



## East African Journal of Environment and Natural Resources

[eajenr.eanso.org](http://eajenr.eanso.org)

Volume 7, Issue 1, 2024

Print ISSN: 2707-4234 | Online ISSN: 2707-4242

Title DOI: <https://doi.org/10.37284/2707-4242>



EAST AFRICAN  
NATURE &  
SCIENCE  
ORGANIZATION

Original Article

### Effects of Stone Mining on Household Livelihoods in Londiani Sub-County

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Article DOI: <https://doi.org/10.37284/eajenr.7.1.2210>

#### Date Published: ABSTRACT

15 September 2024

#### Keywords:

Household  
Livelihoods,  
Poverty Alleviation,  
Policy Makers and  
Stone Mining.

Globally, rural areas are dominated by households earning less than a dollar per day and engaging in subsistence agriculture to meet their basic needs. In Kenya, governments and non-governmental organizations have taken measures to promote agricultural activities and non-agricultural activities to alleviate poverty in rural areas. One of such none agricultural activity in Kenya is stone mining. Stone mining is an alternative source of livelihood for most rural households. The objective of the study was to establishment the effects of stone mining on household livelihoods in the Londiani, Sub-County. Primary data was collected by use of structured household questionnaires and Key Informant Interviews. Descriptive statistics was used during data analysis where percentages were computed and tabulated. The study revealed that: stone quarry activities have adverse effects on residents of Londiani sub-County, notably: respiratory diseases, chest and skin infections, eye problems, rashes, and body injuries. Stone mining has numerous benefits to the miners' livelihoods. The money generated from stone mining is used to pay school fees, purchase food for the family, clothing, and health services and even build shelter for the family. The study recommends for an audit of the number of households directly involved in quarrying activities with a view to extending credit facilities to boost mining sector. The findings are significant to policymakers in the county government of Kericho, and national governments in formulating policies aimed at streamlining informal sectors into mainstream economic activities.

#### APA CITATION

Kibet, R. S. & Karanja, A. M. (2024). Effects of Stone Mining on Household Livelihoods in Londiani Sub-County. *East African Journal of Environment and Natural Resources*, 7(1), 469-474. <https://doi.org/10.37284/eajenr.7.1.2210>.

#### CHICAGO CITATION

Kibet, Rono Samwel and Amon Mwangi Karanja. 2024. "Effects of Stone Mining on Household Livelihoods in Londiani Sub-County". *East African Journal of Environment and Natural Resources* 7 (1), 469-474. <https://doi.org/10.37284/eajenr.7.1.2210>.

#### HARVARD CITATION

Kibet, R. S. & Karanja, A. M. (2024) "Effects of Stone Mining on Household Livelihoods in Londiani Sub-County", *East African Journal of Environment and Natural Resources*, 7 (1), pp. 469-474. doi: 10.37284/eajenr.7.1.2210.

#### IEEE CITATION

R. S., Kibet & A. M., Karanja "Effects of Stone Mining on Household Livelihoods in Londiani Sub-County", *EAJENR*, vol. 7, no. 1, pp. 469-474, Sep. 2024. doi: 10.37284/eajenr.7.1.2210

## MLA CITATION

Kibet, Rono Samwel & Amon Mwangi Karanja. "Effects of Stone Mining on Household Livelihoods in Londiani Sub-County". *East African Journal of Environment and Natural Resources*, Vol. 7, no. 1, Sep 2024, pp. 469-474, doi:10.37284/eajenr.7.1.2210.

## INTRODUCTION

Agriculture is the primary source of livelihood in rural areas globally. According to IFAD (2001), globally, 70% of poor households are engaged in agriculture as a livelihood source and live in rural areas. However, Agriculture is faced with various uncertainties due to extreme weather events and high costs of inputs forcing farmers to diversify their sources of livelihoods. A high population also contributes to a decrease in agricultural production due to land fragmentation and subdivision in Africa, significantly affecting the economies that rely heavily on agriculture (IFAD, 2006). Non-agricultural activities such as stone mining, charcoal burning, and business, remain the only viable options for farmers in rural areas in light of weather extremes (Wells, 2000). Among the leading non-agricultural activity in Londiani sub-County is Stone mining. Stone mining is obtaining non-minerals materials from rocks (Lad & Samant, 2014). Globally the number of people involved in stone mining activities is estimated to be between 80 to 100 million (Hentschel *et al.*, 2002). Stone mining is motivated by the ever-increasing demand for building materials due to high population and economic growth.

According to Smith (2001), the informal sector has offered an alternative source of rural livelihoods due to increase in the amount of unemployment in the formal sectors. In Asia and sub-Saharan Africa, informal sectors provide over 80% of employment opportunities (SIDA, 2004). limited employment prospects in formal sector leave everyday activities such as stone mining as the only alternative for achieving livelihood needs in developing countries, (Ngure *et al.*, 2015). Stone mining is a good example of informal sector offering employment or rather financial support. Stone mining requires a low amount of capital and is characterized by a reduced degree of mechanization, making it accessible to most poor households in developing countries (Hentschel *et*

*al.*, 2002). Stone mining is a source of income for many families in both rural and urban areas. It is a source of income, employment, and foreign exchange to rural households (Aigbdion, 2005).

Despite the benefits, stone mining has negative In developing countries, effects to the miners and the surrounding environment (Nwibo *et al.*, 2012). The negative effects include are loss of habitat, noise pollution, dust that pollutes the air, vibrations that damage structures, chemical spills in rivers and lakes killing aquatic species, erosion of soil, and sedimentation of waterways, and dereliction of productive land (Gale & Groat, 2001). In the Londiani sub-County, Kericho County, stone mining is the primary source of livelihood for the majority of households due to uncertainties in Agricultural sectors over time. However, the effect of stone mining on household livelihoods in Londiani is not documented a gap that necessitated the study.

## MATERIALS AND METHODS

The Study was conducted in Londiani sub – County, Kericho County, Kenya. The Sampled location was Kimasian Location, which borders Kedowa Location to the East, the Kimugul Location to the west, and Londiani location to the North. Londiani sub-County experiences a bimodal rainfall pattern in March, April, May (MAM) and October, November, December (OND). Major ethnic communities found in Londiani sub-County are Kalenjins, Kikuyus, Luhyas, and Luos. The economic activities carried out in the study area include, crop farming, trade, charcoal burning and small-scale stone mining (GoK, 2008).

Primary data was collected using structured Questionnaires and Key Informant Interviews. Questionnaires are tools that gather information of respondents' views, opinions, and perceptions. Questionnaires were considered appropriate for the study due to limitation of time and resource. Key Informant Interviews targeted the area Chief,

Environmental officers working in the Sub-County, and agriculture extension officers.

## RESULTS AND DISCUSSIONS

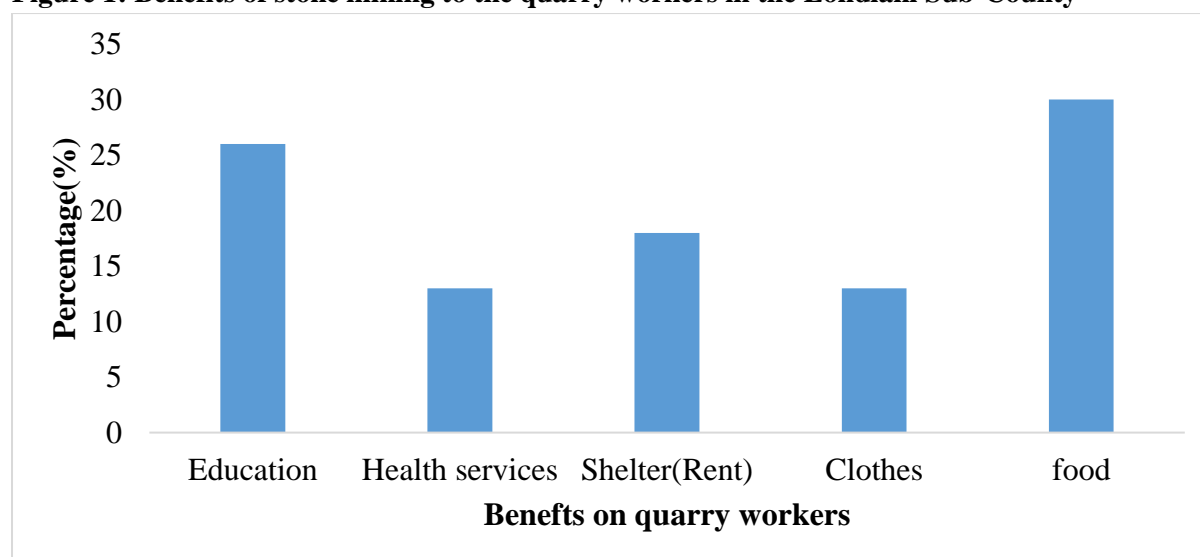
### Effects of Stone Mining on Quarry Workers in the Londiani Sub-County

The findings on *Figure 1* revealed that, money generated from stone quarrying activities is used to meet food needs (30%), clothes (13%), health services (13%), and cost of education (26%) and shelter (18%). This shows that majority of the households in Londiani sub-county depends on the income from stone mining to meet their basic needs and educate their children. The key informants' findings show that quarries provide

the local's communities with various jobs and reduce the unemployment rate. Employment in quarries boosts local economies because the workers spend their money in the nearby local shopping centres.

These findings concur with Dong-dong *et al.* (2009) that income earned from stone quarrying activities is useful to meet financial obligations such as the cost of children's education, health service, shelter, clothes, and food needs. According to Chigonda (2010), the positive impact of stone mining on society includes increasing people's income, improved infrastructure, and job creation.

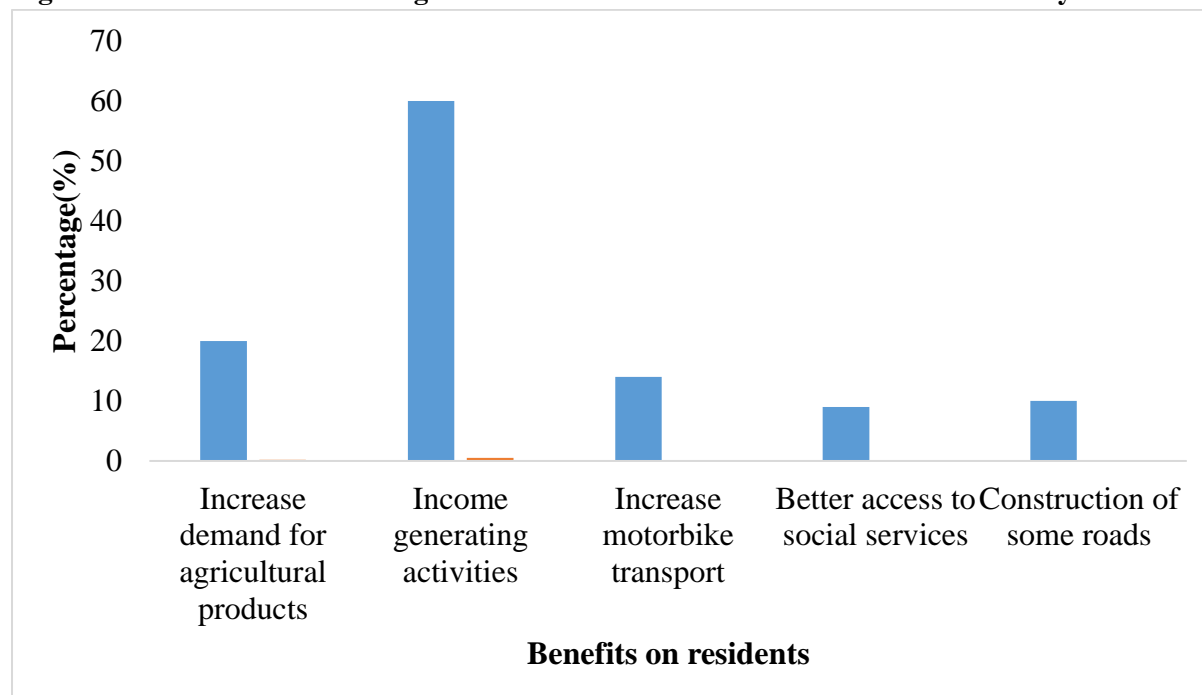
**Figure 1: Benefits of stone mining to the quarry workers in the Londiani Sub-County**



### Effects of Stone Mining on Household Livelihoods in Londiani Sub-County

This research sought to establish how household livelihoods within Londiani sub-County are affected by stone mining. Based on the results in *Figure 2*, 18% of the respondents felt that quarrying activities in an area increases demand of agricultural products while 52% of the respondents felt that the activity is an income-generating activity. Fourteen of the total percentage of the respondents opined that stone quarrying has led into a rise in motorbike transport (boda boda transport). Eight of the total

percentages of the respondents are of the opinion that quarrying activities takes led in terms of better access to social services and nine percent felt that the activity has led to availability of road construction materials. The key informant Interview established that stone quarrying activities had benefitted the residents since it has led to financial base's growth. For instance, several trading centres, retail shops, and food-selling vendors have been established in the mining zones in the sub-County. This view concurs with DFID (1999), which points out that financial assets are essential pursuits of improved livelihood.

**Figure 2: Effects of Stone Mining on Household Livelihoods in Londiani Sub-County**

### Effects of Quarrying on Health of the Quarry Worker in Londiani Sub-County

The study assessed the effects of stone quarrying activities on the health of the quarry workers using Likert Scale. The views of the respondents were sought as to whether they strongly agree (SA) agree (A), Uncertain (U), disagree (D), and strongly disagree (SD). The outcome is presented on *Table 1* which show that, seventy- one of the total percentages of the respondents strongly agree that quarrying activities cause respiratory diseases, seventeen percent of the respondents agree that quarrying activities cause respiratory diseases while twelve percent of the respondents are uncertain on whether quarrying activities causes respiratory diseases. On Asthma, chest, and skin infections, eighty-nine percent of the respondents strongly agree that quarrying activities cause the diseases. Eleven percent of the respondents agree that quarrying activities cause Asthma, chest, and skin infections.

From the result in *Table 1*, eighty-seven of the respondents strongly agree that stone mining lead

into eye problems. Thirteen percent of the respondents agree that stone mining leads to eye problems. On rashes infection, fifty-one percent of the respondents strongly agree that quarrying activities cause rashes, and forty percent agree. The Key informant interview revealed that body tissue injuries is considered to be a problem associated with health of the workers caused by quarrying activities. The finding concurred with Kitula (2006), who noted that same maladies across mining places comprised of aerial soil, hydro-borne maladies, plus communicable diseases. This is further supported by Benez *et al.* (2010) who noted that impacts of quarrying activities such like vibrations resulting from blasting have similarly caused a lot of cracks in a number of structures endangering the lives of those living in such houses. In Additional Key Informants felt that quarrying activities damage biodiversity and leads to decline in vegetation development. These results are supported by Aigbedion (2005), who indicated that there is tendency of decreasing harvest in the farmsteads surrounded by quarrying zones.

**Table 1: Effects of Stone Quarrying on Household Health in Londiani sub-County**

Health problems	SA	A	U	D	SD
Respiratory diseases	80 (71%)	19 (17%)	14 (12%)	0	0
Chest and skin infections	100 (89%)	13 (11%)	0	0	0
Eye problems	99 (87%)	14 (13%)	0	0	0
Rash	58 (51%)	55 (40%)	0	0	0
Muscle pain	-	-	-	-	-

## CONCLUSIONS AND RECOMMENDATIONS

The study found that quarrying activities in Londiani sub-County is a major source of income among the residents. The income gained is used to buy food and educate children. In addition, it provides employment enabling majority of the household to meet their financial obligations. Secondary economic activities have also benefited from quarrying activities, they include transport services, businesses, and rental houses Londiani sub-County. Though the activity is beneficial to majority of the households, several negative effects were identified such as respiratory infection, chest, muscle pains and body injury.

The study recommends that the County Government of Kericho should carry out an audit on the exact number of households who are directly involved in quarrying activities and encourage them to join Savings and Credit Societies (SACCO). This will enable the county government to extend credit facilities to the households involved in quarrying activities. All relevant stakeholders in the quarrying sector, should strengthen the collaboration among themselves for effective awareness creation on environmental impact mitigation and enforcement of mining regulation.

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