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Sports Facilities Condition Assessment in Selected Universities in South Western Nigeria

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Abstract: *Maintenance survey of sports facilities in first generation universities in South-West Nigeria was carried out using facilities condition assessment methodology to determine their current physical condition. All Nigerian University Games Association (NUGA) sports and the attendant facilities were considered but purposive sampling was necessary in the case of the number of institutions. The choice of Universities selected was dependent on the Universities having facilities for all the 15 NUGA sports and for having hosted National and International sporting events. Research findings revealed that the overall average facility condition index (FCI) for sports facilities in universities in Southwestern Nigeria was 8.84% and which fell in a range of facilities in a fairly good condition. The overall FCI of nine sports facilities in the first university sampled was 5.40%. The value fell in a range of facilities in good condition. The second University sampled had overall FCI of 5.51%. The value fell in a range of facilities in good condition. The third University sampled had overall FCI of 20.56%. The value fell in a range of facilities in a poor condition needing immediate attention and renovation. The study revealed that the higher the FCI the worse the facility condition. Thus, the recommendation of this study to the facilities manager is to minimize the FCI or at least to understand the FCI implication to the condition of the sports facilities to increase their reliability.*

Keywords: *Sports facilities, Maintenance survey, Facilities condition assessment, Facility condition index, Physical condition*

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I. Introduction

School facilities make up 80 per cent of the fixed assets owned by conventional tertiary institutions, such as universities [1 and 2]. School facilities are meant to support the core objectives of the university which are teaching, learning, and research [2 and 3]. School facilities include instructional, recreational, residential and general-purpose facilities [3, 4 and 5]. Instructional facilities according to them include classrooms, classroom seats, laboratories, libraries, experimental equipment, zoological gardens and experimental agricultural farms that are specifically meant for teaching and learning. Sports facilities fall under both instructional and recreational facilities which include spaces, lawns, fields, pitches and equipment for sports, games and general recreation. Sports facilities are referred to as mainly the immovable structures for sports practice, maintenance, repair and health, in which safety issues should be considered by authorities [6].

The scheme for University all over the world usually covers the provision of recreational sports facilities because sports is an essential part of the entire learning package offered by the Universities. The provision and maintenance of sports facilities then become a necessary ingrediency if the academic and recreational programme of the University will attain its set goals [7]. The provisions, accessibility, and maintenance of adequate sports facilities and equipment are essential conditions for running a good and meaningful sports programme [7, 8 and 9].

Sports facilities in Nigeria universities are part of physical assets built with large allocations majorly from the Federal and State governments of Nigeria. Due to the nature and needs of each game, the facilities were built in such a way as to meet the standard and comply by international and Nigeria universities games associations (NUGA) rules of the game [7, 10, 11 and 12]. NUGA has fifteen (15) approved sporting activities. These are; track and field, badminton, basketball, hockey, chess, cricket, judo, soccer, squash, table tennis, Tae Kwando, lawn tennis, volleyball, swimming, and handball. NUGA is a member of the World Federation of Universities Games Association (WFUG), West African University Games Association (WAUGA) and other international bodies and participates in the World University Games and other activities of the Federation.

The specific objectives of NUGA include; promotion of friendship through participation in sporting activities among University students in Nigeria, development of sports facilities in Nigerian Universities, and enhancing the development of sports in Nigeria through the contribution of elite athletes from University sports competitions to the national teams [12]. The benefits of participation in sports include: enhances physical fitness, contributes to good health and mental development, self-actualization, improvement of international

relations, promotion of friendship, provision of employment, youth mobilization, promotion of recreation and competitive sports, promotion of women sports [13, 14 and 15].

Sports facilities defects can occur for various reasons which include age, overcapacity, design deficiencies, construction faults, corrosion, physical aggression from athletics, environmental and biological factors and lack of planning and preventative maintenance [16, 17 and 18]. Facility Condition Assessments (FCA) are used to measure this deterioration to collect data to determine the need and timing of preventative or corrective maintenance to sustain the desired level of service [17]. Facilities condition assessment is key to the development of an effective and efficient maintenance strategic plan for sports facilities which are required to be available at all times to provide sporting activities. Condition assessment is the first step in a process to develop the guideline of decision making in the future planning and execution of maintenance programme. The results of periodic condition assessments of facilities are used to predict the extent of damage that will occur in the future. Therefore, the preparation of the condition assessment model is the first step to realize effective and efficient maintenance objective [19].

To manage resources effectively in maintaining facilities, managers must be proactive in identifying the existing condition of a facility asset [20]. Facility condition assessment (FCA) is the process of examining all facilities; including buildings (elements and components), mechanical and electrical types of equipment, internal structure, finishing, and building site [21]. [22] defined FCA as "inspection of a facility be it building or other structure, at a certain date, to determine its state of repair and the needs for maintenance. Also, FCA is defined as predetermined inspections to evaluate asset performance and maintenance needs along with this are maintenance cost estimating, maintenance budgeting, managing of maintenance data and building up historical information [23].

[24] observed that inspection cycles are a basic necessity for a planned maintenance programme. [25] alludes to an important point of consideration for maintenance managers which is prioritising maintenance work which may not be successfully achieved in the absence of facilities condition assessment data. The key contributors to high maintenance cost include; lack of accurate and reliable information on the current condition and maintenance needs of facilities and inaccurate budgeting or poor funding for maintenance work [20, 25 and 26]. Thus, FCA will enable the maintenance department to accumulate necessary data related to sports facilities deficiency information to help manage deferred maintenance backlogs. A positive policy approach for implementing rational facilities maintenance will be promoted based on those accumulated data, especially a plan of maintenance management strategy regarding sports facilities characteristic can be developed [27].

Limitations in the literature in solving similar deferred maintenance problem as highlighted by [20] include Lack of structured assessment methodology for facilities or equipment on its component level with points of failure. Naval Facilities Engineering Command of USA [28] classifies facilities as satisfactory and unsatisfactory. Lack of prioritization tool that considers safety, cost, and time to repair and replace in the event of equipment failure. Facilities audit ranks based on the point rating system in [29]. Scoring techniques that result in ties or equal numbers, and lower risk priority scores. Limitation in [30], [31] and [32]. Condition of facilities known only with cost estimator's role. Facilities Condition Index (FCI) is the most common approach that can be used in school and universities [33]. Only consultants or Builders perform the assessment. Software-oriented systems in the National Association of College and University Business Officers-USA [34].

The existing limitation in literature for solving similar facilities assessment problem brings to fore the need to determine sports facilities condition index. Facility condition index (FCI) is used in facilities management to provide a benchmark for the relative condition of a facility or group of facilities [35]. The FCI is primarily used to support asset management initiatives. Mathematically, the FCI is represented as a ratio of the cost of carrying out maintenance, repair, replacement of defects of the facility and the current replacement value of the facility [36]. FCI as a tool was first published in 1991 by the National Association of College and University Business Officers [34].

In FCI process the primary objective of the assessment is to inspect each facility and note physical deficiencies or defects. For each facility, average life and costs of replacement are estimated based on the date of the construction or the last documented renovation of the system.

The generally accepted range of FCI's for establishing a facility condition is shown in Table 1. This standard has been adopted by the Building Owners and Managers Association, the Council on Education Facilities, and the American University Planners Association, and a number of other international facilities groups [26].

Table 1 Facilities Condition Index

CONDITION	FCI
Good	0 – 5%
Fair	6 – 10%
Poor	10% and above

Source: Edgar, 2001

The FCI is useful in comparing and prioritizing facilities of differing costs or sizes or types by showing the relative physical condition of the facilities. The FCI stated as a percentage – measures the estimated cost of the current year eficiencies and compares it to the projected replacement cost of the facility. The total "Cost of Repairs" is divided by the current "Replacement Cost" for the facility, resulting in the "FCI". The higher the FCI, the poorer the relative condition of the facility [11 and 26]

In Nigeria universities, it is observed that most sports facilities were built at the inception of the university or when the university win the hosting right for a major sporting event such as NUGA or WAUG. These sports facilities were observed to deteriorate, in a poor state of disrepair and their facilities condition indexes worsen as a result of inadequate or poor maintenance practices [6, 11, 37 and 38]. The current facilities condition indexes for sports facilities in Southwestern Nigeria are not known. Literature addressing the subjects of facilities condition assessment and facilities condition index for sports facilities are limited in Nigeria, hence this study. This study, therefore, assessed sports facilities condition in selected universities in Southwestern, Nigeria, with a view to determining the sports facilities condition index.

II. Material and Methods

The sampling frame covered all 15 games featured by the Nigeria University Games Association (NUGA) namely: badminton, basketball, chess, cricket, football, handball, hockey, judo, squash racket, swimming, table tennis, taekwondo, tennis, track and field and volleyball. All NUGA sports and the attendant facilities were considered but purposive sampling was necessary in the case of the number of institutions. The choice of Universities selected for this study was dependent on the Universities having facilities in and for taking part in all the 15 NUGA sports and for having hosted National and International sporting events.

A pilot survey conducted for this study revealed that only three federal universities [Obafemi Awolowo University, Ile-Ife; the University of Ibadan and the University of Lagos] had facilities for all the 15 different sports for the study and had hosted National and international sporting events. Physical condition assessment of all the facilities in the selected universities was conducted. The assessment was performed by visiting each of the selected universities sports complexes and visually inspecting all the facilities used for the games. Examples of facilities surveyed included the buildings hoisting the indoor sports hall and for the physical and health education department, air conditioning in the buildings, internal walls, ceiling, roofs, grass fields (Football, cricket, Hockey pitch). Tables 2, and 3, show lists of the elements that were assessed in the facilities, the information obtained and the details of the assessment that were performed.

Table 2 Building Assessment Elements and components

Facilities	Assessment information	Details of assessment performed
Sports Building (indoor Sport Hall, Sport Administrator Offices, Table tennis hall, Covered Pavilion, squash, and other Sitting Areas)	Exterior wall condition Interior wall condition Exterior finish condition Interior finish condition Roof condition Window/door condition Structural condition (beams and columns) Floor condition Floor finishing condition Electrical condition Fire safety Plumbing condition Air conditioning systems Overall cleanliness	Whether walls are damage from cracks? Whether wall tiles are missing, damage, or lose? Whether flooring has damage from cracks, tears, holes or water damage? Whether interior surfaces have mildew or visible mold? Whether windows are broken, damaged, or missing? Whether doors are damaged, broken or missing? Severe cracks? Whether there is power failure in all or portion of the sport complex? Etc.

Table 3 Hard Courts, Grass Courts and Water Sport Assessment Elements.

Facilities	Assessment Information	Details.
Hard Court (Basketball, Handball, Tennis, Volleyball)	Severe cracks on concrete surfaces and structure? Dry rot/mold appears to undermine the structural element Holes in concrete floors Sound deadening Ball bounce/roll/performance Smoothness of concrete surface Coefficient to friction (slip vs. slide, vs. nonslip) Colour of court areas Permanence/portability Whether marking lines are straight?	Whether there are severe cracks on concrete surfaces and structure? Whether dry rot/mold appears to undermine the structural element? Whether there are holes in concrete floors? Sound deadening? Test the Ball bounce/roll/performance? Smoothness of court? Coefficient to friction (slip vs. slide, vs. nonslip) Whether colour of paint are flaking off? Permanence/portability Whether marking lines are straight?

Grass Courts (Football, Hockey fields, cricket field)	Physical Condition Functionality Identification of defects Estimate cost of repair Dimension Age	Whether the pitch is level? Whether the vegetation is green? Type of grass? Availability of sprinklers? Whether the grass is natural or artificial? Whether ball/bounce? Whether running can be done with ease? Whether turning/pivoting is possible? Whether there is adequate friction/ Adhesion? Date of last renovation
Water sports(Swimming Pool)	Physical condition Functionality Temperature of pool water Chemical Balance of water Size of pool	Whether water pressure is too high or low? Whether water is dirty? Whether pool is filled with refuse? Whether water outlets are clogged? Whether there is water leakage?

The primary objective of the assessment is to inspect each facility and note physical or operational defects or deficiencies. For each sports facility, average life and the cost of replacement was estimated based on the date of construction or the last documented renovation of the facilities. The information generated by the life cycle cost model, and modified by the site assessment was used to calculate the repair and replacement cost of the particular facility. Since the assessment was based on life cycle cost model and statistical inferences, the study did not identify a detailed listing of deficiencies.

III. Results and Discussion

Obafemi Awolowo University, Ile-Ife. The result showed that the tartan track and the swimming pool have FCI of 3.69 % and 1.33% respectively. These two facilities fall in the range in which a facility is considered to be in a very good condition. These facilities are still in excellent condition probably because their ages are within six years. The indoor sports hall and the table tennis gym have FCI of 5.37% and 9.85% respectively, and they fall into the range of facilities in good condition. Basketball court and squash court have FCI of 10.46% and 10.86% respectively, and they fall in the range of facilities in a fairly good condition. The handball courts and volleyball courts have FCI of 19.14% and 27.27% respectively. These facilities fall in the range in which a facility is considered to be in a poor condition. The overall FCI of the nine facilities under consideration in Obafemi Awolowo University has FCI of 5.40%. This is a range in which facilities are considered to be in a very good condition. However, this is as a result of the contributions from the tartan track and the swimming pool which have a total cost of replacement of N490, 042,158.10 and the facilities were less than six years old.

Table 4. Facilities Condition Index for Selected Universities in Southwestern Nigeria (OAU, UI and UNILAG)

s/n	Name of sports facility	Standard dimension of court	Existing gross floor area	Renovation cost	Replacement cost	FCI-Poor above 10%	FCI-Fair 6-10%	FCI-Good 0-5%	Renewal cost N/m2
	OAU								
1	Athletic Tartan track			5,500,000	148,991,937.70			3.69	
2	Basketball Court	28mx17m	2,723.20	1,975,926.75	18,883,894.24	10.46			6,934.45
3	Handball Court	40m x20m	2,600	3,500,000	18,029,570	19.14			6,934.45
4	Indoor sports Hall	39m x31m	3,627	15,000,000	279,279,000			5.37	82,500
5	Squash Court	15.5m x13.5m	418.5	3,500,000	32,224,500	10.86			82,500
6	Swimming Pool	50m x25m	1,250	6,500,000	489,893,116.40			1.33	391,914.49
7	Table Tennis Gym	33.6m x23.8m	799.68	6,500,000	65,973,600		9.85		82,500
8	Tennis Court	40m x 20m (3nos)	2,400	1,827,367.43	16,642,690.63		10.98		6,934.45
9	Volleyball Courts	35m x34m (4nos)	2,380	4,500,000	16,503,991		27.27		6,934.45
	Total			50,625,926.75	938,198,094.60				
	Average FCI OAU							5.40	
	University of Ibadan								
1	Athletic Tartan track			15,500,000	148,991,937.70		10.40		
2	Basketball Court	40.48m x 20.98m	849.27	980,000	5,889,220.35		16.64		6,934.45
3	Handball Court	Under construction							
4	Indoor sports Hall	No information							
5	Squash Court	9.1m x 6.24	56.78	1,500,000	4,684,350		32.02		82,500

Table 4 Facilities Condition Index for Selected Universities in Southwestern Nigeria (OAU, UI and UNILAG) (contd).

6	Swimming Pool	50m x 25m	1,250	15,000,000	489,893,116.40		3.06	391,914.49
7	Table Tennis Gym	Not applicable						
8	Tennis Court	24.36m x12.66m	1,233.59	2,586,810.70	8,554,268.18	41.63		6,934.45
9	Volleyball Courts	19.16m x 10.58m	405.43	850,000	2,811,434.06	30.23		6,934.45
	Total			36,416,810.70	660,824,326.69		5.51	
	Average FCI UI							5.51
	University of Lagos							
1	Athletic Tartan track			45,000,000	148,991,937.70	30.20		
2	Basketball Court		1,631.52	1,923,127.95	11,313,693.86	17.00		6,934.45
3	Handball Court		1600	2,329,975.20	11,095,120	21.00		6,934.45
4	Indoor sports Hall		2,905.11	34,297,002.38	239,671,575	14.31		82,500
5	Squash Court		278.64	3,114,846.90	22,987,800	13,55		82,500
6	Swimming Pool	Re-construction						
7	Table Tennis Gym	Not applicable						
8	Tennis Court		2,110.41	3,313,258.19	14,634,532.62	22.64		6, 934.45
9	Volleyball Courts		2,184	5,403,678.48	15,144,838.80	35.68		6,934.45
	Total			95,381,889.10	463,839,497.98			
	Average FCI for UNILAG					20.56		
	Total			182,424,626.55	2,062,861,919.27			
	Average FCI for OAU,UI,UNILAG						8.84	

Findings of the facilities condition assessment of the University of Ibadan revealed that swimming pool had FCI of 3.06. This value fell in the range in which a facility is considered to be in excellent condition. Tartan tracks and basketball court had FCI of 10.40 and 16.64% respectively and these values fell in the range of a facility is considered to be in a poor condition. Squash, tennis and volleyball courts had FCI of 30.02%, 30.24% and 30.23% respectively. These values fell in the range of facilities in very poor condition and should be considered for renovation.

Concerning University of Lagos, the basketball, indoor sports hall, and squash courts had FCI of 17.00%, 14.31% and 13.55% respectively. There values fell in the range of facilities considered to be in a poor condition and need renovations. The handball and tennis courts have FCI of 21.00% and 22.64% respectively. There values fell in the range of facilities in a very poor condition. They need immediate renovation. Tartan tracks and volleyball courts have FCI of 30.20% and 35.68%. Both values are in a very poor condition needing immediate renovations. The poor condition of the sports facilities in university of Lagos is probably as a result of the higher intensity of use from clubs and other athletes outside the university community using the facilities for training and competitions.

Policy Implication

Adoption of facilities condition assessment methodology will grow to respond to the limitations in the maintenance of sports facilities in the universities. In this methodology, there is a focus on the collection of information on the condition of sports facilities to determine the facilities condition index (FCI). This will enable the maintenance department to determine the resources required in terms of the cost of materials and labour to carry out repair and replacement of defective facilities. It is very important that the maintenance department, sports units and facilities managers know the implication of FCI to the facilities. The study revealed that the higher the FCI the worse the facility condition. A new facility with no deficiencies or defects and a 100% replacement value would have an FCI of 0. Thus, the finding of this study to the facilities manager is to minimize the FCI or at least to understand the FCI implication to the condition of the sports facilities. Also, using the FCI data, it is possible to perform financial analysis over time taken inflation into account.

IV. Conclusion

Facilities condition assessment was conducted for the NUGA sports facilities in the first-generation universities in south west Nigeria (Obafemi Awolowo University, University of Ibadan and University of Lagos) to determine their facilities condition index. This study assessed each sport facility and note physical or operational defects or deficiencies. For each sports facility, an average life and the cost of repair and replacement was estimated based on the date of construction or the last documented renovation of the facilities.

The overall average FCI for sports facilities in universities in Southwestern Nigeria in 2019 was 8.84%. The overall FCI of nine sports facilities in OAU was 5.40%. The value fell in a range of facilities in a good condition. This was however as a result of the contribution from the tartan tracks and the swimming pool which were relatively new with a total replacement cost of N490, 042, 158.00. University of Ibadan had overall FCI of 5.51%. The value fell in a range of facilities in a good condition. University of Lagos had overall FCI of 20.56%. The value fell in a range of facilities in a poor condition needing renovation.

In the light of the research findings and their policy implications, it is recommended that the training of in-house maintenance staff be carried out by the university management on how to carry out FCA process. Specialized training should also be carried out for some selected maintenance staff on the technology involved in the maintenance of swimming pools and tartan tracks.

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