

Socio-Economic Impact of Granite Stone Quarry Engagement on Workers' Livelihood in Ondo and Edo States, Nigeria

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Abstract: Mining operations produce unequal socio-economic effects on its workers. This study focused on the socio-economic impact of granite stone engagement on workers' livelihood in Nigeria; its objectives include examining the socio-economic benefits and demerits of granite stone quarry engagement on workers' livelihood, and evaluating mitigation measure used to curb negative impacts. One hundred structured questionnaires were administered to individual granite stone quarry worker, data from 92 questionnaires retrieved were analyzed. The study revealed that improved standard of living is a regular benefit obtained by workers from engagement, while quarry workers seldom have access to loan facilities, medical facilities, and provision of basic infrastructure. Interest (37.1%) was the major motivation to work by the respondents, as quarry jobs are considered reliable and secure (95.6%). A proportion of 60.8% of the respondents earn N60,000 or less per month accounting for 80.4% of the respondents whose household income come from the granite stone engagement. A significant socio-economic impact of quarry was seen in improvement in social status; 13.1% and 50.0% of the respondents were about an average status before and after picking up quarry job respectively. Most severe negative socio-economic impact was conflict with residents of nearby communities (60.8%), which is largely being curbed by reviewing quarry operational methods. In conclusion, granite stone quarries provide significant socio-economic benefits, especially in improving workers' social class, communal issues, which seldom arise, were been curbed through reviewing of operational methods by granite stone quarries.

Keywords: Livelihood, granite stone, quarry jobs, Nigeria

1. INTRODUCTION

Quarrying activities has led to development of infrastructure, created employment opportunities, growth of towns and has contributed to the establishment of various industries. This is unconnected to the fact that it is an age-long occupation that has transcended centuries. Quarry has also aided in generating wealth for those involved. This implies that people are majorly involved in quarrying because of the economic benefit(s) attached to it and the gains the quarry workers stand to derive from it is the driving force why many are in the business of quarrying. There are two situations that generally result from mineral extraction: first is social and industrial development and the second is short term economic benefits such as reaching production goals and employment.

Economic benefits of quarry operations on workers are numerous. Scholars in different parts of the world have tried to carry out researches in order to identify how quarry activity has impacted the environment (e.g Ajakaiye 1985; Adekoya, 2003; Kibet, 2004). It is believed that quarry workers are undercompensated considering the input of labour they put into the job. Akanimo (2015) posited that economic impacts of quarry operations on workers are synonymous with negative effects and also positive benefits. According to Afeni *et al.* (2015), it could include pressure on local housing, market and increase in community conflict and crime. However, the creation of supporting social infrastructure including schools, hospitals and so on may transform a previously remote area and investment in transport facilities may improve accessibility to other centers of economic activities, further enhancing its prospect for development. Indeed, governments frequently regard quarry operations as an opportunity to 'open-up' peripheral regions. A livelihood comprises of capabilities, assets and activities required for living. It is considered sustainable when it can cope with and recover from stress and shocks, maintain or enhance its capabilities and assets, and provide sustainable livelihood opportunities for the next generation; and contributes net benefits to other livelihoods at the local and global levels and in the short and long duration (Chambers and Conway, 1992). This approach is relevant to stone quarrying in understanding how individuals meet their needs using minimal financial input, simple technology and indigenous resources amidst a competitive formal market and restrictive government policy. Stone

workers use the different assets (human, capital, financial, physical, natural and social capital) they have in order to achieve the different livelihood outcomes. In an effort to ensure sustainable development, laws and policies are often in place to limit over exploitation of these resources (Helmore and Singh, 2001). Quarrying activities generate employment and contribute to a country’s gross national product, both through production for the local market and for export trade (National Council of Bhutan, 2013). Lahiri-Dutt (2000) also added that stone quarrying generates considerable employment opportunities as it is a relatively labour intensive, under-mechanized industry. Even if the availability of accurate data on the sector’s contribution to overall employment is difficult, for example in India around 2 million people were employed in the sand stone mining. However, population growth and its concomitant high demand for natural resources have put severe stress on the available resources with dire consequences on their sustainability. Overexploitation of the natural environment has depleted most resources and rendered most productive land beyond repairs (Independent Evaluation Group [IEG] (2012), World Bank, 2008). This development is likely to compound the health and unemployment problems of the poor majority seeking alternative means of livelihoods in rural areas.

Impacts of quarry operations are not felt equally by affected parties and areas. Although a particular project may be assessed as bringing a general benefit. Some groups and/or geographical areas may be receiving most of any adverse effects, the main benefits going to others elsewhere.

Hence, this research seeks to investigate the socio-economic impact of granite stone quarry engagement on workers’ livelihood in selected quarries in in Ondo and Ekiti States, Nigeria. The specific objectives of this study are to examine the socio-economic benefits and demerits of granite stone quarry engagement on workers’ livelihood, and evaluate the current mitigation measure used to curb the negative impacts.

2. METHODOLOGY

The study was carried out in Ondo and Edo states of Nigeria. Data were collected from quarry workers in 2017, using a well – structured questionnaire on socio-economic variables of age, gender, religion, educational background, household size, years of experience in mining jobs, current employment status, job description, socio-economic impacts (positive and negative) of quarry engagement. Selection of five quarries each from the total currently function granite stone quarries in the two states occurred first by random sampling. Ten quarry workers were selected from each of quarry. One hundred individual workers of the selected quarries were chosen randomly in this second stage; and these were administered with questionnaires. A total of 92 questionnaires were later considered fit for this study based on the accuracy of responses of the respondents to the various items of questions.

Descriptive statistics and Chi – square were used in presenting the summary of the findings from this study.

3. RESULTS

3.1 Socio-Economic Impact of Quarry Engagement on Workers

3.1.1 Socio-Economic Benefits

Table 1: Frequency of workers’ socio-economic benefits

Socio-economic benefits	How frequent? Freq. (%)			Weighted mean	Remark
	Regularly 3	Seldom 2	Never 1		
Access to loan facilities by company	18 (19.6)	22 (23.9)	52 (56.5)	1.63	Seldom
Sponsorship of children’s education	14 (15.2)	8 (8.7)	70 (74.0)	1.39	Never
Access to Medical Facilities	46 (50.0)	12 (13.0)	34 (37.0)	2.13	Seldom
Provision of basic infrastructure	20 (21.7)	22 (23.9)	50 (54.3)	1.67	Seldom
Housing	14 (15.2)	16(17.4)	62 (67.3)	1.48	Never
Improved standard of living	62 (67.4)	20 (21.7)	10 (10.9)	2.57	Regularly
Others (Please, specify) _____	6 (6.5)	0 (0.0)	86 (93.5)	1.13	Never

Source: Authors’ field study, 2017

Table 1 presents the frequency of quarry workers’ socio-economic benefits obtained from engagement in granite stone quarry operations. Quarry jobs in the study area largely does not provide the benefit of children education sponsorship (1.39) and housing (1.48). Granite stone quarry workers seldom enjoy the benefit of the provision of basic infrastructure (1.67), access to medical facilities (2.13) and access to loan facilities by the quarry (1.63). Quarry workers interviewed for this study largely agrees that engagement in quarry works led to improvement in their standard of living (2.57).

Table 2: Quarry workers' perception on quarry job

Quarry workers' perception	Freq.	%	Other statistics
Motivation to work in quarry*			
Interest	46	37.1	
Unemployment	24	19.4	
Skill acquisition	36	29.0	
Good remuneration	18	14.5	
Quarry jobs are reliable and secure			
Yes	86	95.6	
No	4	4.4	
Number of family members working in quarry			Mean = 2.3 persons
Monthly earning from quarry job (Naira)			
< 20,000	25	27.3	71.8%
20,001 – 40,000	27	29.3	
40,000 – 60,000	14	15.2	
> 60,000	26	28.3	
Proportion of household income from quarry job			
< 26%	22	23.9	80.4%
26 – 50%	30	32.6	
51 – 75%	22	23.9	
> 75%	18	19.6	
Welfare packages from quarry engagement*			
Loan facilities	26	28.3	
Free medicals	26	28.3	
Housing	28	30.5	
Subsidized food items	18	20.5	
Subsidized building materials	22	23.7	

Source: Authors' field study, 2017 * Multiple selection

A cross sectional interview of the perception of the respondents indicated that interest (37.1%) and the need for skill acquisition (29.0%) were the leading motivations of the quarry workers to quarry jobs. When workers are self - motivated by interest and the need for skill acquisition, they often stay longer in workplace. This can translate to improved granite stone productivity, especially as they largely (95.6%) have a sense of job satisfaction and security in their quarry engagement. An average of 2 persons from each workers' household participate in the quarry works. A proportion of 71.8% of the respondents earn 60,000 naira or less per month, this accounts for 80.4% of the respondents whose household income come from the granite stone engagement. It is expected that quarry workers will have another source of income to augment the low salaries and wages obtained from the quarry engagement to be able to keep up with household and social obligations. Welfare package from quarry engagement include loan facilities (28.3%), free medicals (28.3%), housing (30.5%), subsidized food items (20.5%) and access to subsidized building materials (23.7%).

Table 3: Impact of quarry job/engagement on household social status

		Period of quarry work		χ^2 -value	P-value
		Before joining Freq. (%)	After joining Freq. (%)		
Household social status	Better off than most	38 (41.3)	38 (41.3)	43.051	0.000
	About average	12 (13.1)	46 (50.0)		
	Poorer than average	42 (45.7)	8 (8.7)		

Source: Authors' field study, 2017

Table 3 presents the perception of quarry workers interviewed for this study on the impact of engagement in quarry on social status. A proportion of 45.7% of the respondents identified that they were poorer than average before joining quarry work while 8.7% attest that they were poorer than average after joining quarry work. A proportion of 13.1% identified that they were about average in social status before joining quarry while 50.0% were about average after joining quarry engagement. With same proportion of 41.3% of quarry workers in 'better off than most' social class before and after joining quarry jobs, it can be inferred that most quarry workers had an improved social status due to their quarry engagement. A significant ($p < 0.05$) association was observed between the period of quarry work (before or after joining) and household social status.

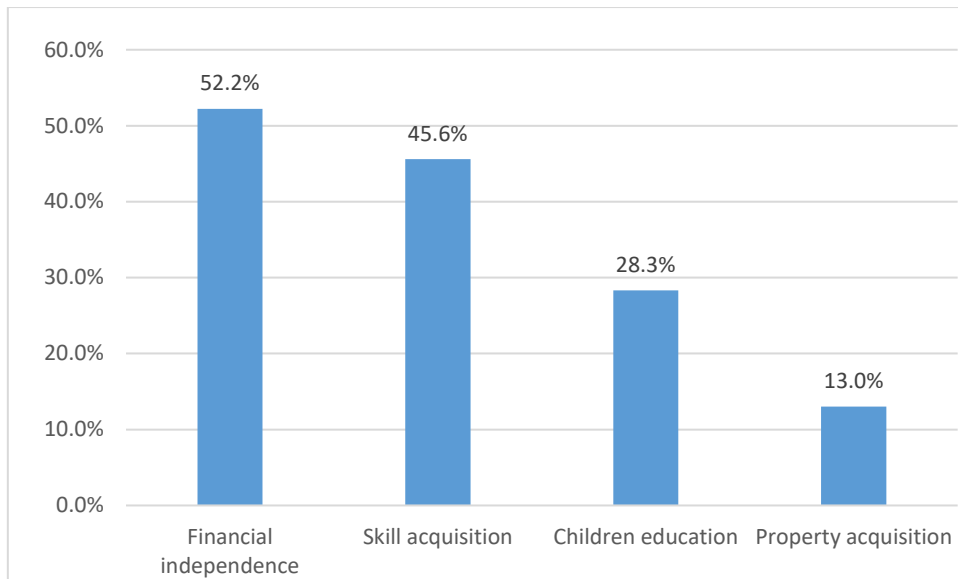


Figure 1: Area of Status improvement from Quarry Engagement

Figure 1 indicates the specific area of social status improvement as a result of quarry engagement. Multiple responses from the respondents shows that financial independence (52.2%) was the lead area of social status improvement; this was followed by skill acquisition (45.6%), affordability of children education (28.3%) and property acquisition (13.0%).

3.1.2 Engagement of other Family Members in Quarry Jobs

Apart from the fact that the respondents were engaged in quarry jobs, the study sought to know if any of their family members were into quarrying. The result in Figure 2 reveals that 22% of the respondents had other family members who also engaged in quarrying while the majority however indicated otherwise.

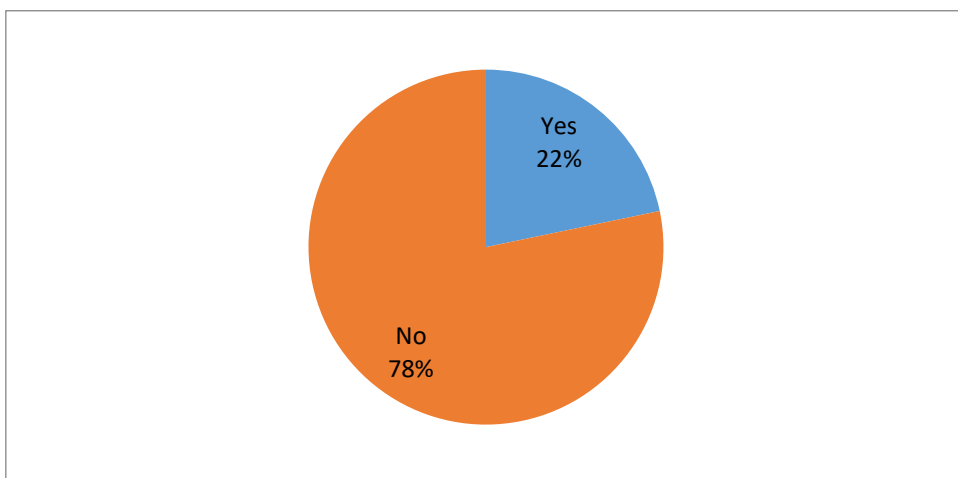


Figure 2: Distribution of respondents on the basis of other family members' engagement in quarry

3.1.3 Socio-Economic Demerit

Table 4: Socio-economic impact of granite stone quarry jobs

Negative impacts	How severe? Freq. (%)		
	Measures of impact		
	No effect	Not severe / Mild	Severe
Conflicts on royalty	52 (56.5)	28 (30.4)	12 (13.0)
Accidents by trucks on community roads	56 (60.9)	18 (19.6)	18 (19.5)
Increased robbery	60 (65.2)	18 (19.6)	14 (15.2)
Drug use	38 (41.3)	32 (34.8)	22 (23.9)
Alcoholism	42 (45.7)	18 (19.6)	32 (34.8)
Conflicts with community residents	36 (39.1)	20 (21.7)	36 (39.1)
Land use conflicts	66 (71.7)	12 (13.0)	14 (15.2)
Prostitution	46 (50.0)	20 (21.7)	26 (28.3)
Reduction in agricultural activities	42 (45.7)	18 (19.6)	32 (34.8)

Source: Authors' field study, 2017

Negative socio-economic impacts of quarry engagement are presented in Table 4. Conflict with residents of nearby communities (60.8%) lead in the negative socio-economic impact of granite stone engagement on workers. Other negative impacts include drug use (58.7%), alcoholism (54.4%) and reduction in agricultural activities (54.4%). Firms performance and productivity is determined by social harmony and order existing in the communities of location. These negative socio-economic impacts can influence negatively workers output and quarry firms' productivity.

3.2 Current Measures at Mitigating Socio-Economic Demerits

Table 5: Various measures used in reducing negative impact of quarry job

	Adequacy of Solutions. Freq. (%)	
	Adequate and yielding result	Inadequate and not yielding result
Regular meeting of mine management with community heads	56 (60.9)	36 (39.2)
Compensation of affected communities	64 (69.5)	28 (30.5)
Reviewing operational methods	70 (76.0)	22 (23.9)
Providing alternative source of drinking water	66 (71.7)	26 (28.3)
Offices/officials between management and community leader.	56 (60.9)	36 (39.2)
Creation of risk assessment team to check operation and exposure to potential risk	52 (56.5)	40 (43.5)
Resettlement of communities	50 (54.3)	42 (45.7)
Enforcing quarry sites to damage fee/fine/compensation.	42 (45.7)	50 (54.3)
Enforcing that quarry operation follow safety guidelines through regular visit of site.	66 (71.7)	26 (28.3)

Source: Authors' field study, 2017

The mitigation strategies for the negative socio-economic impacts of granite stone engagement are shown in Table 5. These are regular meeting of mine management with community heads (60.9%), compensation of affected communities (69.5%), reviewing operational methods (76.0%), providing alternative source of drinking water (71.7%), offices/officials between management and community leader (60.9%), creation of risk assessment team to check operation and exposure to potential risk (56.5%), resettlement of communities (54.6%), and enforcing that quarry operation follow safety guidelines through regular visit of site (71.7%). When negative socio-economic consequences of quarry jobs are adequately attended to, personal productivity of quarry workers should improve.

This study reveals that granite stone quarry workers in the study area who are largely permanent staff indigenes with mean of 6 years quarry job experience largely earn N60,000 per month which is inadequate. Other secondary occupation that they engage in includes civil service, commercial vehicle driving, farming and trading.

4. CONCLUSION AND RECOMMENDATIONS

In conclusion, granite stone quarries provide a number of significant socio-economic benefits to granite stone quarries workers; these include access to loan facilities, sponsorship of children's education, access to medical facilities, provision of basic infrastructure and housing. Negative socio-economic impacts of quarry engagement include; conflict with residents of nearby communities, prevalent drug use, alcoholism and reduction in agricultural activities. To reduce these negative impacts; quarries in the study area review operational methods and provide alternative source of water to the host or nearby communities.

The following recommendations were thereby made from the findings from this study;

1. Current mitigation strategy of reviewing operational methods by quarries should be strengthened. Quarry operations should be carefully scrutinized to identify those that create negative impact of workers
2. Technical training programs should be organized by quarry management on how workers can adequately adjust to negative socio-economic impacts of quarry operations on them.
3. Compensation should be given to the workers who are vulnerable to the direct impacts of quarrying operations, especially workers who have spent long years in quarry service.

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