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# **The Effects of Small-scale Stone Quarrying on Poverty Reduction among Youths in Zamfara State, Nigeria**

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## **Authors' contributions**

*This work was carried out in collaboration between both authors. Author TA designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Author DU managed the analyses of the study and the literature searches. Both authors read and approved the final manuscript.*

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## **ABSTRACT**

The paper examined the effects of small-scale stone quarrying on poverty reduction among youths in Zamfara State. The paper is based on the argument that small-scale stone quarrying has the potentials to reduce poverty in low income settings. Zamfara is one of the poorest states in Nigeria where youths are engaged in small-scale quarrying. The paper examined the extent to which small-scale quarrying has been able to reduced poverty among youths in the State. The sample size of the study comprised of 400 respondents. Structured interview was used as the primary instrument of data collection. Purposive sampling techniques was used to select quarry sites while simple random sampling technique was used to select respondents for the study. Data collected was presented in tables and percentages for better understanding. The outcome of the study revealed that youths between ages of 26-35 years were actively involved in small-scale stone quarrying in Zamfara State. The study found out that small-scale stone quarrying had a positive effect on poverty reduction among youths in Zamfara State. This is because after joining small-scale stone quarrying, majority of youths had improved access to food, healthcare facilities, housing, sleeping materials, clothing

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and ownership of means of transportation. The major factors limiting youth involvement in small-scale stone quarrying were lack of modern quarrying equipment, absence of personal protective gadgets and ignorance about government regulations in the mining industry. The study therefore recommends that government should assist quarry workers with modern quarry equipment, personal protective gadgets and sensitization on government regulations in the mining industry.

*Keywords: Youths; quarry; poverty; diversification; economy.*

## 1. INTRODUCTION

The role of solid minerals particularly small-scale stone quarrying on poverty reduction, contribution to Gross Domestic Product (GDP) and economic diversification has well been documented. Labonne and Gilman [1] provide evidence which suggests that small scale stone quarrying provides employment during incidences of economic shocks. Similarly, it has been established that non-agricultural activities such as small-scale stone quarrying has the potentials of creating employment to 80% of the African population, as well as income to 30-50% of households in Sub-Saharan Africa and Asia [2].

However, inspite of the critical role that small-scale stone quarrying plays in the socio-economic development of nations, the discovery and exploration of crude oil in Nigeria has atomized other important sectors of the Nigerian economy such as solid minerals with attendant declined contribution to Gross Domestic Product from 5.62% in 1980 to 0.16% in 2007 [3,4]. As a matter of fact, with the Nigerian economy coming out of recession and the clamour to diversify the economy becoming the new mantra of President Buhari's administration, preliminary observations show that youths in Zamfara State have keyed into this new agenda. The reason is because solid minerals, especially small-scale stone quarrying is a major source of income to the poorest, the less educated, unemployed, migrants and landless populations in rural settings [1].

Furthermore, Asante, Kabila and Afriyie [5] also underscored the above view by asserting that small-scale stone quarrying plays a key role in improving the livelihood of people living in the rural settings by pulling many out of the poverty net. Moreover, Merem et al. [6] observed that if the solid mineral sector (small scale quarrying inclusive) is given the required attention, it has the prospects of accelerating socio-economic development in Nigeria through the generation of employment and improved national income

earnings at a higher rate than what is currently being earned from the petroleum industry. In addition, the United Nations Development Programme [7] also shares the view that if the solid mineral sector in Nigeria is effectively harnessed, it can become a key instrument in the diversification of the economy, and can help the country to move beyond the orbit of oil, gas and agriculture. UNDP [7] concluded optimistically that if the solid mineral sector is given the desired attention, it can serve as an engine of growth for the Nigerian economy as well as the capacity to promote inclusive development in the future.

Consequently, Zamfara is one of the states in Nigeria that is blessed with a huge amount of unexploited solid mineral resources. This fact was made known by the former Governor of the State; Alhaji Mahmuda Aliyu Shinkafi when he stated that, the state possesses 60% of the untapped total solid minerals deposits of the federation [8]. He explained further that the discovery of large deposits of solid minerals comprising of gold, copper, iron ore, tantalite, manganese among others can contribute to the development of the state and Nigeria at large [8]. This implies that small scale stone quarrying industry has the prospects of reducing poverty among the youths in Zamfara State if well harnessed. It is against this background that the study seeks to assess the effects of small-scale stone quarrying on poverty reduction among youths in Zamfara State.

### 1.1 STATEMENT OF THE RESEARCH PROBLEM

The primary objective of this study is to examine the effects of small-scale stone quarrying on poverty reduction among youths in Zamfara State. The need to undertake the study is premised on the fact that, Zamfara is one among the states in Nigeria with the highest incidence of poverty. It was reported that 71.3 per cent of the people in Zamfara State live on less than \$1.25 a day. The state is also one among the least industrialized in Nigeria (National Bureau of

Statistics [NBS], 2017) [9]. The high incidence of poverty in Zamfara State is made worse with the recent economic recession where most state governments have been struggling to pay workers' salaries as well as embark on development projects due to the sharp decline in Nigeria's oil revenue.

With the negative consequences that the Nigerian economy experienced due to the recent economic recession, it has become abundantly clear that the government and the people of Zamfara State especially the youths need to explore other areas of generating income rather than seeking for paid employment. The need for youths in Zamfara State to key into small scale quarrying is because the state has a large number of small-scale stone quarry workers. Empirical evidence also shows that small-scale stone quarrying is successful and comparatively cheaper at reducing the poverty of those close to the poverty line [1].

Despite the fact that small scale quarrying has the prospects of reducing poverty among youths, most studies on poverty reduction in Zamfara State tend to focus on the role of small and medium enterprises (SMEs) on poverty reduction. For instance, the study by Abdullahi and Zakari [9] focused on strengthening small and medium enterprises (SMEs) as a strategy for poverty reduction in north western Nigeria. In another perspective, Ediawa [10] observed that most studies on efforts at reducing poverty in rural areas especially in developing nations tend to focus more on agriculture consequently giving the wrong impression that everything rural has to do with agriculture. This has consequently made studies on the role of small-scale quarrying and poverty reduction to remain a major gap in literature particularly in Zamfara State. It is as a result of this missing gap in knowledge that this study seeks to examine the effect of small-scale stone quarrying on poverty reduction among youths in Zamfara State.

## 1.2 RESEARCH OBJECTIVES

The main aim of the study is to assess if small-scale stone quarrying has contributed to poverty reduction among youths in some selected local government areas in Zamfara State. The specific objectives of the study are to:

- i. Identify the socio-economic characteristics of youths involved in small-scale stone quarrying in Zamfara State

- ii. Assess the effects of small-scale stone quarrying on poverty reduction among youths in Zamfara State
- iii. Identify the challenges facing small-scale stone quarrying among youths in Zamfara State

## 2. LITERATURE REVIEW

The role of solid minerals as a key driver of economic growth and poverty reduction at local, national and international level cannot be emphasised. This has been alluded to by the World Bank [11] that, a vibrant solid mineral sector, just like any other sector, has the potentials to stimulate a country's growth. Hoadley and Limpithaw [12] also agreed that, all over the world, an estimate of 13 million people earn their living directly from small-scale mining and up to 100 million people depend on small scale stone quarrying for their survival.

In Nigeria, solid minerals have a critical role to play in development. This fact was emphasized by the Federal Republic of Nigeria [3] when it stated that solid mineral sector is crucial to the diversification of the economy from oil dependence. The Nigerian government elaborated further that, sources of income, employment and foreign exchange earned from the solid minerals sector could potentially exceed those from the oil and gas sector [3].

The above fact explains why the Federal government has placed more emphasis on the diversification of the economy especially the solid mineral sector because of its importance as an instrument of poverty alleviation and a generator of national income [13]. For example, the federal government had announced plans to grant the Ministry of Mines and Steel Development access to 30 billion naira under the mining sector component of the Natural Resources Development Fund [14]. Similarly, it was also stated that the ministry would be allowed to raise the sum of \$150 million from the World Bank for mining diversification [14]. The above plans may not be unconnected with the Nigerian Extractive Industries Transparency Initiative [15] report that Nigeria earned N69.74 billion from solid minerals in 2018 making it the highest earning in the industry in the past 12 years.

In Zamfara State, small scale stone quarrying is one of the major industries that has played a key role in poverty reduction and development generally. Mining activities (small scale stone

quarry) has a long history in the state dating to 1945 [16]. Over the years, the solid mineral sector in Zamfara State has grown significantly creating jobs for hundreds of people and generating revenue for the state. This is evident in the report by the National Bureau of Statistics [17] that Zamfara State produced a total of 101,809.19 tons of solid minerals in 2016. According to Salifu, Yusuf, Ahmed, Mohammed and Umar [16], mining is one of the leading industries in the state that has contributed significantly to the socio-economic development of the state.

### 3. METHODOLOGY

The study setting is in Zamfara State, Nigeria. The state is made up of fourteen (14) local government areas. The local government areas are: Anka, Bakura, Birnin-Magaji, Bukkuyum, Bungudu, Gummi, Gusau, Kaura-Namoda, Maradun, Maru, Talata-Mafara, Shinkafi, Tsafe and Zurmi. However, since small scale stone quarrying is not done in all the 14 local government areas of the state, the study utilised purposive sampling technique to select only the local government areas where small-scale quarrying activities is carried out while simple random sampling technique was used to select respondents for the study. To achieve this, a desk study report obtained from Zamfara State Ministry of Environment and Solid Minerals showed that small-scale stone quarrying activities is done in the following local governments: Anka, Bukkuyum, Bungudu, Bakura, Gusau, Maradun, Talata-Mafara and Tsafe Local Government Areas. Therefore, it is from these 8 local government areas where small-scale stone quarrying activities is done that the respondents were selected for the study.

The population of the study consisted of youths involved in small-scale stone quarrying in the selected local government areas in Zamfara State. For the purpose of clarity, the study adopts the African Youth Charter definition of youths due to its consideration of the social, cultural and religious complexities of member States. The African Youth Charter [18] defines youth or young people as persons between the ages of 15 and 35 years.

However, since the exact number of youths involved in small-scale stone quarrying in Zamfara State is unknown, the sample size of the study was determined based on proportion. Therefore, the sample size of the study consisted

of 400 youths involved in small-scale stone quarrying in some selected quarry sites in Zamfara State. Structured interview was used to elicit data from youths engaged in small scale stone quarry in Zamfara State. The reason is because majority of the population can neither read nor write. In line with this, the researchers engaged the services four research assistants who understood Hausa language to assist in data collection. Meanwhile, tables and percentages were used to analyze the data collected so as to establish the effect of small-scale stone quarrying on poverty reduction among youths in Zamfara State.

#### 3.1 DATA PRESENTATION AND ANALYSIS

This section presents and analysis the data obtained from the field with the aim of determining the effects of small scale stone quarrying on poverty reduction among youths in Zamfara State. The presentation is done in the following order: Socio-demographic characteristic of the respondents, effects of small scale quarrying on poverty reduction and factors limiting small scale stone quarrying activities in Zamfara State.

The data in Table 1 indicated that all the respondents represented by 100% (371) were males. This is not surprising because Zamfara is one among the states in Northern Nigeria where sharia is practiced and women are not allowed to engage in most outdoor activities hence the dominance of males in small scale stone quarrying. On the marital status, majority of the respondents represented by 60.9% (226) were married, 38.0% (141) were single while 1.1% (4) were widowed. It can be deduced from the data that majority of the youths involved in small-scale quarrying in Zamfara state were married and may have dependents to cater for hence their involvement in small- scale stone quarrying. On age distribution, 67.4% (250) were between the age bracket of 26-35 years while those between 18-25 years with 32.6% (121). From the data presented, the number of youths between 26 to 35 years were actively engaged into small scale quarrying more than other age categories in Zamfara State. This is because breaking of quarry requires strength and energy and the youths possess both qualities. The educational characteristics of the respondents showed that many of the respondents represented by 59.6% (221) had no formal education, 25.3% (94) had primary education, 12.9% (48) had secondary

education while 2.2% (9) had tertiary education. The dominance of respondents without any formal education and primary school education is because small scale stone quarrying does not require skilled labour force.

**Table 1. Socio-demographic characteristics of respondents**

Variable	Frequency (f)	Percent (%)
<b>Sex</b>		
Male	371	100.0
Female	0	0.00
Total	371	100.0
<b>Marital Status</b>		
Married	226	60.9
Single	141	38.0
Widowed	4	1.1
Total	371	100.0
<b>Age</b>		
15-25	121	32.6
26-35	250	67.4
Total	371	100.0
<b>Education</b>		
No formal Education	221	59.6
Primary	94	25.3
Secondary	48	12.9
Tertiary	8	2.2
Total	371	100.0
<b>Annual Income</b>		
Below N50,000	185	49.9
N51,000-N100,000	15	4.0
N101,000-N150,000	104	28.0
N151,000-N200,000	37	10.0
N201,000 and Above	30	8.1
Total	371	100.0
<b>Religion</b>		
Islam	371	100.0
Christianity	0	0.00
Others	0	0.00
Total	371	100.0

Source: Field Survey, 2019

On the annual income of respondents, many of the respondents represented by 49.9% (185) earned below N50,000, 28.0% (104) made between N101,000-N150,000, 10.0% (37) got between N151,000-N200,000, 8.1%(30) received N201,000 and above while 4.0% (15) earned between N51,000-N100,000. In terms of religious affiliation, all the respondents that is 100% (371) practiced Islamic religion and the reason is because Zamfara State is a Muslim dominated State.

### 3.2 The Effects of Small-Scale Stone Quarrying on Poverty Reduction among Youths in Zamfara State

This section examined the effects of small scale stone quarrying on poverty reduction among youths in Zamfara State.

Table 2 showed the distribution of the respondents based on access to food measured in terms of the number of meals taken per day. From the data elicited, respondents who feed once in a day prior to joining small scale stone quarrying were 39.1% (145), those who ate twice in a day were 25.1% (93) while the number of respondents who ate three times in a day were 35.8% (133). However, after joining small scale stone quarrying, the number of respondents who ate once in a day were 1.2% (4), those who ate twice a day were 27.5% (102) while those who ate three square meals a day were 71.4% (265). It was evident from the data presented that the combined total of those who used to feed once and twice a day before joining small scale stone quarrying were 238 accounting for 64.2% of the total sample size. This means that majority of sampled population were not able to eat three square meals a day before joining small scale stone quarrying. However, after joining small scale stone quarrying, the number of respondents who ate thrice a day accounted for 71.4% (265) of the sampled population. This showed that joining small scale stone quarrying significantly increased youths access to feeding in Zamfara State.

On access to health care facilities, prior to joining stone quarry, the number of respondents who used traditional medicine were 52.0% (193), those who patronized patent medicine stores were 37.7% (140) while those who utilized clinics/hospitals were to 10.2% (38). Those who visited traditional medicine after joining stone quarrying were 4.9% (18), the number of respondents who patronized chemist were 35.0% (130) while the number of respondents who attended hospitals were 60.1% (223). It can be inferred from the above data that the number respondents who had access to clinic/hospital improved significantly from 10.3% to 60.1% after joining stone quarrying. This means that prior to joining stone quarrying, many of the respondents may not have been earning any income and consequently did not have the money to patronize clinic/hospital. However, joining stone quarry conferred income on many of the youths

hence the significant increase in the number of respondents that patronized clinics/hospitals.

The data in Table 4 indicated that small scale quarry significantly impacted on the housing quality of respondents. From the data collected, the number of youths living in mud houses with thatch roof reduced significantly from 38.8% (144) to 16.4% (61) after joining quarry work. Similarly, after joining stone quarrying, the number of youths who lived in cemented walls/floor with zinc roof increased from 45.8 (170) to 54.2% (201). Also, after joining stone

quarry, the number of respondents who were sleeping in houses made of mud walls and zinc increased from 15.4% (57) to 29.4% (109) after joining quarry business.

The data in Table 5 showed that the number of respondents that were sleeping on the floor before joining the quarry business were 2.9% (11). However, after joining quarrying, the number decreased to 0.3% (1). Those who were sleeping on bamboo bed before joining stone quarry were 5.7% (21) but after joining stone quarry the number of bamboo used decreased to

**Table 2. Distribution of respondents based on their access to food**

Access to food (No. of meals per day)	Before joining stone quarrying		After joining stone quarrying	
	Frequency(f)	Percentage(%)	Frequency(f)	Percentage(%)
Once	145	39.1	4	1.2
Twice	93	25.1	102	27.5
Thrice	133	35.8	265	71.4
<b>Total</b>	<b>371</b>	<b>100</b>	<b>371</b>	<b>100</b>

Source: Field Survey, 2019

**Table 3. Distribution of respondents by access to health care**

Access to health care	Before joining quarry		After joining quarry	
	Frequency (f)	Percentage (%)	Frequency (f)	Percentage (%)
Traditional Medicine	193	52.0	18	4.9
Patent Medicine Store	140	37.7	130	35.0
Clinic/Hospital	38	10.3	223	60.1
<b>Total</b>	<b>371</b>	<b>100</b>	<b>371</b>	<b>100</b>

Source: Field Survey, 2019

**Table 4. Distribution of respondents based on access to housing**

House Type	Before joining quarry		After joining quarry	
	Frequency (f)	Percentage (%)	Frequency (f)	Percentage (%)
Mud walls with thatched-roof house	144	38.8	61	16.4
Cemented walls/floor with zinc roof	170	45.8	201	54.2
Mud walls and zinc roof	57	15.4	109	29.4
<b>Total</b>	<b>371</b>	<b>100</b>	<b>371</b>	<b>100</b>

Source: Field survey, 2019

**Table 5. Distribution of respondents by access to sleeping materials**

Type of sleeping material	Before joining quarry		After joining quarry	
	Frequency (f)	Percentage (%)	Frequency (f)	Percentage (%)
Floor	11	2.9	1	0.3
Bamboo Bed	21	5.7	5	1.3
Mat	231	62.3	111	29.9
Bed and/or Mattress	108	29.1	254	68.5
<b>Total</b>	<b>371</b>	<b>100</b>	<b>371</b>	<b>100</b>

Source: Field Survey, 2019

1.3% (5). Those who used to sleep on the mat before joining quarry business were 62.3% (231). However, the number that were sleeping on the mat decreased to 29.9% (111) after joining quarry work. Lastly, the number of respondents who were sleeping on mattresses increased significantly from 29.1% (108) to 68.5% (254) after joining small scale stone quarry.

The data in Table 6 showed that the number of respondents who bought clothes once in year decreased from 36.1% (134) to 3.0% (11). The number of respondents that bought clothes who bought clothes twice a year increased from 39.1% (145 T) to 59.0% (219) while those who bought clothes thrice in a year increased from 24.8% (92) to 38.0% (141). This means that joining stone quarry opened doors for respondents to earn income to buy clothes for themselves.

The data in Table 7 compared the assets holding of respondents before and after joining quarry business. From the data elicited, the number of respondents who had no means of transportation reduced from 34.8% (129) to 16.2% (60) after

joining stone quarrying. Those who owned bicycles decreased from 35.6% (132) to 26.4% (98) after joining the quarry business. Those who owned motorcycles and cars increased from 29.9% (110) to 56.3% (209) and 0.0% (0) to 1.1% (4) after joining the quarry business. The above data clearly showed that the number of respondents who had no means of transportation decreased from 34.8% to 16.2%. Accordingly, respondents also witnessed an improvement in the ownership of means of transportation. For example, the number of respondents who bought motorcycles and cars increased from 29.6% to 56.3% and 0.0% to 1.1 respectively after joining stone quarrying. The increase in the ownership of means of transportation was made possible by increases in income after joining stone quarry.

The data in Table 8 showed that majority of the respondents representing by 45.3% (168) identified lack of modern quarrying equipment, 30.5% (113) complained of lack of personal protective gadgets, 21.0% (78) were not aware of government regulations regarding the mining industry while 3.2% (12) identified the unavailability of market.

**Table 6. Distribution of Respondents Based on Access to Clothing in a Year**

No. of times a pair of cloth is bought per year	Before joining quarry		After joining quarry	
	Frequency (f)	Percentage (%)	Frequency (f)	Percentage (%)
Once	134	36.1	11	3.0
Twice	145	39.1	219	59.0
More than Twice	92	24.8	141	38.0
<b>Total</b>	<b>371</b>	<b>100</b>	<b>371</b>	<b>100</b>

Source: Field Survey, 2019

**Table 7. Distribution of respondents by their ownership of means of transportation**

Means of transport	Before joining quarry		After joining quarry	
	Frequency	Percentage (%)	Frequency	Percentage (%)
None	129	34.8	60	16.2
Bicycle	132	35.6	98	26.4
Motorcycle	110	29.6	209	56.3
Car	0	0.0	4	1.1
<b>Total</b>	<b>371</b>	<b>100</b>	<b>371</b>	<b>100</b>

Source: Field Survey, 2019

**Table 8. Factors limiting small-scale stone quarrying among Youths in Zamfara State**

Variable	Frequency (f)	Percent (%)
Lack of modern quarrying equipment	168	45.3
Inadequate personal protective equipment for workers	113	30.5
Government regulations	78	21.0
Poor market	12	3.2
<b>Total</b>	<b>371</b>	<b>100.0</b>

Source: Field Survey, 2019

**Table 9. Ways to improve small scale quarrying among youths in Zamfara State**

Variable	Frequency (f)	Percent (%)
Provision of modern quarry equipment	203	54.7
Available market	11	3.0
Provision of personal protective equipment	82	22.1
Sensitization on government regulations about the mining industry	70	18.9
Others	5	1.3
Total	371	100.0

Source: Field Survey, 2019

On what can be done improve small-scale stone quarrying among youths, majority of the respondents representing 54.7% (203) said they would have loved to work with modern quarrying equipment, 22.1% (82) made case for the provision of personal protective gadgets to work with, 18.9% (70) were of the view that government needs to sensitize/educate their members about mining regulations while 1.3% (5) suggested other hindrances.

#### 4. DISCUSSION OF FINDINGS

Based on data collected, the findings of the study are as follows:

First, it was discovered by the study that youths are actively involved in small scale stone quarrying in Zamfara State. This is because, majority of the respondents representing 63.1% (213) who are engaged in small scale stone quarry were between the age brackets of 26-35 years. This was not surprising because stone quarry is an activity that requires enormous energy and strength and the youths possess both qualities which makes them more suitable for the job.

Secondly, the study observed that small scale stone quarrying has the capacity to reduce poverty among youths in Zamfara State. The major areas small scale stone quarrying was able to reduce poverty among youths in Zamfara State are:

- (a) Access to Food: It was observed that majority of the respondents could not afford three square meals a day prior to joining stone quarrying. That is not surprising because a study conducted by Wolfson, Ramsing, Richardson, & Palmer [19] admitted that low income was a major barrier to access to food. However, after joining stone quarrying, many of the respondents could afford three square meals in a day. This implies that as the

income of people improves, they get more access to food. Therefore, more youth should be encouraged to be engaged in stone quarrying so as to enable them to earn some income and improved their access to food.

- (b) Access to Health Care: On access to healthcare, the study found out that prior to joining stone quarrying, many of the respondents could not patronize clinics/hospitals. According to Aregbeshola [20], poor people makes up 70% of the Nigerian population and they do not have access to health care because they cannot afford it. However, data obtained from the field indicated that joining stone quarry conferred income on many of the youths hence the significant increase in the number of respondents that patronized clinics/hospitals.
- (c) Access to Housing: Findings from the study indicated that prior to joining stone quarry, the number of respondents who were sleeping in houses made of mud walls and zinc increased from 15.4% (57) to 29.4% (109) after joining quarry business. Similarly, after joining stone quarrying, the number of youths who lived in cemented walls/floor with zinc roof increased from 45.8 (170) to 54.2% (201). This is a clear indication that stone quarrying helped the youths to earn some income which greatly led to an improvement in the type of houses they were living in.
- (d) Sleeping Materials: The study observed that as result of youth involvement in stone quarrying, the number that used to sleep on the floor decreased significantly after joining stone quarrying. Additionally, the number of respondents who were sleeping on the mattresses increased significantly from 29.1% (108) to 68.5% (254) after joining the quarry business. This means that, because of poverty, many of the



respondents could not afford descent sleeping materials prior to joining stone quarrying. Conversely, after joining stone quarrying, many of the respondents started earning some income and this accounts for the substantial increase in the number of respondents who were sleeping of mattresses after joining the quarry work.

- (e) Access to Clothing: The data in Table 6 showed that the number of respondents who bought clothes once in year decreased from 36.1% (134) to 3.0% (11). This shows a significant decrease in the number of respondents who bought clothes once in a year. The number of respondents that bought clothes thrice a day increased from 24.8% (92) to 38.0% (141) in a year while those who bought clothes twice a year increased from 39.1% (145) to 59.0% (219). This means that joining stone quarry opened doors for respondents to have something doing to earn an income to buy clothes for themselves.
- (f) Access to Means of Transportation: Findings on respondents' access to the means of transportation indicated that majority of the respondents had no means of transportation before joining small scale stone quarrying. However, on joining stone quarry, respondents' access to the means of transportation improved significantly. For instance, the number of respondents who owned motorcycles and cars increased after joining stone quarry. The increase in the ownership of means of transportation was made possible by increases in income after joining stone quarry.

Thirdly, the study identified lack of access to modern quarry equipment, lack of protective gadgets for quarry workers and government regulations as the major factors limiting quarry activities among youths in Zamfara State.

## 5. CONCLUSION

In conclusion, it is evident that small-scale stone quarry has the capacity to pull a good number of youths out of poverty in Zamfara State and also generate sizeable amount of revenue for the Nigeria government if adequate attention is given to the sector.

## 6. RECOMMENDATIONS

Based on the findings of the study, the research makes the following recommendations:

1. It is evident from findings of the study that small scale stone quarrying has enormous capacity to positively contribute to poverty reduction among youths in Zamfara State. This is because, majority of the respondents engaged in stone quarry were within the age bracket of 26-35 years. Therefore, since solid mineral development is in the exclusive list, the Federal Government of Nigeria should make deliberate efforts to encourage youths to engage in stone quarrying.
2. It is clear from the findings of the study that the major obstacle to youth involvement in stone quarrying in Nigeria is lack of modern quarrying equipment. This is because, breaking of stones in modern times requires the use of modern machines/equipment and most quarry workers in Nigeria cannot afford those machines. Therefore, the Federal government of Nigeria should provide financial incentives to quarry operators to enable them buy modern quarry equipment to ease their jobs.
3. Working on quarry is very risky. Therefore, workers need to protect themselves. Consequently, government should provide protective gadgets for quarry workers at subsidized rate to enable quarry worker to protect themselves.
4. Many of the respondents believed that the mineral resources in their domain is God given and can be exploited without any regulation. This calls for the immediate attention of Government to organize workshops and town hall meeting to sensitize and educate of members of the public concerning government regulations in the mining industry.

## CONSENT

As per international standard or university standard, respondents' written consent has been collected and preserved by the author(s).

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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