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Practice of Maintenance Management of Infrastructures on Sports Stadia in Ghana

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Abstract

The paper assessed the maintenance practices of traditional public stadia in Ghana. It also sought to evaluate the current state, causes, and effects of poor maintenance practices on the stadia. The study used structured questionnaires administered to 60 maintenance managers,

equipment officers, and property officers. The questionnaire administration was done using the purposive sampling technique. The findings show that failing to respond on time, routine inspection, stadium design and structure and utilization of unstandardized material were perceived by respondent as the main causes of poor maintenance practices. The findings of this study indicate that poor maintenance practices have effects on the full usage of the public stadia. The results clearly indicate that the grievances are mainly man-made.

The paper contributes to the literature on the practices of maintenance of public infrastructure especially for West Africa countries and other emerging countries. The study may be great to professionals on the key activities in the esteem of best maintenance management practices on stadia in Ghana and beyond.

Keywords: maintenance management, stadia, public infrastructure, equipment, Ghana

1. Introduction

Public physical infrastructure constitutes a high share of the country's investment and is managed and controlled by the state for public consumptions. It varies from road, railways, harbors, recreational centers, and others**.** Baldwin and Dixon (2008), divided infrastructure into three groups: machinery and equipment, buildings, engineering structures. These infrastructures are called the public infrastructure since it creates benefits for a large number of users**.** According to San SI (2012**),** public infrastructure such as building and other facilities are to be satisfied social and administrative needs as a means to the fulfillment of economic responsibilities of the general public. Better quality and quantity of infrastructure can directly raise the productivity of human, physical capital and hence growth through many channels (Ag énor and Moreno 2006).

Infrastructures frequently devalue with time so appropriate continuance management needs to be conducted regularly to keep it to the original state. According to the U.S. Congressional Budget Office (CBO), operations and maintenance expenditures are generally needed to provide required service for infrastructures to serve its purpose and also needed to enhance the existing infrastructures from deteriorating (Congressional Budget Office 2007). Maintaining existing infrastructures though comes with a cost but it's a prudent investment that saves cost than erecting new ones. Infrastructure maintenance in advanced countries is not really impressing, however, there seems to be a vast difference in the maintenance and consequently the economic life of infrastructures projects in developing countries (Matthew Dornan, 2012). In the US, 57% of total spending on infrastructure in 2014 has been towards the operation and maintenance of existing infrastructure assets and this has been rising by about 6% since 2014 (Congress 2014).

Over the years, there have been improvements in public infrastructure maintenance through heavy investments but most developing countries still bear the brunt of insufficient infrastructure access, quality, and reliability due to improper maintenance. Nahimah (2008), as cited by (Kumar and Kumar 2018) conducted a research on the state of Nigerian Aviation Industry, opined that the flaws in the Nigerian Aviation sector were ascribed to lack of maintenance culture and the training of expertise engineers. The author further argued that

acquiring aircraft is not as relevant to the industry as good maintenance of the existing ones, adding that a well-maintained aging aircraft is as good as a poorly maintained new aircraft. The condition of infrastructure is very much related to the achievement of the Millennium Development Goals set by the United Nations (Lee, Wang et al. 2018). From this, it is clear that proper maintenance and management of public infrastructure are very keen on ensuring its lifespan to serve its main purpose. Efobi and Anierobi (2014) further explained that the practice of maintaining prevailing public infrastructures have been abandon to the building of new infrastructures in developing countries. Most developing countries are only interested in erecting new structures to the total neglect of placing measures in place to sustain the existing ones. Inadequate maintenance in developing countries has resulted in rapidly increasing deterioration of public infrastructures to prevent it from serving its purpose.

The Government of Ghana is currently engulfed with enormous challenges in infrastructure improvement which are proving to be a constraint on growth and development. Though the country is doing well economically, there stay serious shortfalls with the provision of infrastructure and maintenance of the present ones. This can be attributed to the negative attitude of stakeholders in the direction of rehabilitation and maintenance of its constructions and facilities. In fact, the country is facing a heavy infrastructural deficit and apparently poor maintenance of existing public property (Nkrumah et al 2017). The Ghanaian community is failing to restore the actual functioning of an asset to prolong its lifespan and the maintenance of infrastructure has to with drawing up foolproof maintenance programme, instituting schedule of inspection, establishing schedule of work, supervision of maintenance of work and preparation of schedule of dilapidation (de la Fuente, Gonz áez-Prida et al. 2018). There is no refuting the fact, the spirit of sustainability and maintenance culture among developing countries is very atrocious which Ghana is no exception. This bad attitude is obvious not only amongst those exercising authorities or political powers, however, the ordinary man on the street. It's very disgusting upon entering some premises in the country to see that repair and maintenance are absent in the minds of those in charge of the infrastructure.

The Ghanaian public infrastructures such as stadia, public offices, national theatre, and others are sickening and have led to plug of the death trap. These are attributed to the problem of over-centralization of maintenance decisions. The channels through which decisions are made are very cumbersome which delays the maintenance practices. Also, there is inadequate fund and delays in the release of funds have contributed significantly to the present state of public infrastructures.(Agbenorku 2018) A number of newspapers, political leaders and the citizens have lamented over the state of misery of the public infrastructure but the zeal to execute is very slow. This is quite clear that the issue of poor maintenance culture in Ghana has enjoyed debate but without the necessary actions. However, most studies have been done on the maintenance practices in Ghana and Africa at large but there is no substantial extent of research addressing the problem of public infrastructure management and how to improve the maintenance practices of public infrastructure. This study, however, aims to unravel the infrastructure maintenance practices being hired in public infrastructures that can be improved.

The study focuses on maintenance practices of public infrastructure in general with particular

reference to the Accra Sports Stadium, Kumasi sports stadium, tamale sports stadium and Essippong stadium. The stadia each had a capacity of 20,000, and was once renovated into an edifice to meet FIFA criteria to host the 26th edition of the African cup of nations (Local Organizing Committee, 2008) as cited by (Fuseini, Yaro et al. 2017). The government of Ghana purportedly spent close to GH30 million for renovation and constructions of new ones. These includes the refurbishment of the State box, replacement of the broken seats, re-grassing of the pitch which was in a tremble state, replacement of the broken and weak iron gates, provision of ultra-modern scoreboard, provision of toilet facilities as well as painting of the entire stadium Unfortunately, the modifications at the stadia were short lived. The various sporting infrastructural facilities of the stadia are in the very deplorable state with some not just requiring renovation but replacement. The detrition of the facility commences from the two iron gates and other major iron gates which serves as the entrance. Most of the seats in the stands have broken down and the football pitch is nearly shunned of grass. The scoreboards are not working and the metal pillars that keep it have additionally. The effects on these are not minimal and have caused the loss of a huge sum of money.

This paper assesses the maintenance practices of the traditional public stadia. It seeks to evaluate the current state of public infrastructure and maintenance practice by the stadia. In this regard, the discussions cover the major causes and effects of poor maintenance practice of public infrastructures, suggesting and recommending the appropriate maintenance management to the stakeholders.

The rest of the paper is organized as follows. The next section provides the literature review and formulates hypotheses. The third section provides the methodology for the study. The fourth section analyzes the results, and the final section concludes the paper by providing implication.

2. Literature Review

Current State in Public Infrastructure in Ghana.

Ghana's development is restricted by gaping infrastructure deficit. The infrastructure deficit will require sustained spending of 2.3 billion dollars annually over ten years to bridge this gap (Ghana News Agency, 2017). But the aspiration to reposition the underdeveloped economy has been the topmost priority of present and past government. Since independence, the country has invested heavily in infrastructure such as stadia, constructing of roads, government offices. Ghana has signed a $6 billion contract to rehabilitate the existing network and build a railroad to the country's northern border (Bloomberg, 2010). This will make it the largest rail investment in Africa for at least 50 years. This is a clear indication that the government is working to bridge the infrastructure deficit. However, the appropriate actions to ensure the sustainability of these infrastructures have been neglected. It is common knowledge that the awful state of public infrastructures in Ghana postures great concern to stakeholders. Facilities at Ghana's airports, hospitals, stadia, roads etc. would give a signal that the society lacks an agent that would have helped manage, ensure the effective and efficient functioning of the facilities as well as fostering national development. Evidence of lack of maintenance and repair are frequently demonstrated on the roof, windows, doors, and

other building elements and facilities. The state of disrepair and deterioration of public buildings in Ghana is, therefore, of the great cause of concern.

2.1 Causes of Poor Maintenance

The existence of poor maintenance practices is not a natural problem and certainly has been driven by a number of factors. The outdated neglect of maintenance practices needs to be reversed by thinking maintenance as part of infrastructure preservation. Maintenance is now a priority of facility managers to ensure maximum utilization of infrastructures (Campbell 1995) but, inadequate infrastructure maintenance in Ghana and developing countries at large has been a problem (Efobi and Anierobi 2014). Afrane and Osei 1999 as cited by Efobi, 2014) revealed that the housing industry in Ghana is in critical condition as a result of lack of maintenance. From there, it's quite clear that the state of despair of Ghana infrastructure to some extent is attributed to lack or inadequate maintenance practice. Yet, governments have often prioritized building new infrastructure, acquisition of new furniture and curtains among others overspending on adequate maintenance which was said by Mr. Kwesi Ahwoi, then minister for Food and Agriculture on 20th March 2012. (Sam, Brijs et al. 2018).

According to (Estache and Fay, 2007), maintenance needs have been estimated to be between 1.5 percent and 3.3 percent of Gross Domestic Product (GDP) for developing countries, yet most developing countries spend much less than this. This is quite clear that inadequate funding and human resources (skilled) is a major cause of poor facility management which leads to poor maintenance practice (Yusuf et. al, 2007).

Similarly, (Ibrahim, 2016) attributed budget restrictions to poor maintenance practices. This is most applicable to Ghana, where maintenance practices have to delay to seek for funds to supplement its budget. Government funding on public activities of public infrastructures have been dwindling over the years, the ministry of sports budget, for instance, was reduced thereby making it difficult for managers to make provision for maintenance costs. This has led to the scenario of deferred preventive maintenance which can generate greater charges over the long term. From the above, it can be said that inadequate finance and restriction of the budget are the major cause of poor maintenance practices.

To add to these, there are no maintenance policies which regulate maintenance of public utilities currently in Ghana. Even though, there are estate workshop departments together with the building management committee that developed maintenance guidelines for various institutions. However, these guidelines do not rank preventive maintenance (Quayson and Akomah 2016). Ignoring routine maintenance like painting etc. will generate to the major problem which leads utilities to destruction. There are no laws and regulations that compel stakeholders to undertake maintenance failure to be sanctioned Cobbinah PJ (2010). This is some way leads to poor maintenance practices in the sense that stakeholders carry out maintenance practice anyhow.

2.2 Effects of Poor Maintenance Practices

Timely interventions could avoid accelerated deterioration in later stages (Grussing, 2009). It's, therefore, necessary to fix a problem at the initial stages to prevent further deterioration.

In the same direction, (Jusoff et al. 2008), hinted that a huge sum of money will be needed to restore facilities to its original state and standard for occupancy when they are poorly managed. More often than not, public institutions are not-for-profit gains and therefore require competing with others for the infinitesimal funds available for major maintenance. There is the possibility of such institutions to erode the financial strength of the Institutions or cause them to suffocate without external funds.

The abandonment of maintenance has a collective result which speedily increases deterioration of the building fabrics and finishes which leads to harmful effects on the occupants Wordsworth (2001). In the same direction, Waziri (2016) also indicated that poor facility which often leads to corrosion of some equipment, therefore, increasing the chances of tetanus and collapse of buildings. This has resulted in the collapse of some buildings claiming lives in Ghana. Exemplary cases include the collapse of the Melcom building on 7th November 2012 (also known as the Melcom Disaster) which led to the loss of several precious lives.

In the same vein, Djerdjour 2005 ranted that, poor maintenance leads to more frequent failures, poor utilization of equipment and delayed schedule.

Prevention is cheaper than cure; waiting for the infrastructure to collapse is much more expensive than buttressing it before it collapses. Thus, poor maintenance prevents infrastructure from serving its purpose, every infrastructure has a lifespan, for instance, and a well-maintained road should last 10 to 15 years before it needs to be resurfaced. Thus, lack of maintenance can source dreadful deterioration requiring resurfacing in as little as five years.

2.3 Public Infrastructure Management and Challenges

Buildings and infrastructures are vital assets whose management and maintenance should not be compromised. Repetitive and unexpected maintenance demands are bound to arise (Sarja, 2002), it is, therefore, necessary for every government institutions to proactively develop and implement a facilities Management plan to deal with these demands. Facilities management has been defined as ‘an integrated approach to maintaining, improving and adapting the buildings of an organization in order to create an environment that strongly supports the primary objectives of that organization' (Barrett & Baldry, 2003: xiii). Facility management is, therefore, a crucial segment of the general management functions of an organization that creates a safe and habitable atmosphere for the success of the institution (Jusoff et al., 2008).
The Facility Management principles have been gaining increasing recognition for the important role it plays to create cost financial savings and efficiency of the infrastructure. It deals with the upkeep management of the physical assets and incorporates the dominant services necessary for effective usage [Lavy et. al 2010]. Effective facility management can enlarge the lucrative lives of the buildings concerned and furnish security for the lives of the inhabitants of such buildings (Kamarazaly, 2014).
According to Wireman (1990), maintenance management can be defined as an incorporation of all technical, administrative and managerial actions during the life cycle of an item, intended to retain it to, a nation in which it can execute the required function. Maintenance management, therefore, plays a vibrant role to determine the success of maintenance work

carried out in public infrastructures. In fact, to ensure the effectiveness of maintenance, it is imperative to have sound management applied to execute the maintenance work. This, therefore, requires effective management leaders to champion this policy.

Maintenance management is a dynamic process, in the sense that the strategy and policies are frequently revised to ensure that it is in accordance with the overall objective (Coetzee, 1999) Therefore, project managers should be well equipped to put an effort for improvements to achieve its objectives in order to make sure its infrastructure facilities are in good condition.

It is the prime responsibility of the project manager to ensure that the public infrastructures remain in a good condition. The project manager's normally hiring or employed skilled labor like plumbers and technicians for solving issues like leaking faucets and electrical problems. They also look into the regular maintenance work as the cleaning of the common areas of the buildings and regular upkeep of the externals like the gardens and parks. It's, therefore, the duty of the project manager to adopt a type of maintenance activities that can help the organization to achieve its overall goal. Adequate investment in asset management would prolong the service life, avoid maintenance and reconstruction costs, and reduce risks associated with service disruptions (Canadian Infrastructure Report Card, 2016).

Even though these management practices are very helpful, they do not come easy. Project managers must overcome variable and enormous hurdles; some of which have been elucidated below. Kamarazaly et al. (2013) revealed that insufficient funding and technical expertise is the greatest hindrances attributing to poor facility management among public institutions. They were of the view that, even if there is a designated facility manager with scanty funds to commence timely response to facility management demands, poor maintenance and poor facility outlook is to be expected.

Kaiser (2004) in his survey revealed that lack of facility managers with requisite knowledge and skills in handling buildings and special facilities contributes to poor facility management. This is quite related in the Ghanaian situation because the institutions that train property professionals are few**.** As a general rule, a couple of experts are utilized by the private sectors and thus, fewer experts would be accessible for work as semi-office directors in the somewhat numerous open establishments. The nonattendance of prepared neighborhood ability to auspicious reactions to the poor condition of repairs is viewed as a noteworthy purpose behind poor facility administration**.**

3. Methodology

The research is a quantitative approach to critically assess the maintenance management practices of the traditional public stadia in Ghana. In this study, the sample comprises a manager's maintenance, director of stadium operations, equipment managers from the selected stadia in Ghana. The respondent was randomly selected from the four traditional stadia.

Structured survey questionnaires were utilized to assisting the collection of information from the targeted respondents. The questionnaires on the study were tested before it was administered. (Idolor, 2010). With this, professionals and expect stadium management evaluated the questionnaires for quality assurance of the significant measurement of the objectives of the study, thus irrelevant items were dismissed before it was administered.

The questionnaire is made up of 45 questions which were divided into three sections. Section A consist of the profile of the Respondent (5), sections two contains 15 questions to the respondent on the current state of the public stadia, the third Section contains 15 questions concerning the causes and effects of poor maintenance practices of the public stadia and finally, the last section contains the effective maintenance management practices stadia in Ghana. A four-point Likert scale ranging from "1" (Strongly agree) to range "4" (Strongly disagree) was used on the effective maintenance management practices. A total of two hundred (200) questionnaires was distributed to the sampled stadia from which one hundred and fifty (150) were returned. The distributing was done through hand delivery, by email and the personal collection

3.1 Study Participant

The participant for the study is made of 60 respondent from the selected sports stadia in Ghana. With the usage responses of the 60, approximately 50 percent were had through hand delivery which was sent to Field workers in Ghana which the rest were obtained from emails.

Sixty-four of the respondents are males, and the remaining thirty-six percent are females. Fifty-five percent of the respondents hold of bachelor's degree, twenty- four of them hold professional certificates and twenty percent of them have a higher national diploma (HND). However, thirty percent of the respondent have more than five years working experience, twenty percent of the respondents have less than six years working experience, and finally, twenty percent of the respondents have more than sixteen years working experience. Summary of these findings are shown below in table 1

Table 1. Respondent demographic profile

Description		Percentages	Number
Gender	Male	64	45
	Female	35	25
Age Group	< 30 years	29	20
	31-40 years	50	35
	41-60years	7	5
Edu. Qualification	HND	20	14
	Bachelors	55	39
	Professional Certification	24	17
Year of Employment	< 5 years	20	14
	6-10 years	30	21
	11-15 years	30	21
	> 16years	20	14

3.2 Results and Findings

The current state of the stadia

Based on the questionnaire distributed to the targeted sample. Respondent was asked on their perception of the current states of the stadiums: pitches, stands, roofing, dressing room, scoreboard, toilet, technical area, Roads leading to the stadium, flood light and Media stands on Likert scale 1(not very bad) to Likert scale 4 (very bad). Besides, respondents were asked on the causes and effects of poor maintenance practices on the various stadia.

Table 2. Current state of the four stadia

State	Number	Percentages	Mean	Standard Deviation
Pitches	4	80	4.2 (2)	1.38
Stands	12	79	3.8 (4)	0.58
Dressing room	8	78	3.9 (3)	0.78
Score board	4	75	2.7 (9)	1.62
Toilet	20	70	2.5(10)	2.02
Technical Area	8	70	2.9 (8)	1.22
Roads to the stadium	8	67	3.5 (6)	0.02
Flood light	8	65	4.5 (1)	1.98
Roofing	4	62	3.4 (7)	0.22
Media stands	4	58	3.7 (5)	0.38

Table 2 shows that floodlight of the various stadia is in the very bad state which accounted for the highest mean rating (mean X= 4.5) according to the respondent. It is followed by the stadia pitches with a mean of (mean X= 4.2), a dressing room with a mean (X= 3.9), Stands with a mean of (X= 3.8) respectively. The least was the scoreboard with a mean rating of (X=3.4). The current state in the selected stadia in Ghana is very appalling and this happens when officials responsible for that wield much power but with less maintenance control. Empirically from the data obtained, none of the various stadia has a maintenance department.

The management of the stadia is weak and unproductive because of their huge assignment of ticketing. Therefore, less attention is heed to the maintenance of the various flood light. Thus, making them white elephant and causing the government huge sums of money for a replacement. Presently, the state of the stadia pitches is in the very bad state. This stem from the fact of poor expertise in the management of the pitches.

Table 3. Causes of poor maintenance practices

Factor	SA	Ag	Ud	Dg	Sdg.	Mean	SD
Stadium design and construction	15	24	9	2	-	4.41	1.23
Bad Workmanship	45	31	8	4	1	4.31	1.02
utilization of Substandard Materials	55	25	7	2	2	4.4	1.21
Response time to maintenance	57	29	13	4	1	4.56	1.58
Lack of routine Inspection	45	33	7	5	3	4.49	1.416
Natural Cause	24	27	6	4	4	4.21	.828
Budget Restrictions	31	26	5	-	-	3.45	.022
Conflict of Interest	23	31	10	1	-	3.93	.396

The table illustrated above shows the main causes of poor maintenance management practices in the surveyed stadia. According to the respondent, failing to response time to maintenance is a strong arsenal that causes poor maintenance management practices with the highest rating

of (mean 4.56). This comes behind lack of routine inspection (mean 4.49), stadium design and structure (mean 4.41) and utilization of unstandardized materials. The rest of the of the factors have below the mean rating of 4.4 but the least of as the causal factor of poor maintenance practices are the conflict of interest and Budget restrictions. However, the findings of the analysis shown all the causes of poor maintenance practices in stadia are at the acceptable level.

Table 4. Effects of Poor Maintenance Management Practices in Stadia

Factor	SA	Ag	Ud	Dg	Sdg.	Mean	SD
Outdated Sports Facilities	46	34	5	2	-	4.33	1.211
Non- functional Equipment	53	28	5	2	-	4.44	1.461
Facilities function below standard	47	25	8	3	2	4.27	1.082
Part of the facilities become the death trap	42	29	5	4	1	4.12	0.792
Huge Spending by the State	51	33	3	4	1	4.3	1.144
Negative Effects on the health of the Spectators	51	27	4	3	2	4.21	0.96
Further Deterioration	31	26	5	-		3.45	0.048

From the table (IV), the findings reveal the effects of poor maintenance practices by the management of the stadia. The result shows that non- functional facilities in the stadia were ranked with the highest rating with a mean score of 4.44. This is followed by outdated sports facilities with a mean score of 4.33, huge spending by the government (mean 4.3), but the least of the effects of management failing to practice maintenance management is further Deterioration with a mean rating of (mean 3.45). Non- functional facilities imply that poor maintenance of stadia results in facilities non- function. Management failing to practice maintenance management on the various stadia makes the sports facilities out of date thus functions below the standard which in a way have negative effects on the health of spectators.

4. Conclusion

The study assessed the maintenance practices of the traditional public stadia in Ghana: Kumasi Sports stadium, Accra sports stadium, Tamale and Sekondi Takoradi stadium. The paper also investigated the current state of the stadia, the main causes and effects of poor maintenance management of the surveyed stadia. The findings show that failing to respond on time, routine inspection, stadium design and structure and utilization of unstandardized material were perceived by respondent as the main causes of poor maintenance practices. However, the results further reveal that non- functional facilities, outdated sports facilities, huge spending by the state and facilities functioning below standard were rated as the effects of management failing to practice maintenance management. Besides, the greatest effects concerning poor maintenance culture on the full utilization of the stadia are non- functionality of the facilities in the stadia. The results clearly indicate that the grievances are mainly man-made.

With this, professional property, equipment, management, and all stakeholders should utilize their managerial skills and completely eradicate the poor maintenance practices in the properties of the stadia.

Recently, poor maintenance practice in stadia in Ghana has increased collapsing most stadia and causing the financial loss to the state. Therefore, awareness has to be created among singles principally on stadium managers, maintenance managers, equipment officer and largely on the national sports council on that activity that can materialize poor maintenance, thus the effects of it on the stadia and the activities performed in respect of maintenance. The study has a practical impact for stadium managers, maintenance managers, equipment officer and the National Sports Council on the key activities in respect of maintenance management as well as the activities not utilized.

Therefore, the study would recommend for stadium managers, maintenance managers, equipment officer and the National Sports Council on the key activities in esteem of best maintenance management practices by delineation up maintenance programme which surround all aspect of maintenance: establishing schedule of routine inspection, instating schedule of work, supervision of maintenance work, and preparation of schedule of dilapidation. (Olayonwa (2000).

5. Recommendations

The melancholy of poor maintenance culture is not only restricted to public stadia in Ghana. Most of both public and private infrastructural facilities in the Ghanaian community are striving the same fortune. There should be a transformation towards infrastructural maintenance in Ghana. The national sports council (NSP) should organize seminars directed at sensitizing Ghanaians, stadium managers, maintenance officers, and property officers on the negative effects of poor maintenance practices. It should be a diversified seminar so that all professionals engaged in the maintenance of stadia facilities should be well trained and properly supervised by authorized bodies to ensure that they obey their non-manual ethics.

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