

WOMEN INVOLVEMENT IN STONE QUARRYING ACTIVITIES IN JALINGO, TARABA STATE, NIGERIA

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Abstract

The debate as to whether women provide a bulk of unpaid care and domestic work is not in doubt but the fact that they contribute largely to informal economy is underreported. Mining activities help to generate fund for those involved in it especially now that an almost permanent increase in poverty has compelled people to seek alternative livelihoods. The aim of this study is to investigate the involvement of women in quarrying activities in Jalingo, Taraba state, Nigeria. Simple random sampling was used to arrive at 186 respondents out of about 400 women involved in the quarrying industry, which takes place in four different wards in jalingo local government area. A structured questionnaire was the instrument of data collection. All the questionnaires administered were accurately filled in and returned. The results indicated about 43% of respondents fall between the ages of 36-45 years and only about 5% falling between of 26 years and below. It was also discovered that about 51% of respondents earn between N2000 to N4000 of Nigeria currency daily while about 20% of respondents earn N5000 and above daily. The result also shows that there is no significant relationship between local quarry and women livelihood in Jalingo but there existed statistically significant relationship between age and daily earnings $r(184) = .546, P = .000$. It was recommended that Introduction grant schemes such as survival fund for small-scale quarry operations could come together under one umbrella. This move would make banks and other financial institutions more willing to give them loans as credible and creditworthy entity; this will create better opportunities for diversification of livelihood incomes and assets that will promote positive livelihood outcomes.

Keywords: Informal economy, Livelihood, Quarry mines, Stone quarrying

INTRODUCTION

The female adult gender referred to as women are gradually taking very important place in the economy of the world and the adult women of the developing countries are not left behind as they gradually found in all facet of economic endeavors, as opined by Aminur-Rahman (2013), women are sensitively talking about gaining control over their lives, and participating in making the decisions that affect them in home and community. Stone quarrying is one very important economic activity that women are involved in even though it is time consuming and highly labor intensive it is a land use which involves extraction of non-fuel and non-metal minerals from rocks (Ukpong, 2012). It is usually done by open-cast method using rock drills, explosion of dynamite among other methods. According to Kitula (2006), quarrying has environmental and health effects. And the Nigerian Minerals and Mining Acts 2007 defines quarrying as the extraction of aggregate stones dimensions, laterite, sand, and clay mineral from any location in Nigeria. The operations in stone quarrying, whether small or

large-scale, are inherently disruptive to the environment, producing enormous quantities of waste that can have harmful impacts for decades as a result of inappropriate and wasteful working practices and rehabilitation measures (Sati, 2015). The degradation of environment due to stone quarrying activities has put forth questions as to whether or not the mining activities should be continued (Nartey, et al. 2012; Sati, 2015). It has been revealed that 4 million people died yearly from acute respiratory problems in developing countries, for the most part being aggravated by environmental pollution emanating from quarrying, sandblasting and emission of dangerous chemicals (Nartey 2009; Langer, 2012). But it has been noted in rural Africa that the dependence on agricultural output could no longer provide year round security in terms of finance due to continuous decline in farm yields (Asante, Abass & Afriye 2001). This is not surprising since most of the rural farmers are subject to varying degrees of uncertainty due to climate variability and postproduction loss (Cooper, et al 2008). This has compelled over

500 million people in developing countries to engage in occupations such as small-scale surface mining and quarrying for survival (Wang, 2012). The formal sectors in developing countries have very little potential in terms of job creation the informal sector such as stone quarrying has become an attractive alternative for achieving livelihood (Ibrahim, 2012; Asante, Abass & Afriye, 2014). Indeed, women and girls bear an unequal burden of unpaid domestic responsibilities and are overrepresented in informal and precarious jobs. Women also possess inherent agency and knowledge that is overlooked by policy-makers as they form and implement poverty reduction plans. Development interventions continue to be based on the idea that men are breadwinners and women are dependents. The global population growth and urbanization is very alarming and Nigeria is part of the alarming population growth which could have resulted to more pressure and exploitation on natural resources. This has forced over 500 million people in developing countries to employ in occupations such as small-scale surface mining and quarrying for survival (Wang et al, 2010). This includes increasing number of women in local quarrying as a means of livelihood support in the country which is posing a threat to the resources and physical environmental. Many people in rural area consider non-farming activities as pre-occupation. Several factors account for this. In most societies, gender norms define women's role as largely relegated to the home, as mother and caretaker, and men's role as responsible for productive activities outside the home. These norms influence institutional policies and laws that define women's and men's access to productive resources such as education, employment, land and credit. Ample evidence shows that girls and women are more disadvantaged than boys and men in their access to these valued productive resources. There is also an evidence to show that the responsibilities of women and the challenges they face within poor households and communities are different from those of men. Persistent gender inequality and differences in women's and men's roles greatly influence the causes, experiences and consequences of women's poverty. Policies and programs to alleviate poverty must, therefore, take account of gender inequality and gender differences to effectively address the needs and

constraints of both poor women and men. In most cases it has been revealed that possible over dependence on agricultural output could no longer provide year round food and revenue security because of continuous decline in farm yields due to recent security threats such as kidnappings, inter-tribal wars, incidences of herdsmen and farmers clashes and cases of Boko Haram terrorism. This is not surprising since most of the rural farmers are subject to varying degrees of uncertainty due to climate change. It is for this reason that diversification of rural income has become common among those who wish to live, at least, an average life. Since non-agricultural activities in many instances yield as much returns as subsistence farming the only option for those without access to productive farmlands is to subject the natural environment to other activities such as artisanal, sandblasting, stone extraction and small-scale mining.

Despite the large numbers of women working in local quarry, there is need to study the impact of local quarry as a means of livelihood support for women in Jalingo Local Government Area. This gap of looking at the primitive way of stone quarrying and how women get involved to contribute to family needs is very vital and form the main aim of this study.

MATERIALS AND METHODOLOGY

Study Area

Jalingo Local Government Area is roughly located between latitudes 8° 47'-9° 01'N and longitudes 11° 09" to 11° 30"E. It is bounded to the North by Lau Local Government Area, to the East by Yorro Local Government Area, to the South and West by Ardo-Kola Local Government Area. It has a total land area of about 195km². Jalingo LGA has a population of 139,845 people with a projected growth rate of 3% per annum (Shawulu et al, 2008). It has a projected population of 165,774 in 2014 (Oruonye, 2014).

The relief of Jalingo LGA consists of undulating plain interspersed with mountain ranges. This compact massif of rock outcrops (mountains) extends from Kona area through the border between Jalingo and Lau LGAs down to Yorro and Ardo Kola LGAs in a circular form to Gongon area, thus given a periscopic semi-circle shape that is almost like a shield to Jalingo town. Jalingo metropolis is

drained by two major rivers Mayogwoi and Lamurde, which take their source from the mountain ranges in Yorro LGA and empty their contents into the Benue River System at Tau village. The valley of River Lamurde is dotted with ox-bow lakes which are as a result of depositional activities. Jalingo LGA has tropical continental type of climate characterized by well-marked wet and dry season. The wet season usually begins around April and ends in October. The dry season begins in November and ends in March. The LGA has a mean annual rainfall of about 1,200 mm and an annual mean temperature of about 29°C. Relative humidity ranges between 60-70 per cent during the wet season to about 35-45% in the dry season. Jalingo is located within the northern guinea savanna zone characterized by grasses interspersed with tall trees and shrubs. Some of the trees include locust bean, sheabutter, eucalyptus, baobab and silk cotton tree. The major ethnic groups of Jalingo LGA are the Fulani, Jibu Kona and Mumuye, while other ethnic groups such as Hausa, Jenjo, Wurkum and Nyandang are also found. Hausa language is widely spoken as a medium of communication for social and economic interactions. Jalingo environment is populated by mostly yam farmers because of the relief of Jalingo LGA that consists of undulating plain interspersed with mountain ranges and the compact massif of rock outcrops (mountains) extending from Kona area through the border between Jalingo and Lau LGAs down to Yorro and Ardo Kola LGAs in a circular form to Gongon area, thus given a periscopic semi-circle shape that is almost like a shield to Jalingo town. Jalingo metropolis is drained by two major rivers Mayogwoi and Lamurde which also allows for dry season farming.

Research Design and Methods

This study followed a single-round survey design which Fisher (1991) and Cleland (1990) found to be useful in descriptive and exploratory studies. This study aimed at investigating the level of women involvement in stone quarrying with respect to benefits and problems. The study used a mixed method of qualitative and quantitative research design. This enables the researchers to answer the questions raised as clear as possible at the same time dealing with the logical problems raised.

Since there are no registered figures from the state government on the population of women involved in local quarrying, the estimated number of quarry workers, both males and females was obtained from the local mine quarry owners association, which they believe is not very consistent because some women are more or less part time workers. The quarry mining sites in these areas are allocated to quarry operators based on leases, which could cover a reasonable land mass, and the leases are mapped out in what they call pits for individual quarry operators. The mining sites are considered the property of the federal government and not individuals because all mining activities is on the exclusive list of the Federal Government (FMMP, 1970).

Sample Procedure and Size.

The research adopted two sampling techniques and these are purposive and simple random sampling. Jalingo has ten (10) wards out of which four (4) wards were purposely sampled because these wards are the wards where quarrying activities is concentrated a table is presented below showing the number of women involved in quarrying per ward and the number sampled using Krejcie and Morgan table of random selection. Based on the population of the operators, the sample size for this study is 186, randomly picked from the quarrying sites. About 190 questionnaires was produced and administered and 186 were adequately filled and returned back to the researcher.

Methods of Data Analysis

Correlation analysis was used ascertain the level of statistically significant relationship that exist between age, daily and monthly earnings of respondents at a rejection level of P=.000 of the null hypothesis. An acceptance level of P=.251 was made for the null hypothesis ascertaining a significant relationship between age and daily earnings. The formula used for data analysis is as follows:

$$r = \frac{n(\Sigma xy) - (\Sigma x)(\Sigma y)}{\sqrt{[n\Sigma x^2 - (\Sigma x)^2][n\Sigma y^2 - (\Sigma y)^2]}} \quad (1)$$

x=age of respondents

y=daily earnings of respondents

y²=monthly earnings of respondents

Table 1 Showing sampled population

Name of Centre	Number of Operators	Numbers Sampled
Dinyavoh (Kona Ward)	200	103
Kona Garu (Kona ward)	35	18
Rafin zurfi (Turaki A)	52	27
Turaki B	73	38
Total	360	186

Source: researchers field survey 2020

RESULTS AND DISCUSSION

This section presents the results of the analyzed data collected through field survey carried out and discussions on the results. The variables analyzed in the study include demographic characteristics of

women participating in quarrying activities, the amount of earnings of women in quarry mines, the frequency of visits to the quarry sites for stone quarrying by women and their level of satisfaction with the earnings from quarrying activities.

Table 2 Socio-demographic characteristics of respondents

Response	Frequency	Percentage (%)
Age		
25 & Below	9	4.8
26 - 35 years	29	15.6
36 - 45 years	79	42.5
46 - 55 years	49	26.3
56 & Above	20	10.8
Educational Qualification		
None	86	46.2
Primary	73	39.2
Secondary	23	12.4
Tertiary	4	2.2
Religion		
Christianity	147	79.0
Islam	34	18.3
ATR	5	2.7
Marital Status		
Single	6	3.2
Married	152	81.7
Divorced/Separated	6	3.2
Widowed	22	11.8

Source: Field work, 2020

Table 2 shows the socio-demographic characteristics of the respondents for the study. The result reveals that majority of the respondents were within the age bracket of 36 – 45 (42.5%), followed by those in the age bracket of 46 – 55 (26.3%) and 26 – 35 (15.6%), while 10.8% and 4.8% are accounted for by

those in the age categories 56+ and less than 26 respectively. This shows that majority of the women involved in quarry activities are matured. On the educational qualification of the respondents, the result shows that majority (46.2%) of the respondents have no formal education.

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Table 3 Earnings in stone quarry mines

Variable Class	Frequency	Percentage
Daily Earnings (₦)		
<1,000	53	28.5
2,000 – 4,000	95	51.1
5,000 & Above	38	20.4
Monthly Earnings (₦)		
<11,000	4	2.2
11,000 - 20,000	21	11.3
21,000 - 30,000	61	32.8
31,000 - 40,000	83	44.6
41,000 - 50,000	17	9.1

Source: researcher’s field survey 2020

Table 4 Danger of stone quarrying

Quarry work is low paid and highly dangerous	Frequency	Percentage
Yes	172	92.5
No	14	7.5

Source: Field work, 2020

Table 5 Frequency of participation in quarry activities

Response	Frequency	Percentage (%)
Time women start quarry work		
7am	89	47.8
8am	18	9.7
Not defined	79	42.5
Time women close from quarry		
5pm	11	5.9
6pm	36	19.4
Not defined time	139	74.7
No. of hours at quarry sites per day		
8hrs	23	12.4
9hrs	9	4.8
No defined hours	154	82.8
Do quarry workers get break		
Yes	186	100
Duration of break		
1 hr	159	85.5
2hrs	27	14.5
Situations where women work at night		
No	186	100

Source: Field work, 2020

On the other hand, 39.2% of the respondents completed primary education. Based on religious inclination, the result found

that nearly four-fifth (79%) of the respondents are Christians, 18.3% Muslims, and 2.7% of the respondents are adherents of the Africa

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traditional religions. The marital status of the respondents shows that majority (81.7%) are married, 11.8% are widowed, 3.2% are single or yet to marry. Since majority is married, it is safe to assume that they have children and have needs to cater for them. This explains in part why the respondents have to engage in stone quarrying to complement the efforts of their husbands.

Table 3 shows respondents' earnings from quarry activities. The data show that most of the respondents (51.1%) claimed daily income of between ₦2, 000 and ₦4, 000. Only a few respondents (20.4%) earn 5,000 or more daily. Based on monthly income, the table further reveals that majority (44.6%) of respondents earn between ₦31, 000 – ₦40,000 followed by those who are earning between ₦21,000 – ₦30,000 (32.8%) and ₦11,000– ₦20,000 (11.3%). Comparatively only few respondents earn ₦41,000 – ₦50,000 (9.1%) and ₦1,000 – ₦10,000 (2.2%).

The result presented in table 5 shows the frequency of quarry activities among the respondents. The result shows 47.8% of the respondent start work at stone quarry sites by 7:00 a.m, followed by 42.5% who have no defined time for start of work in the morning at quarry sites, 9.7% starts work at 8a.m daily. Respondents' view on time of closure from quarry sites revealed that majority (74.7%) do not have any defined time of closure, 5.9% and 19.4% close by 5pm and 6pm respectively daily. The results on number of hours women work at stone quarry sites shows that majority (82.8%) of them do not have defined hours of work. 12.4% close at after 8 hours of work while 4.8% spent 9 hours at work. Workers at the stone quarry sites usually observe break time. Nearly nine-tenth (85.5%) observe one hour while the remaining 14.5% take 2 hours off-work rest.

Table 6 Use of earnings from quarry activities on household

Statement	SA	A	D	SD	Mean	S.D	Decision
I use the money I realize from quarry activities to buy food for the family	136	50	-	-	3.73	.44	Accept
The money I realize from quarrying is only for my personal use	-	10	169	7	2.02	.30	Reject
The money from quarrying activities is used for my children school fees	19	160	5	2	3.05	.41	Accept
The money realized from quarrying activities is used when anyone is sick in the house	114	69	-	3	3.59	.52	Accept
I use the money from quarrying activities to establish business	33	124	22	7	2.98	.67	Accept
The money from quarrying activities is used to buy clothing for my children and I	83	99	4	-	3.42	.54	Accept
My daily contribution and local bank is achieved through the money from quarrying activities	78	108	-	-	3.42	.49	Accept
The money I realize from quarrying activities is used in settlement of debts	37	89	52	8	2.83	.79	Accept
Most of the financial needs of the family is met through the money I realize from quarrying activities	103	79	4	-	3.53	.54	Accept
The money I earn from quarrying activities is not enough but to some extent, it solves my family problems	110	70	6	-	3.56	.56	Accept
Average Mean & S.D.					3.213	.53	

Source: Field work, 2020

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Table 6 shows responses of respondents on use of earnings from stone quarrying activities on their households. The results with an average mean of 3.213 and standard deviation of .53 which is above the decision mean shows that women use the earnings from quarry activities to solve most of their household problems. The table shows that among the household problems women use earning from quarry activities on include feeding, children’s school fees, treatment of

sick family members, establishment of small business, clothing for self and children, daily contribution and savings, settlement of debts, financial needs of the family, and solving other family problems. From the foregoing most of the decisions shows accept except the question about using of earnings for personal purpose that the decision show reject, this suggest that women’s earnings from stone quarry activities is able to solve their household problems.

Table 7 Correlation analysis between age, daily and monthly earning

		Age	Monthly Earnings	Daily Earnings
Pearson Correlation	Age	1.000	.049	.546
	Monthly Earnings	.049	1.000	.091
	Daily Earnings	.546	.091	1.000
Sig. (1-tailed)	Age	.	.251	.000
	Monthly Earnings	.251	.	.109
	Daily Earnings	.000	.109	.
N	Age	186	186	186
	Monthly Earnings	186	186	186
	Daily Earnings	186	186	186

Source: researcher’s field survey 2020

A simple linear regression was computed to predict the relationship between Age of women, daily earnings and monthly earnings. A statistically significant relationship was found between age and daily earnings $r(184) = .546$, $P = .000$ therefore, we reject the null hypothesis. But, there was no statistically

significant relationship discovered between age and monthly earnings $r(184) = .049$, $P = .251$ to that end we accept the null hypothesis. There was a positively large association between age and daily earning ($r = .546$) while positively very weak or none association existed between age and monthly earning ($r = .049$).

Table 8 Showing correlation analysis between educational qualification, daily and monthly earning.

Correlations

		Educational Qualification	Monthly Earnings	Daily Earnings
Pearson Correlation	Educational Qualification	1.000	-.119	-.206
	Monthly Earnings	-.119	1.000	.091
	Daily Earnings	-.206	.091	1.000
Sig. (1-tailed)	Educational Qualification	.	.053	.002
	Monthly Earnings	.053	.	.109
	Daily Earnings	.002	.109	.
N	Educational Qualification	186	186	186
	Monthly Earnings	186	186	186
	Daily Earnings	186	186	186

Source: Researcher’s field survey 2020

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A statistically significant relationship was found between educational qualification and daily earnings $r(184) = -.206$; $P = .002$. But the relationship between educational qualification and monthly earnings is more complex: $r(184) = -.119$, $P = .053$. The p-value of 0.053 is slightly non-significant ($\alpha = 0.05$).

The result presented in table 2 revealed that majority (43%) of the respondents are within the age bracket of 36–45, only few (5%) were below 25 years age bracket. This implies that most of the women involved in quarry activities are matured. Most of the respondents have no formal education. A good percentage of them have primary education as their highest level of education. Only few respondents have secondary and tertiary education respectively. Based on religious inclination, majority of the women involved in quarry activities in the study area are Christians. Only few are Muslims and adherents of the African traditional religions. Based on the marital status of the respondents, majority of the respondents are married. On the other end, few are widowed, single or divorced/separated respectively.

Table 3 presents findings on respondents' earnings from quarry activities. The result shows that most (51%) of the respondents earn daily income between ₦2,000 and ₦4,000. Fewer (20%) earn ₦5,000 or more daily this amount of money earned is very small considering the present economy of Nigeria. This is similar to the finding of Wang et al, 2010 where he discovered that most surface mining are done in small scale for taking care of survivals

Table 4 presented a finding based on respondents perception of dangers associated, with stone quarry mines, where nine-tenth (92.5%) complained of low pay and the risks involved. This finding tallied with the discovery of Nartey (2009) and Langer (2012).

The result presented in Table 5 shows the frequency of quarry activities among the respondents. The result shows that most women (48%) working in quarry mines start work at quarry sites by 7:00 a.m., while others do not have any defined time for start of work in the morning. On the time of closure from quarry sites, the finding reveals that most women do not have any defined time of closure from quarry sites. Few either close by 5pm or 6pm respectively. Most of the women working at

quarry sites do not have defined hours of work. Some spend eight hours (8hrs) or nine hours (9hrs) depending on their strength or other activities they have to attend to. Women working at quarry sites do have breaks in between working hours. The duration of this break varies. Most of the women reported that they do spend just one hour (1hr) break during work. The women reported that there are no situations where they have to work at quarry sites in the night.

The findings presented in table 6 shows that women use the earnings from quarry activities to solve their household problems. The household problems on which women use earning from quarry activities include household feeding, children's school fees, treatment, establishment of businesses, clothing for self and children, savings, settlement of debts, financial needs of the family, and solving other family problems. This implies that earning of women from quarry activities is capable of solving their household problems.

A Pearson product moment correlation coefficient was conducted to evaluate the null hypothesis that there is no significant relationship between local quarry and women livelihood support in Jalingo. Preliminary analysis show that in table 7 there existed statistically significant relationship between age and daily earnings $r(184) = .546$, $P = .000$ therefore the null hypothesis is rejected but, there was no statistically significant relationship discovered between age and monthly earnings $r(184) = .049$, $P = .251$ in this case the null hypothesis is accepted. There was a positively large association between age and daily earning ($r = .546$) this implies that age of the women engaged in quarrying determine their livelihood support.

There was negatively weak association between educational qualification, daily earning ($r = -.206$) and monthly earning ($r = .049$) this imply that as the educational status of women increases they leave business for better business. Religion and marital status of women engaged in quarrying have nothing or little do with the livelihood support of women but their educational qualification has.

CONCLUSION

Quarrying provides some employment levels and generates some income for the women of the selected areas in Jalingo. The majority of

the people studied, however, are engaged in small-scale operations. With inadequate financial capital and simple hand-made tools, small-scale stone quarrying does not generate returns to commensurate the efforts and time spent. Consequently, income from the sector is meager.

The quarrying operation in its current form is environmentally unsustainable. Land degradation is widespread, posing a severe threat to food security. Quarry mine dust concentration coupled with the physical nature of the quarrying process creates negative health consequences.

Based on the findings, the study recommends the following:

(1) In order to control and reduce the extent of environmental damage caused by the quarry industry, the Ministry of Environment and Ministry of Mineral Resources must enforce its environmental regulations, seeing to it that all those involved in quarrying operations have, as a matter of priority, the protection of the integrity of the environment.

(2) Introduction of grants schemes such as survival fund, small-scale quarry operations could come together under one umbrella. This move would make banks and other financial institutions more willing to give them loans as credible and creditworthy entity; this will create better opportunities for diversification of livelihood incomes and assets that will promote positive livelihood outcomes.

(3) Further study should be conducted on quarry workers' exit strategy in terms of savings and future business plans. Studies should be conducted on the effects of crude instruments and protective gears on quarry workers.

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