



SUSTAINABILITY OF SANDCRETE BLOCKS AS A RESOURCE FOR DEVELOPMENT IN THE CONSTRUCTION INDUSTRY IN NIGERIA.

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ABSTRACT

Sandcrete blocks as a structure part have been used in Nigeria and numerous different countries for quite a while, the construction industry is vital in the sustainability of the demand and supply of the required numbers of sandcrete blocks. These blocks are produced using a combination of sand, concrete, and water in a specific mix ratio. This investigation is pointed toward researching Sandcrete block creation assets for economical improvement in the sustainability and advancement of the construction industry in Nigeria. The goals of this study are to investigate the number of the Sandcrete blocks produced in every long stretch of the

Introduction

Sandcrete block moulding ordinarily should be a thriving building construction material production business in most cities and urban cities in Nigeria, striving to meeting its demand as a cladding material in housing delivery schemes Mac-Barango (2011). Oseghale et. al (2015) stated that building construction provides humanity with a great variety of accommodation in form of residence, offices, schools, hospital, industries, commercial and religion activities. For the buildings to function effectively, it must be of the required materials that are capable of withstanding the load imposed upon it and also to satisfy the test of time. The world's population continues to grow creating the need for more houses, buildings, public infrastructures, energy consumption, waste production, and increase in water consumption. If resources are misused, the ability of future generations to adequately meet their needs will be significantly reduced (Adetunji, 2005). The construction sector is very important in the sustainability debate as it sits right at the interface between being a vehicle (means) for improving quality of life of the world's rapidly growing population, and the actor (agent) that mitigates the environmental, economic and social consequences of development endeavours (Du Plesis 2001, [Pearce et al., 2012](#)). Demaid and Quintas ([2006](#)) remarked that in most parts of the world, majority of construction projects were still carried out in accordance with traditional methods and norms, where short-term solutions are favoured over long-term ones, with material, technical solutions and managerial approaches that can seldom be classed as innovative green technology and practice. In most parts of the world, the sector has responded in numerous different ways, all aimed at 'meeting developmental needs of today, while considering the effect on



year and lay out the proportion of Sandcrete blocks delivered by individual makers against the complete volume for the year. Unstructured surveys were administered to address the exploration questions. A sum of 20 block fabricating industries randomly chosen across four Locality in Kaduna city was utilized. The outcome of the discoveries was investigated utilizing descriptive statistics. The outcome from this study shows that only seven of the twenty producers utilized for the review was able to meet the month-to-month average demand, this shows that the number of produced Sandcrete blocks doesn't meet the need. All in all, this study shows a need to increase the production of Sandcrete blocks. The research suggests that the needed infrastructure such as Water, Light, and Power required for the creation of Sandcrete blocks ought to be accessible and available.

Keywords: Production, Sandcrete blocks, demand, supply, Sustainability

future generations' (World Commission on Environment and Development., 1987). However, developing countries are often faced with challenges and priorities that are different from those of more advanced countries and have not been able to match the strides that have been made towards sustainable construction globally. Sustainable construction is one of the most important challenges faced by the construction industry today (Adetunji, 2005). Adebayo, (2002) opined that sustainable construction has not received sufficient attention in Africa even though it is an important aspect of sustainable development (Ahn, Kwon, Pearce and Wells 2008). This research is aimed at investigating sandcrete block production resource for sustainable development in the Construction Industry in Nigeria. This is achieved through the following objectives determining the value of sandcrete block produced in each month of the year and establishing the ratio of sandcrete block produced by individual manufacturer against the total volume for the year.

Literature review

Mac-Barango (2011) carried out a research on the capacity building for block moulding industry: some desirable inputs for sustainable development and findings however reveals that block moulding firms produced below optimal levels, innovations and strategic market positioning are low resultant of financial inadequacies. He concluded that production is highly influenced by the level of sales; increases in sales induce a corresponding increase in production level.

Ikechukwu Onyegiri (2017) conducted a research on bridging the gap between low cost housing demand, supply and affordability in Nigeria through the use of indigenous building materials, in his investigation he reviewed the past and current housing delivery programmes in Nigeria and analyses the demand and supply side issues and concludes by recommending indigenous building materials as an affordable strategy for supply of low cost housing in Nigeria.

In a bid to ascertain the strength characteristic of hollow sandcrete blocks, Akanbi et al (2022) investigated the characteristic of hollow sandcrete blocks produced in kaduna south local government area and the findings of the research showed that the materials, mix ratio, and general strength of the blocks produced in kaduna south local government are does not meet the minimum requirements as specified by the Nigeria industrial standard (NIS).



Methodology

The research was conducted in Twenty- nine block manufacturing industries along Nnamdi Azikiwe express way in Kaduna was be considered. Which cuts across four local Government councils: Kaduna North, Kaduna South, Igabi and Chukun Local Government areas for the study. Descriptive Survey design survey was adopted with semi-structured questionnaire. questionnaire was administered personally to all the respondents through interview method. Five block industries were selected randomly from each of the Local Governments making a total of 20 block industries.

Results and Discussion

Kaduna south local government sandcrete blocks producers

The data collected was analysed using descriptive statistics. The ratio of each month's production to the total production and the ratio of each manufacturer to total production and ranking was obtained. The results for Kaduna south sandcrete producers are shown in table 1 and figure 1.

Table 1: Total Monthly Production and Total for each Manufacturer in Kaduna South, Local Government areas

Industry	1	2	3	4	5	Total Monthly Production	Ratio of each manufacturer to total production	Ranking
Mar, '11	10000	4500	5000	7000	9000	35500	7.23	6
Apr '11	9500	5000	4500	8500	9000	36500	7.44	5
May '11	95000	5500	3000	8000	7600	119100	24.26	1
Jun '11	15000	5000	4000	9000	9500	42500	8.66	2
Jul '11	12000	7500	6000	8000	6500	40000	8.15	3
Aug '11	8500	8000	7500	7500	6000	37500	7.64	4
Sep '11	11000	6500	3000	7000	5800	33300	6.78	7
Oct '11	10000	3300	4500	6000	7500	31300	6.38	9
Nov '11	9000	7000	4000	6700	5000	31700	6.46	8
Dec '11	8000	6000	4500	5000	5000	28500	5.81	10
Jan '12	9000	6000	1000	7000	4500	27500	5.6	11
Feb '12	10000	5000	1500	6000	5000	27500	5.6	11
Total for each Manufacturer	207000	69300	48500	85700	80400	490900	Ratio = 8.33%	
Ratio of monthly production	42.17	14.12	9.88	17.46	16.38	100% ratio =20%		



to	Total								
Production									

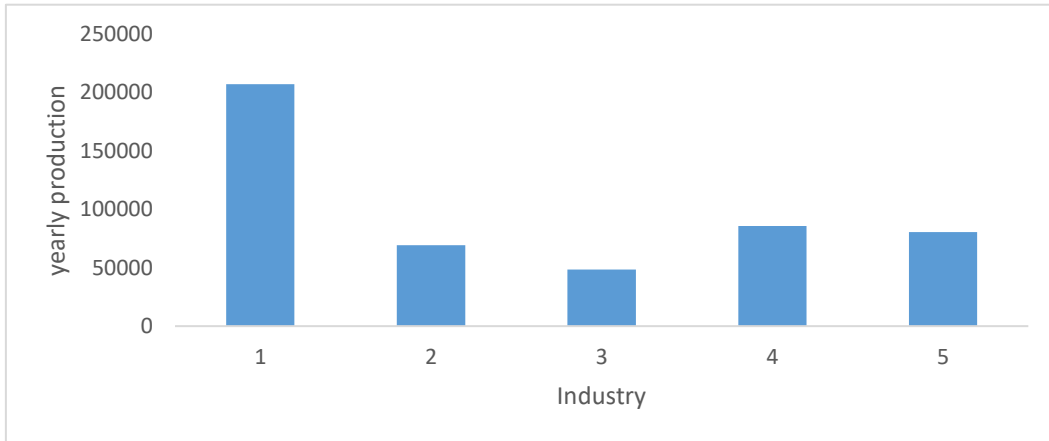


Figure 1: Yearly Production of the five sandcrete blocks producers in kahuna south LGA

Table 1 shows that the average monthly production is 8.33%. From the result, only two (2) months within the period met and surpass this average. The months are May (24.26% with rank = 1) to June (8.66% with rank =2). While the average of production for all the respondents is 20%. Only one of the respondents with 42.17% was able to meet this average. From this study this implies that the demand surpass supply.

Kaduna North local government sandcrete blocks producers

Table 2 revealed that the average monthly production is 8.33%. From the result, six (6) months within the period met and surpass this average. The months are September and October (9.21 with rank = 1 respectively), July (8.74 with rank = 3), June (8.56 with rank = 4), April (8.54 with rank = 5), and December (8.38 with rank = 6). While the average of production for all the respondents is 20%. Only one of the respondents that was able to meet this average is 29.2%. From this study this implies that the demand surpass supply but on the average supply.

Table 2: Total Monthly Production and Total for each Manufacturer in Kaduna North, Local Government areas

Industry	1	2	3	4	5	Total Monthly Production	Ratio of each manufacturer to total production	Ranking
Mar, '11	12000	9000	6500	8000	9000	44500	8.28	7
Apr '11	13000	8500	8000	7500	8900	45900	8.54	5
May '11	12000	7800	8000	8000	8000	43800	8.15	10
Jun '11	13000	9000	8000	7000	9000	46000	8.56	4
Jul '11	15000	8000	8000	8000	8000	47000	8.74	3
Aug '11	14000	9500	7500	6000	7000	44000	8.19	8
Sep '11	13000	10000	9000	8500	9000	49500	9.21	1



Oct '11	12000	11000	10000	9000	7500	49500	9.21	1
Nov '11	13000	9000	8000	7500	6500	44000	8.19	8
Dec '11	15000	8000	8000	8000	6000	45000	8.38	6
Jan '12	13000	6500	7500	7500	7000	41500	7.73	11
Feb '12	12000	7500	5500	5000	6500	36500	6.79	12
Total for each Manufacturer	157000	103800	94000	90000	92400	537200	Ratio = 8.33%	
Ratio of monthly production to Total Production	29.2	19.3	17.5	16.8	17.2	100% ratio =20%		

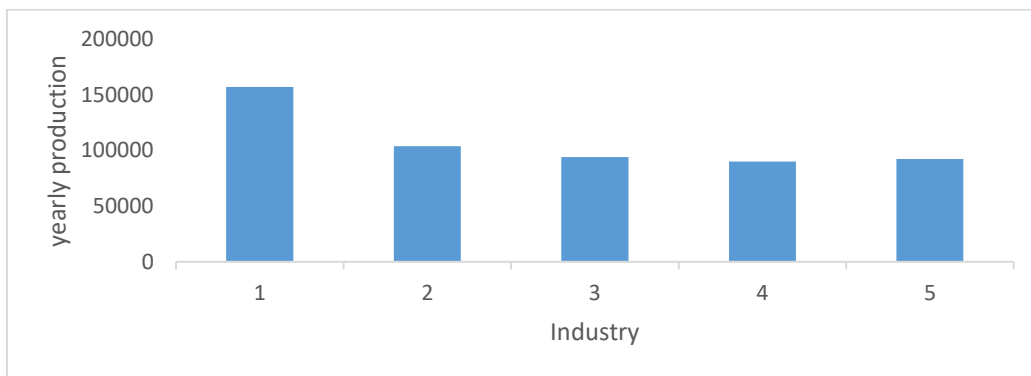


Figure 2: Yearly Production of the five sandcrete blocks producers in Kaduna north LGA

Igabi local government sandcrete blocks producers

Table 3 shows that the average monthly production is 8.33%. From the result, six (6) months within the period met and surpass this average. The months are June and July (9.39 with rank = 1 respectively), September (8.80 with rank = 3), April (8.68 with rank = 4), March (8.59 with rank = 5) and August (8.45 with rank = 6). While the average of production for all the respondents is 20%. Four of the respondents was able to meet this average with percentage ratio 19.57, 19.64, 20.65 and 20.77 respectively. From this study this implies that the demand surpass supply but on the average supply.

Table 3: Total Monthly Production and Total for each Manufacturer in Igabi, Local Government areas

Industry	1	2	3	4	5	Total Monthly Production	Ratio of each manufacturer to total production	Ranking
Mar, '11	7500	6700	8500	7000	6900	36600	8.59	5
Apr '11	7000	7000	8000	8000	7000	37000	8.68	4



May '11	7500	6500	7500	7000	6500	35000	8.21	7
Jun '11	9000	8000	8000	8000	7000	40000	9.39	1
Jul '11	8000	8000	8000	8000	8000	40000	9.39	1
Aug '11	7000	7500	7500	6500	7500	36000	8.45	6
Sep '11	8000	8000	8000	7000	6500	37500	8.8	3
Oct '11	7000	6500	7000	6500	7000	34000	7.98	8
Nov '11	6000	5500	5000	5500	8000	33000	7.74	9
Dec '11	6000	6000	7500	6000	7500	33000	7.74	9
Jan '12	7500	7000	7000	7000	6500	32000	7.51	11
Feb '12	7500	7000	6500	6000	5000	32000	7.51	11
Total for each Manufacturer	88000	83700	88500	82500	83400	426100	Ratio = 8.33%	
Ratio of monthly production to Total Production	20.65	19.64	20.77	19.36	19.57	100% ratio =20%		

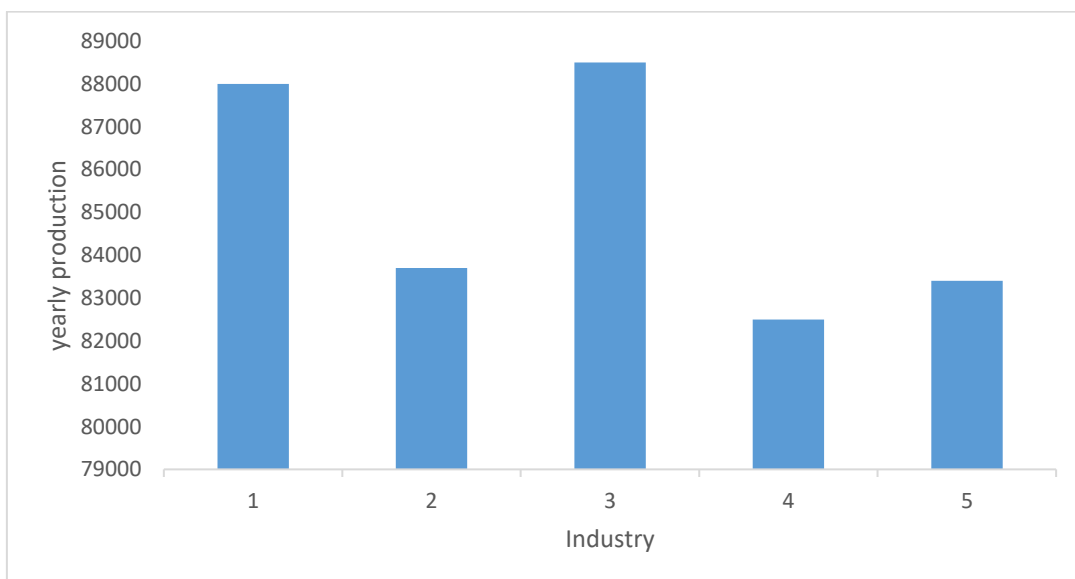


Figure 3: Yearly Production of the five sandcrete blocks producers in Igabi LGA

Chukun local government sandcrete blocks producers

Table 4 shows that the average monthly production is 8.33%. From the result, five (5) months within the period met and surpass this average. The months are March (8.69 with rank = 4), April (8.80 with rank = 2), June (8.39 with rank = 5), July (9.2 with rank = 1) and August (8.71 with rank = 3). While the average of production for all the respondents is 20%. Only one of the respondents was able to meet this average with percentage ratio 30.48%. From this study this implies that the demand surpass supply but on the average supply.



Table 4: Total Monthly Production and Total for each Manufacturer in Chukun, Local Government areas

Industry	1	2	3	4	5	Total Monthly Production	Ratio of each manufacturer to total production	Ranking
Mar, '11	8500	5500	12000	7500	9000	42500	8.69	4
Apr '11	9000	5000	12000	8000	9000	43000	8.8	2
May '11	8000	5000	11000	7500	8000	39500	8.08	8
Jun '11	7000	6000	12000	8000	8000	41000	8.39	5
Jul '11	8000	8000	12000	8000	9000	45000	9.2	1
Aug '11	7000	6500	13000	7600	8500	42600	8.71	3
Sep '11	6000	7000	12000	8000	7500	40500	8.28	6
Oct '11	6500	6000	15000	7000	6000	40500	8.28	6
Nov '11	8000	6500	12000	7000	5500	39000	7.98	10
Dec '11	7000	7000	13000	6500	6000	39500	8.08	8
Jan '12	6000	6000	12000	7000	7500	38500	7.87	11
Feb '12	5500	5000	13000	6700	7600	37300	7.63	12
Total for each Manufacturer	86500	73500	149000	88800	91600	488900	Ratio = 8.33%	
Ratio of monthly production to Total Production	17.69	15.03	30.48	18.16	18.74	100% ratio =20%		

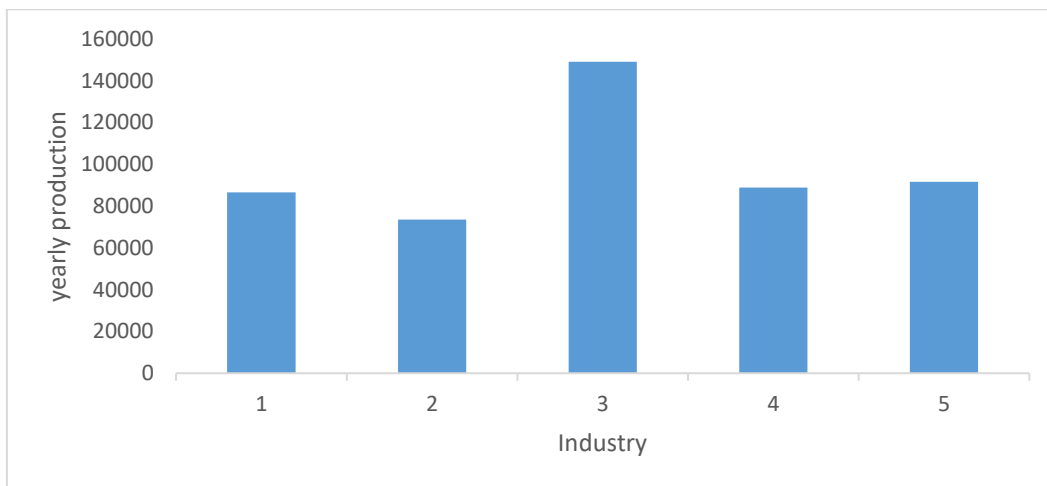


Figure 4: Yearly Production of the five sandcrete blocks producers in Chukun LGA

Analysis of result from the four LGAs

The average monthly production of each of the five industries is 8.33%. From the results of the four LGAs, the average production of the table 1 indicated that only two months (May and June with 24.26% and 8.66% respectively), table 2 indicated six (6) months this includes:



September and October with values of 9.21 each, July, June, April and December with 8.74, 8.56, 8.54 and 8.38 respectively, table 3 shows six (6) months this includes: June and July with 9.39 value each), September, April, March and August with value of 8.80, 8.68, 8.59 and 8.45 respectively. while table 4 indicates five months this includes: July, April, August, March and June with values = 9.20, 8.80, 8.71, 8.69 and 8.39 respectively. This implies that, these values above met and surpass this average production of 8.33% within the period of the monthly (table 1 = two months, table 2 = six months, table 3 = six months and table 4 = five months) production of these industries. The average of production for all the respondents (industries) is 20%. From the results, it was observed that respondents with values greater than 20% are one respondent each from table 1 and table 2 with values = 42.17% and 29% respectively, four respondents from table 3 with values = 19.57, 19.64, 20.65 and 20.77 respectively, and one respondent from table 4 with value = 30.48 that were able to meet this average. From this study only seven respondents were able to meet this average. This implies that the demand surpass supply.

CONCLUSION

The two-research questions addressed the issues the value of Sandcrete block produced in each month of the year and the ratio of Sandcrete block produced by individual manufacturer against the total volume for the year. The answer to this is that only 19 months out of 48 months in the period under study met the monthly average production and only six of the twenty manufacturers studied met the monthly average hence the demand surpass supply. This study shows that there is a need to bridge the supply gap created in the months that production fall below average and also reveals the need to increase the volume of Sandcrete blocks produced so supply can meet demand.

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