross Domestic Product
KNBS	Kenya National Bureau of Statistics
MDGs	Millennium Development Goals
OECD	Organization for Economic Cooperation and Development
OLS	Ordinary Least Squares
PCA	Principal Component Analysis
SDGs	Sustainable Development Goals
SDGA	State Department of Gender and Youth Affairs
SPSS	Statistical Package for Social Sciences
UNDP	United Nations Development Programme
WAD	Women and Development
WAMs	Women Artisanal Miners

WID Women in Development

OPERATIONAL DEFINITIONS OF TERMS

Artisanal Mining	Means traditional and customary mining operations using traditional or customary ways and means (Rijksoverheid, 2015).
Artisanal Permit	A license allotted to artisanal miners involved in traditional and customary mining operations using traditional or customary ways and means, and which authorizes the holder to carry out small-scale mining operations (Analysis of the Mining Act, 2016).
Mining Value Chain	Alludes to consecutive stages in the mining business life cycle, including investigation and improvement, creation, treatment, transportation, refining or other beneficiation and circulation (Rijksoverheid, 2015).
Gender	Alludes to socially developed meaning of women and men. The origination of errands, capacities and jobs credited to women and men in the public arena and in public and private life (Bashwira, Cuvelier, Hilhorst and van der Haar, 2014).
Mining Bond	A compulsory money or money payment that might be expected of a mineral right holder as assurance for the due execution of an affirmed mining programme (Alba, 2009).
Mineral Dealer/Dealings	Any substance or individual authorized to complete mineral dealings. Mineral dealings mean purchasing, offering, bargaining, keeping or getting minerals as a vow or security or culling, cleaning, preparing, refining and treating minerals (Rijksoverheid, 2015).
Mining Permit	Means a license granted as per Act, which authorizes the holder to do small-scale mining operations (Rijksoverheid, 2015).
Mineral Deposit	Means a mass of normally happening minerals of financial value.
Mining Operations	Means an activity completed regarding a mineral from where it jumps out at concentrate metal or valuable mineral or to discard a mine waste or tailings coming about because of winning,

	extraction or donation.
Reconnaissance	Means the activities and attempts to do the non-meddling quest for mineral assets by geochemical reviews, photograph geographical studies or other remote detecting; however, avoids boring and unearthing.
Reconnaissance Permit	This is provision of mineral rights to the holder to enjoy non-exclusive rights to conduct reconnaissance for minerals in the area specified by the permit.
Socio-Cultural Practices	They are the, distinctive, spiritual, material, intellectual and emotional features that characterize a society or a social group.
Precious Stones	These are visually appealing gemstones created from rocks or minerals. Gemstones are considered precious since they are all rare and there is a limited supply of them. They include Diamond Ruby, Sapphire, and Emerald.

ABSTRACT

The Artisanal and small-scale mining sector plays a significant role in the development of the Kenyan economy. For instance, this sector contributed 0.4% of the national gross domestic product in the year 2016. Despite the significant involvement and contribution of women to the Artisanal and small-scale mining sector, women have not fully benefited from it. Therefore, the purpose of this study was to determine the level of women participation in the artisanal mining sector and establish the factors influencing their level of participation using a case of Taita Taveta County, Kenya. Specifically, the study sought to investigate the effect of Social-Capital cultural practices on women participation, to investigate the effect of mining legal framework on women participation, and to determine how access to financial capital affects women participation in artisanal and small-scale mining in Taita Taveta County. The study was guided by the Theory of Empowerment and the Social-Capital theory. The study used cross-sectional research design and targeted where a total of 146 women were selected using stratified sampling technique to participate in the study. Semi-structured questionnaires were used to collect individual-level data from the respondents and the information triangulated with findings from key informant interviews and Focus Group Discussion. Descriptive statistics such as mean, standard deviation, percentages, and frequency distribution table and inferential statistics like correlation, regression, and hypotheses tests were used to analyse data. Correlation statistics were conducted using Pearson's approach while Ordinary Least Square method was adopted in regression analysis and T-test for independence was used to test the hypotheses. The findings indicate that socio-cultural practices such as attitude about women's role, and gender-based biases against women have adverse effect on women participation in Artisanal and small-scale mining. In addition, the study has established that mining legal framework determines women participation in Artisanal and small-scale mining. Specifically, the requirement for mining permits has a positive impact on women participation while the process of obtaining the permit has a negative effect. Understanding of the mining law was insignificant. Furthermore, the study has found that accessibility to mining tools and equipment, and access to skills and knowledge on finance affects women participation in Artisanal and small-scale mining negatively. The study concluded that socio-cultural, legal practices and financial capital determine participation of women in Artisanal and small-scale mining in Taita Taveta County. It is recommended that, to improve women's position in the Artisanal and small-scale mining sector, there is need to educate and train women on use of better mining tools/machines, help them get mining license, get access to financial systems where they can get affordable credit, and engage them in leadership positions so that they can champion for their rights in the Artisanal and small-scale mining sector.

CHAPTER ONE

INTRODUCTION

1.1 Background

Artisanal and small-scale mining (ASM) is a labour-intensive industry that involves less venture and skills to take part in (Maclin, Kelly, Perks, Vinck and Pham, 2017). The process involves the use of simple tools such as picks, shovels, chisels and hammers to exploit precious minerals and metals from the ground (Eftimie, Heller, Strongman and Hinton, 2012). This mostly occurs in many emerging nations around the world and provides a source of livelihood to many impoverished local people in areas where it occurs (Bansah, Duamkor-Dupey and Sakyi-Addo, 2017).

Globally, the World Bank estimates that more than 100 million individuals benefit from ASM, which mainly occurs in emergent nations in Asia, Africa, Oceania and South and Central America (Hilson and McQuilken, 2014). ASM supports hundreds of millions of livelihoods and has grown immensely in recent times from a projected 10 million mineworkers in 1999 to hundreds of millions two decades later. Along with the growing recognition of the socio-economic importance of artisanal and small-scale mining is the realization that gender inclusivity is key to the success of efforts to toughen mining as a financial sector in need of support (GrOW, 2017).

The mining sector in Africa and specifically Kenya were designed and promoted under the Swynnerton plan in 1954, the goal of this particular plan was to ensure compliance with navigation Acts and related policies and Laws which has been a challenge however, ASM offers equal economic growth opportunities for governments and communities. It is estimated that there are more than 8 million artisanal and small-scale miners in Africa (Lahiri-Dutt, 2015). In most areas of Sub-Saharan Africa, ASM has overhauled smallholder farming as a principal livelihood activity (Verbrugge, 2015). For instance, in Sudan, ASM has a significant contribution to the national economy because it

accounts for about 85% of total gold extracted yearly from 2010 to 2015 (Ibrahim, 2015). According to the Embassy of Sierra Leone in Washington DC in the United States of America (USA), 90% of mineral exports in Sierra Leone can be attributed to thriving artisanal diamond mining in the country (Bansah *et al.,* 2017).

According to the Mining Act 2016, the mining segment in Kenya contributes about 0.4% of Gross Domestic Product (GDP). In April 2016, the Ministry of Mining launched the Mining and Minerals Policy that sets out the structure for mining movement and supports the new Mining Act of 2016. The Mining Act represents the development of a modernized legislative framework which, for the first time, introduces a grid system to limit mineral rights disputes due to overlaps in licensed areas. There is additional clarity on the license and permit classes, procedures, and conditions that lead to revocations and suspensions. The new law also provides structures for negotiating mineral agreements and stipulates those mineral agreements should include terms and conditions for minimum activity and spending for work programmes, structure for payments (i.e., royalties, fees, etc), and other provisions.

The Mining Act 2016 recognizes artisanal and small-scale mining activities and has provided clear procedures for ensuring safe activities, which is a departure from past enactments that banned artisanal mining. This law has provided a stage for more secure mining activities while enabling more profits from minerals in the localities of the miners (International Energy Agency, 2012).

Artisanal mining operations in East Africa are mostly confined along the coastal region of Kenya in Taita Hills, going across Tsavo, Kasigau and Kuraze areas, and to the Umba Valley of Northern Tanzania (Eftamie and Strongman, 2009). The Taita Taveta County in Kenya is gifted with one of the wealthiest minerals deposits in Kenya and in the Eastern Africa region (Mwakumanya *et al*., 2016). The County is presently the primary source of Tsavorite in the world. Among other minerals available in the County are marble from the east of Mwatate, building stones and sand. Table 1.1 presents a summary of minerals at the Kenya coastal region.

Table 1.1: Summary of Mineral Occurrence at the Kenya Coastal Region

County	Minerals
Taita Taveta	Iron Ore, Gemstones, Manganese, Graphite
Kwale	Gemstones, Titanium, Nibium
Kilifi	Titanium, Manganese, Gypsum, Gemstone
Tana River	Gypsum

Source: Ministry of Petroleum and Mining (2016)

The mining sector in Kenya falls under the Ministry of Petroleum and Mining, State Department of Mining. Part of the mandate of the ministry is to issue mining license to any person or entity for large scale operations or issuing out mining permits for small-scale operations (see Table 1.2). The issue of the licence of permits gives out mining rights. Artisanal mining operations are now lawful under the new legal framework. Essentially, they are reserved for citizens of Kenya, individuals, groups, cooperatives or associations (Analysis of the Mining Act, 2016).

Table 1.2: Mineral Rights for Artisanal Miners as Defined by the Mining Act 2016

Type of Permit	Meaning
Reconnaissance Permit	This permit provides the holder with non-exclusive rights to conduct reconnaissance for minerals in the area specified by the permit.
Prospecting Permit	The prospecting permit for artisanal and small-scale operations authorizes its holder to carry out prospecting operations.
Mining Permit	This is given according to the Mining Act, which gives consent to the holder to do small scale mining operations.
Artisanal Permit	This is issued to artisanal miners involved in ancient and customary mining operations using ancient or customary ways and means.

Source: Ministry of Petroleum and Mining (2016), The Local Content Bill 2016

Artisanal miners are governed by Section 95 of the Mining Act of 2016. The Cabinet Secretary appoints a Director of Mines representative at the county level, who reports to

the Director of Mines. Artisanal Mining Committees are established in every county and include representatives from both National and County governments. The task of the Committee is to advise the person representing the Director of Mines on the issue, renewal or cancellation of artisanal mining licenses (Government of Kenya, 2015).

1.1.1 Establishment of Offices in the County

According to the Kenya Mining Act 2016, the Cabinet Secretary establishes a County office of the Ministry and appoints a Director of Mines representative who heads the County office and reports to the Director of Mines. The functions of the officer include: granting renewal and revoking artisanal mining licences, compiling a register of the artisanal miners and stipulating details that can be decided by the Cabinet Secretary, and overseeing and supervising the operations and activities of artisanal miners.

Other responsibilities include guiding and giving training amenities and helping in essentials for effective and well-organized artisanal mining processes and submitting to the Director of Mines reports or other documents and information on artisanal mining activities within the county as prescribed in the regulations. The office also facilitates the creation of artisanal organization setups and encourages reasonable trade by artisanal miners. The county offices provide access to artisanal and small-scale miners who would like to apply for permits. This was initially centralized in Nairobi but, in the wake of devolution, this has been devolved to counties.

1.1.2 Artisanal Mining Committee

The Mining Act 2016 establishes an Artisanal Mining Committee in every county. The committee advises the person representing the Director of Mines on the issuing, renewal or cancellation of artisanal mining permits. The members of the committee are in office for a certain time and on such terms and conditions determined in the instrument of appointment. The committee comprises a representative of the Governor, who serves as the committee’s chairperson, the Director of Mines representative who is the secretary,

three persons not being public officers and elected by the association of artisanal miners in the county, a representative of the inspectorate division of the Ministry, a representative of the National Environment Management Authority (NEMA), and a representative of the County Land Board. All artisanal miners, including those of women gender, can apply for permits or appeal for revoked permits.

1.1.3 Qualification of ASM Applicants

According to the Kenya Mining Act 2016, the requirement of applicants for an artisanal mining license is given to individuals who are Kenyan citizens and have reached of age; and may be an affiliate of an artisanal mining cooperative association or cluster. The application for an artisanal mining permit should contain the name, nationality and address of the applicant; the name of cooperative, association or group; area of registration and the registered office address; the minerals through which permit is pursued; description of the zone through which the license is pursued; and the landowner's consent, which is obtained where the land is not designated as an artisanal or small-scale mining area.

The representative of the director of mines shall give notice to the applicant either to allow or refuse the application within the prescribed time. A permit granted by the director of mines representative shall be for the specified mineral in the application and shall be subject to conditions specified in the permit. The ASM permit granted under this Act is substantial for a three years' period from the date of issue and shall be renewable upon application for another term. A holder of an artisanal mining permit can apply to alter it to a small-scale permit in a manner as may be prescribed in regulations. The representative of the Director of Mines may revoke a permit granted where the holder of the permit contravenes the terms and conditions of the permit or is convicted of any felony related to smuggling or illegal sale or dealing in minerals.

1.1.4 Women's Roles in ASM and Participation in Value Chain

Mining value chain refers to sequential stages in the mining industry life cycle, including exploration and development, production, treatment, transportation, refining or other beneficiation, and distribution (Rijksoverheid, 2015). The methodology centres on the vertical connection among purchasers and venders and the development of a good or service from producer to customer (Johnson *et al*., 2010).

Women in Kenya are an important part of artisanal mining, taking on roles from panning to processing and then trading of goods and services in the value chain (see Figure 1.1) (Omolo, 2014). Female's participation varies by country and mineral, and despite the challenges they face, an initial analysis established that women participate in the extractive industry value chain (Tschakert, 2009).

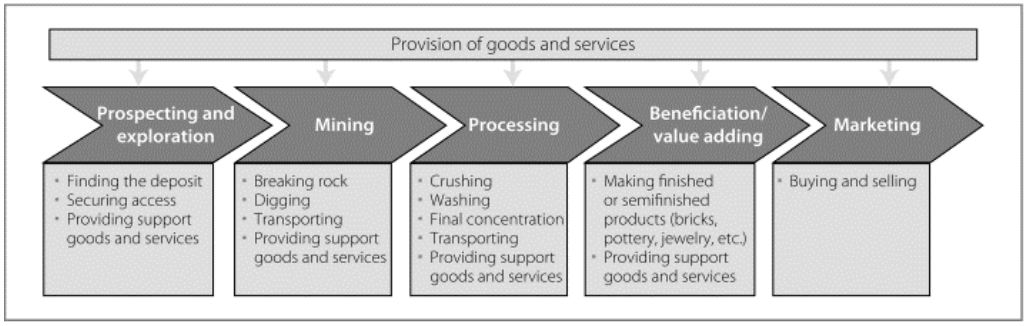

Figure 1.1: Artisanal and Small-scale Mining value chain

Source: Buss *et al*. (2017)

Figure 1.1 show various stages, merchandise and enterprises on artisanal mining. As indicated by the World Bank examination on understanding women's roles in ASM, through a contextual analysis on women in ASM, crosswise over Africa and Asia (Kipsang, 2014), the study recognized that women's contribution changes by nation and mineral. However, women regularly go up against a scope of undertakings inside ASM mining activities, including burrowing, panning, handling, transporting, pulling, cooking and cleaning. Women's commitment is regularly focussed around lower paying

activities, bring down their morale and their commitment normally drops as the level of association and mechanization goes up (Susapu and Crispin, 2000). In this manner, women's roles are generally less advantageous and productive than the different roles commanded by men (e.g. owners, managers and sellers).

The mining sector is a male-dominated industry when contrasted with other sectors in Africa. Nearly 30% of the global artisanal are women and youth involved in numerous jobs ranging from work concentrated mining techniques to the handling part of distinctive mining (Mwakumanya, Maghenda and Juma, 2016). By and large, the roles of women and youth in artisanal mining vary extensively from the ones of men and include mostly support in mining activities, which are regularly disregarded and paid lowly (Anyona and Kipsang, 2015).

Social convictions and customs unequivocally impact communications among people and gatherings, the nature of network association and societal guidelines or standards. These variables are basic not only in sexual orientation roles, and for the degree to which distinctive mining impacts and benefits social orders. Societies generally have moderately solid solutions for people's roles in the residential and network circles (Hinton, Kabongo, Kabiswa, Okedi and Mbabazi, 2003). Considering gender roles, women consistently do not have a break even with proprietorship or rights over assets; they are as often differentially connected with essential authority, and women are by and large ineligible to settle on individual choices or their family lives. Regarding their various jobs and capacities, individuals may be differentially impacted by the fragment itself or by changes or tasks in the business (Bashwira *et al.*, 2014).

Artisanal mining is poorly regulated and often not taxed, and artisanal miners are exploited by companies that buy their produce cheaply. The use of child labour and mercury in small-scale mining are critical human rights and health issues that need to be addressed. Although the legalization of artisanal mining in Kenya's new Mining Law 2016 (Analysis of the Mining Act, 2016) provided a great opportunity for artisanal miners, there is need to engender the process to streamline the challenges, which

include: environmental dilapidation, bad health and well-being records, prostitution, disease and child labour (Siwale and Siwale, 2017).

The obstructions on women's territorial rights prevent their capacity to access assets, and are unable to use land as collateral to get credit. Women face challenges of receiving elective advancements and contracting work when required. What is more, women are not able to get to other steady administrations, for example augmentation projects and preparing on imaginative land administration approaches (Anyona and Kipsang, 2015). Although women involve themselves in ASM, men embrace governing and proprietorship of most assets and financial capital. Evidence shows that land (including mining zones) and proceeds from mining and other activities are largely owned by men. Men own mining and farming tools, homes, crops, and in some cases even youngsters are principally claimed and controlled by men (Eftimie *et al.,* 2012). Additionally, the advantages from these assets, prevalently accumulate to men (International Energy Agency, 2012).

1.2 Statement of the Problem

The emergence of the ASM sector in Kenya presents an opportunity for development in the country. The sector offers a chance to potentially transform the economy through employment and income generation, especially to those in the lower income group, and hence poverty alleviation. It is evident that there is significant involvement and input of women to the artisanal and small-scale mining sector globally (Hinton *et al*., 2003). Women play a much more substantial role in artisanal and small-scale mining as workers or providers of support roles (e.g., as chefs and service providers). However, a growing body of evidence reveals that women have not fully benefited from the ASM since they mainly operate at the lower level of the value chain, with dismal returns or benefits (Maclin *et al.,* 2017). In addition, women have minimal participation in decision-making in the sector (Yakovleva, 2007).

Auxiliary obstructions reduce women's capacity to completely take an interest in and advantage in ASM (Buxton, 2013). The obstructions include a myriad of social-cultural taboos that keep women from entering mine locales or taking part in some roles, and women's domestic chores such as cooking, gathering water, and taking care of families. In some countries, a woman is not allowed to work underground or get inside a mine site if menstruating (Mkubukeli and Tengeh, 2016). Lack of proper legislation and legal framework system keeps women from controlling their proceeds from ASM activities; the area is unregulated and subsequently connected with corruption, complicated bureaucracy, and misuse by middlemen (brokers) and this problem is mostly related to women who want to get involved with proceedings at the activity. Women are also constrained from access to assets such as land, and the males who head households often control family finances and financial credit (Siwale and Siwale, 2017).

Majority of women in Taita Taveta County live in the countryside and are mainly engaged in subsistence farming (Government of Kenya, 2015). According to the Kenya National Bureau of Statistics (KNBS, 2017), the county is ranked at position 28 among the poorest counties in Kenya with a poverty rate of 54.0%, which is extremely higher than the national average of 36.1%. With the emergence of ASM, most women have switched from agriculture lands to ASM for job opportunities, livelihood and economic opportunities (Mpagi, 2017).

Given the important role of women's involvement in economic activities through provision of labour, ownership of production inputs, direct participation in production process, and carrying out the household chores (Mwakumanya *et al.*, 2016), there is need to understand the local gender dynamics, detachments and encounters around the ASM sector. This calls for stakeholders to recognize the gender dynamics at all stages of the ASM value chain prior to developing ASM assistance strategies and/or programmes, and the need to mainstream gender in artisanal and small-scale mining sector (Rijksoverheid, 2015). This would go a long way in providing opportunities for viable employment among women in the rural areas, which in turn would significantly reduce the levels of rural poverty by involving women in development (Yakovleva, 2007).

From existing literature, the role of women in ASM and towards economic empowerment, and the extent of women participation in the sector has been made very clear that women involvement is not at the best describable and desired levels despite the clear show of desire by many women to participate in the activities involved in the ASM sector. This has been discovered and reviewed by a few studies conducted in and around our Kenyan region. Studies in Kenya, Tanzania and the Democratic Republic of Congo (DRC) have linked cultural practices, insufficient capital and legal framework as key impediments to women participation in the ASM sector. However, many of these studies are based on desktop review and not empirical findings. In addition, these studies have paid limited focus to aspects such as the influence of role models, attitude about women role in mining, artisanal mining permit requirements, and skills and knowledge required of women in the sector, for which the current study has examined in detail.

According to a study published by the International Labour Authority in 2021 women have less decision-making authority and fewer educational and economic opportunities in mining compared to men. Women comprise 11% of the people in ASGM, and women are generally poorly paid compared to men. Gender inequality, health and safety of women in small-scale mining are still compromised, with only a few accessing their rights. Large- and small-scale mining is the main livelihood of millions of men and women in mining countries and mining communities across the world, and this has been the case for centuries. Yet women, despite their significant contribution to the extraction of valuable resources and raw materials, have frequently been excluded from underground mining and many other forms of mining, and continue to face discrimination and barriers to decent work in the mining sector today. In artisanal and small-scale mining in the informal economy, women constitute up to a third of the workforce. Although their work is as hazardous and precarious as that of men, it is usually less valued, and women are generally less protected. In LSM operations, women rarely make up more than 10 per cent of mineworkers, and are most frequently employed in administrative positions. In many countries, women are prohibited by law from working in particular roles and forms of mining, particularly underground mining.

Furthermore, majority of the previous studies have relied more on descriptive studies, but the current study adopted both descriptive and regression analysis, which is the most reliable method of identifying what factors have great effect, the nature of the effect (negative or positive) or what factors matter most to help in drawing conclusions. Arising from the outlined gaps and it is in this regard that the researcher found out that it was imperative to conduct a robust and complete study on the determinants of women participation in the artisanal mining industry value chain and provide appropriate policy and legislative recommendations given the support from other studies of the proper involvement of women in the ASM sector. This will directly inform successful design and implementation of ASM assistance policies and programmes that could bridge the gap in the attainment of 10% contribution of GDP by the extractive sector by the year 2030 as set out in the Kenya Vision 2030, the national development blueprint.

1.3 Objectives

1.3.1 General Objective

The study sought to investigate women participation in artisanal and small-scale mining in Taita Taveta County, Kenya.

1.3.2 Specific Objectives

The specific objectives are:

1. To investigate the effect of social-cultural practices on women participation in artisanal and small-scale mining in Taita Taveta County.
2. To investigate the effect of mining legal framework on women participation in artisanal and small-scale mining in Taita Taveta County.
3. To determine how access to financial capital affects women participation in artisanal and small-scale mining in Taita Taveta County.

1.4 Research Hypotheses

This study sought to test the following alternative hypotheses:

Ha_1: Social-cultural practices affect women participation in artisanal and small-scale mining in Taita Taveta County.

Ha_2 : Mining legal framework affects women participation in artisanal and small-scale mining in Taita Taveta County.

Ha_3 : Financial capital affects women involvement in artisanal and small-scale mining in Taita Taveta County.

1.5 Significance of the Study

The study directly feeds into the United Nations Sustainable Development Goals (SDGs) declaration in 2015 on inclusion, which is very precise on the necessity of meeting the needs of children, women and girls, disabled persons, and the elderly persons by the year 2030 (Stuart *et al.,* 2016). The SDGs will not be met if the less fortunate and most side-lined people (which include women) still lag behind, development-wise (Boateng, 2017). The analysis also generates information on the employment opportunities that the artisanal and small-scale mining sector can create.

The study still contribute to the Kenya Vision 2030 under the social pillar, which concentrates on gender, youth and susceptible groups, and which endeavours to ensure equity in access, control and contribution in resource distribution for the improved livelihood of women, youth and vulnerable groups (Government of Kenya, 2007). In addition, the study provides gender information on women who take part in the artisanal and small-scale mining industry.

Finally, the study discusses the legal framework for mining in Kenya and how this has favoured or discouraged women from participating in artisanal mining (Mishra and Reddy, 2012). This brings out concrete evidence on how ownership or lack of purchase of assets feeds into women participation in small-scale mining in Kenya. By doing so, the study tries to fill the existing gaps regarding mainstreaming gender in artisanal mining in Kenya.

1.6 Scope of the Study

The research was done in Taita Taveta County, situated in the coastal region which covers an area of 17,083.9 km^2, of which 62% or 11,100 km^2 is within Tsavo East and Tsavo West National Parks. The remaining 5,876 km^2 consists of small scale farms, ranches, sisal estates and water bodies. Even though there are similar ASM activities in the western and coastal zones, Taita County was preferred since the area had more organised populations, in particular women involved in ASM for a more extended period. Taita Taveta also boasts of presently producing the bulk of Kenya's gemstones are from one district known as Taita. The gemstone belt stretches between Kenya and Tanzania. In addition, the County is rich in minerals such as gemstones, iron ore and limestone, and is located along the Mozambique Belt, a primary structural or metamorphic unit that spreads along the African east coast from Mozambique (Mishra and Reddy, 2012). The belt is typically comprised of high-grade metamorphic rocks thereby placing it at a strategic position when it comes to mining in Kenya (Government of Kenya, 2015). The county also has had the a good number of companies that have invested in mining of minerals and this has also given to opportunity in an increase in job opportunities which would have encouraged women to get involved in the mining business. The researcher conducted this study in Taita Taveta County across the period running from May to July 2019

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviews critical literature related to the topic of study. There are three main sub-sections in the chapter. The first sub-section contains discussions of the theories upon which the study is anchored, while sub-section two presents the conceptual model, which highlights the link between women participation in ASM and the possible determinants. The last sub-section reviews relevant empirical findings and ends with a summary and highlights of research gaps.

2.2 Theoretical Literature Review

There are various theories that can be used to explain the determinants of women participation in development initiatives. Nevertheless, this study will focus only on the key ones, which include women in development theories, sustainable livelihood approach theory, and capability approach theory.

2.2.1 Women in Development

This theory was conceived in the 1960s and it focused on women as a group and sought to address the exclusion of women from the development process, emphasizing that if development incorporated and included women's productive capacity, it would be much more efficient. Under this theoretical perspective, there exists mainly two approaches regarding women and economic development, namely: Women in Development (WID), that purposes at including women in development projects to make them more competent, and Gender and Development (GAD), which addresses disparities in women's and men's social roles as related to development (Sadan, 2004). These theories are supported on the fact that there is need to acknowledge that women form an integral

part of their society and that supportable development must include full and equal involvement of women and men.

2.2.1.1 Women and Development

The women and development (WAD) approach originated back in 1975 in Mexico City, as it sort to discuss women's issues from a neo-Marxist and dependency theory perspective. Its focus was to explain the relationship between women and the process of capitalist development in terms of material conditions that contribute to their exploitation. WAD focuses specifically on the relation between patriarchy and capitalism. The WAD perspective states that women have always participated and contributed towards economic development, regardless of the public or private spheres. (Alexander and Welzel, 2007).

The WID approach, in spite of its adjustment in focus from one of equity to one of productivity, depends on the fundamental basis that improvement procedures would continue much better if women were completely consolidated (Alexander and Welzel, 2007). It centres mostly around women in disconnection, advancing estimates, for example, access to acknowledge and work as the methods by which they can be better coordinated into the advancement procedure. It can, in this way, be stated that the advancement of WID was the start of a proactive restorative activity for effectively including women and acknowledging their efforts in development initiatives.

There is the relevance of this approach in artisanal mining as women were previously overlooked in the mining sector and therefore in need of skills training and better access to resources such as land and finance (Slusser, 2009). The approach helps to identify women's actual productive roles and recognise the gender division of labour. In this case, enhancement of women's credit, marketing, and skills in technology will help in encouraging them to actively participate in mining activities. While artisanal mining is mainly male-dominated sector, recent studies indicate that women have been actively involved in ASM both directly and indirectly (Buss *et al.*, 2017).

There is therefore need to challenge some commonly held perceptions anchored on the allocation of gender roles between male and female gender (Moser, 1993). It is evidenced that from the background of the study, women are actively involved in the ASM in Taita Taveta County throughout the entire mining value chain process (Government of Kenya, 2015). Application of the WID approach to this scenario would be core in ensuring that Taita Taveta women are recognised as main participants in ASM, and therefore the activity should not be male-dominated. This would imply developing necessary policy and even legal framework that identifies women as an integral part of ASM not just in Taita Taveta County, but Kenya at large. This theory assisted in addressing social-cultural factors, mining legal framework, and capital availability and how these affect women participation in ASM in Taita Taveta County.

2.2.1.2 Gender and Development

Gender and Development (GAD) approach is more concerned particularly with the manner in which society doles out jobs, duties and desires to women and men (Oxaal and Baden, 1997). GAD centres fundamentally around the gendered division of work and sexual orientation as a connection of intensity implanted in foundations (Burns, Keswell and Leibbrandt, 2005). GAD initially sees people make and look after society; however, they obtain unequal benefits. Accordingly, more noteworthy spotlight must be set on women since they have been verifiably more hindered. Also, women and men are mingled contrastingly and frequently work in various circles of the network, although there is common association. Therefore, they have needs and viewpoints. Due to gender roles, men can compel or extend women's choices (Unterhalter Vaughan and Walker, 2013). Furthermore, development influences people in an unexpected way, and women and men will differently affect projects. Both must be associated with distinguishing issues and arrangements if the welfare of the community is to be advanced.

In the mining sector, there is a structure of inequalities and discrimination in access to resources, skills and market, which impact negatively on women more than men. The GAD notion views women as mediators of change rather than as passive receivers of

progress efforts. In this case, women are not supposed to engage only on manual jobs in mining, such as cleaning. One of the approaches recommended by the GAD approach is the self-organisation of women at the local, regional, and national levels. Women in mining associations help them to advocate for issues that concern them, and the government can adopt and enforce equal opportunity laws in artisanal mining. The GAD concept is based on an institutional change within socio-economic and political structures to eliminate gender variations and to strengthen the position of women. In this study, the theory helped to address the social-cultural (roles, responsibilities, and expectations) and legal framework, which either discriminates against women or does not support women participation in ASM.

2.2.2 Sustainable Livelihood Approach

Sustainable livelihood framework is associated with the work of Scoones (1998). This approach describes livelihood as the abilities, assets (and material and social assets) and activities essential in creating a means of living. A livelihood is maintainable once it can adapt to and recuperate from strains and stuns, keep up or upgrade its sizes and incomes, without interfering with the normal asset base. The definition centres around occupations, connecting worries over work and work with destitution decrease with more extensive issues of sufficiency, security, prosperity, and ability. In addition, it centres on the flexibility of employments and the characteristic asset. The maintainable occupations calculated system is a specific type of vocation investigation used by a developing number of research and connected advancement associations (Heemskerk. 2005).

Sustainable livelihood approach brings out three fundaments upon which it is anchored. To start with, is the acknowledgment that whereas financial growth is the remedy for poverty reduction, there is no programmed connection among the two since everything depends upon the capacities of the unfortunate to exploit growing monetary chances (Krantz, 2001). Therefore, if the poor cannot use the open doors emerging from financial

development, at that point the development being experienced does not reduce neediness by any means.

Secondly, there is the acknowledgment that destitution, as brought about by poor people, is not only an issue of small wage, but also includes diverse measurements, for instance, sick well-being, absence of education, absence of social administrations, among others, and also a condition of helplessness and sentiments of feebleness. Lastly, it is currently perceived that the underprivileged regularly know their state and wants better and should, thus, get engaged with the plan of approaches and undertakings planned to better their lives. This requires participatory development (Morse McNamara, and Acholo 2009).

From the United Nations Development Programme (UNDP) point of view, sustainable livelihood approach serves essentially as a programming system to devise an arrangement of coordinated exercises to enhance the supportability of employment among the poor and defenceless by reinforcing the flexibility of their adapting and versatile procedures. Notwithstanding, from the CARE point of view, sustainable livelihood approach centres around three properties, to be specific: the ownership of human abilities; access to unmistakable and immaterial resources; and the presence of monetary exercises whose collaboration shapes the vocation methodology. The central message here is that of strengthening by means of reinforcing the ability of needy individuals to empower them to take activities to anchor their very own vocations (Robeyns, 2003).

According to Department for International Development (DfID), sustainable occupation centres around mainstreaming arrangement of central standards establish that destitution centred improvement (Adato and Meinzen-Dick, 2002). These standards ought to be individual-focused, responsive, and participatory, staggered, led in organization, feasible, and dynamic. Secondly, it focuses on applying an all-encompassing point of view in the programming of help exercises to guarantee that these compared to issues or zones of direct importance for enhancing needy individuals' occupations. A focal

component of DfID's methodology is the Sustainable Livelihood (SL) framework, a legitimate structure to encourage a wide and orderly comprehension of the different elements that oblige or improve job openings, and to demonstrate how they identify with one another (Morse *et al.,* 2009).

The relevance of economical vocation approach in this study originates from the reality that the arrangement goes past the traditional definitions and strategies for neediness destruction. This methodology would assist this investigation by addressing the part of characteristic capital, normal asset stocks and natural administrations, financial capital, capital base cash, credit or debt, savings, and other economic assets, including necessary infrastructure and production equipment and technologies, human capital aptitudes, learning, capacity to work, well-being and physical ability basic for the effective quest for various job procedures in ASM; social value, the social assets (systems, social cases, social relations, affiliations, women relationships, among others). Of significance among the parts of supportability approach is capital access, and arrangements that are induced to empower women's contribution in high quality mining.

2.2.3 Capability Approach

The Capability Approach is categorized by its choice of centre upon the people's capacity of realising the sort of lives they have motivation to esteem (Comim, 2001). The Approach was first verbalized by the Indian financial specialist and rationalist, Amartya Sen, during the 1980s. The attention on individuals' abilities in the decision of improvement approaches has a significant hypothetical effect and prompts completely extraordinary procedures, contrasted with neo-progressivism and utilitarian strategy remedies (Maclin *et al.,* 2017).

Sen contends that people can contrast fundamentally in their capacities to change over similar assets into significant working's (Unterhalter *et al.,* 2013). For instance, those with physical inabilities may require particular products to accomplish portability, and pregnant women have particular dietary necessities for their well-being. Along these

lines, an assessment that centres just around means, without thinking about what specific individuals can do with them, is deficient (Maclin *et al.,* 2017).

The notion of ability has global-local character in that its definition abstracts from precise situations; however, its acknowledgment depends on specific nearby requirements (Oxaal and Baden, 1997). For example, a similar ability to be all around can be analysed for various persons in spite of the fact that it may entail diverse amounts and sorts of nourishment depending upon one's age, or condition of well-being.

This makes the Capability Approach pertinent crosswise over political, financial, and social fringes. For instance, Sen calls attention to that being generally poor pay in an affluent society can involve total neediness in some critical capacities, since they may require more assets to accomplish (Dinye and Erdiaw-Kasie, 2012). For instance, the capacity for business may require more long periods of instruction in a more prosperous society. Concerning ASM, the general viewpoint helps to comprehend why women, regardless of a similar open door in the segment having their cooperation are low and get terrible returns. This will be clarified by social-cultural factors, and the societal jobs and obligations that thwart or engage women capacities. It will likewise be intriguing to relate the lawful necessities whether they impact women's abilities.

2.2.4 Theory of Empowerment

This theory was originally linked to the Marxist sociological theory but was later associated with Julian Rappaport (1981). The Empowerment theory seeks to empower individuals and communities to gain personal, interpersonal and political power to better their lives. This work also strives to challenge systems that hinder these groups from meeting their needs. According to the Theory of Empowerment, empowerment is encouraged in systems or institutions that give their members access to information, resources, support, and the opportunity to study and advance. As stated by Abebe (2016), the term "empowerment" has been described as giving authority to another

person or investing power in other. The imbalance of power (inequality) is attributed to competing goals, coexisting layers of authority, and rigidity.

Several studies have used the theory of empowerment to understand its influence on nursing practice. Research posits that nurses who feel their work environment is empowering are more content with their work and feel more effective in realising their work (Garmerts and Emanuel, 2015). These studies also reported a higher level of patients to care quality on their units.

The higher level of empowerment in ASM may be linked to high participation of women in the sector. Research has shown that empowered nurses, for instance, are most likely to mentor and enable peers (Mpagi, 2017). In this case, the theory will help understand how ASM focus group members can act as a change agent in motivating other women to participate. This grows with time as group members acquire greater control over their lives and progressively participate in governance decisions that affect them. The theory thus suggests the need to engage members, in this case women artisanal miners, to increase their sense of empowerment and foster growth and performance of the concerned institutions. Focus on the legal framework and financial resources available for these groups can help understand how to empower them to increase participation in the sector.

2.2.5 Social Capital Theory

The theory was conceived by Bourdieu and Coleman (1985) and it contends that social relationships are resources that can lead to the development and accumulation of human capital .Social capital is a system of interpersonal networks that improves teamwork and partnerships, which helps to improve economic prospects (Heemskerk, 2005). The basic instinct of social capital theory lies on the social ties that include one's family, friends and associates as an essential asset that can be utilised for its own sake, and during crisis and as leverage for financial and social growth (Woolcock and Narayan, 2000).

The study of social networks has gained momentum since the 1960s and has produced inspiring conclusions, for example that persons who are more united into their systems have a better life expectancy .The concept of social capital recommends that collective efforts are interceded by the presence or absence of trust, reciprocity and cooperation. The theory viewpoint has its emphasis on social capital at the group level, with debates concentrating how some groups advance and sustain social capital as a collective asset, and how such a joint asset improves group members.

Linking social capital as defined here with ASM women groups, and social support in the informal networks is central to objective and subjective welfare. Social capital is viewed as an enabler and a source of information among group members through informal sharing, personal and psychological support, the frame of reference and mentorship, access to resources through sharing and utilisation in the groups, and the source of potential suppliers and customers for their products. Some of the most utilised sources include self-help groups, women funds groups, merry-go-rounds, and family members financial support (KNBS, 2017). Although social capital does not necessarily translate to financial support, the group social network through access to information on economic opportunities can be a gateway to the use of additional financial aid (Kabeer, 2001). This is an excellent platform for table banking, which is a source of funds to help them climb the value chain. Social capital helps the group's members connect and be able to generate wealth.

2.3 Conceptual Framework

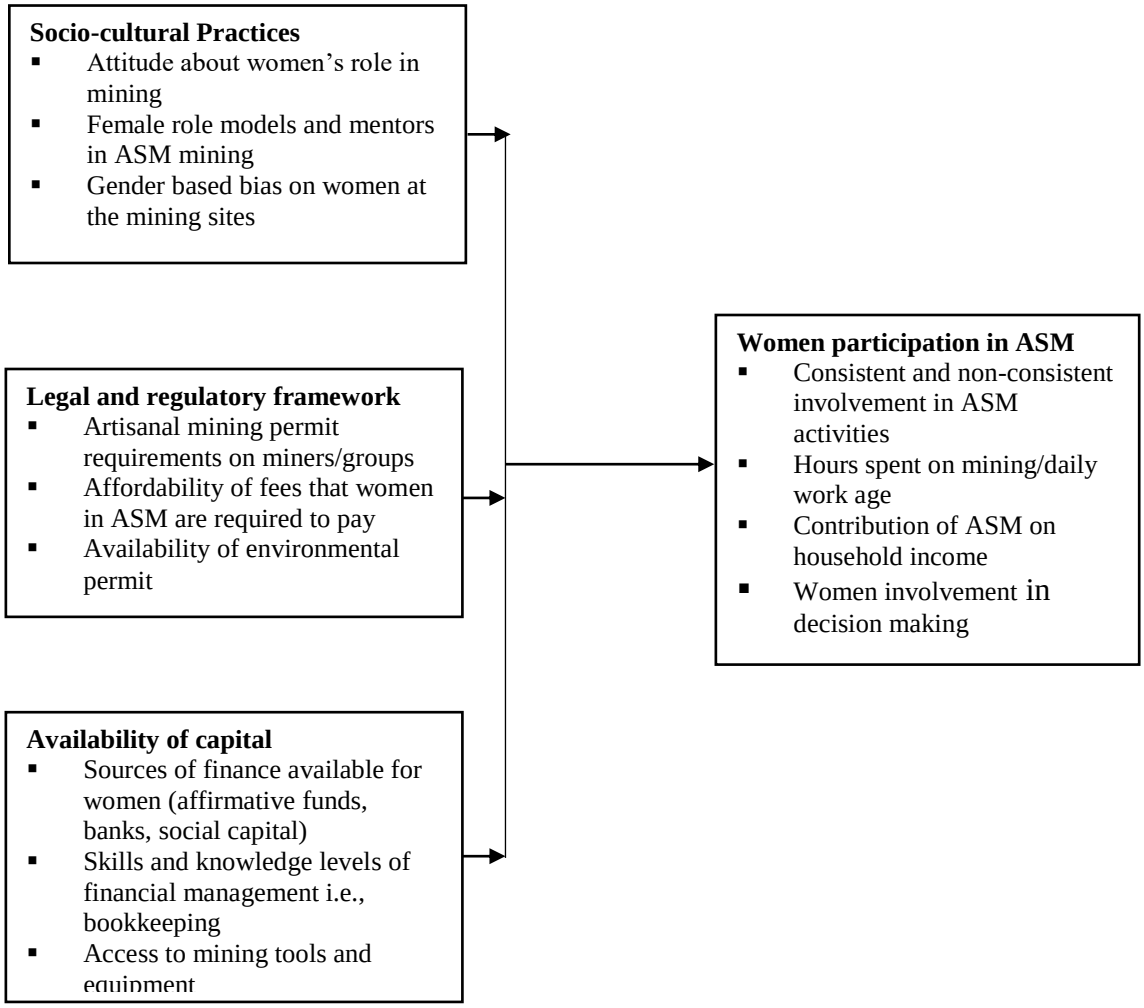

Figure 2.1: Conceptual Framework

2.3.1 Socio-Cultural Factors

Socio-cultural factors are defined as the cultural beliefs that hinder or support the involvement of working women in mining. These include the attitude about women's role in mining, female role models and mentors in ASM mining and gender-based bias on women in mining. The women roles and responsibilities on artisanal mining in Taita Taveta County helped to answer the question of how they are involved in the value chain. Average daily or monthly income for women data gave feedback on income disparities between men and women. It was also of interest to understand what cultural practices restrict women activity in mining, and members' culture and rules.

2.3.2 Legal and Regulation Framework

The legal and regulatory framework has been operationally defined as procedures or requirements for artisanal miners' operations. These include artisanal miners permit requirements for ASM miners/groups, fees required to be paid and environmental permits required from the National Environmental Management Authority (NEMA). In addition, miners are also expected to pay some fees to either the county or national government. The framework also includes any technical or administrative support provided by county and national government officers to artisanal miners.

2.3.3 Access to Financial Capital by Women

Access to finance capital by women refers to sources of finance available for women (affirmative funds, banks, and social capital), skills and knowledge levels on financial management. This variable will be measured by identifying participants' access to finance from merry-go-round/table banking, access to finance from government affirmative funds which include Women Funds, access to finance from banks/SACCOs, access to finance from family funds, identify production and returns on minerals, investigate whether there is any specific training provided on finance management or mining value chain mining skills which include, production, processing and marketing,

and finally identify the primary source of income/livelihood for the participants. This will help understand the time investment allocated to mining business.

2.4 Empirical Literature Review

There are numerous studies that have sought to examine determinants of women participation in artisanal mining in several parts of the globe. This sub-section has critically examined these studies with focus on social-cultural, policy framework and financial capital as substantial determinant for women to take part in the mining sector.

2.4.1 Social-Cultural practices and Women Participation in ASM

Abebe (2016) examined the determinants of female investment in Ghana and attests that because of constrained women's support in the artisanal mining segment, most women mineworkers have inadequate specialized learning of the mining market and need satisfactory subsidizing for business development. They are not organized in work and preparing opportunities and are not engaged with planning meetings and basic leadership along the mining esteem chain. Additionally, under-estimation of women potential/distinctive excavators is principally an impression of existing sex imbalances, profoundly established in conventional and social standards. Similarly, across the board, social convictions keep women from widely investigating their potential in mining, and most measurements do not consider women as distinctive diggers by any means (Buss *et al.*, 2017).

Maclin *et al*. (2017) analysed the inspiration of women of migration to ASM in DRC Congo and show that women are frequently not involved in making decisions or are consulted during talks prior to project implementation and are neglected in the instalment of remuneration and eminences. Moreover, women have exceedingly problematic or non-existent rights in a dominant part of asset-rich African countries. This sex predisposition is exacerbated by restricted access to assets, for example credit, instruction and innovation; only from time-to-time authorized lawful security; and

constrained impact in basic leadership circles. Therefore, due to corruption emerging from mining activities, women regularly lose basic occupation and monetary chances, access to arrive, confront avoidance from asset administration and are influenced lopsidedly.

Garmerts and Emanuel (2015) observed that women in mining regions are particularly vulnerable to socio-economic hardship and are mostly forced towards mining for the economic survival of their families. The study indicated that women take on multiple roles simultaneously, leading them to being over-worked and overburdened. Many women reported extreme tiredness, with their mining work additional to their domestic responsibilities, and many confirmed that fatigue leads them to undertake what they considered unsafe practices to complete their job to get back to their families. From the study, the interviews highlighted critical challenges experienced by women in small-scale mining. For instance, the barriers cited by the group to attend formal training programs included: males discourage women from attending courses; women are uneasy at attending a male-dominated event; time limitations; primarily responsible for child rearing; market gardening and other domestic responsibilities (Anyona and Kipsang, 2015).

Romanus *et al.* (2012) argue that the mining industry in Ghana and in many societies is dominated with a male culture of total sexual harassment and mistreatment by men. Women feel that they work harder than their male partners in most small-scale gold networks on the planet. Even though females undertake the same labour as men in the gold industry in Ghana, discriminations is evident from the pay. Cultural beliefs and traditions highly affect interactions among persons and groups, the nature of society organisation and societal rules or norms.

Bansah *et al.* (2017) in their research on the role of female participants and reasons why they engage in ASM observed that over 100 women between the ages of 18 and 50 participate in ASM for survival. They involve in ASM primarily because they have no alternative employable skills and income sources. The reasons given for working in

ASM by women include lack of employment and alternative sustainable sources of livelihood, neglect by husbands, loss of parents at an early age, need to care for siblings, retrenchment of husbands from large firms, and lack of sustainable income. The majority (41%) of these women were youth between the ages of 18 and 30 years while 32% were between 41 and 50 years.

Reconsidering alternative livelihood projects for women doing ASM, an investigation by Boateng (2017), including 20 members were somewhere in the range of 14 and 62; eight were hitched, six were bereaved or separated, and the staying six were single. Distinguished that neediness, absence of monetary chances, and ugly country destitution easing systems have added to the predicament of these women. Women appeared to have less learning about the long-haul repercussions of remaining in sloppy waters and washing sand for gold.

A United Nations report argues that some communities especially in developing countries have certain norms that prevent women from actively participating in the mining sector (Blair, 2017). For instance, in Tanzania, the reports observe that prohibition of women to access, use, or control of land and other resources acts as a hindrance to their full participation in the extractive industry. The norms are majorly attributed to the notion that women are weak physically and intellectually and cannot therefore manage or use these resources productively. In addition, it has been established that even in the case where women own concessions, they do not have equal rights with men when it comes to earnings. Lack of women involvement in critical areas such as actual pit mining limits them and in turn gives their male counterparts leverage to manage financial issues. This leaves women with little gain from the industry.

2.4.2 Legal Framework and its Influence on Women Participation in ASM

The strategies that limit or prevent women from gaining concessions or land rights contribute to the feminisation of poverty. In Kenya, female miners can have access to land but cannot control land and mining activities as well (Amutabi and Lutta-Mukhebi,

2001). The majority of women in mining in Kenya, like any other African country, are in the informal artisanal mining sector, which has little regulation and is often dominated by men (Salo *et al.,* 2016). While small-scale mining has been legalised in Kenya, detailed rules are needed to guide the operationalization and engendering of this provision (Analysis of the Mining Act, 2016).

Fearon and Agbah (2015) studied the perceptions on females taking part in artisanal and small-scale mining, the case study of Birim North District of Ghana. The study focused on the causes of female involvement in the ASM sector and the influence of this type of employment on women's income, health, and families. The findings of the study exhibit the utility of sexual orientation mainstreaming in the small-scale mining formalization process, and in addition the need to advance other practical business openings to serve women who live in the country regions. To ensure artisanal mining becomes a sustainable economic opportunity for both men and women, the study recommended an urgent need to formalise small-scale mining operations (Davies and Osano, 2005).

Salo *et al.* (2016) in a study on local perspectives of the artisanal and small-scale mining in the Madre de Dios gold fields of Peru noted that formalization is not only about the control and mitigation of the adverse impacts of ASM, but also about harnessing the helpful participations and channelling benefit flows towards politically chosen directions. The article emphasised the need for government to formalise artisanal mining operations; support women artisanal miners with training and technical expertise; and engender policies and development plans involving women artisanal miners.

Spiegel (2015) conducted a study on shifting policies and recentralizing power, the case of Zimbabwe's artisanal gold mining sector. The study uncovered how and why governments recentralize expert in rustic asset administration even in the wake of presenting decentralization changes. These proactive formalization strategies gave worldwide offices the feeling that administration experts in Zimbabwe were effectively trying to urge casual labourers to take part in the formal economy, and hence gave contributors a feeling of trust in getting to be engaged with ASM. While this certainty

prompted different universal help programs, this was added as a preferred standpoint to women investment.

Hinton *et al.* (2003) in their study on ladies and artisanal mining: gender roles and the road ahead noticed that in the context of women and artisanal mining, key administration issues relating to the adequacy of approach in propelling correspondence, especially as far as land rights, portrayal of women in basic leadership forms, and an institutional situation that is helpful for investment by women. In a few countries, women may have legitimate access to assets, but hindrances on women's territory rights prevent their capacity to utilize property as security to get credit. Women experience issues embracing elective advances and enlisting work when required (Mkubukeli and Tengeh, 2016). In addition, the study observed that women are often unable to get to other strong administrations, for example augmentation projects and preparing on inventive land administration approaches.

ASM is normally sought after to intensify better control of unfriendly effects of mining (Hilson and McQuilken, 2014). In Kenya, the Mining Act 2016 addresses these basic issues and generally has arrangements that advance best practices in mining. Models of good work with respect to administration incorporate arrangements to permit examinations and reviews of mineral tasks (Rijksoverheid, 2015). Despite that, as with most things law and strategy, how the lawful and administrative structure will affect the mining area remains predicated on usage and requirement. The extraordinary trouble in securing mining licenses; absence of topographical data on the yield limit of their mines because of an absence of accounts for the work of surveyors/geologists; absence of specialized know-how of the division because of inaccessibility of limit building openings; absence of data available elements, including charge motivating forces will in general thwart women's investment in high quality mining in Africa (Government of Kenya, 2015).

2.4.3 Financial Capital and its Effect on Women Participation

Stuart *et al*. (2016) posits that 30% of Customary Landowners (CLO) have a mining site on their customary land in analyses on artisanal and small-scale mining governance and customary tenure institutions, practices and outcomes in Guinea. Ten of these mines were found to be officially plotted, and of those that have been assigned, only half had formal permit or license. Analysis of household and miner survey data shows that the customary tenure system is the predominant means for gaining authorisation to a mine site. According to the ASM survey, miners mainly bank on approval from the CLO to excavate a site. This is mostly an informal process that does not require miners to obtain a formal license to use the mining site. This is a challenge in Taita Taveta where women do not own land.

According to Mwakumanya *et al*. (2016) on his study on socio-economic and environmental impact of mining on women in Kasigau mining zone in Taita Taveta County, the factors that hinder women participation in artisanal mining in Kenya include but are not limited to: inaccessibility to financial credits, low income levels/high poverty levels, reduced/low wages in the artisanal mining sector, expensive transport to mining sites, lack of capital for purchase of equipment, lack of ready market for the minerals, and lack of alternative markets.

A study by Anyona and Kipsang (2015) on the character and profile of artisanal and small-scale gemstone mining community in Taita Taveta County, Kenya, discovered that the segment is male-dominated and due to absence of capital, most artisanal diggers are under a 'landowner' who provides them with the genuinely necessary nourishment, water and shield and whichever mineral they recoup is divided out with the proprietor taking the bigger offer. Very few small-scale diggers earn substantial sums of money from the business. These frequently have place that is known for their own with title deeds and practice mechanised mining with a decent system of customers locally and universally. They have put their salary somewhere else particularly in land in main or adjacent towns such as Voi and Mwatate, and they regularly go about as proprietors or

intermediaries to high quality excavators. With their improved capital base combined with their comprehension of the region, this classification of little scale mineworkers champion to be the best recipients of mining business around the zone.

In another study done by Fearon and Agbah (2015) on the perspectives on small-scale mining in the Birim North District of Ghana, it was revealed that women support in artisanal mining in Africa is affected by lack of capital and financing for the mining activities from financial facilities; the absence of suitable machinery and innovation (for example, the utilization of the intensely dangerous mercury for amalgamation of gold) and absence of access to data on accessibility of mining claims.

According to Bansah, Duamkor-Dupey and Sakyi-Addo (2016), through a study on the role of artisanal and small-scale mining to local area progress, numerous interventions have not come without challenges, including lack of financial support and small technical assistance from financial institutions and stakeholders. Access to credit facilities has been a significant issue for ASM operators in Ghana. Since financial aid is lacking, ASM operators are unable to hire the required technical staff and purchase tools to improve operations and increase revenue.

According to Dinda (2013), social capital contributes to economic growth by focusing on the importance of trust of members. To be competitive in artisanal mining, women generate money from various sources that include self-help groups, merry-go-round, women funds, among others because they do not have collateral to secure bank loans.

Financial constraints affect the participation of women in ASM activities especially in developing countries (Rickard Treasure, McQuilken, Miahalova and Baxte, 2017). The study observes that majority of women do not have control over resources such as land and finances, and even getting practicing licence is difficult for most of them. In addition, the study noted that in Tanzania, traditional beliefs deny women opportunities to exploit their potential in the mining sector. The inability for women to obtain equipment, mining tools and the necessary technology is another hindrance for women

participation in the ASM sector. Furthermore, the study argues that women are often put at the periphery when it comees to decision-making in the industry, and this impairs their active participation.

2.4.4 Women Participation in ASM

In artisanal and small-scale mining in the informal economy, women constitute up to a third of the workforce. Although their work is as hazardous and precarious as that of men, it is usually less valued, and women are generally less protected. In LSM operations, women rarely make up more than 10 per cent of mineworkers, and are most frequently employed in administrative positions. In many countries, women are prohibited by law from working in particular roles and forms of mining, particularly underground mining. Until recently, this discriminatory practice was reflected in international labour standards, notably in the ILO Underground Work (Women) Convention, 1935 (No. 45), which is still in force in 68 Member States today. Following a comprehensive review of occupational safety and health conventions and recommendations, however, the fourth meeting of the Standards Review Mechanism Tripartite Working Group (held in Geneva from 17 to 21 September 2018) recommended that Convention No. 45 should be classified as outdated. At its 334th Session in October–November 2018, the Governing Body of the International Labour Office approved the recommendation and placed an item concerning the abrogation of the Convention on the agenda of the 113th Session of the International Labour Conference.

Sound employment relations and effective social dialogue contribute to good governance in the workplace, decent work, inclusive economic growth and democracy for women and men. Social dialogue remains vital to meeting the challenges and opportunities faced by the mining industry, both today and in the future. From job losses to skills training, and from addressing discrimination to changing requirements in occupational safety and health, social dialogue can help governments, employers and workers find solutions and facilitate the promotion of decent and sustainable work.

Social dialogue is particularly critical in ensuring that employers and workers in the mining sector are involved in the formulation of policies and actions to address the issues faced by women in mining, and fully support the implementation of policies to advance gender equality. In this regard, it should be noted that social dialogue, including collective bargaining, has diverse forms and takes place at different levels depending on the contexts and traditions of each country. In LSM, trade unions and employers mostly seek to address complex market and technological challenges, preserve business competitiveness, and ensure better employment and working conditions. In ASM, by contrast, social dialogue is less developed and tends to involve other stakeholders as well, including but not limited to cooperatives, and community-based and non-governmental organizations. The participation of women in all of these processes is critical to represent the diversity of the workforce and ensure the democratic function of these processes (ILO 2019d).

Women who do become mine workers, especially those who work underground, face numerous risks, including sexual harassment and physical and verbal abuse from male colleagues. Alternative income opportunities are often displaced by mining. Women become providers of various services, such as selling food to miners and become heavily dependent on the mine to make a living. MINCOSA (2020). The research also revealed that that men are more likely to reap any benefits from mining projects through employment, greater income and compensation. Training opportunities are often prioritised for men, while women are generally offered menial and low-paid positions if any. This poor distribution of benefits exacerbates existing gender inequality.

Molomo (2021) sited that in rural areas, mining projects pose a great risk to the availability and quality of agricultural land that women need to feed their families and produce surplus for local markets. Mining operations contaminate and degrade the fertility of soil through the release of toxic minerals and heavy metals, poor rehabilitation measures, and deforestation. This causes decreased crop yields.Not only soil but water is also affected. Water also becomes polluted and unfit for agricultural or domestic consumption. The researcher also goes ahead and says there are many other

ways that mining negatively impacts women. “Fewer women can look for work outside the home because they have to care for relatives who have been sickened by pollution. The mines often hire male workers from other areas who already have experience in the industry. This leads to higher unemployment amongst local men and in turn increases rates of domestic violence, underage sex work and teenage pregnancy.” The research shows women living close to mines are more likely to experience “heightened insecurity and violence, limited voice in decision making, health risks from pollution, heightened socio-economic vulnerability, increased prostitution and greater exposure to sexually transmitted diseases, such as HIV/AIDS.”

2.5 Critique of Existing Literature

According to Mwakumanya *et al*. (2016) on his study on socio-economic and environmental impact of mining on women in Kasigau mining zone in Taita Taveta County, the factors that hinder women participation in artisanal mining in Kenya include but are not limited to: inaccessibility to financial credits, low income levels/high poverty levels, reduced/low wages in the artisanal mining sector, expensive transport to mining sites, lack of capital for purchase of equipment, lack of ready market for the minerals, and lack of alternative markets. This research necessitates the exclusion of women in the mining industry and sites lack of invest and money in terms of funds and blames that on the lack of women participation, disregarding the cultural barriers that are put in place to not improve and encourage women in the sector.

Abebe (2016) examined the determinants of female investment in Ghana and attests that because of constrained women’s support in the artisanal mining segment, most women mineworkers have inadequate specialized learning of the mining market and need satisfactory subsidizing for business development. They are not organized in work and preparing opportunities and are not engaged with planning meetings and basic leadership along the mining esteem chain. From the study it can be noted that the major concern is constrained women’s support in education in matters regarding to mining. The study omits that the gender imbalance in dishing out equal opportunities has also been an

addressed issue. The fact that a man would be hired into a job without any experience or skills or education but not a woman and without any probable cause is still among the few other constraints.

A United Nations report argues that some communities especially in developing countries have certain norms that prevent women from actively participating in the mining sector (Blair, 2017). For instance, in Tanzania, the reports observe that prohibition of women to access, use, or control of land and other resources acts as a hindrance to their full participation in the extractive industry. The study comes under critic due to its exclusion of the unavailability of funds and other sources to funds to be focused on the introduction, growth and encouragement of women in the mining sector but just cites cultural barriers. But even with the lifting of cultural barriers there's need to support and grow the women who want to be involved in mining.

2.6 Summary and Research Gap

The study has reviewed various studies explaining the factors influencing women participation in artisanal small-scale mining. What is evident from the existing literature is that women, especially in developing countries, are at a disadvantage when it comes to ASM industry. In addition, studies have demonstrated that women gain very little in the industry due to their peripheral roles. Furthermore, it has been demonstrated that socio-cultural, legal and economic factors affect women participation in the ASM sector.

Nevertheless, most of reviewed findings are based on expert reports and not empirical investigations, which have an advantage of getting first-hand information from the field. In addition, these studies have paid limited attention to such aspects as the influence of role models, attitude about women role in mining, artisanal mining permit requirements and skills and knowledge of women required in the industry for which the current study has examined in detail. Furthermore, most of the reviewed studies are mainly based on descriptive findings, which are merely summaries. Apart from descriptive statistics, the

current study has also adopted inferential statistics, which has made it easier to draw conclusions from extrapolations.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter describes the research methodology adopted in this study. Specifically, the chapter outlines the study's research design and philosophy, target population, sample size and sampling techniques, data collection instruments, validity and reliability of the instruments and data analyses techniques.

3.2 Research Design

The research design defines a strategy aimed at assembling and utilising data to facilitate the achievement of the study's objectives with slight efforts and time (Borg and Gall, 2009). This is an arrangement and structure of examination to acquire answers to research questions. The study adopted cross-sectional research design. According to Creswell (2003), cross-sectional research design is used when gathering information about people's attitudes, opinions and habits and is appropriate for analysing social behaviour and patterns. The cross-sectional design was preferred because it was appropriate to find the frequency of the result of interest, for the populace or sub-classes within the community at a given point in time, which is descriptive, often in the form of a survey. The design is relatively inexpensive and takes little time to conduct the study. The design also allows for use of mixed methods, that is, both quantitative and qualitative techniques. With this method, both statistics and participant's experience are captured.

3.3 Population

This study focused on women who participate in artisanal mining in Taita Taveta County. Taita Taveta County is one of the forty-seven (47) counties in Kenya, located to the southwest part of Kenya. It borders Makueni, Tana River and Kitui counties to the

north, Kilifi and Kwale counties to the east, Kajiado County to the northwest and the Republic of Tanzania to the south and southwest. The county is located between latitude 2° 46' and 4° 10' South and between Longitude 37° 36' and 30°14' East. It covers an area of 17,128.3km^2. Majority of inhabitants of the county are the Taita community, though other tribes also live harmoniously with the natives. According to the 2019 national census, the county had a population of 340,671, with 173,337 males and 167,327 females (KNBS, 2019).

Specifically, the study targeted all women artisanal miners in Taita Taveta County. These women are organized in groups that are registered in the county. In total, there are 16 women groups artisanal miners with a total membership of 230 (see Table 3.1). A sampling frame was obtained from the Department of Social Services. The unit of investigation in this research were women participating in artisanal and small-scale mining (ASM) in Taita Taveta County, Kenya.

The criteria for inclusion in the subjects' list was dictated by the fact that all groups operate in the project area and are therefore permanently eligible. The unit of analysis was both the groups and individual women participating in artisanal and small-scale mining (ASM) in Taita Taveta County. The study targeted individual women to measure descriptive aspects of the research, while the groups provide the case study component of the study. Information was also obtained from the county administration and the National Government Ministry of Mining to provide insight into the data collected from the women.

Table 3.1: Study Target Population

Women Artisanal and Small-Scale Mining Groups in Taita Taveta County			
No.	Group Name	Sub-County	No. of Members
1	Kamtonga Small-scale Mining	Voi	16
2	Manoa Mining Group	Voi	12
3	Wazito Mining Group	Voi	19
4	Wema Mining group	Voi	14
5	Awongo Community-Based Women Group	Voi	14
6	Dapata Community-Based Women Group	Voi	15
7	Ngua Mlambo Development Group	Voi	15
8	Mbuni Mining Group	Mwatate	12
9	Mkengerenyi Mining Group	Mwatate	10
10	Taita Taveta Women Mining Group	Mwatate	16
11	Sauti ya Mchibaji	Mwatate	13
12	Stone Gate Mining group	Mwatate	13
13	Kishushe Women Mining Group	Wundanyi	12
14	Chawia Miners CBO	Wundanyi	15
15	Precious Women Group	Taveta	15
16	Wuki Women Group	Taveta	19
	Total	4	230

Sources: Taita Taveta County Gender and Youth Affairs Department

3.4 Sampling Frame

The sampling frame was generated from the list of all women artisanal miners given in Table 3.1. The choice of the 16 women mining groups was informed by the fact that they registered with the County Government of Taita Taveta, and they have been in operation for more than three (3) years, and they are stable and have a consistent membership of over 10 participants.

3.5 Sample Size and Sampling Technique

The primary objective of a survey is to collect a sample that represents a population (Kothari, 1990). Sampling from a large population requires that a survey sample is independent and identically distributed. Sampling is a system of selecting the units of analysis from the target population. This is done in a way that the selected units represent the population perfectly.

3.5.1 Sample Size

The sample size for the study was computed using Yamane (1967) formula, which is expressed as:

$$n = \frac{N}{1+n(e)^2} \quad \text{…… Equation 1}$$

Where; *n* is the sample size, *N* is the population size, and e (confidence level) is the level of precision. Conventionally, a 95% confidence level is adopted. Using this formula, the study obtained a sample size as follows:

$$n\frac{230}{1+230\,(.05)^2} = 146 \text{ women} \text{……} \text{ Equation 2}$$

3.5.2 Ssampling Technique

Stratified random sampling was used to get the sample from the four sub-counties of Taita Taveta County (Mwatate, Taveta, Voi and Wundanyi). Each of the sub-counties was treated as strata. In each stratum, all artisanal miner's women groups were picked and simple random sampling technique applied to select the sample size as indicated in Table 3.2.

Proportionate sampling of each group was computed using the author's formula:

$$Group\ sample\ size = \frac{n}{N} * 146 \text{……} \text{ Equation 3}$$

Where: *n* refers to number of members in each group, and N is the total group membership.

Random sampling ensured that equal opportunities to participate in the study were given to all women in each group. This helps to eliminate selection bias, an internal validity

problem in research. The study adopted this probability sampling technique based on the assumption of homogeneity of the target population.

Table 3.2: Sample size

No.	Group Name	Sub County	Population	Sample
1	Kamtonga Small-scale Mining	Voi	16	10
2	Manoa Mining Group	Voi	12	8
3	Wazito Mining Group	Voi	19	12
4	Wema Mining Group	Voi	14	9
5	Awongo Community-Based Women Group	Voi	14	9
6	Dapata Community-Based Women Group	Voi	15	10
7	Ngua Mlambo Development Group	Voi	15	10
8	Mbuni Mining Group	Mwatate	12	8
9	Mkengerenyi Mining Group	Mwatate	10	6
10	Taita Taveta Women Mining Group	Mwatate	16	10
11	Sauti ya Mchibaji	Mwatate	13	8
12	Stone Gate Mining Group	Mwatate	13	8
13	Kishushe Women Mining Group	Wundanyi	12	8
14	Chawia Miners CBO	Wundanyi	15	10
15	Precious Women Group	Taveta	15	10
16	Wuki Women Group	Taveta	19	12
Total			**230**	**146**

3.6 Research Instruments

The study used questionnaires, Key Informant Interviews (KIIs) and Focus Group Discussions (FGDs) to collect data. This sub-section explains each of these tools.

3.6.1 Questionnaires

The study used questionnaires to collect data from women. This was a semi-structured instrument with two main sub-sections. Sub-section one contains questions on background characteristics of the respondents while the second sub-section contained questions concerning access to finance, legal framework and social-cultural

characteristics of women participating in ASM (se Appendix II). It contained items with a blend of open-ended, closed-ended and matrix questions.

3.6.2 Key Informant Interviews

Interview guides were used to collect data from professionals in mining matters at both the National and County Government level, including County Executive Committee for Mining, Director of Mining and Field Mining Officer. This helped the interviewer to ask vital questions and get deeper information. Key informant interviews were also critical as they allowed clarifications to be sought from the research participants in situations where responses were not clear. The area of focus was effects on legal framework and access to finance (see Appendix III).

3.6.3 Focus Group Discussions

The study organized two FGDs in each sub-county, bringing the total to 8. Each group comprised of 6 women all of whom were given an opportunity to provide views. The discussions focused on the determinants of women participation in ASM in their respective sub-counties. The discussions were moderated by the researcher using pre-set questions (see Appendix IV).

3.7 Reliability

The quality of data is characterized by the degree to which the study data reliably measures what it is supposed to (Fraenkel, Norman, Wallen and Hyun, 2012). In this study, the quality of data was guaranteed through triangulation. Distinctive respondents provided their views (data) on similar issues. A pilot survey was also done. After the pilot survey, the researcher contemplated the things that were likely to be conflicting during the final survey and they had been forgotten to expand their dependability.

The Cronbach Alpha was used to test the reliability of the instruments. The Cronbach Alpha is a statistic used as a measure of internal consistency; it determines how closely

related a set of items are as a group, and the reliability of Likert scale items (questions). A Cronbach Alpha coefficient of 0.7 and above is termed to be more liable.

3. 8 Validity

The validity of research instruments is vital in any research (Dowson, 2002). This is because it indicates how much a test estimates what it indicates to measure. The study adopted expert opinion to guarantee that research instruments have content validity. The instruments were presented to the supervisor and opinion was also sought from other senior researchers at the Department of Development Studies to ascertain whether the instruments captured questions that could respond to the study objectives. The instruments were revised and later validated. In addition, the pilot study helped to address content validity of the instruments.

Furthermore, a pre-test (pilot study) of the data collection tool was done to determine the validity of the data collection tools. Test of equivalence was ensured through questionnaire pretesting with a sample of 16 randomly selected informants (1 from each of the group), and they did not participate in the actual research. The aim of the pilot study was to unearth deficiencies in the research instruments and recommendations for improvement. This guaranteed that the data collection instruments were clear of any uncertainty, bias, indistinct wording and could provide the data they were supposed to produce.

3.9 Data Collection Procedures

Mugenda and Mugenda (2009) characterize data collection as a thorough, logical assembling of information appropriate to the research sub-issues, and utilizing strategies such as interviews, member perceptions, centre gathering talk, stories and case chronicles. For purposes of this study, the data collection procedure involved seeking for authorization from JKUAT to allow the researcher to collect data. A research permit was also obtained from the National Commission for Science, Technology and Innovation. In

addition, the researcher sought permission from Taita Taveta Governor's office to be allowed to collect data from County Government officials. The primary data was collected through use of questionnaires. The questionnaires were presented to the respondents through a questionnaire-forwarding letter along with an introductory letter from the University. The researcher identified the respondents, introduced himself and requested to drop the questionnaire and collect back answered instruments. All data was collected between 6th and 30th May 2019.

3.10 Pilot Testing

Pilot study is the component in the data collection process and a crucial of a good study design. It is a small-scale trial run of all the procedures planned for uses in the main study, (Monnetet. al, 2002). The Pilot Study sample was 15 (10%)-10% of the study sample size (146). The study was conducted in Sagalla ward which was excluded from the actual study, Questionnaire was used to collect data. The results were within accepted rate. The pilot test was done in Taita Taveta County in the Voi area. The sample size used in this pilot test was obtained from Wazito Mining Group where 12 miners were interviewed and the data got from them was used. The reason for doing this was to ensure that the instruments which was used in carrying out the main study was appropriate for the study and provided valid data that was reliable for the study.

3.11 Data Processing and Analysis

Data analyses involved organization of raw data to make it easier for inferences. Prior to analysis, raw data from questionnaires was checked for completeness and coded for analysis. Both descriptive (means, standard deviation, frequencies and percentages) and inferential statistics (correlation, regression and hypothesis testing) were adopted to analyse quantitative data. Thematic analyses approach was adopted for qualitative data.

Dimension reduction using Principal Component Analysis (PCA) method was applied to derive factor scores for various variables of interest in the Likert scales. Eigen values

were considered in extracting the scores and only those scores with Eigen values of 1 and above were utilized. For variables that had more than one principal component, the scores were combined by addition to get a composite score, which would explain a higher percentage of total variations. These were then used for conducting correlation, regression, and hypothesis testing. Pearson's moment correlation was used to analyse the correlation between women participation in ASM and its determinants while Chi-square test was adopted to analyse the hypotheses.

Regression analysis was conducted using Ordinary Least Squares (OLS) method. This was done to establish the relationship between the dependent (women participation in ASM) and independent variables (socio-cultural practices, legal framework, and availability of capital). In addition, the regressions ascertain whether the variable is statistically significant or not. The overall regression equation is expressed as:

$Y = \alpha_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon$ ..... *Equation 4*

Where; Y refers to women effective participation in ASM (hours spent on mining).

α_0 is *Y* intercept (constant), X_1=social-cultural practices such as attitude about women's role in mining, female role models and mentors in ASM mining, and gender-based biases on women at the mining, X_2=legal and regulatory framework which includes ASM permit requirements for ASM miners/groups, fees that women ASM required to pay, and environmental permit approval required by the National Environment Management Authority (NEMA).

X_3=availability of capital, which was measured by sources of finance available for women (affirmative funds, banks, social capital), skills and knowledge levels on financial management i.e., bookkeeping, and access to mining tools and equipment, $\beta_1 - \beta_3$ are coefficients to be estimated and ε is the error term.

3.11.1 Operationalization of Variables

Table 3.3 presents measurement of variables captured in equation 4.

Table 3.3: Variable Description

Variable	Description	Unit of analysis
Women effective participation in ASM	This is a dependent continuous variable explaining the participation of women in ASM	Number of hours undertaken by a woman in mining ASM
Socio-cultural practices	This is a continuous variable which includes aspects such as attitude about women's role in mining, female role models and mentors in ASM mining, and gender-based biases on women at the mining	Likert scale items. PCA was applied to extract fewer factors from items for regression and hypothesis tests
Legal and regulatory framework	This is a dummy variable, which includes aspects such as ASM permit requirements for ASM miners/groups, fees that women ASM required to pay, and environmental permit approval and required by NEMA	This is measured by ability to meet requirement for mining permit
Availability of capital	This is a continuous variable measured by sources of finance available for women (affirmative funds, banks, social capital), skills and knowledge levels on financial management, such as bookkeeping, and access to mining tools and equipment.	Measured by access to finance, skills/knowledge on finance and access to tools and equipment

3.12 Ethical Considerations

Jennings, (2014) defines ethics as a moral code of conduct that is applied in a particular area. The researcher worked to ensure that all the questions raised are in accordance to the research topic. In addition to this, no respondent had the questions beforehand to prevent any pre-meditated responses. The researcher sought permission from the University to authorize the study. The researcher will also wrote to respondents clearly

stating the motive of the study, the targeted employees in the company, the time frame for data collection and the security of the information given. The researcher assured all the respondents that the data collected is for academic use only and were not be accessed by any other party.

CHAPTER FOUR

RESEARCH FINDINGS AND DISCUSSIONS

4.1 Introduction

This chapter presents results followed by their discussion and interpretation. There are two sub-sections in this chapter. Sub-section one outlines the study response rate, followed by demographic characteristics of the respondents while sub-section two presents the findings, discussion and interpretation based on research objectives.

4.2 Response Rate

The study collected data from 146 women who participated in ASM within Taita Taveta County. This was 100% response rate. This higher rate of return was attributed to the fact that the researcher adopted interviewer administration of questionnaire. According to the results, 44% of the respondents were from Mwatate Sub-County, 32% from Voi Sub-County, 12% from Taveta Sub-County, and 12% from Wundanyi Sub-County (Table 4.1).

Table 4.1: Distribution of the Respondents Per Sub- County

Sub-County	Number of respondents	Percentage
Voi	46	32
Mwatate	64	44
Wundanyi	18	12
Taveta	18	12
Total	**146**	**100**

Besides questionnaires, the study conducted eight (8) FGDs (2 in each sub-county) involving the women and 7 KIIs; that is, 1 with National Government Mining Officer, 2 County Mining Officers, 1 with the geologists (Ministry of Mining), 1 with chairperson ASM and lastly, 2 ASM directors.

Before presenting the results, the study conducted reliability test on Likert scale variables to guarantee validity of the findings. Table 4.2 presents the results of the test, which indicate that Cronbach's Alpha values for all the constructs are above the suggested value of 0.7. Therefore, the study concludes that the Likert scale variables are reliable.

Table 4.2: Reliability Tests Summary

Variables	Cronbach's alpha	Comment
Social Cultural factors	0.765	Accepted
Legal and Regulatory Framework	0.747	Accepted
Availability of Capital	0.713	Accepted
Women effective participation in ASM	0.812	Accepted

The study validated the findings using expert opinion. The research instruments were presented to research experts in the Department of Development Studies at JKUAT to check if they could generate the needed data to respond to the objectives. Upon examining and suggesting corrections, the instruments were validated. The next sub-section presents demographic characteristics of the study participants.

4.3 Demographic Characteristics

This sub-section documents the findings on several demographic characteristics of women engaged in ASM. This included their age, number of years they had spent in ASM, distance between their home and the mining sites, their education level, marital status, their occupation, income levels, position in the household and sources of their income. Demographic characteristics present socio-economic profiles of the women, with implications on their participation in the ASM sector. The findings, discussion and interpretation are presented in this sub-section. To begin with, Table 4.3 presents summary results on age, years in mining business, and distance from home and the mining site of the women who participated in the study.

Table 4.3: Demographic Characteristics of the Respondents

Characteristic	Min.	Max.	Mean	Std. Deviation
Age of respondents (years)	20.00	67.00	40.12	8.66
Years of mining	0.50	28.00	8.06	5.47
Distance between home and the mine (km)	0.20	39.00	12.93	8.03

N=146

The results reveal that the average age of the women who participated in ASM is 40.12 years with a minimum of 20 and maximum of 67 years at the time of this study. This implies that the young and the elderly women participate in ASM. In addition, these findings mean that age is not a barrier for participation into ASM. Regarding the number of years, they had spent in ASM, the study has established the average age of 8.06 years with a minimum of 0.5 years and maximum of 28 years. This suggests that most of them were more experienced in ASM activities and, therefore, they were competent enough to participate in the study. In terms of distance, the respondents had to cover an average of 12.93 km from their homes to the nearest ASM industries per trip with a minimum of 0.2 km and maximum of 39 km. This implies that most women travel a long distance to get to the mining site, an indication of the struggles they undergo to earn a living.

4.3.1 Marital Status

Figure 4.1 presents summary results regarding marital status of women in ASM.

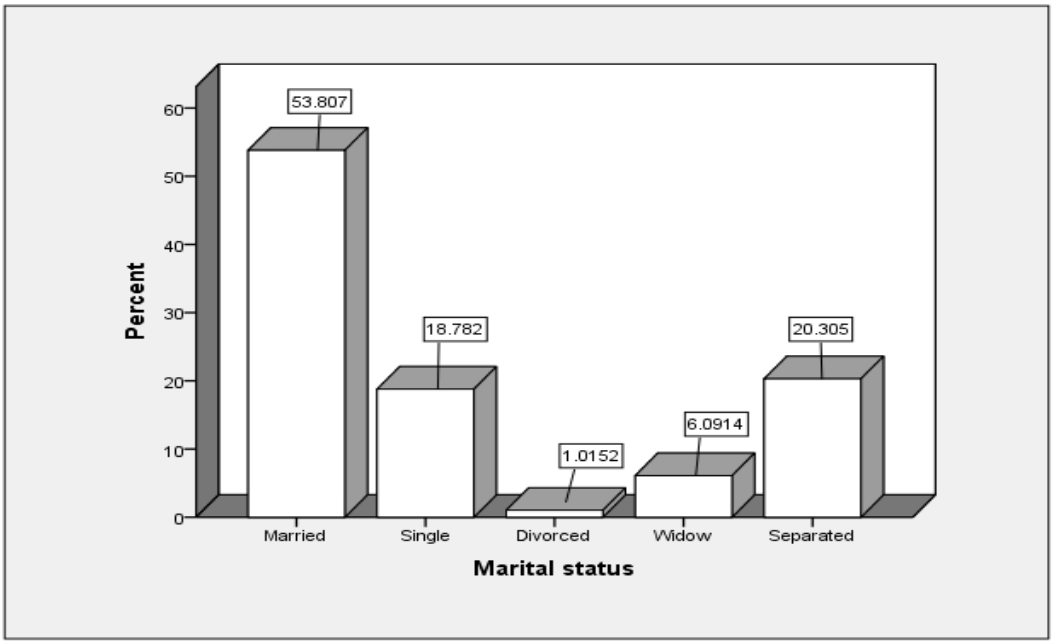

Figure 4.1: Marital status

In terms of marital status, 53.8% of the sampled women were married, 20.3% were separated, 18.8% were single, 6.1% were widowed, and only 1.0% of the respondents were divorced. The results show that slightly more than half of the women who participate in ASM are married and hence, are more likely to have some financial responsibilities in their households. Single women in most cases do not find the need to engage in mining activities because the mines are in remote places. This could explain the reason why they were represented by few. The percentage of women who had separated from their husbands is also slightly higher. This can be attributed to the fact that since they are alone, they must try and fend for themselves, and hence the reason for their participation in ASM business.

4.3.2 Education Level

Regarding the highest level of education attained by women engaged in ASM, Table 4.4 shows that majority of them had primary level certificates at 57.9%, followed by those with secondary level education (37.1%).

Table 4.4: Education Level

Education Level	Frequency	Percent
None (informal)	3	2.0
Primary	84	57.9
Secondary	54	37.1
Tertiary (college)	5	3.0
Total	**146**	**100.0**

In addition, the results indicate that 3% and 2% of the respondents had tertiary and informal education, respectively, as their highest level. These results are in line with those found in Uganda where most women who participated in ASM activities had low levels of education (DRASPAC, 2017). The high level of illiteracy among women in ASM make them to work in less paying jobs where they earn very little compared to men.

4.3.3 Occupation

Summary results for occupation of women engaged in ASM business are presented in Figure 4.2. Women were asked to indicate their main source of income within the ASM. The results indicate that majority (63.7%) of the respondents considered mining as their major source of income. This was followed by 19.1% of the respondents who indicated farming as their main source of income. In addition, 13.1% of women engage in trade activities as their main source of income.

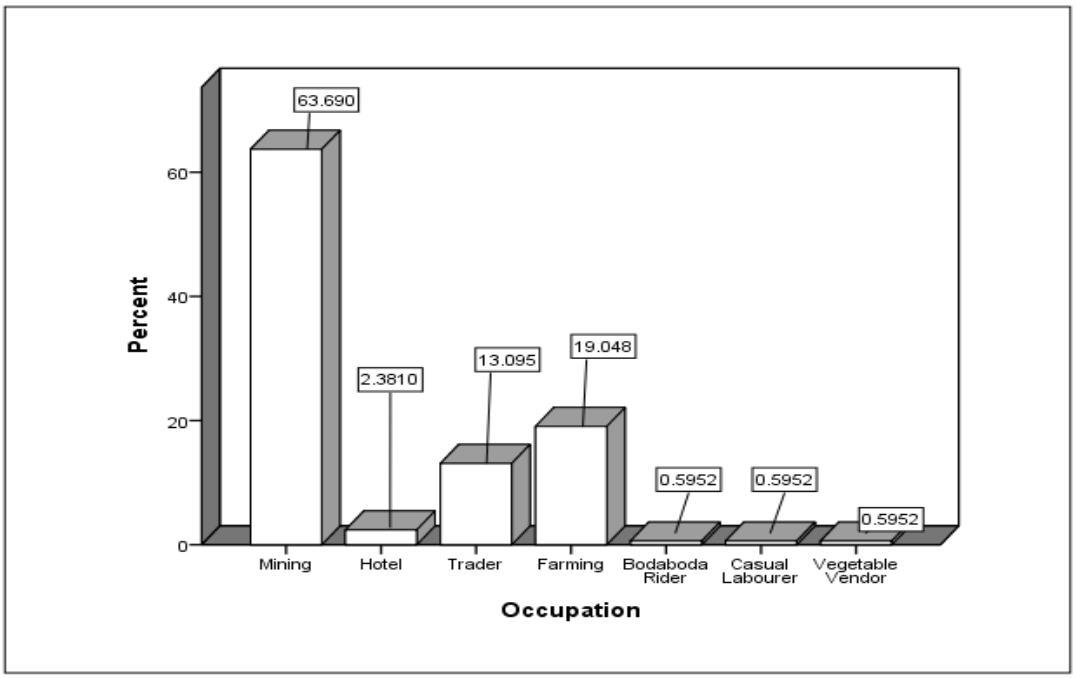

Figure 4.2: Occupation

The findings further reveal that some women obtain their income by providing hotel services (2.4%), as *boda boda* riders and casual labourers 0.59%. These findings indicate that majority of the women take ASM as their main source of livelihood.

4.3.4 Respondents' Operations

The study sought to establish which activities the women were engaged in within the mining sites. Respondents were asked to indicate their operations within the mines. These include the nature of work the respondents were engaged in, tools used in mining, and hours spent in mining activities. Figure 4.3 presents their operations.

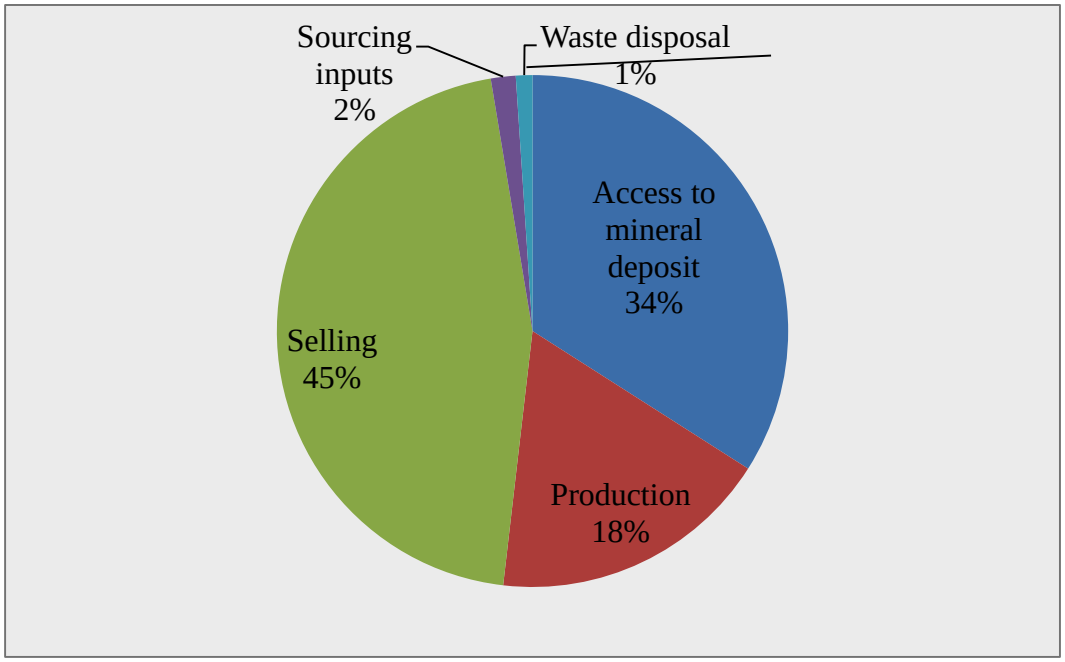

Figure 4.3: Nature of work in mining operations

The findings indicate that majority of the women participating in the ASM are 45% participating in selling of minerals, especially precious stones after they have been cut and engraved. This was followed by women engaged in locating mineral deposits (access to mineral deposits) at 34%. They help in tracing mineral deposits using traditional equipment. In addition, the study results show that 18% helped in processing the ores. This process involves separation of ores from waste rock. Finally, 2% helped in sourcing inputs needed in ASM mining sites, and 1% assisting in waste disposal.

This means that women are involved in the lesser paying jobs compared to their male counterparts. The actual mining activities (for example digging of the ores) is left to men and this fetches higher income since it is a riskier activity. Grinding (pulverisation to the size of fine sand or flour) of ore is done mainly by women using grinding stones, who may be paid or perform the service for free, if a spouse of the miner is providing the ore. In addition, the results imply that women were mainly engaged at the subordinate level of the ASM value chain where they help in low-end activities such as vending food,

credit, and carrying and cleaning of ores in the mining sector. In some extreme cases, women help their husbands as unpaid workers in handling the mining task at their home. Culturally, women are prohibited from entering the mining holes especially during menstrual periods as this is seen as “bad omen”. Women are also overburdened with house chores, and therefore have less time for mining activities. The mining sites were located in the remote places far from settlement, without good sanitary facilities and people residing in tents without good security, thus women could probably experience gender-based violence. The miners could stay in the camp for months before going back home; this was a challenge and seems to fuel family breakdown. However, Taita culture was very favorable hence encouraged women participation.

These results are similar to previous studies where women in the ASM industry are mainly engaged in crashing, sluicing, washing, panning, sieving, sorting, and a few in actual mining (Susapu and Crispin, 2001; Gemerts and Emanuels, 2015). The actual ore digging activities are mainly left for men (Amutabi and Lutta-Mukhebi, 2001). Furthermore, women are involved in provision of goods (vending of food and drink, sales of artisanal equipment such as sieves, and credit for mobile phones) and services (e.g., transporting dirt, ores, ore particles and water; cleaning; laundry; nightclub entertainment; and trading) (Akabzaa and Darimani, 2001).

4.3.5 Nature of Mining Industry

Figure 4.4 provides summary findings on the nature of mining industry where women worked.

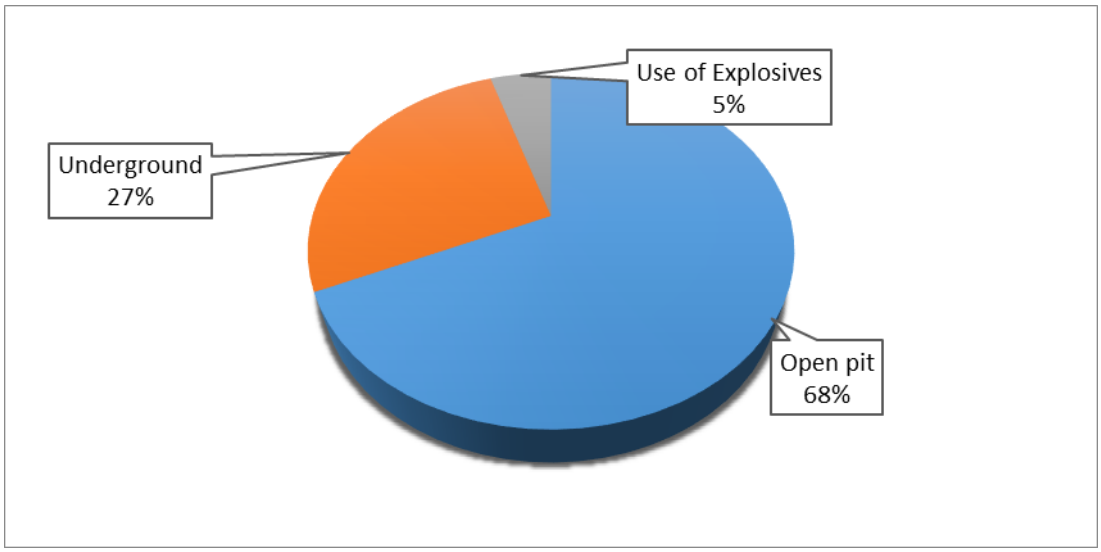

Figure 4.4: Methods Used in Mining

The findings indicate that majority of women interviewed (68%) worked in open pits followed by 21% of women who indicated to be working in the underground tunnels. Finally, 5% of the women worked in mining industries that use explosives to break the rocks. These results demonstrate the risk, and the danger women face while performing their daily duties in the mines. Similar results are reported in Burkina Faso where women are highly exposed to danger while working in the mines (Katja, 2009).

4.3.6 Commodity Mined

Table 4.5 displays summary findings regarding the nature of commodities mined.

Table 4.5: Commodities Mined

Commodity	Frequency	Valid Percent
Yellow Stone	42	28.6
Gemstone (Green Garment)	49	32.6
Rubi	4	2.9
Red Garnet	2	1.7
Tourmaline	10	6.9
Green Garnet	8	5.7
Road-lite	1	.6
Sand	12	8.0
Concrete	4	2.9
Bricks	2	1.7
Mica	3	2.3
Black	2	1.7
Blue Caenite	2	1.1
Tsavorite	1	.6
Rose	2	1.7
Amathest	2	1.1
Total	**146**	**100.0**

The results in Table 4.4 indicate that Gemstone is the most mined mineral at 32.6%, followed by Yellow Stone at 28.6%. In the third and fourth place are sand and Tourmaline at 8.0% and 6.9%, respectively. Gemstone scored a higher percentage because it is considered most precious and marketable.

On tools used in mining, Figure 4.5 indicates that women mainly use hand tools in their daily mining operations. According to the findings, 96% of the sampled women used non-mechanized hand tools such as shovels, spades, and wheelbarrows, among other non-mechanized tools to carry out their daily operations. Only 4% of the women were able to access and use mechanized mining tools, for example tractors, excavators, and pressurized water pumps.

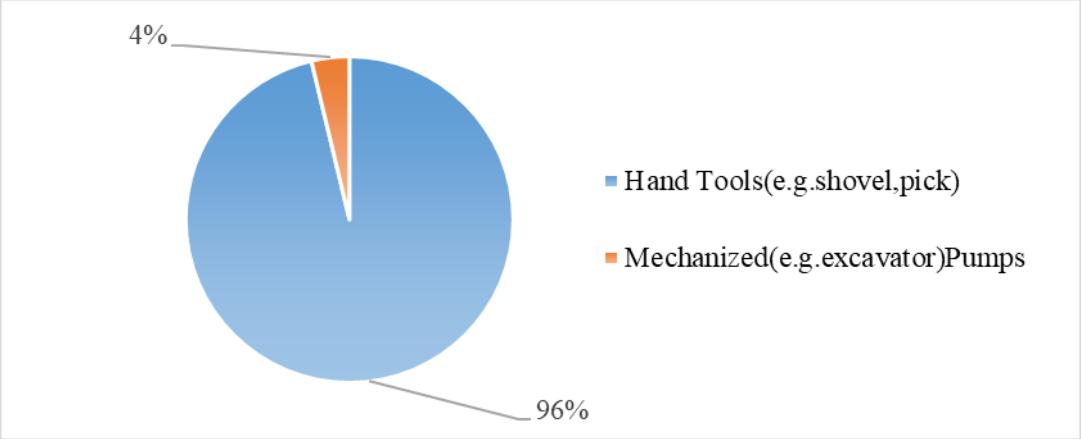

Figure 4.5: Equipment used in mining

4.3.7 Means of Transport

The study sought to find out the means of transporting material and minerals in the mines. The findings are presented in Figure 4.6.

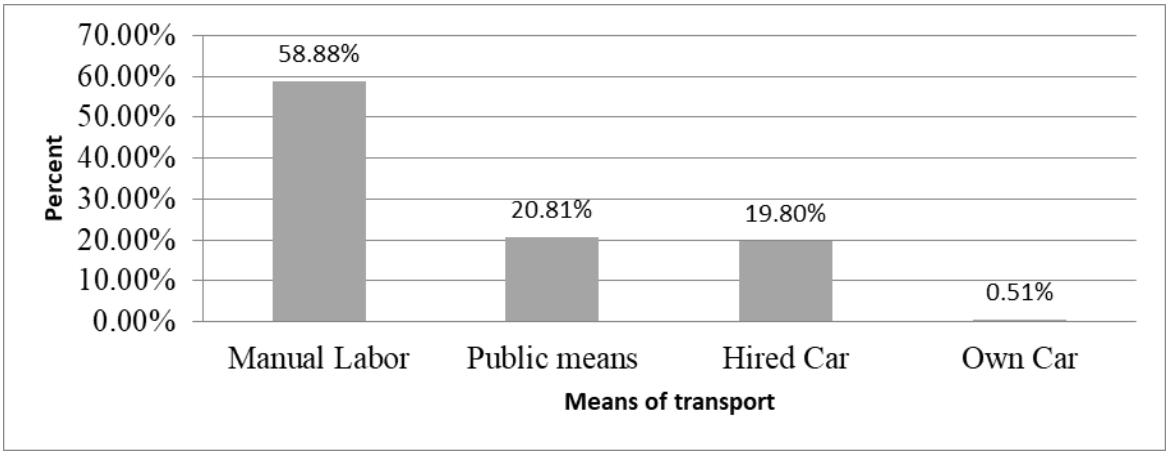

Figure 4.6: Means of transport

Regarding the means of transport used, majority of women (58.9%) mainly use manual labour to transport the raw materials in the mining sector. Only a few (21.0%) managed to use public means to transport their raw materials; 20.0 and 1.0 used hired cars and

own cars, respectively. Women face great financial challenges when it comes to hiring equipment that can be used to ferry their raw materials from the mines to the selling point. Therefore, they are forced to walk on foot to the nearest buyers.

4.3.8 Source of Energy

The respondents were asked to indicate what source of energy was used in mechanised mining. The summary findings are presented in Figure 4.7.

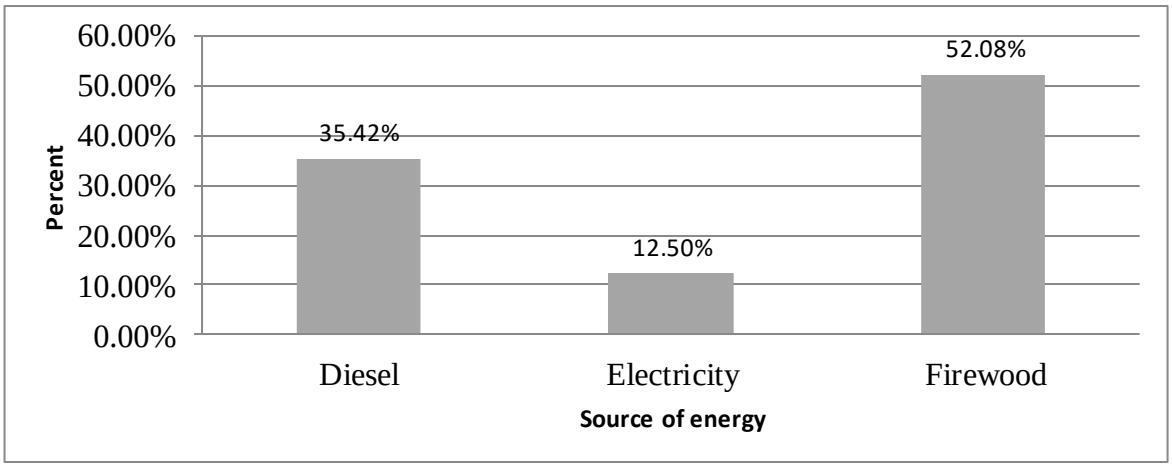

Figure 4.7: Source of energy for mechanized mining equipment

For those women able to own mechanized mining equipment, 12.50% are powered by electricity, 35.42% are powered by diesel, and 52.08% are powered by energy from firewood. These findings imply that women's access to efficient energy sources such as electricity and diesel could compromise their earning ability.

4.4 Determinants of Women Participation in Artisanal and Small-Scale Mining

The study sought to investigate the determinants of women's participation in ASM in Kenya, with focus on Taita Taveta County. Three specific objectives were formulated. These were: to investigate the effect of social-cultural practices on women participation

in artisanal and small-scale mining, to investigate the effect of mining legal framework on women participation in artisanal and small-scale mining, and to determine the effect of access to financial capital on women participation in artisanal and small-scale mining in Taita Taveta County. This sub-section presents the descriptive statistics followed by inferential statistics based on the afore mentioned objectives.

Descriptive statistics include means, percentages and frequency distribution tables of the variables included in the study. Inferential statistics include regression, correlation analyses and hypotheses testing. Since the study involved Likert scale items (for first objective) to quantitatively assess opinions, attitudes or behaviours regarding determinants of women participation in ASM, factor analysis using Principal Component Analysis (PCA) was used. This method was adopted to reduce the dimensionality of numerous Likert scale variables and transform them into fewer factors that still comprise most of the information in the larger data set. The reduced variables were then used to conduct regression, correlation, and hypotheses testing.

4.4.1 Social-Cultural Practices and Women Participation in ASM

The first objective sought to investigate the effect of social-cultural practices on women participation in artisanal and small-scale mining. Under this objective, the study focused on the attitudes about women participation in mining, availability and presence of female role models and mentors in mining, and gender bias on women at the mining and how this affects women participation in ASM.

To begin the analysis, respondents were asked to indicate domestic tasks mostly undertaken by them. A summary of the findings is contained in Figure 4.8.

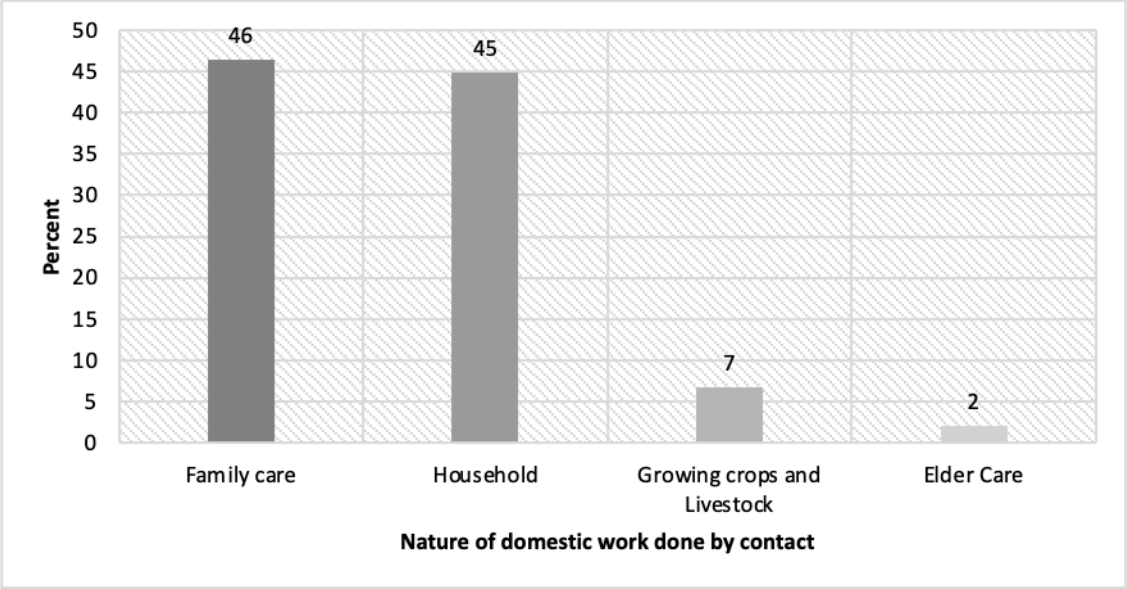

Figure 4.8: Respondents Domestic Chores

In as much as women were engaged in mining activities, they were also responsible for taking care of other duties at the household level (Figure 4.8). Majority (about 91%) of women participated in family-related daily activities (household chores and family care combined) while 7% participated in crop farming and livestock keeping. This means that women were required to allocate and manage their time well so that they can fulfil all their responsibilities. During the day, they also take care of their children, especially the infants who are sometimes carried on their backs during mining activities. In the process, working in mines might generate serious health issues, as infants are exposed to dust, noise and harmful substances such as mercury in the processing spots. Therefore, women are required to wake up early to handle domestic chores and work in the mines. Furthermore, women typically have intensive domestic responsibilities, typically working four to eight hours more than men per day, which adds to their workload; this is largely unrecognized and undervalued.

A qualitative interview with the women during FGDs reaffirms these findings. Majority of the women argued that they have additional responsibilities; that of taking care of the domestic chores, which reduces the time they spend in the mines. This in turn reduces

their earnings and hence their living standards. This is contrary to their male counterparts who have all the time to work in the mines. In addition, the discussions also revealed how unequal women and men are regarding jobs. For instance, a participant explained:

> *"Hii dunia tunamoishi haina huruma kwa wanawake, ni ya wanaume. Wanawake twatakiwa kushugulika na kazi za nyumbani na pia kutafutia familia posho, lakini wanaume wako tu na jukumu moja" (this world where we are living is unmerciful to women, in fact it belongs to men. Women are supposed to take care of the domestic chores as well as looking for daily bread, but men on their part, have only one responsibility) (FDG05).*

These statements are a clear confirmation of the inequalities still exiting between men and women when it comes to access to opportunities and resources.

4.4.1.1 Time Spent working in the Mines

The study sought to establish the number of hours that women spent in mining activities. Figure 4.9 presents a summary of the results.

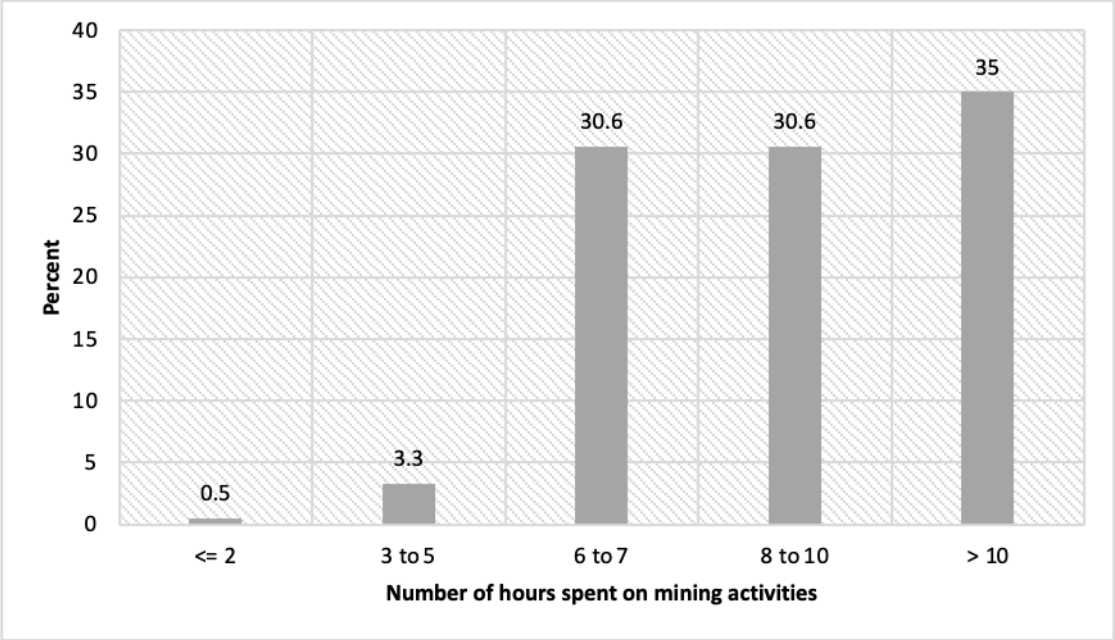

Figure 4.9: Time Spent on Mining Activities

The findings indicate that women spend most of their time in the mines, as a majority (35%) worked in the mines for more than 10 hours. In addition, those who worked between 6-10 hours accounted for about 61%. This means that, on average, women participate in the ASM for at least 6 hours. This can be attributed to the fact that most of the women have added responsibilities of taking care of the homes. They wake up in the morning, perform home chores and head to the mines, and then later on return home for the same chores. These sentiments were also expressed in the FGDs.

4.4.1.2 Attitude about Women Role in Mining

The respondents were asked on their level of agreement with statements regarding attitudes on participation of women in mining using Likert scale of 1-5 where 1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree and 5=Strongly Agree. The results are as presented in Table 4.6.

Table 4.6: Attitude about Women's Role in Mining

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Std. Deviation
Mining is an industry which is not accommodating women.	67.0	3.1	3.6	8.2	18.0	2.07	1.634
I am always reminded am a woman in this job.	25.5	25.0	12.2	21.4	15.8	2.77	1.441
I usually undertake a range of tasks within ASM mining operations, including digging, panning, processing, transporting, hauling, cooking and cleaning.	8.2	12.8	15.3	29.6	34.2	3.69	1.285
I am paid less for my role than other roles dominated by men.	36.9	22.6	26.2	4.6	9.7	2.28	1.274
I am more susceptible to human rights abuses, sexual and gender-based violence and health risks.	35.4	24.1	21.5	6.7	12.3	2.36	1.349
My domestic responsibilities (e.g. preparing food, gathering water, and caring for families) affects the time I spend in ASM work.	16.4	30.3	5.6	29.2	18.5	3.03	1.414
I usually face challenges including the unequal burden of domestic responsibilities and women's under-representation in authority structures.	16.5	13.4	8.8	28.9	32.5	3.47	1.472

N=146

Key: Mean Strongly Disagree=1-1.9, Disagree=2-2.9, Neutral=3, Agree=3.1-4, Strongly Agree=4.1-5

Based on the results in Table 4.6, majority (67%) of the respondents strongly disagreed that the mining industry is an industry not accommodating women. This result reveals the strong perception women have that makes them feel that like men, they can also make it in the mining sector. Half of the respondents further disagreed that they are always reminded that they are women, hence they cannot work in the mining sector. In terms of tasks/duties, most of the women agreed that they usually undertake a range of tasks within ASM mining operations, including digging, panning, processing, transporting, hauling, cooking and cleaning. This implies that women are a vital asset when it comes to the mining sector, as they render majorly supportive services that are

considered more often as subordinate. However, most women disagreed (37%) with a statement regarding their pay vis-a-vis their income, as they disagreed with being paid less compared to men in the tasks they perform. They also disagreed that they are more susceptible to human rights abuses with s 35% score.

In terms of mining jobs and domestic activities, the statement received a balance score from women. Some 30% scored on disagree, felt domestic chores affected their activities/participation in mining, while others (29%) agreed that domestic shores affected their involvement in ASM activities. However, a majority (32% and 29%) of the women strongly agreed and agreed, respectively, that they are under-represented in ASM leadership roles and even in domestic tasks, as they are rarely included in key decision-making.

4.4.1.3 Female Role Model and Mentor in ASM Mining

The respondents were asked on their level of agreement with statements regarding attitudes on participation of women in mining. The results are as presented in Table 4.7.

Table 4.7: Female Role Model and Mentor in ASM Mining

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Std. Deviation
I have role models and mentors who I look up to in the women mining groups.	10.8	11.3	2.6	29.4	45.9	3.88	1.381
I believe successful women in ASM were inspired by role model.	11.3	13.3	13.8	41.5	20.0	3.61	2.527
Our role models always support us in networks that encourage women's participation, bargaining power, work conditions and economic independence.	30.9	18.6	8.8	25.3	16.5	2.78	1.516
I believe publicity surrounding successful role models are gradually influencing women to join ASM.	10.3	19.1	13.9	35.6	21.1	3.38	1.291

N=146

Key: Mean Strongly Disagree=1-1.9, Disagree=2-2.9, Neutral=3, Agree=3.1-4, Strongly Agree=4.1-5

Regarding women's perceptions of role models and mentors, a majority (46%) of the women agreed that they have a mentor whom they look up to in the mining sector. Such mentors guide them and help in learning new mining technics. In line with the mentorship approach, 41% agreed to the assertion that women in ASM were inspired by role model, while 20% strongly agreed to this statement. Concerning the statement that role models always support, 25.3% had role models who encourage them to participate in ASM. In addition, the results indicate that majority of the women (30.9%) strongly disagreed, 25.3% agreed while those who strongly agreed accounted for 16.5% of the women who were interviewed on this issue. The results further indicate that most women agreed to the argument that they were surrounded by successful role models who are gradually influencing then to join ASM at 35.6% while 21.1% of them strongly agreed to this statement. Nevertheless, 19.1% of the women disagreed. Generally, these results imply that role models play a significant role towards influencing women to participate in ASM in Taita Taveta County.

4.4.1.4 Gender bias on women at the mining

The respondents were further asked about their perception on gender bias on women in mining. The respondents were required to give their levels of agreement to various arguments shown in Table 4.8.

Table 4.8: Gender bias on women at the mining

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Std. Deviation
I am not allowed to go into an underground mine, as a woman.	21.8	9.8	3.6	19.2	45.6	3.57	1.635
My cultural taboos (e.g., women during menstruation) prevent me from entering mine sites.	25.3	8.8	6.2	17.5	42.3	3.43	1.672
My engagement in mining is often concentrated around low paid work such as washing, cooking and polishing.	25.6	29.2	21.5	9.7	13.8	2.57	1.339
There is no awareness session for men working in mines on how to respect their colleagues' women.	23.3	7.8	11.9	29.0	28.0	3.31	1.529

N=146

Key: Mean Strongly Disagree=1-1.9, Disagree=2-2.9, Neutral=3, Agree=3.1-4, Strongly Agree=4.1-5

A strong response "strongly agree" was recorded for women not being allowed to go underground in mining, as demonstrated by 46% of the respondents scoring on it and cultural taboos hindering women from entering mine sites during their menstrual cycles as 42% of the respondents score on this statement. Women are seen as weak and therefore they could easily suffocate in the pits. The statement on lack of awareness sessions for men working in the mines scored a positive response, as most of the women agreed (29%) and strongly agreed (28%) with this statement. This explains the reasons why women are discriminated by men and presented in the society as weak individuals with no voice. However, mining is a low paying job concentrated around washing, cooking, and polishing and thus received a negative response as a majority, 29% and 26%, disagreed and strongly disagreed, respectively.

4.4.1.5 Factor Analysis

To conduct regression and hypotheses test regarding the first objective, the study carried out factor analysis using the Principal Component Analysis (PCA). The analysis involved socio-cultural variables expressed in Likert scales. The aim of the PCA was to reduce the number of Likert scale variables into a few factors while still maintaining most of the information in the larger data set variables. The first output of the analysis is the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's Test. For the sample to be adequate, KMO should be greater than 0.5 to realise satisfactory factor analysis. According to the findings (see Table 4.9), KMO of 0.710 was obtained, meaning that the sample was very adequate.

With reference to Bartlett's Test, which measures how strong variables are related, the null hypothesis is that correlation matrix is an identity matrix. For the hypothesis to be accepted, the p-value should be less than 5%. The findings in Table 4.9 indicate acceptance of the null hypothesis since p-value is 0.00. These results imply that Bartlett's test for Sphericity is significant, and therefore factor analysis is satisfactory.

Table 4.9: KMO and Bartlett's Test

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.710
Bartlett's Test of Sphericity	Approx. Chi-Square	1173.715
	Degrees of freedom	105
	P-Value	0.000

The next output (Table 4.10) explains extracted factors with their eigenvalues, percentage of variance attributable to each factor, and the total variance of the factor and the previous factors.

Table 4.10: Total Explained Variance

Component	Initial Eigenvalues[a]			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	**Cumulative %**
1	8.611	23.690	23.690	8.611	23.690	23.690	6.512	17.915	**17.915**
2	8.146	22.411	46.101	8.146	22.411	46.101	5.250	14.443	**32.358**
3	4.561	12.549	58.650	4.561	12.549	58.650	5.301	14.585	**46.943**
4	3.435	9.449	68.100	3.435	9.449	68.100	3.564	9.804	**56.747**
5	2.504	6.890	74.990	2.504	6.890	74.990	6.631	18.243	**74.990**
6	.900	5.228	80.218						
7	.544	4.249	84.468						
8	.176	3.235	87.703						
9	.127	3.101	90.803						
10	.916	2.520	93.323						
11	.667	1.834	95.158						
12	.555	1.528	96.686						
13	.497	1.368	98.054						
14	.380	1.045	99.099						
15	.327	.901	100.000						

Extraction Method: Principal Component Analysis

Table 4.10 shows that the PCA extracted five factors (components) where the first factor explains 23.690% of the total variance, while the second, third, fourth and fifth factors accounts for 22.411, 12.549, 9.449 and 6.890%, respectively. Each of the extracted factors have an eigenvalue (total amount of variance that can be explained by a given PCA) of at least 1. The remaining factors (6-15) each with an eigenvalue of less than 1 were discarded in the process. In total, the extracted factors explain 74.990% of the variance in the socio-cultural variables (which is above the threshold of 60%) while the remaining 25.01% variance is explained by external factors. To put this into more perspective, Table 4.11 presents rotated component matrix indicating the extracted components and variables that were loaded on each component.

According to the rotated component matrix, the first seven variables were substantially loaded on the first and second components. These variables (statements) are associated with attitude about women role in ASM. A variable is said to be substantially loaded on a component if it has a coefficient of 0.5 and above. The statements concerning women role models were substantially loaded on the third and fourth components and, finally, all the variables associated with gender-based biases on women are adequately loaded on the fifth component as presented in Table 4.11. Therefore, these three components were converted into variables (attitude about women role, women role models and biases on women) and later used in inferential analyses in the next sub-sections.

Table 4.11: Socio-Cultural Practices Rotated Component Matrix

Construct	Component				
	1	2	3	4	5
Mining is an industry not accommodating women.	**1.203**	0.473	-0.214	-0.025	-0.138
Am always reminded am woman in this job.	**1.112**	-0.124	0.139	0.001	-0.058
I undertake a range of tasks within ASM mining operations.	0.413	**0.896**	0.135	0.060	0.105
I am paid less for my role than other roles dominated by men.	**0.647**	0.059	0.021	0.109	0.010
I am more susceptible to human rights abuses.	**0.944**	0.022	0.418	-0.308	-0.083
My domestic responsibilities affect the time I spend in ASM work.	**0.665**	0.374	0.172	0.010	-0.192
I face challenges such as unequal domestic responsibilities and women's underrepresentation.	**0.545**	.056	0.203	0-.012	-0.026
I have role models and mentors who I look up to in the women mining groups	0.398	0.408	**0.908**	0.350	0.150
Successful women in ASM were inspired by role models.	-0.269	0.364	0.010	**0.760**	0.125
Role models always support us in networks that encourage women participation, bargaining, work conditions and economic independence.	0.116	0.024	-0.016	**1.400**	0.143
Publicity surrounding successful role models are gradually influencing women to join ASM.	-0.316	-0.017	**0.688**	**0.619**	0.264
Not allowed to go underground.	-0.321	0.113	-0.026	-0.305	**1.403**
Cultural taboos prevent women from entering mine sites.	0.012	0.135	0.282	-0.284	**1.200**
Women roles in the mines are majorly low paid work like washing, cooking and polishing.	0.328	0.095	0.475	0.321	**2.531**
There are no awareness session for men working in mines on how to respect their women colleagues.	0.138	0.406	-0.009	0.394	**0.705**

Source: Author (2020)

4.4.1.6 Correlation of Socio-Cultural Practices and Participation in ASM

The study adopted Pearson's correlation approach to conduct correlation analysis between socio-cultural practices and women participation in ASM in Taita Taveta. Summary results for this analysis are presented in Table 4.12.

Table 4.12: Correlation between Socio-Cultural and Women Participation in ASM

		Women participation in ASM	Attitude about women role	Women role model	Biases on Women
Women participation in ASM	Pearson Correlation	1	-0.357**	-0.168*	-0.195*
	Sig. (2-tailed)		0.000	0.029	0.011
	N	146	146	146	146
Attitude about women role	Pearson Correlation	-0.357**	1	0.000	0.000
	Sig. (2-tailed)	0.000		1.000	1.000
	N	146	146	146	146
Women role model	Pearson Correlation	-0.168*	0.000	1	0.000
	Sig. (2-tailed)	0.029	1.000		1.000
	N	146	146	146	146
Biases on Women	Pearson Correlation	-0.195*	0.000	0.000	1
	Sig. (2-tailed)	0.011	1.000	1.000	
	N	146	146	146	146

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

The findings indicate that there is a negative and statistically significant correlation between women participation in ASM and attitude about women role, women role model, and gender-based biases on women participation in ASM. The correlation coefficient shows that the correlation between women participation in ASM and socio-cultural practices is weak. Nevertheless, the results indicate that there is at least a relationship between women participation in ASM and socio-cultural practices. To explore more on this relationship, the next sub-section presents regression findings.

4.4.1.7 Regression Analysis

The study regressed women participation in ASM on socio-cultural practices (attitude about women role, women role models and gender-based biases on women). Ordinary Least Square (OLS) method was adopted. Simple regression was used to determine whether the value of socio-cultural practices can predict women participation in ASM. In simple regressions, any change to the dependent variable can only be attributed to the

independent variables as opposed to multiple regression analysis. The summary findings are presented in Table 4.13.

Table 4.13: OLS Estimated Results

Independent variables	B	Std. Error	Beta	T	Sig.
(Constant)	8.303	0.157		53.027	0.000
Attitude about women role	-0.770	0.154	-0.354	-4.983	0.000
Women role model	0.078	0.155	0.036	0.507	0.613
Biases on Women	-0.412	0.152	-0.192	-2.704	0.008
Dependent	Women Participation in ASM				
Adj. R squared		0.150			
Std. Error		2.035			
F – ratio (3, 168)		10.914			
Prob. > F		0.000			

According to the F-statistic (ANOVA test), the model was found to be statistically significant given the p-value of 0.000 <0.05. This implies that the study has found a significant relationship between women participation in ASM and socio-cultural practices in general. The adjusted R squared indicates that socio-cultural practices explain 15% of women participation in ASM.

Turning to the coefficients, the results indicate a negative and statistically significant relationship between women participation in ASM and attitude about women role (-0.354, Sig.=0.000 <0.000). These findings show that attitude about women role in ASM has a negative effect on their active participation in the mining activities. The size of the coefficient shows that a unit change in attitude about women role reduces women participation in ASM by 35.4%. This is a huge impact. The attitude of demeaning women and stereotyping them has an adverse impact towards women empowerment in Taita Taveta County. Similarly, a study by Buss *et al*.(2017) established that certain cultural attitudes discourage women from mining activities in some communities and therefore women have no equal opportunity to exercise their potential in the industry. In addition, a UN report of 2014 observes that some communities in developing countries have certain norms that prevent women in participating actively in ASM. The report

cited an example of Tanzania where some communities see women as weak and hence cannot do actual mining jobs (United Nations, 2014).

Regarding gender-based biases against women, the study has also established a negative and statistically significant relationship with women participation in ASM (-.192, Sig.=0.008, <0.05). In addition, the findings indicate that a unit change in gender-based biases reduces participation of women in ASM by 19.2%. This implies that discrimination against women adversely affects women in Taita Taveta County towards access to opportunities and resources. Similarly, earlier studies support these results. For instance, Romanus *et al*. (2012) found that the mining industry in Ghana, for example, is dominated by a male culture and characterised by gender-based biases and discrimination against women. The study further indicates that women receive less pay despite working hard just like their male counterparts. Generally, cultural beliefs and traditions highly affect participation of women in development initiatives.

Finally, the study has established a positive relationship between women role models and women participation in ASM (0.036). Nevertheless, this relationship is not statistically significant given a p-value of 0.613 >0.5. These revelations could be attributed to none or limited role models to women participating in ASM in Taita Taveta County.

These regression findings are further supported by FGDs. For instance, during focus group discussions, women expressed various socio-cultural impediments to their participation in ASM in Taita Taveta County. It was common to almost all the participants in all FGDs that they are overburdened by household chores and, therefore, they have limited time to participate in ASM. Another socio-cultural practice that came up during the discussion is the issue of prohibiting women to go into the pits. This hinders them from participating in the actual mining. This was attributed to the traditional belief that women are weak, both physically and intellectually, and cannot therefore engage in duties requiring physical and intellectual strength. Indeed,

quantitative statistics have indicated that most women do supportive tasks such as locating mining sites, disposing off wastes and selling of the minerals.

In addition, the study has learned that the beliefs of the communities in Taita Taveta County prohibit women who are experiencing their menstrual cycles to go to the mines for work. This is a big challenge especially for women in reproductive age. It implies that in every month, a woman could miss going to work in the mines at least for 5 days. This poses an economic challenge especially for those households depending on the earnings of the women for living.

Another cultural aspect is the issue of marriage where some women reported that in certain clans, some men prevent their women from going to the mines. For instance, one respondent argued that:

> *Married women are not "supposed" to engage in mining, this because one must stay in the home to look after children and the house (FGD04) respondent.*

These revelations indicate that some cultural responsibilities and norms oppress women in their quest for economic emancipation and, therefore, leaving them with little time for mining. Nevertheless, there were also those with contrary opinion in connection with the effect of culture on participation of women in ASM. For instance, a woman stated that:

> *Nowadays, women have been empowered and the times of women slavery is over. Culture is no longer a hindrance to women access to jobs or participation in development (FGD01).*

Other participants also thought that culture is very favourable and hence it encourages women participation in ASM. However, majority of the women were of the view that certain cultural practices derail women empowerment and should henceforth be discarded.

4.4.1.8 Hypothesis Testing

Finally, the study sought to test the first hypothesis, which was stated as:

Ha_1: Social-Cultural practices affect women participation in artisanal and small-scale mining in Taita Taveta County.

The results of Chi-square test are presented in Table 4.14.

Table 4.14: Chi-Square Test for First Hypothesis

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	23349.000[a]	41	.000
Likelihood Ratio	1662.225	41	.060
Linear-by-Linear Association	2.241	1	.050
N of Valid Cases	146		

The chi-square statistics of 23349 with p-value of 0.000 indicates an association between socio-cultural practices and women's participation in ASM. This means that socio-cultural practices influence the women's participation in ASM. These findings are consistent with regression results.

In summary, the study has established that women participation in ASM in Taita Taveta County is negatively influenced by attitude on women's role in the sector and biases towards women. Negative attitude concerning women's role, and biases against women which are advanced by men, discourages most women from venturing into the sector or benefiting greatly in the ASM sector since, those who are already in the mines preform auxiliary duties that earn them less income compared to what men receive. For instance, there are commonly held beliefs that women are weak both physically and intellectually. Consistent with these findings is the study by Romanus *et al.* (2012) where the study observed that the mining industry in Ghana and in many societies is dominated with a male culture of total sexual harassment and mistreatment of the opposite gender.

4.4.2 Legal Framework and its Effect on Women Participation in ASM

The second objective of the study sought to investigate the effect of mining legal framework on women participation in artisanal and small-scale mining. The respondents were asked for their opinion on a few issues regarding mining legal and regulatory framework. Majority of respondents said that the process of acquiring ASM permits is complicated and time wasting, and they were therefore forced to corrupt mining officers in some cases to get the permits. This was also fueled by the fact that distance to mining office was located at Voi Sub- County, which was far from the mining camps. There was also lack of awareness, education, and clear guidelines for easy application of ASM permits.

Qualitative findings show that most women miners declined to apply for ASM permits in fear of government compulsory taxation even when there are no mines. In addition, for a few women who work as traders, they sell their final products to non-licensed traders (brokers) who, in most cases, exploit them by offering lower prices (see Table 4.15). For instance, findings indicate that 43 women sold Yellow Stone to unlicensed buyers against 5 who reported to have sold to licensed buyers. Similar findings are reported for sand, but, for the main mineral (Gemstone), majority of the respondents (30) sold to licensed buyers.

Table 4.15: Cross Tabulation between Commodity Mined and the Market (Buyers)

		Yellow Stone	**Gemstone (Green Garment)**	**Road-lite**	**Sand**	**Mica**	**Total**
Where the Contact sells their products	Licensed buyer	5	30	0	0	0	35
	Unlicensed buyer	43	7	1	14	4	69
	Other	2	20	0	0	0	22
Total		**50**	**57**	**1**	**14**	**4**	**126**

Generally, these findings point to the challenges women go through when marketing their mines, as the unlicensed buyers could be the source of their exploitation in terms of income. Studies show that obtaining a license involves significant costs and bureaucratic

barriers (Werthmann, 2009). The ability to obtain an ASM license is based on awareness of procedures, financial and technical capacity, and personal freedom to get a license, requirements that are of great challenge to female miners (Yakovleva, 2007).

Table 4.16 presents summary findings on women's understanding on the mining regulations. The findings indicate that majority of the respondents (62.1%) indicated that they did not understand the laws that affect rights to access mineral deposits. In addition, 61.1% reported that the mining laws should be changed, 64.6% were not aware of the environmental effects of ASM on women, 97.9% said there were not enough women in government structures that influence ASM, 96.9% reported that mining administration offices are far away, 51.3% of the respondents indicated that there was ease to comply with the laws while only 38.5% expressed comfort in dealing with law enforcement agents.

Table 4.16: Respondents' opinion on Mining Regulatory Aspects

	Yes	**No**
I understand the laws that affect rights to access mineral deposits	37.9	62.1
Should the laws be changed	61.1	38.9
Are there enough women in government structures that influence ASM	2.1	97.9
Are mining administration offices close enough	3.1	96.9
Ease of complying with the laws	51.3	48.7
Comfort in dealing with law enforcement agents	38.5	61.5

Further, the respondents suggested ways in which ASM structures and policies could be transformed. This can be attributed to the fact that there is poor understanding of mining legal framework and, in some instances, dealing with enforcement institutions is difficult. In addition, it has also been argued by the respondents that compliance process is quite cumbersome and expensive. These suggestions are illustrated in Figure 4.10.

As illustrated, the suggested ways of transforming ASM structures were by increasing the number of women in the structures (52.1%), decentralizing the structures (28.4%) and by improving their accountability (17.5%).

Figure 4.10: Ways of transforming ASM Structures and Policies

In addition, the suggested ways of transforming the policies that affect ASM include raising awareness on the policies (56.3%), increasing participation in the review of policies and laws (30.0%) and development of new policies, laws, and programs (13.7%).

4.4.2.1 Mining License

The study sought to establish whether the respondents had mining permits. Majority of the women (65%) did not have valid mining permits. When asked for the reasons why they did not have valid licenses, they cited various reasons as illustrated in Figure 4.11.

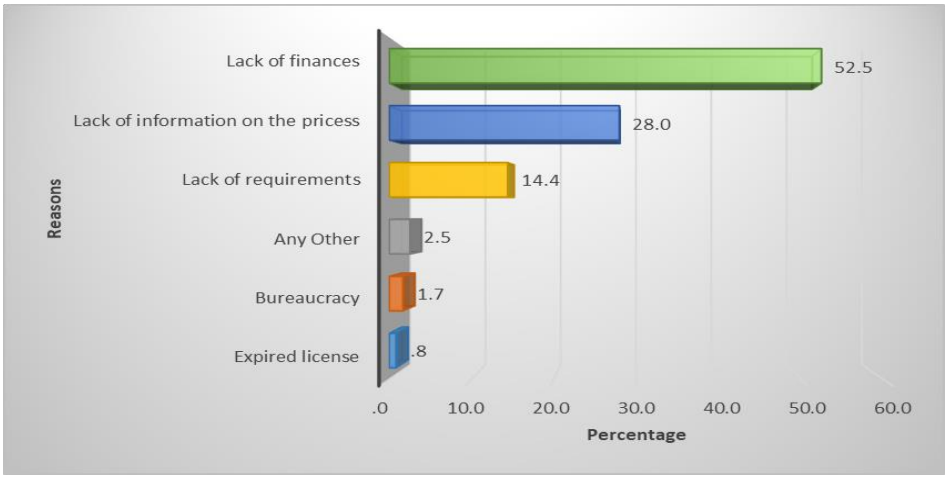

Figure 4.11: Reasons for not having a Mining License

Most of the respondents cited challenges such as lack of finances (52.5%), while others lacked mining permits due to lack of information on the prices and where to acquire the mining permit (28%), lack of necessary document to get a mining permit (14.4%), bureaucracy (1.7%) and expired licenses (1.0%). This result suggests that only 35% of the respondents were authorized to work in the ASM mines.

According to literature, even though ASM workers can register themselves or obtain permits to become part of the formal ASM system, the procedures are such that in practice women are generally unable to obtain the licenses. Besides, women's ability to travel is often restricted by their husbands and families, hence it is difficult for them to access government offices to acquire mining permits, especially when they are far from their homesteads. Similar findings were reported for the case of ASM activities in Uganda where most women were unable to get access to mining permits mainly due to lack of time to access government offices to apply for the permits.

4.4.2.2 Submission of Tax

Most of the respondents (62%) reported that they submit their taxes annually, while 38% do not submit their taxes. The reasons given for not submitting taxes were lack of

information on the process (56%), lack of finances (42%) and bureaucracy (1%) as shown in Figure 4.12.

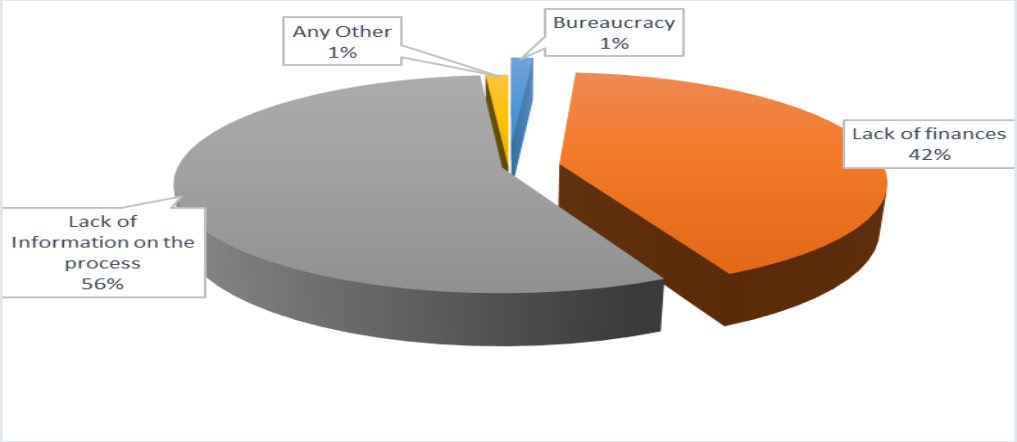

Figure 4.12: Reasons for not Paying Taxes

Having presented and discussed descriptive statistics on mining legal framework and its relationship with women participation in ASM, the next sub-section discussed correlation, regression, and hypothesis test regarding the second objective.

4.4.2.3 Correlation analysis

Table 4.17 presents correlation between mining legal framework and women participation in ASM.

Table 4.17: Correlation between Mining Legal Framework and Women Participation in ASM

		Women participation in ASM	Understanding of mining laws	Mining permit requirements	Process of obtaining mining permits
Women participation in ASM	Pearson Correlation	1	.219**	.343**	.288**
	Sig. (2-tailed)		.003	.000	.000
	N	183	183	183	183
Understanding of laws of mineral deposits	Pearson Correlation	.219**	1	.382**	.533**
	Sig. (2-tailed)	.003		.000	.000
	N	183	195	195	195
Mining permit requirements	Pearson Correlation	.343**	.382**	1	.665**
	Sig. (2-tailed)	.000	.000		.000
	N	183	195	195	195
Process of obtaining mining permits	Pearson Correlation	.288**	.533**	.665**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	183	195	195	195

** Correlation is significant at the 0.01 level (2-tailed).

The correlation statistics revealed a positive correlation between women participation in ASM and all the variables of legal framework, which include understanding of mining laws, mining permit requirements and process of obtaining permit. This is because all the coefficients are positive and statistically significant given p-values of less than 0.05. This implies that there is at least a relationship between women participation in ASM and mining legal framework. The next sub-section presents regression analysis results.

4.4.2.4 Regression for Legal Framework and Women Participation in ASM

OLS regression was carried out to determine the influence of awareness and adherence to the laws about mining on women participation in mining. The dependent variable was participation in mining measured by the number of hours' women participate in mining activities. The regression was analysed at confidence level of 95%. The summary results are presented in Table 4.18.

Table 4.18: OLS Estimated Results

Independent variables	B	Std. Error	Beta	T	Sig.
(Constant)	5.431	.627		8.664	.000
Understanding of mining laws	.395	.369	.087	1.071	.286
Mining permit requirements	1.165	.405	.265	2.878	.004
Process of obtaining mining permits	.316	.1945	-.589	-.3	0.003
Dependent	Women Participation in ASM				
Adj. R squared		0.1564			
Std. Error		2.070			
F – ratio (3, 179)		12.25			
Prob. > F		0.000			

According to the F-statistic (ANOVA test), the model was found statistically significant given the p-value of 0.000 <0.05. This means that the results are valid and that a significant relationship exists between mining legal framework and women participation in ASM in Taita Taveta County. Concerning adjusted R-squared, the results show that mining legal framework determines women participation in ASM by 11.6%.

Turning to the coefficients, the study indicates that there is a relationship between mining legal framework and women participation in ASM. This implies that understanding of the legal framework, the ability to meet the requirements and therefore obtain the permit, and the processes involved in meeting the legal requirement of the industry could influence the participation of women in the mining sector. For instance, the study has established a positive and statistically significant relationship between mining permit requirements and women participation in ASM (0.265, Sig.=0.004). The size of the coefficient indicates that unit improvement in the mining legal framework could increase the participation of women in ASM by 26.5%.

According to the results, the process of obtaining mining permits was found to explain women participation in ASM negatively (-0.589, Sign. = 0.003). In addition, the size of the coefficient indicates that this variable has a great impact on influencing women participation in ASM (58.9%). This means that a decline in obtaining mining permits could reduce participation of women in ASM drastically. These results could be attributed to challenges experienced in obtaining permits. Nevertheless, the study has failed to establish a statistically significant relationship between understanding mining laws and women participation in ASM. This could be attributed to poor understanding of mining laws among the respondents.

FGDs have revealed various challenges that women face in acquiring mining permits for their activities. For instance, almost in all FGDs conducted, women have argued that getting permits is very cumbersome and time consuming. This could explain the reasons why regression findings have indicated a negative coefficient, which implies that acquisition of mining permit has an adverse effect on women participation in ASM enterprise. In addition, the study has established that getting those permits is an expensive exercise and they have to pay twice for the same, i.e. both to the National and County Government. This, therefore, discourages majority of women who might want to venture into ASM.

Furthermore, through the FGDs, the study has established that women are often harassed by the authorities in charge of giving out the permits, and that the administrate offices are located far away from their residential areas. This makes it difficult and even expensive to access the mining permits. The other challenge that was brought up by the women during discussion was the issue of awareness. Some women noted that awareness about the mining permits and the requirements was a big challenge and some of them do not understand the process, and hence this could lock out any potential entrant. Corruption was another issue that came up during the discussions. Some women stated that they had to bribe some officials for them to get mining permits, and that this was a very serious issue to them that requires urgent redress. Furthermore, it became

very clear during the discussions that there were no clear guidelines for applying the mining permits.

4.4.2.5 Hypothesis Test

Finally, the study sought to test the second hypothesis, which was stated as:

Ha_2 : Mining legal framework affects women participation in artisanal and small-scale mining in Taita Taveta County.

The study conducted a Chi-squared test whose results are presented in Table 4.19.

Table 4.19: Chi-Square Test for the Second Hypothesis

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	18.238[a]	17	.004
Likelihood Ratio	21.860	17	.190
Linear-by-Linear Association	2.627	1	.105
N of Valid Cases	146		

The hypothesis was accepted given a p-value of 0.004. This means that there is statistical dependence between women participation in ASM and mining legal framework. These findings are consistent with regression results.

The study has shown that mining legal framework influences women participation in ASM. While mining permit requirements have a positive effect on women participation, the process of obtaining such permits has an adverse impact on women participation. This implies that while women seem to meet the requirements of obtaining mining permits, the process of getting the permits is tedious and complicated and hence, it discourages women participation. This was the first study to ever focus on legal framework and how it affects women participation. This implies that these findings are very critical to policy formulation to enhance, the role of women in ASM sector.

4.4.3 Effect of Access to Financial Capital on Women Participation in ASM

The third objective of the study aimed at determining how access to financial capital affects women participation in artisanal and small-scale mining. Under this objective, the study sought to establish the types of access the respondents have, constraints faced in accessing assets, markets and services, and access to credit. The study discusses the descriptive statistics followed by inferential analysis. Figure 4.13 illustrates the various financial institutions that women belonged to and from where they could save and possibly obtain credit to finance their mining activities.

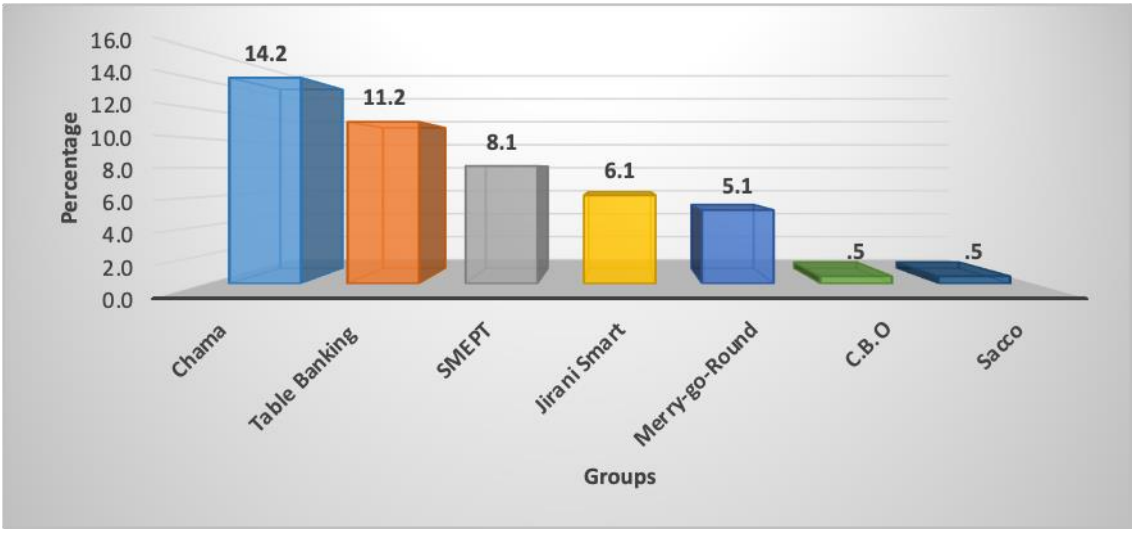

Figure 4.13: Types of self-group joined

Women belonged to a number of informal self-help groups that supported them in different ways. The most common groups were religious-related social gatherings, financial support self-help groups such as Savings and Credit Co-operatives (SACCOs), SMEPT, Jirani-Smart, merry-go-rounds, and locally organized table banking (Figure 4.13). A few of the respondents belonged to Community-Based Organizations (CBOs) that aim at improving the livelihoods of miners.

With reference to the market for mined products, the study shows that most women sell their minerals or products to unlicensed buyers (brokers), as it presented the larger share

at 65%, followed by licensed local buyers at 32% and foreign markets took the remaining 3% of the mined products (Figure 4.14). These results are a clear suggestion of the exploitation of women's effort by the brokers who buy their mined products. Brokers take advantage of the ignorance of the women on market conditions, including the prices in the market. Majority of the women interviewed have low levels of education, which makes them susceptible to exploitation by the brokers. In addition, most are poor and therefore would sell their products fast, just to get daily bread.

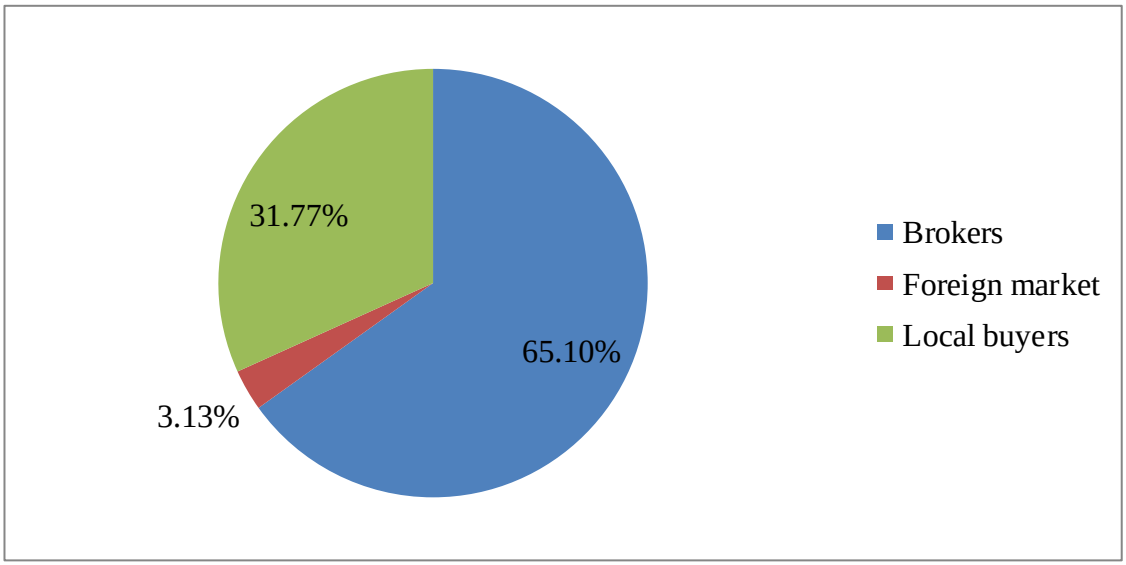

Figure 4.14: Main Market for the Ores

4.4.3.1 Monthly Income

The study sought to establish women's monthly disposable income from mining activities, and the summary results are presented in Table 4.20.

Table 4.20: Average Monthly Individual Income from Mining Activities

Role in Mining Operation		N	Minimum	Maximum	Mean	Std. Deviation
Owner	Average monthly production	35	1,000	30,000,000	10,113,457	10,686,796
Buyer	Average monthly production	5	1,000	50,000	12,200	21,276
Worker	Average monthly production	91	20	150,000	13,491	21,816
Other	Average monthly production	7	1,000	15,000	4,571	5,623

Women who participated in ASM business reported earning different amounts depending on the role they play in mining. For instance, owners of mining ores earned an average of Ksh 10,113,457 per month as shown in Table 4.20. The highest earner took home Ksh 30,000,000 while the lowest earned Ksh 1,000 per month. Buyers of minerals earned an average of Ksh 12,200 per month while workers in the mines pocketed Ksh 13,491 per month, on average. The variation in income is based on the position in which the women occupy in the ASM industry. Women tend to work mostly in the informal, riskier ASM, often in more remote areas where incomes are lower. Men generally undertake most of the higher paid underground small-scale mining while women and children are typically engaged in more traditional, informal, and lower paying open pit ASM work. Besides, women tasks are paid by individual miners on a piece rate basis (per basin of ore washed). While the price is in principle agreed upon, a buyer may decide to pay less in case a particular load of ore does not contain the expected amount of mineral and sometimes does not pay if the mineral is not recovered.

4.4.3.2 Access to assets

The various types of assets accessed by the respondents were as presented in Table 4.21. For each category, respondents were interviewed to establish their level of access. In the capital assets category, 73.7% of the respondents had access to mineral deposits while 25.3% were able to access land. In the human asset category, majority of the respondents were able to access the skills required for mining at 96.4% while in the positive capital assets equipment technology was accessed by most women at 55%. Regarding social capital assets, most women (72.6%) could access formal association in formal networks

while in financial assets category, 47.2% of the respondents (majority) reported that they had access to savings in cash followed by credit access at 35.2%. Finally, with reference to physical capital assets, 62.1% had access to roads and 26.8% on telephone.

Table 4.20: Type of Assets Accessed by Respondents

Category	Asset	Percent
Capital assets	Mineral deposits	73.7
	Land	25.3
	Other	1.1
Human capital assets	Skills ability	96.4
	Other	3.6
Positive capital assets	Equipment technology	55.0
	Other	45.0
Social capital assets	Formal association informal network	72.6
	Other	27.4
Financial assets	Credit	35.2
	Savings in cash	47.2
	Savings in livestock, harvests	14.0
	Other	3.6
Physical capital assets	Roads	62.1
	Telephone	26.8
	Electricity	4.7
	Buildings	4.7
	Other	1.6

4.4.3.3 Constraints in accessing assets

In addition, respondents were asked whether the following issues were a constraint or not a constraint in accessing assets. The results were as presented in Table 4.22.

Table 4.21: Constraints in Accessing Assets

Parameter	A Constraint (percentage)	Not a constraint (percentage)
Poor education background	54.9	45.1
corruption	54.2	45.8
Poor conveying of information	63.5	36.5
Poor infrastructure	71.1	28.9
Lack of finances	68.8	31.3
Lack of knowledge/skills	25.0	75.0
Technology	31.3	68.7

The study has established that poor education background was perceived as a constraint by 54.9% of the respondents, corruption by 54.2%, poor conveying of information (63.5%), poor infrastructure (71.1%). In addition, majority of the respondents cited lack of finances at 68.8% as a constraint while only 25.0% and 31.3% perceived lack of knowledge/skills and technology as a constraint to access to assets, respectively.

4.4.3.4 Constraints in Accessing Market and Services

Further, access to market was constrained by poor prices (60.0%), fluctuating prices (65.6%) and illegal trade (16.9%). Similarly, access to services was hampered by poor infrastructure (71.3%) and lack of extension services (54.4%) as shown in Table 4.23. It would be good to establish the linkage to access to markets and services.

Table 4.22: Constraints in Accessing Markets and Services

	Constraint	Per cent
Market	Illegal trade	16.9
	Poor prices	60.0
	Fluctuating prices	65.6
	Other	5.1
Services	Poor infrastructure	71.3
	No extension	54.4
	Other	2.1

4.4.3.5 Information Gaps in Accessing Assets

Respondents were asked if they had information gaps in accessing mineral deposits, markets and laws and regulations. The summary results are presented in Table 4.24.

Table 4.23: Information Gaps in Accessing Assets

	Have information gap	No information gap
Mineral deposits	25.6	74.4
Markets	70.3	29.7
Laws and regulations	29.2	70.8
Other information	1.0	99.0

Majority of the respondents (70.3%) reported a gap concerning market information as shown in Table 4.22. Moreover, 29.2% had information gaps regarding laws and regulations while 25.6% had information gaps on mineral deposits.

4.4.3.6 Perceptions on Access to Resources

Respondents were asked about their perception regarding access to resources and how this affected participation in ASM. Majority reported that lack of access to resources had affected women participation in ASM (see Figure 4.15).

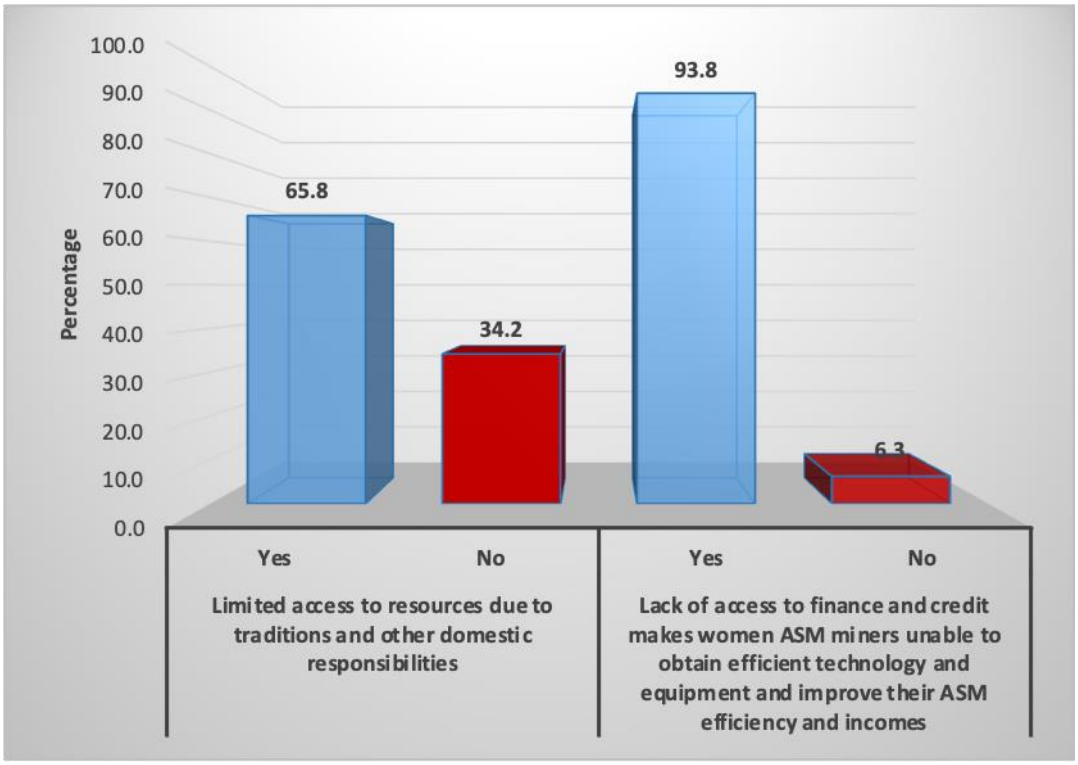

Figure 4.15: Perceptions on Access to Mining Resources

Based on the results in Figure 4.15, most of the respondents (65.8%) reported that they have limited access to resources such as land rights and financial credit due to their traditions and other domestic responsibilities. Besides, 93.8% indicated that lack of access to finance and credit was one of the leading reasons why women ASM miners were unable to obtain efficient technology and equipment and improve their ASM efficiency and hence incomes.

4.4.3.7 Perceptions of Women Miners on ways to improve their Position

Women considered a number of technological interventions that can help them improve their current position in the mining sector. The results reveal that 82% of women consider introduction of excavator as the best way of reducing their labour burden and making their work easier in mines (Figure 4.16). Introduction of a compressor is considered as a second viable intervention by 56% of the women. To improve their

measurement and weighing systems, 29% of the women consider introduction of digitalized weighing machines as the best intervention to cut on fraud resulting from poor weighing scales.

To improve on the means of transport, 28% of women consider introduction of bulldozers as a better intervention to improve the mining sector. Having issues with breathing especially in underground mines, 17% of the women consider introduction of oxygen supply equipment as a better approach to improving the sector. Finally, 3% of the respondents prefer having proper and reliable source of energy to power their mining equipment.

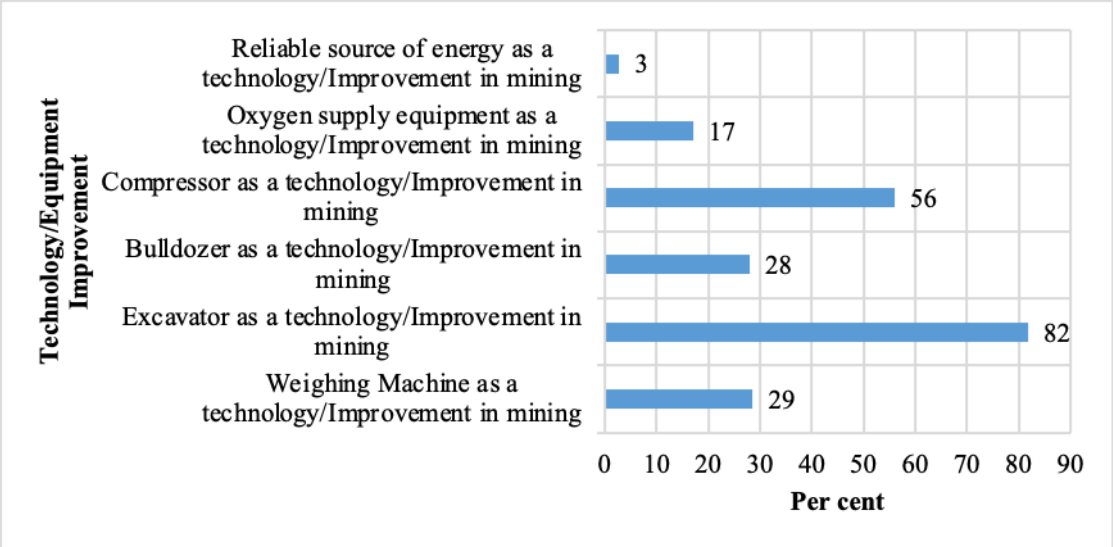

Figure 4.16: Technology Equipment Improvement

In terms of training, 68% of the women consider being trained on how to identify good mines as the most important skills to improve their operations (Figure 4.17). Receiving training on proper operations of complex mining machineries was considered by 48% of the women as the second most important skill they need to improve their operations. Besides, 38% of the women consider being trained on mining laws to be a better way of improving their daily operations, as it will reduce the conflicts and harassment, they face from law enforcers when they fail to comply with set standards and regulations. In terms

of safety, 32% of the women consider having better training on safety skills during mining as the most important training they need as women to improve their mining operations. Finally, 22% of the women prefer being trained on value addition, as it will enable them to get better returns from their mines.

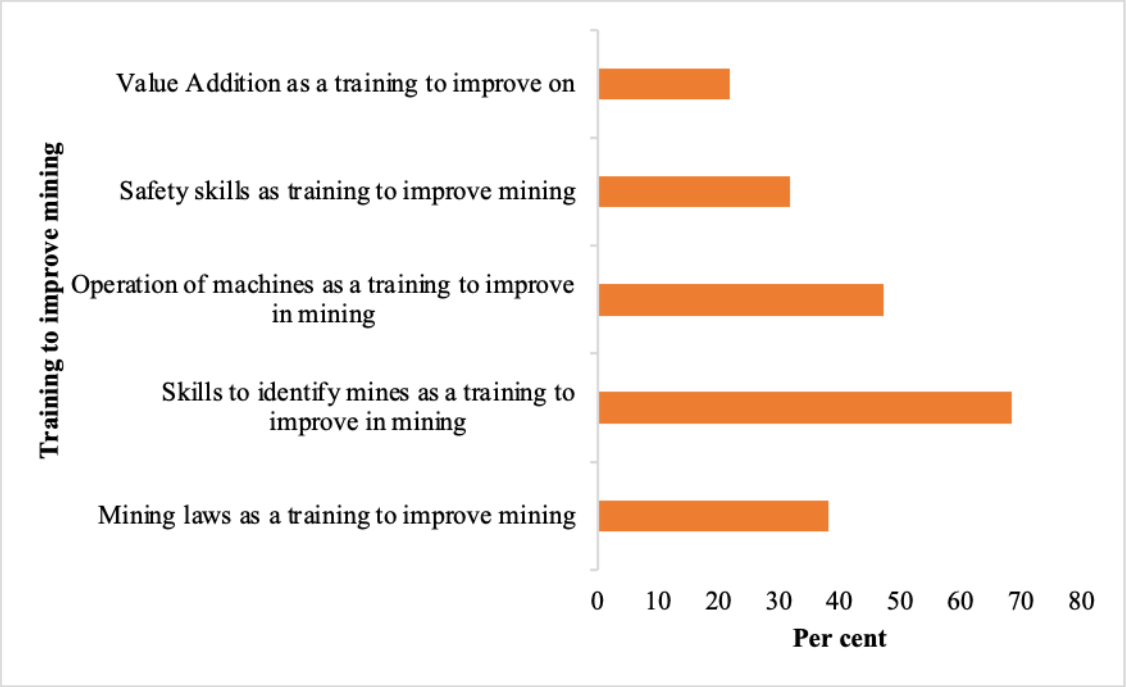

Figure 4.17: Training to Improve Mining

4.4.3.8 Benefits of self-help groups

The study sought to establish from the respondents how they benefited from self-help groups (SHGs). The summary results are presented in Figure 4.18.

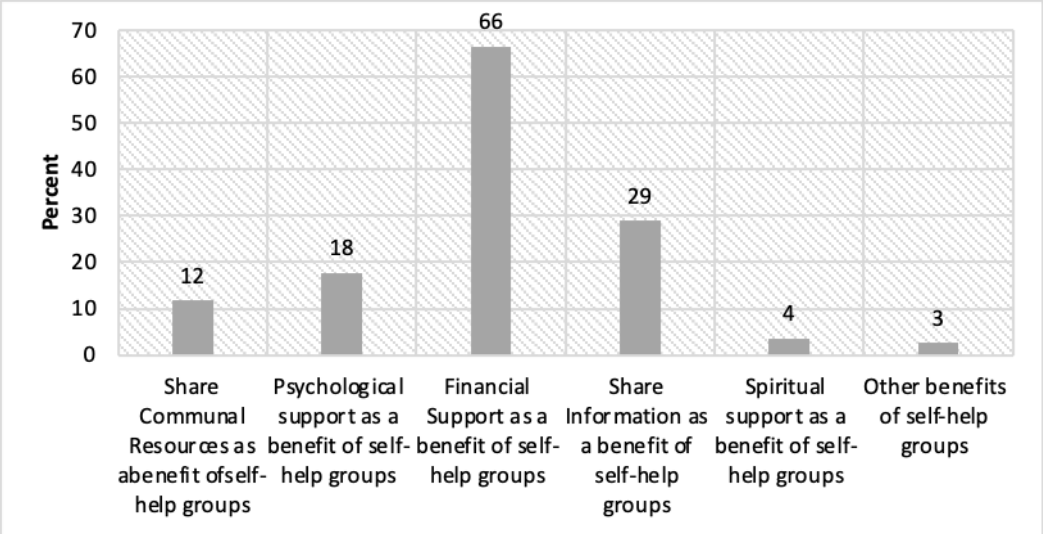

Figure 4.18: Benefits of Self-help Group

Figure 4.18 reveals that 66% of the respondents considered financial support as the most important benefit from the social groups. Sharing of vital information regarding the mining sector came in as the second important benefit as demonstrated by a score of 29%. Psychological support was considered third most important benefit resulting from social groups, as revealed by a score of 18%. Sharing of communal resources came in fourth with a score of 12%. A few (3%) of the respondents considered spiritual benefits as some of the key benefits resulting from social groups in the region.

4.4.3.9 Sources of Funds for Mining Business

Respondents were asked to indicate the channels they used to mobilize funds for their mining businesses. The findings are illustrated in Figure 4.19.

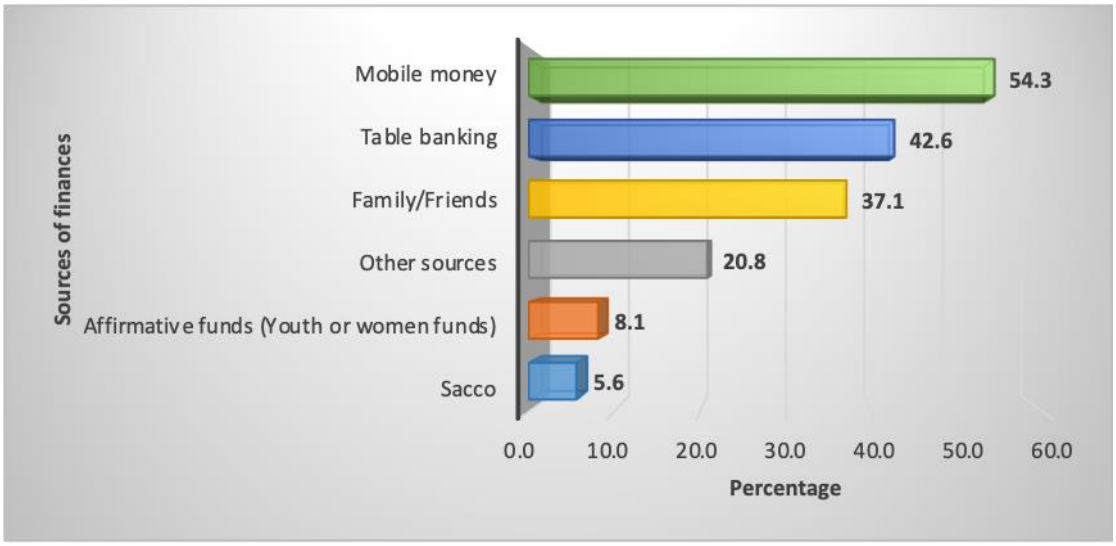

Figure 4.19: Sources of Funds

As evidenced in the Figure, more than half of the respondents (54.3%) accessed money for mining business from mobile money. An additional 42.6% got money from table banking, 37.1% from family and friends, 8.1% from affirmative funds such as youth and women funds, 5.6% from SACCOs while 20.8% got money for their businesses from other sources not enumerated in this study. Having presented descriptive statistics, the next sub-section presents correlation and regression findings.

4.4.3.10 Correlation Analysis

Table 4.25 shows the results of the correlation between availability of capital and women participation in ASM.

Table 4.24: Correlation between availability of Capital and Women Participation in ASM

		Women Participation in ASM	Source of finance	Knowledge on finance	Access to mining tools
Women participation in ASM	Pearson Correlation	1	-.180*	-.220**	-.124
	Sig. (2-tailed)		.017	.006	.117
	N	146	146	146	146
Sources of finance	Pearson Correlation	-.180*	1	.048	.110
	Sig. (2-tailed)	.017		.547	.161
	N	146	146	146	146
Skills and knowledge on finance	Pearson Correlation	-.220**	.048	1	-.277**
	Sig. (2-tailed)	.006	.547		.000
	N	146	146	146	146
Access to mining tools/equipment	Pearson Correlation	-.124	.110	-.277**	1
	Sig. (2-tailed)	.117	.161	.000	
	N	146	146	146	146

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

The results indicate that there is a negative correlation between availability of capital variables and women participation in ASM. Both the variable on source of finance and respondents' knowledge on finance have negative and statistically significant results. Though the coefficient of access to mining tools was negative, its findings are not statistically significant.

4.4.3.11 Regression for Access to Financial Capital and Participation in ASM

The study conducted regression using OLS to determine the influence of access to finance on women participation in mining. The summary estimates are presented in Table 4.26.

Table 4.25: OLS Estimated Results

Independent variables	B	Std. Error	Beta	T	Sig.
(Constant)	14.635	1.706		8.580	.000
Sources of finance	-0.305	0.190	-0.127	-1.603	.111
Skills and knowledge on finance	-1.106	0.365	-0.247	-3.032	.003
Access to mining tools/equipment	-2.162	0.771	-0.230	-2.803	.006
Dependent	Women Participation in ASM				
Adj. R squared		0.095			
Std. Error		2.134			
F – ratio (3, 149)		6.229			
Prob. > F		0.001			

According to the F-statistic (ANOVA test), the model was found to be statistically significant given the p-value of 0.001 <0.05. This means that the results are valid and that a significant relationship exists between availability of capital and women participation in ASM. Concerning adjusted R squared, the results show that mining legal framework determines women participation in ASM by 9.5%.

The study established that capital availability in general has a negative relationship with women participation in ASM. The results indicate that sources of finance influence women participation in ASM (-.127). Nevertheless, this coefficient is not statistically significant, given a p-value 0.111. These results could be attributed to the fact that the respondents (women) have limited access to resources, and therefore have little access to financial resources. They are supported by a UN report (2014), which observes that control over resources such as land and other resources act as a hindrance to their full participation in the extractives industry. The report further states that even in the case where women own concessions, they do not have equal rights with men when it comes to earnings. A similar argument was advanced by Rickard *et al*.(2017) who reported that majority of women do not have control over resources such as land, finances and even getting practicing licence is quite difficult for most of them.

Regarding skills and knowledge of financial matters, the study found a negative and statistically significant relationship between skills/knowledge of the women and women

participation in ASM (-.247, Sig.=0.003). In fact, the size of the coefficient indicates that an additional training in skills/knowledge on finance reduces participation of women in ASM by 24.7%. The results could be attributed to the argument that majority of the women are illiterate and have limited knowledge and skills in finance. They therefore have poor financial management skills and hence inability to control resources that can help them enhance their ASM.

Similarly, the study has found a negative relationship between access to mining tools/equipment and women participation in ASM (-.230, Sig.=0.006). This implies that accessibility to mining equipment has adverse effect on women participation in ASM. This can be attributed to inability of women to access tools and equipment for mining due to their meagre resources.

The FGDs have revealed that poor knowledge about the market of minerals was a big challenge that discourages most women from participating in ASM. This was highlighted by majority of the groups. They argued that they are often exploited by the brokers who take advantage of their ignorance on market prices of their products. In addition, women argued that majority of their buyers are unregistered and that their prices are extremely poor. Furthermore, they cited prices fluctuation in the market as a disappointment. These factors have led to some of them abandoning mining.

4.4.3.12 Hypothesis test

Finally, the study sought to test the third hypothesis, which was stated as:

Ha_3 : Financial capital affects women involvement in artisanal and small-scale mining

n Taita Taveta County.

The results based on Chi-square test are presented in Table 4.27.

Table 4.26: Chi-Square Test for the third Hypothesis

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	49.10[a]	16641	.030
Likelihood Ratio	62.025	16641	.074
Linear-by-Linear Association	.300	1	.800
N of Valid Cases	146		

The hypothesis was accepted given a p-value of 0.0005 <0.05. This means that there is statistical dependence between women participation in ASM and availability of capital by women.

In summary, the study has established that access to financial capital has a negative influence of women's participation in the ASM sector. In particular, skills and knowledge of finance, and access to tools and equipment have an adverse effect on women participation in ASM in Taita Taveta County. Most men as opposed to women own resources such as land, and as such, women may not be able to raise cash required to formalize operations in the sector and buy tools and equipment of trade. In an earlier study, Mwakumanya *et al*. (2016) argued that the factors limiting women participation in ASM in Taita Taveta County was inaccessibility to financial credit and lack of capital for purchase of equipment. Similar arguments were made by Bansah *et al.* (2016).

4.5 Overall Regression

The study conducted a multiple regression analysis between women participation in ASM and the determinants of the participation including socio-cultural, legal practices and availability of capital. The estimated results are provided in Table 4.29. The F-statistics results show that the regression results are statistically significant given the P-value of 0.000. The adjusted R-squared value of 0.267 indicates that socio-cultural, legal practices and availability of capital explains 26.7% change in the participation of women in ASM.

Concerning the first objective, the study investigated the effect of attitude about women, women role models and biases against women on women participation in ASM. The findings show that attitude about women has a negative and significant effect of their participation in ASM in Taita Taveta County (-0.327, Sig.=0.000). This implies that the perception of the society towards women affects their full participation in the mining activities. This could explain the reason why women's role in ASM is more of supportive such as cleaning, selling and waste disposal in the mines rather than mining itself. Similarly, the study finds that gender bias on women has a negative effect of women participation in ASM (-.167, Sig. =0.020). In some African communities, the society has always discriminated and side-lined women especially when it comes to opportunities and access to resources. This makes them to hold low profile jobs and hence, less contribution to societal developmental.

The FGDs have shown that sexual exploitation by men is big challenge to women's participation in ASM. Some women admitted to having yielded to men's pressure to engage in sexual activities to get work in the mines. The harsh terrain and discrimination by men are some of the challenges highlighted by the women in the FGDs. For instance, most participants argued that it was very challenging to walk to the mining sites as one has to go through unfriendly hills and valleys. "In the mines, men dominate the main activities because according to them, women are weak and therefore, cannot be engaged in the actual mining", argued one woman. Interview with women in groups also revealed several challenges affecting women who participate in ASM in Taita Taveta County. For example, it was revealed that women do not have a voice and are not even involved in decision-making, since there are overlooked by their male counterparts. In addition, they play peripheral roles in the mines and are not allowed to enter the pits to do actual mining. As a result, they end up getting meagre pay. Since mines are in remote areas, the issue of insecurity was raised by several participants. This was cited to reduce the working hours because they have to leave much earlier to their homes.

Table 4.27: Overall Regression Estimates

Independent variables	B	Std. Error	Beta	T	Sig.
(Constant)	9.897	2.083		4.750	.000
Attitude about women role	-0.716	0.204	-0.327	-3.518	.001
Women role model	0.354	0.187	.0151	1.895	.060
Gender bias on women	-0.384	0.202	-0.167	-1.898	.020
Understanding of mining laws	0.442	0.462	0.091	0.958	.340
Mining permit requirements	0.850	0.462	0.191	1.839	.048
Process of obtaining mining permits	-0.219	0.499	-0.048	-0.438	.662
Sources of finance	-0.021	0.219	-0.009	-0.098	.922
Skills and knowledge on finance	-0.803	0.358	-0.180	-2.242	.027
Access to mining tools/equipment	-1.121	0.812	-0.110	-1.381	.170
Dependent	Women participation in ASM				
Adj. R squared		0.267			
Std. Error		1.908			
F – ratio (9, 139)		6.635			
Prob. > F		0.000			

Source: SPSS Output (2020)

On the issue of role model, the coefficient is positive, indicating that the variable has a positive effect on women participation in ASM. Nevertheless, this variable is not statistically significant given a p-value of less than 0.05. This implies that women's role models in the ASM (Taita Taveta County) have no effect on women participation in the industry. This could be attributed to lack of or existence of a few role models in the community who could inspire and give encouragement for enhanced participation of women. Focus group discussions revealed that women lack role models and mentors in general who could support and encourage them.

Concerning the second objective on mining legal framework, the study examined three indicators which are: understanding of mining laws, mining permit requirement, and the process of obtaining mining permits. The findings reveal a positive and statistically significant relationship between mining permits requirement and women participation in

ASM (0.191, Sig.=0.048). These findings are also consistent with simple regression analysis. This implies that having the necessary requirement such as mining permit enables women to have an active participation in the ASM industry. This is what the law requires, and those without the permits cannot practice. Nevertheless, multiple regression analysis could not establish statistically significant results for the case of understanding mining laws and the process of obtaining mining permits.

With respect to availability of capital, the overall regression shows that there is a negative effect of skills and knowledge on finance on women participation in ASM (-0.180, Sig.=0.027). Nevertheless, the source of finance and access to tools/equipment are not statistically significant. This is contrary to the common logic. Access to credit should positively influence the level of participation in ASM activities. Women who have access to credit are able to buy machines used in mining, hence improving their level of operations compared to those who lack financial support. Women consider lack of financial support, poor mining skills and lack of proper machine operation skills as their main challenges in the ASM sector. But the results could be justified on the arguement that most sources of financial support for women are informal and include loans from family and friends, mobile loans, welfare groups, family savings and savings from *chamas*, which may not be sufficient to create an impact. Qualitative discussion reveals that women considered financial support as the most important benefit from social groups. Women face great financial challenges when it comes to hiring equipment that can be used to ferry their raw materials from the mines to the selling point. Therefore, they are forced to walk on foot to the nearest buyers.

The knowledge and skills level on financial matters has also been shown to positively and significantly influence the level of women's participation in ASM (Johnson *et al.*, 2010). Women with better knowledge and skills work at a better position in the mines, as managers or traders, compared to the less knowledgeable women who mainly work as carriers of ores or support system (seller of food, water, and airtime to the men who work in the ASM. Similar results are reported in Uganda and Congo where well-educated and skilled women work in better-paying mining jobs compared to the less

learned ones who mainly work as a carrier of ores, a seller of food, and sometimes as sex-workers (Johnson *et al.,* 2010; Hinton *et al.,* 2011).

Generally, these results imply that women have limited knowledge and skills in matters finance and hence the adverse effect on their participation. In addition, women have limited access to mining tools and equipment and sources of financing to create an impact on their participation in ASM.

The Key Informant Interviews (KIIs) with mining officers reveal that women who participated in the ASM business as the owners of the mining sites are able to get better pay and work in a better position compared to those who are employed. This can be attributed to the empowerment and confidence that women get in self-employment. The nature of the machines and tools used in mining can also have a significant effect on women's involvement in the ASM business according to the County Mining Officer.

An interview with the Ministry of Mining official revealed that mines that mainly require mechanized equipment for most operations tend to limit the engagement of women compared to those that primarily use non-mechanized equipment. This suggests that women are mainly required in mining activities that require manual human labour. These findings agree with those of Dinye and Erdiaw-Kwasie (2012), where in the mining sector, women are mostly involved in casual manual labour compared to men who engage primarily in technical activities such as operating the excavators. However, these findings differ from those of Heemskerk (2005) who noted that lack of proper mechanized equipment forced women to be employed in supportive activities in the small scale mining sector.

The final buyer of the mined products determined the level of women's engagement in the ASM business according to the geologist officer in the county. In cases where the buyer/trader is licensed, the participation of women tends to be higher than where a final buyer is an unauthorized person (broker). This can be attributed to the profit margin or incentives women get when dealing with an authorized dealer than a broker who mostly

exploits them through low pay. This result concurs with those of Perkes (2011) in Congo, where better pay attracted women in the ASM business as they used the income to improve their livelihoods.

The interviews also indicated that group membership positively increases the chances of women participation in a higher level of the ASM business. Through groups, women can enhance their networking and even access information concerning ASM compared to those who are not in groups. Besides, groups can be used as a source of credit to support individuals' mining activities. In some cases, mining groups enable women to pool their resources and purchase mining equipment that requires huge capital outlay. Similar findings are reported by Buxton (2013) where knowledge networking helped small scale miners to solve their key challenges in the ASM industries with little difficulties.

According to the County Mining Officer, access to credit positively influenced the level of participation in ASM activities. Women who have access to credit can buy machines used in mining, hence improving their level of operations compared to those who lack financial support. According to Collins and Lawson (2014), lack of access to financial support (e.g. credit access) is considered as one of the key barriers limiting women to fully participate in and benefit from ASM business, as most women lack capital to invest in trading business.

It was also revealed that distance to the nearest mines affects the level of women's participation in ASM activities. The Mining Officer revealed that when mines are far from the homestead, women engage in the ASM business to a lesser extent. This can be attributed to the inability of women to walk for long distances to access the mines. Therefore, they prefer to work in the nearest mines where they can juggle domestic activities with mining tasks. In most cases, women resort to help their husbands' clean ore within their homestead, where they are paid peanuts or are treated as free laborers (Blair, 2017).

According to Key Informant Interviews with the County Mining Officer, lack of mining skills and inadequacy of resources were among some of the challenges encountered by women miners. The County Director for Mining argued that majority of women miners lack relevant tools, and this could be attributed to their peripheral roles in the mines. Rejection and discrimination of women is another issue that was highlighted by the officer. Furthermore, the County Mining Officer stated that miners work in extremely poor conditions characterised by poor sanitation, lack of water and toilets. These is a great danger to the health of miners. The officers also pointed out the critical role played by the ASM towards economic empowerment of women. For instance, an interview with government mining officer reveals that ASM has created many jobs for the youth, women and men. He further argued that ASM contributes both directly and indirectly to the local economies, directly due to increase in cash flows and indirectly as it increases the purchasing power.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The participation of women in ASM in Taita Taveta County was meant to empower them economically and hence reduce poverty levels. Nevertheless, the study has established several factors that have discouraged women in participating in these ventures in the county. This chapter provides a summary of the findings as discussed in the previous chapter and gives a conclusion. Finally, recommendations that are based on findings are outlined.

5.2 Summary

The study sought to establish the determinants of women participation in ASM focusing on Taita Taveta County. To accomplish this aim, three specific objectives were formulated. These are:

1. To investigate the effect of social-cultural practices on women participation in artisanal and small-scale mining in Taita Taveta County.
2. To investigate the effect of mining legal framework on women participation in artisanal and small-scale mining in Taita Taveta County.
3. To determine how access to financial capital affects women participation in artisanal and small-scale mining in Taita Taveta County.

The study adopted descriptive design approach with primary data from 146 women participating in ASM in Taita Taveta County. The study employed both descriptive and inferential statistics to analyse data. This sub-section presents a summary of the findings based on the outlined objectives.

5.2.1 Socio-Cultural Practices and Women Participation in ASM

The first objective of the study sought to investigate the effect of social-cultural practices on women participation in artisanal and small-scale mining. Descriptive findings show that most women who participate in ASM business are the main breadwinners in their households. Therefore, ASM business plays an important role on the livelihoods. On average, women spend more than eight (8) hours per day working in the ASM activities; however, their operations are mainly focused on the subordinate roles where they are left to perform less paying jobs. A majority work as cleaners of ore, food vendors, and sellers of airtime to men working in the ASM sector, and some are sex workers. Only very few women work in the mines as traders or owners of the mining sectors.

The correlation statistics show a negative and statistically significant correlation between women participation in ASM and attitude about the role of women, women role model, and gender-based biases on women participation in ASM. Regression results also indicate existence of a negative relationship between cultural practices and participation of women in ASM. The coefficients of attitude about women role, and gender-based biases against women were found to be negative and statistically significant. This implies that they explain the participation of women in ASM in Taita Taveta County negatively. Nevertheless, the role model and mentor variable were not significant though with a positive sign. This could be attributed to the fact that women admitted having few role models in the community. However, when it comes to overall regression, this variable was significant at 10% level of significance.

5.2.2 Legal Framework and Women Participation in ASM

The second objective sought to establsih the effect of mining legal framework on women participation in artisanal small-scale mining. Descriptive results indicate that majority of the women have limited understaning of the legal framework governing the minining sector. It was also discovered that obtaining mining permits is a tedious process and very

expensive as women are sometimes forced to pay double for the licence (to the County and National Government). In addition, applying for permits is riddled with corruption, and women often have to part with extra money to get a licence.

Correlation statistics indicate existence of a a positive correlation between women participation in ASM and all the variables of legal framework, which include understanding of mining laws, mining permit requirements and process of obtaining the permit. The regression results indicate that mining permit requirement affects women participation in ASM positively, while obtaining the permit was found to influence women participation in ASM negatively. This means that poor processes of obtaining mining permits could reduce the participation of women in ASM drastically. These results could be attributed to challenges experienced in obtaining permits.

5.2.3 Access to Financial Capital and Women Participation in ASM

The third objective sought to determine how access to financial capital affects women participation in artisanal and small-scale mining. The study found that capital availability variables (sources of finance, skills and knowledge in finance) and women participation in ASM are negatively correlated. Nevertheless, even though access to mining equipment/tools had a negative coefficient, it is not statisically significant.

With repect to regression anslysis, the study has established that both access to mining tools and equipment, and skills and knowlgde in finance affect women participation negatively. Although the coefficient of sources of finance was negative, the results were not statistically significant. These findings can be attributed to the fact that women are mainly using traditional non-mechanized equipment and firewood as a source of energy in their day to day operations, and hence an adverse effect of women participation as some could be discouraged along the way due to lack of proper tools. In addition, the adverse effect of financial capital can be attributed to financial hindrances. Furthermore, most of the women participating in ASM are illiterate, hence it becomes difficult for them to manage their finances well.

5.3 Conclusions

From the findings, the study makes several conclusions based on the objectives.

5.3.1 Socio-Cultural Practices and Women Participation in ASM

Regarding the first objective, the study concludes that cultural practices have a negative effect on participation of women in ASM in Taita Taveta County. Specifically, practices such as negative attitudes towards women's role, lack of role models and gender-based biases against women discourage and affect the productivity of women in the mining business. In addition, the study concludes that most of the women, despite being bread winners in their households, can only spend little time at the mines because of their roles in household chores. This derails efforts for women empowerment.

5.3.2 Legal Framework and Women Participation in ASM

Concerning the second objective, the study concludes that some aspects of the mining legal framework and its implementation are not favourable for women participating in ASM. This is due to the established negative effect. The study has reported that the process of applying for mining permit is tedious and expensive. In addition, applicants have to pay twice to obtain the permit coupled with corruption on the way.

5.3.3 Financial Capital and Women Participation in ASM

With reference to the third objective, the study concludes that most women in ASM in Taita Taveta County have limited skills to operate the mining machines. This worsens their chances of being able to earn more from mining. In addition, sources of finance are a challenge to most of them. Majority of the women engage in ASM business as employees due to lack of adequate capital to participate in ASM as the owner (traders or owner of the mines), some of them lack money to buy mechanized equipment that can increase their scale of operations. Therefore, they are forced to engage in poor and remote mines where they work in the high labour demanding jobs, and low paying jobs.

5.4 Recommendations

To improve women's position in the ASM industry and in particular in Taita Taveta County, the study makes several recommendations:

There is need for the Government (both National and County), civil society organizations and relevant stakeholders to execute educational campaigns that target women to reduce illiteracy levels among women. The policy should address barriers to women/female education and even support school-going girls.

The National Government in collaboration with other stakeholders can consider coming up with programs that train and equip women with various skills regarding machine operations and marketing to be able to participate in other nodes of the ASM industry. This can enhance their level of awareness regarding mining operations and legal requirements and improve their mining skills, which can enable them to work at better positions of the value chain.

There is need for the Government in collaboration with other stakeholders such as civil society organizations to adopt strategies that will enable women to participate in key decision-making and increase their earnings in mining activities. Such strategies should allow women to participate in different activities within the ASM values chain, from digging to final trading of the ores.

There is a need for the Government and stakeholders to mainstream gender and come up with proper policy frameworks particularly when it comes to a mining license. This can be achieved by reducing the procedural and paperwork required to obtain work permits. Besides, the Government could introduce licenses under different categories where women can easily access medium or small-scale mining licenses.

There is need to establish a field office of the body offering the ASM mining licenses near the mining area so that it can be more comfortable for women to access them. With the growing knowledge of digital technology in Kenya, the Government can consider

introducing an online license application or giving the necessary resources to County offices to offer licenses to the needy miners.

Policy gaps also exist and there is need for both levels of Government to come up with proper policies and strategies that will improve women's participation in group activities and leadership positions in the community. This will help women to share ideas and the problems they face in the ASM industry. The policies and strategies could include coming up with proper health and safety programs that enable women bring their children to the worksites. This will allow the women to increase the time spent in the mining activities as they will be able to take care of the children at the same time work in ASM.

There is need for collaboration between the Government (both National and County), civil society organizations, financial providers, and other stakeholders to increase women's access to credit by promoting micro-credit that provides financial services to women. Access to credit can enhance women's ability to pay for mining licenses and buy better mining equipment.

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APPENDICES

Appendix I: Introduction Letter to Respondents

David Thiong'o Mugo,
Jomo Kenyatta University of Agriculture and Technology,
The school of Communication & Development Studies,
P.O. Box 11158-00400
NAIROBI.

Date_____

Name_____

Dear Respondent,

This questionnaire is intended for gathering data for scholarly research purposes of investigating "**Determinants on women participation in artisanal and small-scale mining in Taita Taveta, Kenya**". The study is in part fulfilment of the requirements for the award of a PhD degree in Jomo Kenyatta University of Agriculture and Technology (JKUAT).

Please be guaranteed that any information gathered through this questionnaire will be treated with extreme confidence and will be utilized for research purposes only. High level ethical standards will strictly be adhered to, to guarantee that the study results and reports will not include reference names of any respondents. Thank you in advance for your time and cooperation.

Yours faithfully,

David Thiong'o Mugo

PhD Candidate, Development Studies

Reg. No. HD419-1891/2014

Appendix II: Questionnaire

Serial No	

Instructions: (*Please read the instructions given and answer the questions as appropriately as possible*). It is advisable you answer or fill in each section as provided. Try to answer every question fully and correctly

SECTION I: BACKGROUND INFORMATION

CHECK LIST

Name of Enumerator	Date
Start Time	End time
Checked by Supervisor	Signed

GEOGRAPHICAL DETAILS

Q1.2.1 Contact address ……

Q1.2.2 Name of Sub-County

Voi □ Mwatate □ Wundanyi □ Taveta □

Q1.2.3 Name of Ward …….

Q1.2.4 Name of the Location ……...

Q1.2.5 Name of the Sub Location …….

Q1.2.6 Name of the Village ……

BIOGRAPHICAL INFORMATION

Q1.3.1 Ages (Year) …….

Q1.3.2 Marital Status Married □ Single □ Divorced □ Window□ Separated □

Q1.3.3 Level of education (number of years of schooling) ……

□ None

□ Primary

□Secondary

□Tertiary (college)

Q1.3.4 Occupation……

Q1.3.4a How much do you earn per day? ……..

Q1.3.4b Are you the head of the household? □Yes □ No

Q1.3.4c Are you the breadwinner? □ Yes □ No

Q1.3.5 What is the **main source** of income for your family?

Income streams		**Tick**
i.	Crop Farming	
ii.	Mining	
iii.	Livestock farming (Cows sheep)	
iv.	Small stock (chicken, rabbits)	
v.	Tree farming	
vi.	Salary Income	
vii.	Pension -yours or spouse	
viii.	Remittances	
ix.	Trader	
x.	Wages from casual labour	
xi.	Other /specify	

Q1.3.6 Rank from the **most to the least** source of income for your family

Income streams	Rank

i.	Crop Farming	
ii.	Mining	
iii.	Livestock farming (Cows sheep)	
iv.	Small stock (chicken, rabbits)	
v.	Tree farming	
vi.	Salary Income	
vii.	Pension -yours or spouse	
viii.	Remittances	
ix.	Trader	
x.	Wages from casual labour	
xi.	Other /specify	

ROLES AND RESPONSIBILITIES

Q1.4.1 What is your role in the mining operation?

□ Owner □Buyer

□Worker □ Other (specify)

Q1.4.2 Do you have a valid mining license?

□Yes □expired

□No, □never had

□ Other (specify)

Q1.4.3 What is the nature of your work?

□Miner (digger)

□ Processor

□Carrier of ore

□Carrier of water, firewood □ Other (specify)

Q1.4.4 What type of mining method?

□Open pit

□Underground

□Use of explosives

Q1.4.5 What commodity is being mined?.....

Q1.4.6 What equipment do you use for mining?

□ Hand tools (e.g., shovel, pick)

□ Mechanized (e.g., excavator) Pumps

□ Other (specify)

Q1.4.7 How many years have you been in mining?

Q1.4.8 How many people work at the mining operation?

Gender	Diggers	Marketers	Processors	Transporters	Others
Male					
Female					

Q1.4.9 How far is the mine from your home (km)?

Q1.4.10 What domestic work do you also do?

□Household

□Family care

□Elder care

□Growing crops and livestock

Q1.4.11 What is the source of energy to power mining equipment?

□Electricity

□Diesel

□Firewood

□Other (specify)

Q1.4.12 Where do you sell your products?

□Licensed buyer

□Unlicensed buyer

□Other (specify)

Q1.4.13 How do you transport your raw materials and inputs?

□Own car

□Hired car

□Manual labour

□ Other (specify)

Q1.4.14 What technology/equipment would improve the way you work?

a.

b.

c.

Q1.4.15 What training would improve the way you work?

a.

b.

c.

Q1.3.16a Do you belong to any self-help groups Yes□ No □

Q1.3.16b What type of self-help group and purpose?

NO	Type of Group	Purpose of Group
1		
2		
3		
4		
5		
6		

Q1.3.16b What are the benefits for your self-help group to you?

No	Type of Benefits	Tick as appropriate
1	Share communal resources	
2	Psychosocial support	
3	Financial support	
4	Share information	
5	Spiritual Support	
6	Others	

SECTION II: SOCIAL CULTURAL PRACTICES AND THEIR EFFECT ON WOMEN PARTICIPATION IN ASM.

Q2.1 Below are statements on **Attitude about women role in mining** and effect on women participation in artisanal and small-scale mining.

Please indicate the degree to which you agree with each (Please use a scale of 1-5 where; **1**= strongly disagree, **2**= disagree, **3**= neutral, **4**= agree and **5**= strongly agree)

Statement	**1**	**2**	**3**	**4**	**5**
Attitude about women role in mining					
Mining is an industry which is not accommodating women					
I am always reminded am a woman in this job					
I usually undertake a range of tasks within ASM mining operations, including digging, panning, processing, transporting, hauling, cooking, and cleaning					
I am paid less for my role than other roles dominated by men					
I am more susceptible to human rights abuses, sexual and gender-based violence and health risks					
My domestic responsibilities (e.g., preparing food, gathering water, and caring for families) affects the time I spend in ASM work					
I usually face challenges including the unequal burden of domestic responsibilities and women's underrepresentation in authority structures					

Q2.2 Below are statements on **Female role model and mentor** in ASM mining and their effect women participation in artisanal and small-scale mining.

Please indicate the degree to which you agree with each (Please use a scale of 1-5 where; **1**= strongly disagree, **2**= disagree, **3**= neutral, **4**= agree and **5**= strongly agree)

Statement	1	2	3	4	5
Female role model and mentor in ASM mining					
I have role models and mentors who I look up to in the women mining groups					
I believe successful women in ASM were inspired by role model					
My role models always support us in networks that encourage women's participation, bargaining power, work conditions and economic independence.					
I believe publicity surrounding successful role models are gradually influencing women to join ASM					

Q2.3Below are statements on **Gender bias on women at the mining** and theirs effect on women participation in artisanal and small-scale mining.

Please indicate the degree to which you agree with each (Please use a scale of 1-5 where; **1**= strongly disagree, **2**= disagree, **3**= neutral, **4**= agree and **5**= strongly agree)

Statement	1	2	3	4	5
Gender bias on women at the mining i.e. entering quarry hole					
I am not allowed to go into an underground mine, as a woman					
My cultural taboos (e.g. women during menstruation) prevent me from entering mine sites.					
My engagement in mining is often concentrated around low paid work like washing, cooking and polishing.					
There is no awareness session for men working in mines on how to respect their colleagues' women.					

Q2.4 How can the informal processes (cultures, norms, and values) that affect ASM be transformed?

□Supporting change in norms, values, and cultures

□Review traditional, indigenous, and community rights

□Awareness of legal and social rights

□Other (specify)

Q2.5 do you think is possible to review and change the customary laws that hinder the participation of women in ASM? □Yes □No

SECTION III: LEGAL AND REGULATORY FRAMEWORK AND THEIR EFFECT ON WOMEN PARTICIPATION IN ASM

Q3.1 Do you feel you understand the laws that affect rights to access mineral deposits?

□ Yes □ No

Q3.2 Should the laws be changed to improve the access of men and women in ASM to mineral deposits?

□ Yes □ No

Q3.3 Do you think environmental impacts of ASM affect women more than men?

□ Yes □ No

Q3.4 Are there enough women in the government structures that influence ASM?

□ Yes □ No

Q3.5 Are the mining administration offices close enough for you?

□ Yes □ No

Q3.6 Is it easy for you to comply with the mining law?

□ Yes □ No

Q3.7 Are you comfortable dealing with law enforcement agents and courts?

□ Yes □ No `

Q3.8 How can the structures that affect ASM be transformed?

□Increase number of women in structures

□ Decentralization

□Improve their accountability

□Other (specify)

Q3.9 How can the formal processes (policies, legislation, programs) that affect ASM be transformed?

□Increase participation in the review of policies, laws, and programs

□Development of new policies, laws, and programs

□Awareness raising

□Other (specify)

Q3.10a Do you own a licensed mining company or member of registered ASM group? □ Yes □ No

Q3.10b If No, what are the reasons for not having a license?

□ Lack of requirements

□ Bureaucracy

□ Lack of finances

□ Lack of information on the process

□ Expired License

□ Any other

Q3.11a Do you submit tax annually on income related to mining activities □ Yes □ No

Q3.11b If No, what are the reasons for not paying taxes?

□ Bureaucracy

□ Lack of finances

□ Lack of information on the process

□ Any other

Q3.12 Have you ever been trained on mining issues?

Safety □ Yes □ No

Skills □ Yes □ No

Technical □ Yes □ No

Others: ……..

Q3. 13 What are technical or administrative support provided by County/ National Government officers to artisanal miners……

□ Training

□ revenue collection

□ Consultation

□ information sharing

□Other (Specify

POWER AND DECISION MAKING

Q3. 14 What decisions making do you usually control in the household?

□Non-Household expenditure

□ Income-generating activities

□Family care Sourcing water and energy

□Trading-up decision

□ Other (specify)

Q3. 15 What constraints do you face in decision making in the household?

□ No voice

□No control

□ Other (specify)

Q3.16 What decision making do you usually participate in at the community level?

□ Selecting political representation

□ Consultation in review and development of community initiatives

□Other (specify)

Q3.17 What constraints do you face in decision making at the community level?

□Inadequate consultation

□ Intimidation

□ Lack of platform to voice opinions

□Other (specify)

Q3.18 What are some reasons that hinder women involved in decision-making processes in artisanal mining? Please tick as it applies.

NO	Reasons that hinder women involved in decision-making processes	Tick as it applies
1	Culture that discriminate women	
2	Lack of Education	
3	Gender Favorism	
4	Lack of Mentorship	
5	Other (Specify)	

Q3.19a Do you know what is environmental impact assessment?

□ Yes □ No

Q3.19b Is it requirement to do environmental impact assessment in ASM?

□ Yes □ No

Q3.19c have you carried environmental impact assessment for your mining?

□ Yes □ No

SECTION IV: AVAILABILITY OF CAPITAL AND THEIR EFFECT ON WOMEN PARTICIPATION IN ASM

ASSETS AND RESOURCES

Q4.1 What natural capital assets do you have access to?

□Mineral deposits

□Water Forests

□Land

□Other (specify)

Q4.2 What human capital assets do you have access to?

□Skills Ability

□Other (specify)

Q4.3 What productive capital assets do you have access to?

□Equipment Technology

□ Other (specify)

Q4.4 What social capital assets do you have access to?

□Formal association Informal network

□ Other (specify)

Q4.5 What financial capital assets do you have access to?

□Credit

□Savings in cash

□ Savings in livestock, harvests

□Other (specify)

Q4.6 What physical capital assets do you have access to?

□Roads

□Telephone

□Electricity

□Buildings

□Other (specify)

Q4.7 What constraints do you face in accessing assets?

a.

b.

c.

Q4.8 Which of the following capacity and ability issues constrain your access to assets?

□Skills

□Financial

□ Technology

□ Information

□Other (specify)

Q4.9 What constraints do you face in accessing markets?

□Illegal trade

□Poor prices

□ Fluctuating prices

□Other (specify)

Q4.10 What constraints do you face in accessing services?

□Poor infrastructure

□No extension services

□ Other (specify)

Q4.11 What information do you lack in accessing assets?

□Mineral deposits

□Markets (illegal trade, poor prices)

□Laws and regulations

□ Other (specify)

Q4.12 Do you have a limited access to resources e.g. land rights and financial credit due to our traditions and other domestic responsibilities

□ Yes □ No

Q4.13a Do you think lack of access to finance and credit is one of the leading reasons why women ASM miners are unable to obtain efficient technology and equipment and improve their ASM efficiency and incomes?

□ Yes □ No

Q4.13b If Yes what makes it hard to access the access the grant and loan schemes from bank?

□ Complicated procedures

□ Lack of Guarantors

□Lack of collateral

□ Others

Q4.14a How do you mobilise you funds for your mining business? (tick below as it applies);

Source of Funds	**Tick as it applies**
Table banking	
Affirmative funds- Youth or women funds	
Family /freinds	
Mobile money - Mshwari, KCB, Mpesa, Tala, other	
Sacco	
Others	

Q4.15 What are mining tools and equipment's do you have?

a.

b.

c.

Q4.16 What types of personal protective equipment do you have?

a.

b.

c.

Q4.17 What is your average monthly production of the main mineral you mine?

……

Q4.18 In what form do you sell your minerals?

 Processed

 Mineral (ore)

 Refined mineral

Q4.19 Whom do you sell your mineral to?

☐ Foreign market

☐ Brokers

☐ Local buyers

☐ other

Q4.20 How would you compare the price for your preferred mineral the past four years

☐ Increased

☐ Decreased

☐ Remained the same

☐ Fluctuating

Q4.21 How do you plan for the use of the monies you get/ how do you invest your savings?

☐ invest in mining tools

☐ buy lands

☐build house

☐other

SECTION IV: WOMEN PARTICIPATION IN ARTISANAL AND SMALL SCALE MINING

Below are statement on areas on how **women spend time** on ASM production/daily work age**.**

Q5.1 When do you work, which hours in the day? ……..

Q5.1 What activity usually takes most of your time per day? ……..

Q5.2 How many hours do you spend per day on mining activities? ……..

Q5.3 Do your household activities limits the number of hours you participate in the mining

☐ Yes ☐ No

Q5.4 Do you double work burden of productive work in ASM and reproductive role work at home?

□ Yes □ No

Q5.5 Do you feel growing or gathering foodstuffs creates a triple work burden for many women

in ASM?

□ Yes □ No

Q5.6 Do you feel you work longer workday than men; that can cause health and other vulnerabilities?

□ Yes □ No

Below are statement on Women's **additional income from mining** tends to be spent on their community and family contributes to livelihood

Q5.8 How much income do you generate from mining per day? …….

Q5.8 Do you think mining provide you with more income than other livelihood activities
□ Yes □ No

Q5.9 How do you spend the income generated from mining work? (Tick as it applies)

How i use my funds	**Tick as is applies**
Educational expenses,	
Repayment of debt,	
Pay Hospital Bills	
Household Consumption,	
Medical expenses	

Investment in ASM	
Other	

Q5.10 Do you think lack of access to finance and credit is one of the leading reasons why women

ASM miners are unable to improve their ASM incomes?

□ Yes □ No

Below is statement on Women's involvement in ASM leadership and decision-making level.

Q5.11 What community participation do you also do?

□Political representation/decision making

□Infrastructure maintenance

□Association activities

□Other (specify)

Q5. 12 What decision making do you participate in at the mining operation?

□ Access to mineral deposit

□ Production

□ Selling

□ Sourcing inputs

□ Waste disposal

□ Other (specify)

Q5. 13 What constraints do you face in decision making at the mining operation?

□ Exclusion

□Disrespect

□Conflict

□Other (specify)

Q5.14 Below are areas women are involvement in decision making processes in mining, Please indicate whether Yes or No on women involvement.

A. Company Directors □ Yes □ No How many…….
B. Company Board members □ Yes □ No How many…….
C. Managing mining companies □ Yes □ No How many…….
D. Consultation □ Yes □No How many…….
E. Mentorship □ Yes □No How many…….
F. Other (Specify)…… How many…….

Appendix III: Key Informant Guide

Name of Interviewee	Date
Start Time	End time

The following question is intended to answer on research on determinants of women participation in artisanal and small-scale mining (ASM) in Taita Taveta County, Kenya.

Q1.0 What is contribution of ASM to County revenue in Taita Taveta County

Q2.0 What are the main issues affecting women ASM in Taita Taveta County

Q3.0 What is being done to support women ASM

Q4.0 What are the challenges or benefits of new Mining Act 2016, on women artisanal miners in Taita Taveta County?

Appendix IV: Focus Group Discussion

Name of the Focus Group	Date
Start Time	End time

The following question is intended to answer on research on determinants of women participation in artisanal and small-scale mining (ASM) in Taita Taveta County, Kenya

Q1.0 How are the cultural practices in Taita Taveta County that affect women participation in artisanal and small-scale mining?

Q2.0 What is your opinion on process of acquiring the ASM permit to operate business in the County?

Q 3.0 What are the challenges experienced by women artisanal and small-scale miners in Taveta County?

Q4.0 What are the sources of financial capital support for women artisanal and small-scale miners in Taveta County?

Appendix V: Research Authorization from NACOSTI

NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY AND INNOVATION

Telephone:+254-20-2213471,
2241349,3310571,2219420
Fax:+254-20-318245,318249
Email: dg@nacosti.go.ke
Website : www.nacosti.go.ke
When replying please quote

NACOSTI, Upper Kabete
Off Waiyaki Way
P.O. Box 30623-00100
NAIROBI-KENYA

Ref: No. **NACOSTI/P/19/29860/28011** Date: **6th February, 2019**

David Thiongo Mugo
Jomo Kenyatta University of
Agriculture and Technology
P.O. Box 62000-00200
NAIROBI.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on ***"Determinants of women participation in artisanal and small scale mining in Taita Taveta County, Kenya"*** I am pleased to inform you that you have been authorized to undertake research in **Taita Taveta County** for the period ending **5th February, 2020.**

You are advised to report to **the County Commissioner and the County Director of Education, Taita Taveta County** before embarking on the research project.

Kindly note that, as an applicant who has been licensed under the Science, Technology and Innovation Act, 2013 to conduct research in Kenya, you shall deposit **a copy** of the final research report to the Commission within **one year** of completion. The soft copy of the same should be submitted through the Online Research Information System.

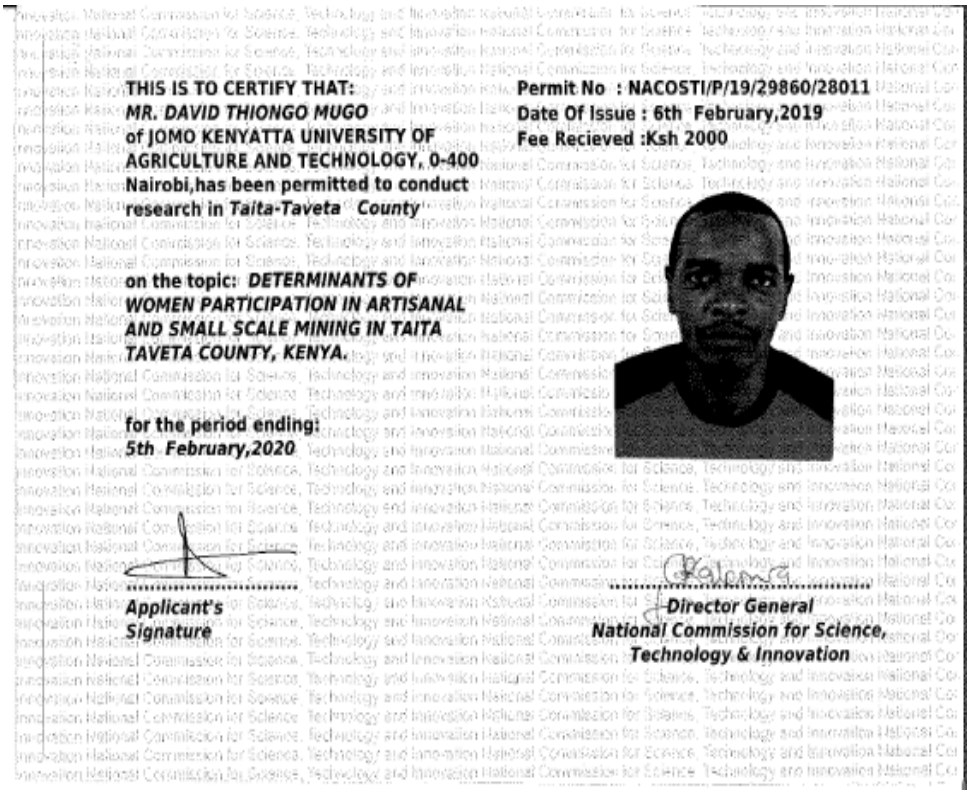
GODFREY P. KALERWA MSc., MBA, MKIM
FOR: DIRECTOR-GENERAL/CEO

Copy to:

The County Commissioner
Taita Taveta County.

The County Director of Education
Taita Taveta County.

Appendix VI: Research License



THIS IS TO CERTIFY THAT:
MR. DAVID THIONGO MUGO
of JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY, 0-400 Nairobi,has been permitted to conduct research in *Taita-Taveta County*

on the topic: *DETERMINANTS OF WOMEN PARTICIPATION IN ARTISANAL AND SMALL SCALE MINING IN TAITA TAVETA COUNTY, KENYA.*

for the period ending:
5th February,2020

Permit No : NACOSTI/P/19/29860/28011
Date Of Issue : 6th February,2019
Fee Recieved :Ksh 2000

.....
Applicant's Signature

.....
Director General
National Commission for Science, Technology & Innovation

THE SCIENCE, TECHNOLOGY AND INNOVATION ACT, 2013

The Grant of Research Licenses is guided by the Science, Technology and Innovation (Research Licensing) Regulations, 2014.

CONDITIONS

1. The License is valid for the proposed research, location and specified period.
2. The License and any rights thereunder are non-transferable.
3. The Licensee shall inform the County Governor before commencement of the research.
4. Excavation, filming and collection of specimens are subject to further necessary clearance from relevant Government Agencies.
5. The License does not give authority to transfer research materials.
6. NACOSTI may monitor and evaluate the licensed research project.
7. The Licensee shall submit one hard copy and upload a soft copy of their final report within one year of completion of the research.
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Email: dg@nacosti.go.ke, registry@nacosti.go.ke
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REPUBLIC OF KENYA

National Commission for Science, Technology and Innovation

RESEARCH LICENSE

Serial No.A 23021

CONDITIONS: see back page