

# Mining Impacts on Society: A Case Study of Taita Taveta County, Kenya

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## Abstract

Taita-Taveta County is rich with a wide variety of minerals in the world. Gemstones like Ruby, Tsavorite, Ruby and green garnets have caused many people to migrate to the area. These people came from within the county and from other parts of the country, greatly impacting the lifestyle of the local community. There was a need to understand how mining impacts on society and cultural values of a community. This study was carried out in 9 villages which included; Eastleigh A and B, Central, Ndigai, Mungololini, Mukenge- reni B and C, Mkuki and Kambanga. Respondents from 173 households from the villages were interviewed and discussions from 8 key informants who included: a Manager of Classic Mines, an official of Chawia Mining Community Based Organization (CBO), an individual manual artisanal miner, a retired senior Warden of Kenya Wild Life Service (KWS), Kenya Forest Service Manager (KFS), a gemologist from the Taita Taveta County government, Chief of Mwatate location and the County Director of National Environment Management Authority (NEMA). On a scale of 1 - 4 (1 = strongly disagree, 2 = Disagree, 3 = Agree and 4 = Strongly agree), the respondents agreed that there was a loss of their ancestral land, conflicts, dilution of Taita culture through mixed intermarriages, increased prostitution, alcoholism and high school dropouts. The study recommends review of the legal and policy framework governing mining in community areas and subsequent vigorous enforcement to maintain the good order of the public and to sustain meaningful traditions and culture to ensure conflict resolution and mining site ownership.

## Keywords

Conflict, Culture, Household, Land, Mining

## 1. Introduction

Taita-Taveta County is rich with a wide variety of minerals in the world [1] (Taita Taveta County Government, 2013). Mining attracts people from all over Kenya and Eastern Africa to the county [2] (Anyona & Rop, 2015). Small-scale mining plays a vital role in poverty eradication and contributes to the national and foreign exchange revenues of the country and many developing countries [2] (Anyona & Rop, 2015). Mining contributes to community development projects and provides employment even though it has had potential adverse impacts on cultural heritage, natural environment, society and health. The safety of mineworkers and communities adjacent to the mining operations has also been negatively affected. Some of the impacts include the displacement of local people from their ancestral lands, marginalization, and oppression of lower economic classes groups. This has been experienced in countries such as Ghana, Liberia, Sierra Leone, Malawi and The Democratic Republic of Congo [3] (Hilson, 2011).

The opening of a new mine triggers a rural to urban migration among local farmers, when they lose their sustainable sources of survival, in this case, their farmlands. Mining activities affect social structures of communities when mining villages and towns attract large numbers of workers who are normally accompanied by their families. Tension and even violence occur due to social differences between the various groups. Mining causes reduced access to clean water and land, impacting negatively on people's livelihoods. Mining communities are exposed to harassment and insecurity at the mines. This state of affairs worsens when local people are not consulted or informed of a planned mine site and are excluded from decisions of where to locate the mines. Discontent fuels conflicts. Mining is a "paradox of plenty" or a "resource curse". In Peru, mining brought about impacts like decentralisation, displacement and mining conflicts and ways of mitigating it are yet to be properly demonstrated [4] (Azapagic, 2004). Peruvian history shows that the country has been inflicted with the resource curse for decades, and this condition has delayed Peruvian economic and political development. The people who live near mining projects are often concerned about the environmental effects of such projects. Local residents often do not benefit greatly from mining projects because they are poor negotiators, or because their local leaders do not always have their interests at heart and have limited access to judicial systems. Thus, if a mining company violates a regulation or an agreement it has with a community, the local people may have difficulty forcing the mining company to comply with regulations or live up to its promises. [5] (Loayza, *et al.* 2013). This scenario is reflective to many countries rich with mineral resources including Kenya and in this case, the study area which is in Taita Taveta County.

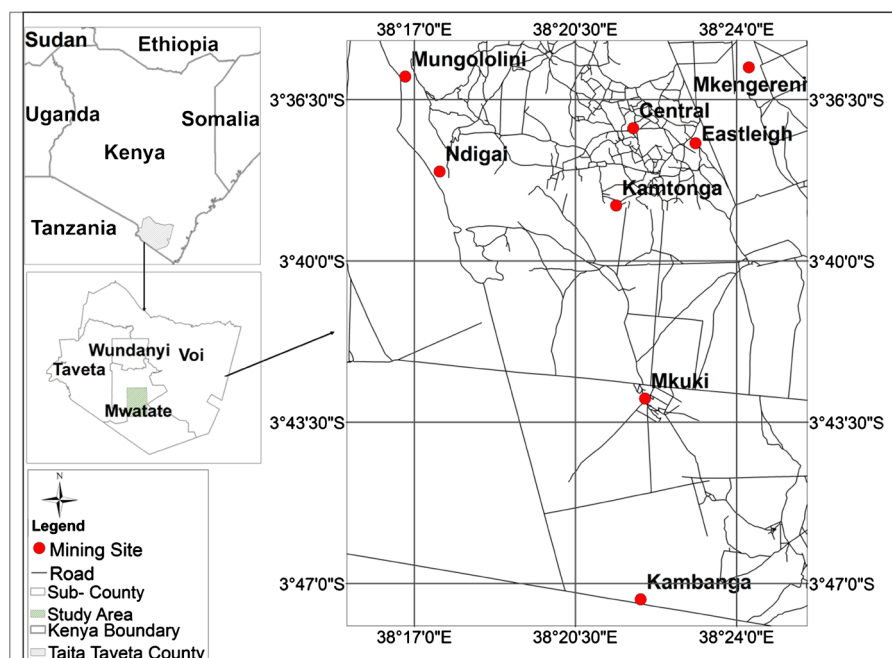
Studies in Taita, have mainly dwelt on political economy, and recently research on socio-economic and environmental impacts on women was conducted in Kisagau mining zone in Taita Taveta County the mining area including prospects of mining and conflicts over land and mineral resources [6] (Mwakumanya

*et al.*, 2016; [7] Mghanga, 2011). Areas touching on the relationship between mining and gender, human rights, education, health, culture, environment, water, social and economic standing are inadequately addressed. The study, therefore, sought to examine the socio-cultural impacts of people's perceptions, interactions, way of living, education, beliefs and how the communities have responded to the demands of mining in Mwatate sub-county minefields of Kamtonga and Mkuki.

## 2. Materials and Method

### 2.1. Area of Study

This research was done in Kamtonga and Mkuki minefields, Mwatate sub-county in Taita Taveta County (**Figure 1**). The County is located in the South-Western part of Kenya's Coast, between the longitudes 37°30' and 39°30' East and latitudes 2°30' and 4°30' South. The distance from the Southeast of Nairobi is 360 km and approximately 200 km Northwest of Mombasa. It borders Kilifi and Kwale counties to the East; Makueni, Kitui and Tana River counties to the North; Kajiado county to the Northwest; and the Republic of Tanzania to the Southwest [8] (Rop, 2014). Taita Taveta receives about 400 mm of rainfall annually and 23°C mean temperature [1] (Taita Taveta County Government, 2013). It lies on the geographical coordinates of 3°30'S, 38°23'E. Taita Taveta is divided into three major topographical zones. The upper zone, suitable for horticultural farming comprises of Taita, Mwambirwa and Sagalla hills region with altitudes ranging between 304 meters and 2208 meters above sea level. The lower zone consists of plains where there is ranching, national parks and mining. The study covered Mwatate sub-county where mining sites and industrial minerals



**Figure 1.** Map of the study area.

are scattered in Kamtonga, Mgeno, Chawia and Chungaunga and Mkuki mine-fields.

## 2.2. The Geology of the Study Area

The county covers an area of 17,084.1 km<sup>2</sup> and lies between latitudes 2°46' east and 30°14' East. According to [2] Anyona & Rop (2015), Taita Taveta County mines follow a belt known as the Mozambique belt where forty high-value gemstones are found. The mineral rich areas under this belt are listed as Taita Hills, Mwatate, Kasigau and Kuranze areas among others. Taveta region of Taita Taveta County is covered by a volcanic belt. Popular mines found in Taita are red garnets, green garnets, yellow garnets, green tourmalines, yellow tourmalines, change colour, blue sapphire, pink sapphire, amethyst, peridot, iolite, spinel, rhodolites and kynites, to list a few [6] (Mwakumanya *et al.*, 2016; [8] Rop, 2014). The County emerges as the only main source of Tsavorite and ruby minerals worldwide.

## 2.3. Sample Size

To derive to the sample figure of 173 households from the known population, the researcher used this formula [9] (Booth *et al.*, 2003):

$$n = \frac{(z^2 \times p \times q \times N)}{e^2 (N - 1) + (z^2 \times p \times q)}$$

where:

$n$  = Sample size (being determined).

$N$  = Population size (known).

$p$  = Sample proportion (assumed to be 0.02, if not given).

$q = 1 - p$ .

$e = 0.02$  (since the acceptable error should be 2%).

$z$  = Standard deviation at a given CI ( $z = 1.96$  at 95% CI).

( $\times$  Means multiplication).

## 2.4. Data Collection

Structured questionnaires were administered to target random respondents of 173 households drawn from nine villages which included; Eastleigh A and B, Central, Ndigai, Mungololini, Mukengereni B and C, Mkuki and Kambanga. Identification of respondents was based on gender, age, education and occupation to collect quantitative data. Mobile technology was used to collect the data.. Qualitative data approach was used for key informants that in the form of narrative discussions on various identified thematic areas.

## 2.5. Identification of KID Respondents

Respondents for key informants' discussions were selected using a purposive method and based on their exposure to the mining operations in the study area.

These comprised of Manager of Classic Mines, an official of Chawia Mining Community Based Organization (CBO), an individual manual artisanal miner, a KWS retired senior Warden, the KFS Manager, a gemologist from the Taita Taveta County, Chief of Mwachabo ward in Mwatate and NEMA County Director. A guide for the discussion was developed that guided the researcher in discussions with key informants. The main focus was on the land ownership, community and social behaviour, tradition and cultural activities and religion.

## 2.6. Data Analysis

Statistical Package for Social Science (SPSS) version 21.0. was used to code and analyze the survey data. The description took two scenarios of historical aspects before mining started and the scenario after the mining started. The data was represented in the form of percentages, frequencies, means and Cross tabulations. Key informants discussion was transcribed and information categorized in different themes represented in the block diagrams. The qualitative data was mainly from key informants that were given in the form of narrative on various identified thematic areas.

## 4. Results and Discussion

### 4.1. Respondent Age, Gender, and Education

Majority of the respondents were between 36 - 45 years of age (**Table 1**). The study sought to establish the education level and age concerning gender. Most of the respondents were male, comprising of 56.6% with 43.4% of the female respondents. The males had attained more formal education ( $p > 0.05$ ). Of the males' respondents, 39.4% and 14.3% had attained primary and secondary level respectively. Regarding the female respondents, 28.0% had attained primary level and 6.9% had no formal education. This indicates a lower transition from

**Table 1.** Respondent gender, education and age.

Category of Age and Education		Male		Female		Total		<i>p- Vaule</i>
		n	%	n	%	n	%	
<b>Education</b>	None	2	1.1	12	6.9	14	8.0	0.02
	Primary	69	39.4	49	28.0	118	67.4	
	Secondary	25	14.3	10	5.7	35	20.0	
	Tertiary	3	1.7	5	2.9	8	4.6	
<b>Age</b>	16 - 25 Years	11	6.3	12	6.9	23	13.1	0.119
	26 - 35 Years	25	14.3	18	10.3	43	24.6	
	36 - 45 Years	27	15.4	26	14.9	53	30.3	
	46 - 55 Years	16	9.1	6	3.4	22	12.6	
	56 - 65 Years	8	4.6	11	6.3	19	10.9	
	>65 Years	12	6.9	3	1.7	15	8.6	

primary to secondary school among girls hence reduced enrollment in secondary schools due to mining activities in the area. Interviews conducted revealed school dropout among girls to engage in food vending in mining areas while others dropped out due to early pregnancies and prostitution. In Migori, Vihiga and Magarini, socio-economic factors have contributed to rise in school dropout rates [10] (Nyamweno *et al.*, 2015; [11] Ocholla *et al.*, 2013, [12] Omollo, 2013). Similar findings have also been reported showing a low transition of girls compared to boys from primary to secondary level to pursue employment in the mining sector [13] (Yakovleva, 2007). Also due to economic household constraints and high opportunity costs of educating a girl child compared to a boy, girls dropping out of school seem to be an acceptable norm [14] (Amina, 2015; [15] Quadri & Kalyankar, 2010).

## 4.2. Social-Cultural Aspects of People Living Near Mining Areas

Mining affected the socio-cultural dynamics of people living close to the mining areas in Taita-Taveta County. There were historical and recent impacts on society and culture. The historical impacts on culture were not purely associated with mining and traditional concepts. Traditional values of the indigenous people tended to disappear as people were forced to look for other sources of socioeconomic gains to meet their livelihood. Similarly, the responsibility to protect ancestral cultural heritage and economic development prospects remain divided among the communities elsewhere [16] (Wetzlmaier, 2012). However, recent cultural evolution could be directly related to mining as it causes loss of land hence loss of strong socio-cultural ties and identity of the indigenous communities. Some of these social-cultural changes, as perceived by respondents, are reflected in **Table 2** on a scale of 1 to 4 (1-*strongly disagree*, 2-*Disagree*, 3-*Agree*, 4-*Strongly Agree*). The key ones included land ownership, community and social behaviour, tradition and cultural activities, religion and morality.

### 4.2.1. Indigenous Land Ownership

Historically, land according to respondents was owned by the indigenous people living within its locality communally and was termed as ancestral land. The form of land tenure was not clear as some respondents considered all land that people lived on as communal land. So although from the survey, engagement in mining activities led to loss of land by some, there lacked evidence as others reportedly leased their land to miners (**Table 2**).

People of Taita-Taveta County were rich before the mining started, though their wealth was derived from crop and animal agriculture [6] (Mwakumanya *et al.*, 2016; [17] Mwanyumba *et al.*, 2010). However, with the advent of mining, in the 1960 s, the land was alienated from the local people. The gemstones mining created an influx of outsiders resulting in loss of control of the vast communal land and also to some people losing their ancestral land to mining activities [2] (Anyona and Rop, 2015). Citing the case of Geita mine, [18] Kitula (2006) reported that extraction of minerals often resulted in grabbing of lands from

**Table 2.** Indigenous land ownership.

Indigenous Land Ownership Before Mining	Gender	Education Level				Total
		None	Primary	Secondary	Tertiary	
Land was owned by local people	Female	3.0	3.1	3.0	3.0	3.0
	Male	3.0	2.8	2.9	3.3	2.9
Inherited ancestral land	Female	3.0	3.0	2.8	3.0	3.0
	Male	3.0	2.8	2.7	3.7	2.8
Local people lived on communal land	Female	3.0	2.9	2.6	3.3	2.9
	Male	3.0	2.8	2.5	3.0	2.7
Local people leased land and lived there	Female	3.0	2.9	2.6	2.3	2.8
	Male	3.0	2.6	2.6	2.3	2.6
<b>Indigenous Land Ownership After Mining</b>						
Loss of land to mining	Female	2.6	2.6	2.6	2.3	2.6
	Male	3.0	2.6	2.6	2.3	2.6
Leased land to miners	Female	2.6	2.7	3.0	2.7	2.7
	Male	3.0	2.9	2.8	2.3	2.8

(Scale: 1-Strongly Disagree, 2-Disagree, 3-Agree, 4-Strongly Agree).

indigenous people leading to the displacement of residents. In that case, about 1800 residents were forced to move from indigenous land, losing their agricultural, grazing lands and mine sites. Frequently, more financially endowed foreign miners, in comparison to local people, can secure more land rights. However, the data in this study did not verify this as factual as respondents remained fairly neutral to the question of land ownership as affected by mining.

#### 4.2.2. Communal/Social Relations

Traditionally, Taita Taveta County, people lived in villages among their clansmen and had strong family units. Children played on one compound peacefully together and communities shared in activities such as cooking. There was a general consensus on communal and social aspects between the non-educated and educated respondent (Table 3).

After mining started, family units disintegrated with loss of their land to mining and family members were dispersed from their villages. Thus mining activities disrupted peaceful habitation in the villages and family members no longer spent much time together as mining activities kept them away from home. Consequently, children have to cope with parents' absenteeism. Open land to prospect is diminishing resulting to social conflict between displaced residents and mine operators, including large scale mining companies. Profound conflict among mineral stakeholders suggests that there are weak or inadequate policy and legal framework for mining or that if it exists, its enforcement is poor [18] (Kitula, 2006). Regulations are required to focus on conflict resolution and mining site ownership.

**Table 3.** Communal/social relations (peaceful habitation).

Communal/social relations (Peaceful Habitation) before mining						
Communal/social relations	Gender	Education Level				Grand Total
		None	Primary	Secondary	Tertiary	
People lived in villages	Female	2.9	3.0	3.0	3.7	3.0
	Male	3.0	2.9	2.6	3.0	2.8
Strong family unity	Female	3.0	3	3	3.3	3
	Male	3.0	2.9	2.8	3.3	2.9
Children played on one compound peacefully together	Female	2.9	3	2.8	3.3	3
	Male	3.0	2.9	2.6	2.7	2.8
Communities cooked and ate together peacefully	Female	2.9	2.9	2.8	3.3	2.9
	Male	3	2.9	2.6	2.7	2.8
Communal/social relations (Peaceful Habitation) after mining						
Mining activities disrupted peaceful habitation in the villages	Female	2.4	2.6	3.0	2.7	2.6
	Male	3.0	2.5	2.7	3.0	2.6
Families no longer spend time together because of working at the mines	Female	2.7	2.7	3.0	3.0	2.7
	Male	3.0	2.8	2.8	3.5	2.9
Children lives have been interfered with by the changed family occupation	Female	2.7	2.6	3.0	2.7	2.7
	Male	3.0	2.7	2.8	3.5	2.7
Sharing community or extended family activities has been disrupted	Female	2.7	2.8	3.0	2.7	2.8
	Male	3.0	2.8	2.8	3	2.8
People have become busier than before with both employment and farming	Female	3.0	3.1	3.0	3.3	3.1
	Male	3.0	3.0	3.2	3.0	3.1

(Scale: 1-Strongly Disagree, 2-Disagree, 3-Agree, 4-Strongly Agree).

#### 4.2.3. Traditional/Cultural Activities

Historically, people upheld their important traditional, social and cultural activities including communal hunting and gathering, and cultural dances that occupied their leisure time and social events such as childbirth, child naming and weddings. The Taita people had their own dressing culture that differed between men and women. The influx of new people into the county eroded these traditions and culture. Most of the traditional cultural activities of the Taitas living around mining areas have disappeared as a result of changed occupations, dispersion, and interaction with different peoples and with discreet and reserved behaviour expected and usually observed around mining. The latter has eroded natural trust, traditionally common among the Taitas. The mining areas have become cosmopolitan with economic gains altering the dressing and music cultures of the Taita Taveta people living in the mining areas.

It is no longer secure to have open ceremonies in the nights like before due to insecurity reasons. Findings below indicate that Taita communities had already



been into religion mainly Anglican, Catholic and Muslim and they also had their own sacred beliefs before mining activities began. On the onset of mining activities, sacred beliefs and artefacts have no prominence anymore and religious platforms have also changed with more protestant churches in the mining areas (**Table 4**).

**Table 4.** Traditional/cultural activities before and after mining.

	Gender	Education Level				Total
		None	Primary	Secondary	Tertiary	
People upheld their traditional and cultural activities	Female	3	3.1	2.8	2.7	3
	Male	3	2.9	2.7	3.3	2.9
Cultural dances occupied leisure time	Female	3	3	2.8	2.7	2.9
	Male	3	2.8	2.6	2.7	2.8
Events like weddings, childbirth, and child naming were very important for families	Female	3	3	3.2	3	3
	Male	3	3	2.9	3	3
Taita people had their own dressing culture for men and women	Female	3	2.9	2.6	2	2.8
	Male	3	2.8	2.6	2.3	2.7
Hunting and gathering was part of peoples important social activity	Female	3	2.8	2.8	2.3	2.8
	Male	3	2.8	2.8	3	2.8
<b>Traditional/Cultural After Mining</b>						
The onset of mining brought in an influx of none residents into the county	Female	3	3.2	3	3.3	3.2
	Male	3	3.3	3.3	3.7	3.3
Tradition and culture has been altered because of the presence of a mixed population	Female	3.1	2.9	3.2	2.7	3
	Male	3	2.9	2.9	3.3	2.9
Communities no longer live in trust because of secret remunerations supposedly given	Female	2.6	2.7	2.8	2.7	2.7
	Male	3	2.7	2.7	3	2.7
Most of the cultural activities of the Taitas living around mining areas have died due to the changed occupations in the area	Female	3	2.8	3.2	3.3	2.9
	Male	3	2.9	2.9	3.7	2.9
Mining areas have become cosmopolitan	Female	3	3.1	3	3.3	3.1
	Male	3	3.1	3.1	3.7	3.1
Economic gains have altered the dressing and music cultures of the Taita Taveta people living in the mining areas	Female	3	2.9	2.8	3	2.9
	Male	3	2.8	2.8	3.3	2.8
It is no longer secure to have open ceremonies in the nights like before	Female	2.6	2.6	2.6	2.3	2.6
	Male	3	2.6	2.5	2.7	2.6
Sacred beliefs and artefacts have no prominence any more	Female	3.1	3	3	3	3
	Male	3	2.9	3.1	2.3	2.9
Religious platforms have also changed with more protestant churches in the county	Female	3	2.9	3	3.7	3
	Male	3	3	2.9	3	3

(Scale: 1-Strongly Disagree, 2-Disagree, 3-Agree, 4-Strongly Agree).

Gemologist reported, "increased immigrants have brought about insecurity in the areas with increased reported cases of theft within the mining centres. No trust in the families as miners get a lot of money but this money doesn't go down to families".

From the key informants' discussion, people lived in peace, but with the influx of people from other counties, insecurity has become a factor in these areas. Similarly, [18] Kitula (2006) also alludes that there have been some negative mining impacts in Geita District in Tanzania. These included displacement and unemployment, child labour, accidents and theft. High influxes of migrants in search of jobs also brought about prostitution and culture changes including internal competition for natural resources.

#### 4.2.4. Moral Behavior

The results in **Table 5** showed that when it comes to behavioural patterns the mining environment has introduced new lifestyles to the communities. Both formal and informal education existed before mining and boys and girls went to school. As mining started the study revealed escalation of girls drops out from schools to engage in prostitution. Gainful remunerations have encouraged alcoholism and drug addiction which has resulted in the rise of family neglect, coupled with divorces and polygamous habits. The study findings revealed that mining activities have devalued the moral values of the people, which were highly upheld before mining started. During that time men and women did not mix in public village meetings and churches as a sign of respect. Sex education was sacred and aunties and uncles took the mantle to talk about it to the youth (**Table 5**).

From the key informants, it was evident that mining activities have impacted most of the areas either positively, or negatively. Although most respondents agreed their lives have improved from sales of minerals, they still complained about the high numbers of immigrants, use of alcohol and drugs, high levels of

**Table 5.** Moral behaviors.

Moral behaviours	Gender	None	Primary	Secondary	Tertiary	Grand Total
Mining has introduced a new lifestyle to the communities	Female	3	3.1	3	3.3	3.1
	Male	3	3	3	3.3	3
Alcoholism and drug addiction has escalated	Female	2.7	3.1	2.8	3.7	3
	Male	4	3.2	2.9	3.3	3.1
More girls are dropping out of school to do prostitution	Female	2.7	2.9	3	3.7	3
	Male	3	3.1	2.9	3.3	3
Family neglect is on the rise	Female	2.7	2.9	3	3.3	2.9
	Male	3	2.8	2.8	3	2.8
Also, divorces and polygamy habits are on the rise	Female	2.7	2.9	2.6	3.7	2.9
	Male	3	2.8	3	3.3	2.9

(Scale: 1-Strongly Disagree, 2-Disagree, 3-Agree, 4-Strongly Agree).

Chief in the area said, "Schoolchildren disappear from schools to engage in mining activities. People are engaging in alcohol drugs and prostitution in the area. Additionally, in Mkuki area, prostitution is high with a high rate of HIV/AIDS spread. Families are breaking up due to financial constraints since it is not every day that one gets the gemstone in the mining areas. For the last two months, we've been fighting chang'aa" (a local brew).

school drop-outs especially among the girls and prostitution that has escalated in mining areas. Mining activities have caused high numbers of immigrants in search of jobs. This has brought drastic change to community lifestyle as mixed communities from other parts of the counties and country diluted the Taita culture. Additionally, it has led to increased prostitution and natural resources competition among the local dwellers. According to [18] Kitula (2006), mining activities are a contributor to high prostitution level which translates to the spread of transmittable diseases like HIV and AIDS in mining regions. Similar findings were reported by [6] Mwakumanya *et al.* (2016) concerning a high rise of family breakages and loss of family values at the mining sites.

## 5. Conclusion and Recommendations

Mining has brought both positive and negative effects on the sociocultural aspects of Taita Taveta County. The mining sector has brought in an influx of none residents in the area in search of jobs and the area has become cosmopolitan. Negatively mining has introduced a new lifestyle to the communities resulting in conflict issues, high rate of alcoholism and drugs addiction, high levels of school drop-outs especially among the girls, prostitution, dilution of the Taita culture and devalued moral values of the people. There is a need for community sensitization on the importance of education. Implementation of mining regulations is crucial.

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## Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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