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Assessment of Infrastructure Maintenance Practices As They Influence Sustainable Development of Akwa Ibom State

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Abstract: This paper evaluated infrastructure maintenance practices in Akwa Ibom State with a view to ascertaining how they influence sustainable development. One of the immediate reasons for the study was the observed neglect of infrastructure across the state. Descriptive and analytical methods were adopted in the study. It was found out that, yes, public infrastructure maintenance practices had deflected from best practices. Nonetheless, the reinvigorated AKROIMA is leaving no stone unturned with maintenance of public infrastructure in Akwa Ibom State. The paper recommended among others a system of charging maintenance token from industries and firms for roads maintenance.

Keywords: **Road Maintenance, Akwa Ibom State, AKROIMA, SustainableDevelopment, Infrastructure**

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I. INTRODUCTION

In the field of industrial psychology, it is a given knowledge that the content of a person can largely be deduced by his carriage. In a similar vein, the worth of a city can be gleaned by it landmarks. Little wonder cities like New York with it Statute of Liberty, Paris with its Eiffel Tower, London with its Stanford Bridge continue to welcome millions of visitors for business and pleasure annually. Yet, these iconic infrastructures of the iconic cities were constructed centuries ago but continue to be very attractive today because of effective maintenance. Maintenance begins with man himself. For man to live a functional life, he daily takes care of himself by bathing, brushing his teeth, expelling wastes, eating, drinking, exercising etc. The same is true of household appliances, automobiles, buildings, roads, offices, ports, and so on. Maintenance and repair are so critical to development such that as one budgets to build or acquire a machine, he should also, ordinarily provide funds for maintenance and repair. And it is not just enough to provide funds for maintenance and repair, it has to be carried out in a timely fashion. It should be acknowledged that breakdown of a system is not always necessarily a function of neglect. The concept of entropy in thermodynamics teaches us that there is a tendency for breakdown due to universal entropy i.e. things breakdown with time. Nonetheless, much of the breakdowns in Nigeria are not due to universal entropy but neglect. That's why the United Nations Industrial Development Organization's Report on Maintenance and Repairs in Developing Countries indicated that "one of the strongest factors responsible for poor utilization of machines, equipment and infrastructure was the poor maintenance of these physical facilities". It added that "improving maintenance culture in developing nations would be one of the most important and effective methods of stimulating development" (World Bank, 2015).

Of course, maintenance culture isn't inherent in man. Man has to discipline himself to cultivate it in view of the myriads of benefits thereto. For one thing, a culture of maintenance is a cost savings strategy. Also, effective maintenance promote safety and development beside longevity and esthetics of the subjects in question. Conversely, a reactionary approach to maintenance and repair result in high penalty costs. Such costs may include financial, material, time, and lives or all of these.

In the light of the above, Akwa Ibom State Government has a responsibility to promote effective maintenance culture. The State has especially since the return to democracy in 1999 invested huge sums in development. There are state of the art infrastructure and cutting edge facilities owned by government. These include roads, bridges, buildings, stadia, airport, street lightings, equipment etc. Optimum benefit from these investments can come only if the facilities are kept in good maintenance and repair. Experts from different fields must be on ground to carry out planned maintenance. That is how such development can be sustainable.

Sustainable development is that development that meets the needs of the present without compromising the ability of future generations to meet their own needs (UNO, 1992). Sustainable development is about integration; developing in a way that benefits the widest possible range of sectors, across borders and even between generations. In other words, every man's action should take into account potential impact on society, the environment and the economy, while keeping in mind impact on future generations. Our environment is fragile and must be handled with care. Infrastructure is fragile and must be maintained otherwise, they are lost.

One then wonders, are Akwaibomites maintenance conscious? Is the Akwa Ibom State Government doing enough to maintain her investments? To what extent does effective maintenance culture an effort at sustainable development?

II. LITERATURE REVIEW

Daily, almost all our journeys begin and end on a local road. Roads keep thepopulation connected and the economyflowing. That is perhaps why next to national security, the public believes that improving the condition of roads is a national priority. Roads are a major national asset that represents the wealth of all nations. They are central to every country's economic growth, development and poverty reduction initiatives, and can potentially deliver a wide range of economic and social benefits to all sectors of the economy –health, education, tourism, agriculture, rural and urban development, etc. Without sound and well maintained road infrastructure, physical access to resources and markets suffer, growth stagnates and countries can fall into economic decline (Pinard and Newport, 2016). Smart thinking holds that road construction is great but its maintenance is cool. So, how should maintenance be understood?

Maintenance as a concept is a combination of both technical and administrative actions to keep facilities and equipment in a state which can perform expected functions effectively. In a similar vein, the Chartered Institute of Building (CIOB)(2010) defines maintenance as work undertaken in order to keep, restore, or improve every facility i.e. every part of a building, its services and surrounds, to an agreed standard determined by the balance between the need and available resources.

Maintenance culture on the other hand, is the attitude, disposition and love for keeping facilities in effective condition at all times. It involves the discipline to study and know how an investment ought to be sustained and actually follow through on this regularly. As noted by Bolaji and Adejuyibe (2012) maintenance culture focuses on the design and implementation of a technical procedure that supports prevention or correction of premature failure of engineering systems with least cost and time without compromising the performance and safety parameters.

Attitude to Maintenance

Maintenance has been classified as follows: inspection, breakdown routine, planned, preventive, predictive, corrective,design out maintenance, total productive maintenance and contracted out maintenance (Westerkamp, 2009).The type of maintenance that can be employed by any industry depends on the maintenance objectives of thatindustry. Also, the specific and operational objectives of maintenance are determined by the nature of theorganization's business. Therefore, in order to ensure effectiveness, the objectives of maintenance must beclearly defined to be understood by all stakeholders in the organization. Maintenance is primarily:

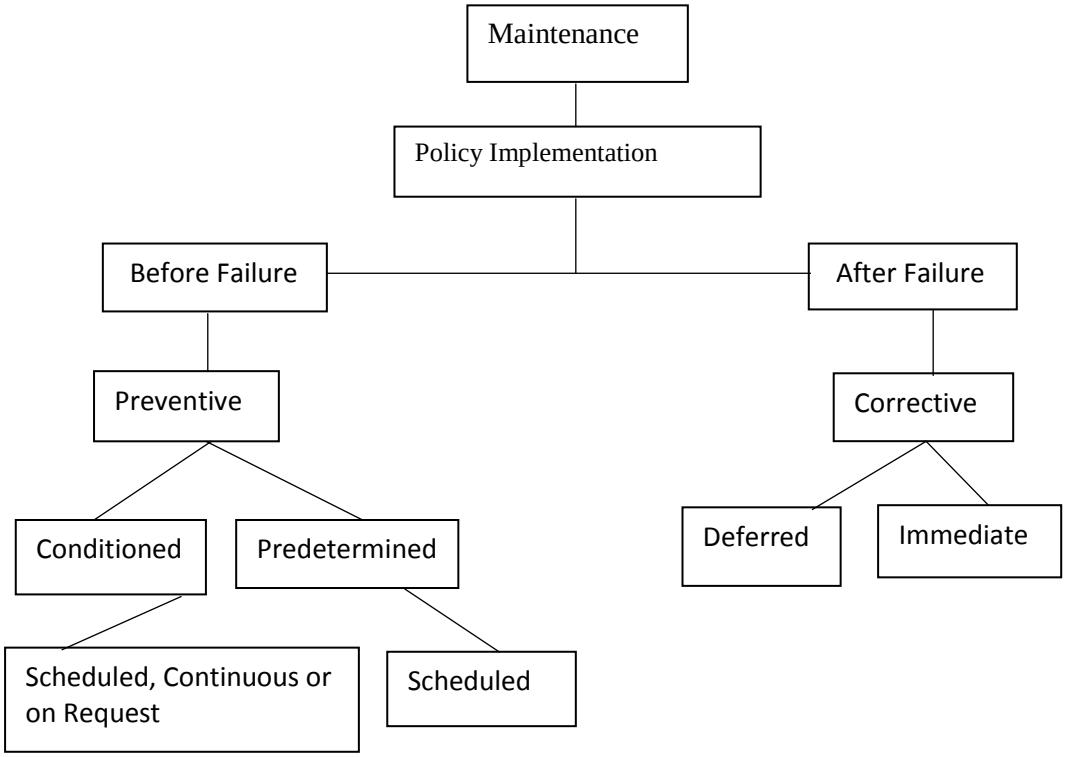
- To sustain equipment and facilities as designed, in a safe, effective operating condition;
- To ensure production targets are met economically and on time;
- To prevent unexpected breakdown of machinery and equipment
- To continue to yield expected return on investment
- To extend the useful life of equipment; and
- To ensure the safety of personnel using the system.

People say that attitude is slow to develop but *very slow* to change. An empirical assessment of our attitude shows that citizens tend to neglect routine maintenance. To be sure, part of the daily struggles at the Ministry of TransportUyo,is the regular evacuation of breakdown and accidented vehicles on the roads. And for what reasons have these vehicles down on the roads? Often, basic routine maintenance and safety checks were neglected leading to breakdown and accident. This negative attitude of individuals is carried into business, public work and even the church. Is it surprising why so many houses are collapsing in Nigeria? Expert say that apart from the use of substandard materials, the next single contributor to collapse houses in Nigeria is that landlords and tenants fail to carry out needed checks and repairs on the roof, walls, foundations etc. This attitude of neglect is seen among some charged with managing public facilities.

In recognition of the need to educate and build good attitude among the generality of citizens in Akwa Ibom State, Government established the Ethical and Attitudinal Re-Orientation Commission. Part of what that Commission is doing is to tackle poor attitude to work in Akwa Ibom State. And I believe that negligent of work, delayed work, or compromised work are part of poor attitudes that cost us money and delayed progress.

Types of Maintenance

Approach to maintenance vary depending on condition and application contents. But broadly, there are two types- corrective and preventive maintenance.



Maintenance Classification
Adapted from Enofe, (2009: 24)

Preventive Maintenance: Preventive maintenance suggests predetermined or scheduled intervalchecks intended to reduce the probability of failure or degradation of the functioning of an item. In Wireman's(2000) view,preventive maintenance is any planned maintenance activity designed to improve equipment life and avoid any unplanned/unscheduled maintenance activities. In other words, it is a systematic approach to a regular inspection carried out at a pre-determined interval or in accordance to prescribed criterion, intended to reduce of preferably eliminate probability of failure or performance of degradation of an item/equipment. The objective of preventive maintenance is to reduce the number of failures and their financial expenditure by performing maintenance at a predetermined point of times without considering the component/equipment condition. Preventive maintenance involves inspection, testing, repairing and replacement of equipment before failure occurs, and is in most cases applied to complex system in order to avoid operational failure especially when the failures consequences are critical, with regards to environment, economy or safety (Alsyouf, 2004).

Preventive maintenance templet for buildings may include the items listed on table 1.1.

Table 1.1 Maintenance /Safety Checklist for Simple Facility

Task	Task Description	Jan-March	Apr-June	Concerns? Yes	No
Building					
Roof	Check for leaks and water damage. Check condition of each				
Exterior	Check for cracks greater than 2mm.				
Structural	Check that columns and beams are free of cracks				
Interior	Check for water damage, walls, ceilings, floors etc				
Housekeeping	Unused items are disposed				

Doors/Windows	Check their operation, appearance and safety				
Mechanical					
Plumbing	Check operation of taps, toilets, flush valves etc				
AC	Clean the filters				
Fire Extinguishers	Check functionality and expiry date				
Civil					
Drains	Check that there is no ponding				
Fence	Check general condition. Check gate hinges, locks etc				
Manholes	Ensure access to roof eyes, manholes, water meters is clear				
Electrical					
Distribution Panels	Check that the circuit breakers work correctly				
Lights	Check the condition and rectify appropriately				
Equipment					
Sound Equipment	Check operation, condition, connections				
Generator	Operate and check functionality as per load capacity				
Video equipment	Check operation and connection				
Technical					
Alarm System	Operate. Check door contacts and motion sensor				
Safety					
Flammable Liquids	Should be stored away from main building				
Clean Compound	Is clean and hazardous materials stored away from kids				
Slip/Trip/Fall Prevention	Check anti-slip surfaces, handrails, holes etc				

Infrastructure maintenance is a regular feature of workplace. It is a daily exercise. However, the templet in table 1.1 is use for a thorough quarterly checks.

Corrective Maintenance: This is also known as breakdown maintenance.It is the kind of maintenance carried out after a failure has occurred, and it is intended to restore an item to a state in which it can perform its required function.As noted byChiang, Russell and Braatz(2001), corrective maintenance may consist of maintenance activity which includes repair, restoration or replacement of component that has undergone failure or that has totally broken down. True, it may be a challenge to detect problems that are beginning to develop, before they lead to total failure and to correct the faults at the lowest possible cost. Corrective maintenance is expensive and increases production downtime as well as risk of secondary failures.

Maintenance Efforts in Akwa Ibom State

In the past, government had a reactionary or ad hoc arrangement towards maintenance of public utilities. There was usually this spirited effort to fix roads, street lightings, repainting of public buildings etc, during national events or the visit of a national political figure. And since such maintenance or repair were usually hurried, they also, usually hurriedly dissipated. Public funds spent on such frantic and enthusiastic maintenance, often amounted to waste as conditions returned to status quo or worsened shortly after.

To arrest such trend, Government in 2009 created and equipped the Akwa Ibom State Roads and Other Infrastructure Agency (AKROIMA). Interestingly, much could not be achieved as envisaged.

The situation is different today. Governor Udom Emmanuel has since breathed life into AKROIMA. Government has prioritized maintenance as never before. Through the commitment of Government, Board, Management and Staff, AKROIMA has ventured into the nooks and crannies of Akwa Ibom State to maintain and repair roads and other infrastructure. It is said that charity begins at home. In that wise, AKROIMA has refurbished the machines and equipment at her disposal and put same to optimum use.It also takes the safety and

maintenance of all herfacilities seriously. That may explain partly why timely intervention on facilities continue to put Akwa Ibom State in the search light of businesses and destinations in Africa.

Challenges to Infrastructure Maintenance in Akwa Ibom State

Here, we attempt to highlight some of the issues confronting maintenance culture in Akwa Ibom State. They include but not limited to:

1. Attitude: Attitude is everything. Effective infrastructure maintenance or lack of it, begins, is driven and sustained by human attitude. Attitude itself is a complex subject, but generally relates to a person's mental state involving beliefs, values, feelings and disposition to act in a particular way. So, whether maintenance will be carried out or neglected is largely tied up to the actor's attitude towards it. Attitude drives the actor to be dispatch or sluggish, prudent or lavish, thorough or haphazard, consistent or reactive. Most Akwaibomites tend to show negative attitude towards maintenance. Evidences abound to justify this position. For one thing, those who sweep the roads, sweep into the gutters. Households though wastes into gutters as well. In time, the drains get filled up with sand and refuse. Rain water that suppose to run in the gutter now flows into houses because the drains are filled up with sand and refuse. What an avoidable problem!

2. Procrastination: Procrastination is said to be a theft of time. Often, both government and individuals delay effecting maintenance because in their minds, the work is not urgent yet. There is the fire brigade approach to things in Nigeria. yes, they may reason that a week or a month's delay will not destroy the subject of maintenance. And truly the machine does not breakdown, the building does not collapse and the road does not cave in within a month into due maintenance date. The individual is emboldened to ignore due maintenance. Meanwhile, Nkrumah, Stephen, Takyi and Anaba (2017) note that maintenance practices are often carried out to restore the operationalstate of an asset at a reduced cost in order to enhance the life span ofthe asset. Procrastination is therefore a loss to the organization. That delayed maintenance will increase cost of replacement shortly.

3. Funds: Maintenance requires funds. Lack of or delayed release of funds impairs timely maintenance. Mkilania (2016: 146) holds that "maintenance budget have not been integrated to meet maintenance demands as well as business objectives. They have been a trend of interfering maintenance budget when money is required for other unbudgeted activities." In Akwa Ibom State, AKROIMA, has struggled with funds. AKROIMA's Chairman, Dr. Godwin NtukUdeh told the researcher that they have almost specific irregular release of funds for maintenance. Government releases are irregular, yet, the delayed release is not based on budget, but the discretion of the Governor of the State.

Impact of Infrastructure Maintenance on Sustainable Developmentin Akwa Ibom State

Sustainable development as a concept is not new. However, it has gained leap jump in literature since the UN replaced the Millennium Development Goals (MDGs) with Sustainable Development Goals (SDGs). From the UN's view point, sustainable development embraces the so-called triple bottom line approach to human wellbeing: economic development, environmental sustain ability, and social inclusion (Sachs, 2016). Certainly, as yet, no consensus regarding the tradeoffs and synergies across the economic, environmental, and social objectives has been agreed by experts. Still, a shared focus on economic, environmental, and social goals is a hallmarkof sustainable development and represents a broad consensus on which the world can build.

From that vantage point, one easily appreciates the central role of effective utilization of government hard earned income for the common good of all. That means government funds is scarce and always have alternative use. Therefore, any investment of government has to be accompanied with maintenance strategy to optimize and leverage on the funds. One of the public facilities that meet inexhaustibility and non-excludability parameters is road. Roads provide access, linking investments to destinations. Roads make it easier for farm produce to reach markets on time. Everyone on the agric value chain benefits: the farmer, bulk traders, transporters and consumers. As such government is able to pick needed taxes from these ventures. To keep the roads in good maintenance and repair is therefore a necessity. That's why AKROIMA devotes bulk of her votes to road maintenance and repair because of its high premium and utility. For instance, AKROIMA have intervened internal roads in Uyo metropolis regularly, making the capital city almost potholes free. It has made major intervention along Oron road, Okobo, Ikot Udo, Mbiabong, Etinan and construction of UNIUYO filling station access road etc.

Moving forward, sustainable development of Akwa Ibom State means venturing into new investments while maintaining the existing ones. The nexus between these two is locked, safe and eternal. That is why learning cities like Johannesburg, Brussels,Helsinki etc do not wait for maintenance votes from government but receives marginal % of profits from firms in the city for maintenance and upkeep. That's why there is a ready poll of funds for city maintenance, repairs and services.Of course, the law establishing AKROIMA grants it leverage to raise funds to fix infrastructure. But since people are averse to tax, the agency is understudying the

temperature of the industry to know how best to approach it. But in the meantime, government continues to fund the operations of the agency to the delight of the people.

III. CONCLUSION

Government represents not only today's generation, but also those to come. To that end, governance should be as close to the people as functionally as possible, giving individuals and businesses the platform to operate. Government therefore serves by providing the tangible and the intangible enablers for people and businesses to thrive. In the context of this paper, maintaining infrastructure of State is a key ingredient of sustainable development. Contextually, infrastructure is sustainable if it is kept in good maintenance and repair. True, maintenance is expensive and the scale of work is massive, but where there is the will there is the way. AKROIMA's strategic underwriting is simple "give a penny we work a shilling". Government, must not neglect the maintenance of existing facilities for the construction of new once despite the trappings. AKROIMA on it part must activate the rental provision in its establishment Act. Smart road users understand that maintenance is key to longevity of roads and will endeavor to pay maintenance rate especially if it is kept pocket friendly. One perhaps easy way of collecting maintenance rate is to attach it to the yearly particulars renewal.

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