
Challenges of Swimming Pool Maintenance in Akwa Ibom State, Nigeria

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ABSTRACT

This study examined the problems of swimming pools in Akwa Ibom State, Nigeria and assessed the barriers to pool maintenance in the study area. The study covered the 32 public pools available in the study area as at the time of study. A purposive sampling method was used to distribute questionnaire to three categories of persons – Pool attendants, maintenance personnel and users. Information on the common problems of swimming pools, maintenance problems and pool maintenance strategies were collected from the respondents. Data collected were analyzed using percentages and relative severity index (RSI). Findings revealed that the commonest problem as perceived by pool management was that some pool facilities could not be assessed after construction (RSI = 0.969) whereas, users ranked no safety equipment to stop children from drowning (RSI = 0.793) first. Results also revealed that high maintenance cost was the most severe maintenance problem in the study area (RSI, 0.628) followed by lack of maintenance expertise (RSI, 0.616). The most frequently used maintenance strategy in the study area was found to be corrective maintenance (REI, 0.678). The study recommends that pool developers should ensure the production of sustainable designs to enhance future maintenance.

Keywords: swimming pool, challenges, maintenance, maintenance strategies.

INTRODUCTION

Swimming pool is an artificial basin; chamber or tank used, or intended to be used, for public swimming, diving, or recreational bathing, but does not include baths where the main purpose is the cleaning of the body, nor individual therapeutic tubs (Health System Accountability and Performance- HSAP, 2014). Pools, apart from adding beauty to property and enhancing aesthetics, are used for bathing, relaxation, therapy, swimming, military training and exercise, socializing, water sports, as well as for the training of lifeguards and astronauts. (Haraldsson and Cordero, 2014). Recently, swimming has become a prerequisite for employment in certain sectors like aviation, marine, oil drilling and prospecting. More people are also learning to swim because of the health benefits associated

with swimming. Sadly, swimming pools have a wide variety of microorganisms which are introduced in different ways, and pool users inadvertently ingest a substantial amount of the water while using the pool (Evans *et al.*, 2001). This enhances the transmission of plagues and other epidemics causing pools to be dreaded by many. WHO (2006) and Nichols (2006) link the risk of illness or infections in recreational waters to faecal contamination by bathers and animals, or a contaminated source of water. In recent years, there have been many reported cases of infectious diseases caused by the inadvertent swallowing of swimming pool water that was contaminated with bacteria, fungi or protozoa cysts while swimming (Kiyohara, *et al.*, 2006). This shows that swimming pool maintenance should be given a high premium for its numerous benefits to be adequately enjoyed. On the contrary, Nigerian researchers are unanimous about the fact that the maintenance culture in Nigeria is poor (Ikpo, 2006; Egboluchi, 2009; Folu, 2009; Iwarere and Lawal 2011; Kola, 2011). This explains why the chemical contents of most pools in south-south Nigeria were less than the values recommended for effective disinfection of the pools and hence causing the microbial contents of most swimming pools in the area to be higher than permissible values for swimming pools (Itah and Ekpombok, 2004). For instance, mean heterotrophic bacteria for most pools in Akwa Ibom State ranged from 2.8×10^4 - 8.1×10^4 CfU/ml > 200 CfU/ml permissible and mean fecal coliform ranged from 2.0×10^3 CfU/ml to 4.4×10^3 CfU/ml > 10 CfU/100 ml permissible (Antia and Umoh, 2016). Therefore, there is need to assess the barriers to effective pool maintenance in the study area as this can enhance pool maintenance and management to provide a safe environment for pool users.

MATERIALS AND METHODS

There were 32 public swimming pools in Akwa Ibom State during the time of study and all were covered in this study. A purposive sampling method was used to distribute questionnaires to three categories of persons – Pool attendants, maintenance personnel and pool owners. Information on the common problems of swimming pools, swimming pool maintenance problems and pool maintenance strategies were collected from the respondents. Pool maintenance problems and maintenance strategies identified in literature were placed on a likert scale where the respondents ranked them based on their relative severity (RSI) or effectiveness (REI) as the case may be. The value of RSI for each individual factor was obtained from the weighted average value using the following formula:

$$RSI = \frac{4n_1 + 3n_2 + 2n_3 + 1n_4 + 0n_5}{4N} \text{-----} 1$$

Where n_1 = number of respondents for 'no effect'; n_2 = number of respondents for 'very low'; n_3 = number of respondents for 'low'; n_4 = number of respondents for 'high'; n_5 = number of respondents for 'very high'; N = Total number of respondents.

THE STUDY AREA

This study was carried out in Akwa Ibom State, Nigeria. Akwa Ibom State is located in the coastal South-Southern part of the country, as shown Figure 1a. Akwa Ibom State lies between latitudes 4° 32' and 5° 33' north and longitudes 7°25' and 8°25' east(Figure 1b). The state is bordered on the east by Cross River State, on the west by Rivers State and Abia State, and on the south by the Atlantic Ocean and the southernmost tip of Cross River State, and has a land mass of 6,900 square kilometres (Ekpenyong, 2013). The climate is characterized by a rainy season from March to October, while dry season stretches from November to February. Akwa Ibom State had five major urban areas, which are Ikot Ekpene, Uyo, Ikot Abasi, Eket and Oron. This research covered these five urban areas.(Haraldsson and Cordero, 2014).



Fig. 1: Maps showing (a) location of Akwa Ibom State in Nigeria and (b) Akwa Ibom State

RESULTS AND DISCUSSION

This section presents the analysis carried out in the research and also discusses the findings of the study.

Common Problems of Swimming Pools

The commonest problem as perceived by pool management (Table1) was that some pool facilities could not be assessed after construction (RSI = 0.969) followed by no safety equipment to stop children from drowning (RSI = 0.794) and no emergency phone located near the pool in case of emergency (RSI = 0.775) while pool water goes green every rainy season (RSI = 0.588) was ranked last. On the other hand, users ranked no safety equipment to stop children from drowning (RSI = 0.793) first, followed by some pool facilities cannot be assessed after construction (RSI = 0.690), no access road for vehicle in case of emergency (RSI = 0.475) and pool water goes green every rainy season (RSI = 0.310) last.

Table 1: Common Problems of swimming pools

S/N	Problems	Management		Users	
		RSI	Ranking	RSI	Ranking
i	Some pool facilities cannot be assessed after construction.	0.969	1	0.690	2
ii	No safety equipment to stop children from drowning	0.794	2	0.793	1
iii	No emergency phone located near the pool in case of emergency.	0.775	3	0.468	4
iv	There is no access road for vehicle in case of emergency	0.769	4	0.475	3
v	The drains of the pool are not visible.	0.725	5	0.448	5
vi	The pool drainage does not work because the pool is put the wrong way.	0.722	6	0.398	7
vii	The pool is always over-crowded	0.697	7	0.410	6
viii	Top of pool wall moves in towards the pool when the pool is empty	0.606	8	0.395	8
ix	Pool water goes green every rainy season.	0.588	9	0.310	9

Source: Field survey

Ranking of Swimming Pool Maintenance Problems

Results in Table 3 showed that 100% of pool managements carried out maintenance work in their pools but out of these only 12.5% of pool management had maintenance manual as shown in table 4. This implies that though the management of the pools carried out maintenance, their works

were unguided and were inappropriate and would have also impinged on their properties life. This is in agreement with Folu (2009); Kola (2011) and Egboluchi (2009) who reported that facilities in Nigeria were not long lasting due to inadequate maintenance. Result on maintenance problems (Table 2) showed that high maintenance cost (RSI = 0.628) was the most severe maintenance problem followed by lack of maintenance expertise (RSI = 0.616), lack of proper tool for maintenance work (RSI = 0.569), while the least severe problem was that materials used for construction were obsolete and no longer available. Al-Khudair (1988) reported that availability of skilled labour is very important, as their requisite skills could assist to improve the quality of work and also minimize cost. It could be deduced from the foregoing that, perhaps the unavailability of maintenance experts in the study area led to the increase in maintenance cost perceived by management as the most severe problem by pool owners.

Table 2: Relative severity index and ranking of observed problems

S/N	Problems of Maintenance	RSI	Ranking
i	High maintenance cost.	0.628	1
ii	Lack of maintenance expertise.	0.616	2
iii	Lack of proper tool for maintenance work	0.569	3
iv	Inaccessibility of some facilities to carry out maintenance work.	0.541	4
v	Misuse of facilities after construction.	0.525	5
vi	Importance of maintenance work not understood by the management.	0.506	6
vii	Provision not made for maintenance during design/construction.	0.469	7
viii	Amount of money generated from the pool not sufficient for pool maintenance.	0.453	8
ix	Unavailability of operation and maintenance manual.	0.397	9
x	Materials used for construction are obsolete and no longer available.	0.394	10

Table 3: Maintenance worksdone in pools

Response	Frequency	Percent	Cumulative Percent
Yes	80	100.0	100.0
No	0	0.0	100.0
Total	80	100.0	

Table 4: Availability of maintenance manual or plan in pools

Response	Frequency	Percent	Cumulative Percent
Yes	10	12.5	12.5
No	70	87.5	100.0
Total	80	100.0	

Swimming Pool Maintenance Strategies

From the result presented in Table 5, it is evidenced that the most practiced maintenance strategy in Akwa Ibom State swimming pools is corrective maintenance (REI = 0.678) followed by condition based maintenance (REI = 0.563) and lastly preventive maintenance (REI = 0.369). Al-Khatam (2003) maintained that, corrective maintenance is the simplest maintenance strategy. This could be the reason pool managements use more of corrective maintenance coupled with the fact that there are limited expertise to handle the more demanding and complex maintenance strategies. This is also in line with Arditi and Nawakoraivit (1999) who reported that few facility owners regard scheduled maintenance as a matter of concern.

Table 5: Swimming pools' maintenance strategies ranking by pool management

S/N	Maintenance Strategies	REI	Ranking
i	Corrective maintenance	0.678	1
ii	Condition based maintenance	0.563	2
iii	Preventive maintenance	0.369	3

Source: Field survey

CONCLUSION

This study examined the challenges of swimming pool maintenance in Akwa Ibom State. The study observed that the most disturbing swimming pool problems were that some pool facilities could not be accessed after construction and also the lack of safety equipment to prevent children from

drowning. High maintenance cost was the most severe maintenance problem. The most frequently used maintenance strategy for pool maintenance in the study area was found to be corrective maintenance. The study recommends that proper and timely maintenance should be carried out to enhance the lifespan of the facilities. Also, designs and materials that will ensure sustainability should be considered for pool construction.

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