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The Phenomenon of Building Maintenance Culture: Need for Enabling Systems

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Abstract

This article is based on experience through practice and training, augmented by a literature review on the phenomenon of building maintenance generally, and with reference to the Kenyan case where maintenance of buildings especially in the public sector has attained a crisis. The overarching objective is to delve into the nature of the maintenance problem, issues entailed and how they can be tackled in a structured system so as to somewhat resolve the crisis of poor, or lack of, maintenance which renders building unsightly and unattractive.

Keywords: Building maintenance, Legislation for maintenance, Professional practice, Business community, Training institutions, public media.

Introduction

Building stock is part of a nation's wealth, and its quality and condition reflects not only on the prosperity of the nation but also the social values attached to it. As the building stock ages, it is pertinent that an adequate level of maintenance be sustained to ensure the economic value of the buildings.

The proper maintenance of buildings is an important program for sustainable development, and plays a major role towards national prosperity and a healthy environment (Zulkarnain *et al*,: 2011). This is, in addition to the production of new buildings, a key role for the building industry. The World Commission on Environment and Development (WCED) in the report 'Our Common Future' (WCED: 1987) defines 'sustainable development as follows:

Sustainable Development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

Maintenance forms a critical part in the involvement of the building industry in creating a sustainable environment. This issue is now widely recognized as demonstrated from the conclusions and recommendations of the UNIDO organized "First Consultation on the Construction Industry" held in Tunisia in May 1993. In a key part of the conclusions, the gathering observed that:

"Generally, maintenance and rehabilitation of buildings and infrastructures are neglected aspects of construction activities in developing countries. Governments should set up policy guidelines for integration maintenance and rehabilitation in cost analysis, estimating and contracting for new works. Steps should also be taken for adequate maintenance of existing housing stocks, service networks and other infrastructures."

Thus the maintenance of building and infrastructure is seen as a matter requiring the attention of not just the industry but policy makers at high government levels.

The connection of a healthy living environment with proper social values has been made by several scholars and underlines the importance of maintaining a sustaining culture that continuously awakens society to the need for attention in keeping the resources represented by building. It is therefore clear that the maintenance of buildings ought to be a vigorous exercise within the industry and society in general. The objective goals can be spelt out as follows, to:

- reduce the total cost of building operation
- preserve invested value during the expected lifetime
- maintain the useful qualities of the building at a level chosen beforehand
- preserve the aesthetic qualities of the building at a level chosen before
- maintain the necessary safety and sanitary level
- ensure continued adherence to the building regulations

We can from here move on to the observation that buildings will always need to be maintained. As soon as a facility is built, it begins to decay. This downward curve is a natural trend that can only be reversed by human intervention-which may range from the minor and continuous process of maintenance to major rehabilitation and renovation (Lozano: 1990). This is because despite the evidence of Egypt and ancient Greece, buildings do wear and tear. Materials deteriorate with time and a need arises to recoup the fading glory.

The perception by the community of the place of maintenance is related to several other factors. In modern city living, this matter cannot be divorced from the alienation from nature that tends to be a natural consequence. Open space which constitute a good portion of the public domain, and which underlines the urban fabric as a shared habitat, may be seen as no more than wasted opportunity to develop and make money. Poor maintenance in the urban context may be related to the weak sense of community and therefore weak commitment t the quality of the shared living environment. Moreover in our environment exposure to dust, rain and other elements of the weather have proved to be complicating factors in the well-being of buildings. Architecture contributes to the physical environment primarily through its aesthetical quality and it is from here that the first signals of a crisis usually emanate.

The Crisis of Building Maintenance in Kenya

Building maintenance in Kenya has not received much attention in the past as the emphasis is on the development

of new buildings (Coetzee: 1999). This is also echoed by other researchers, (see Yiu:2008; Lateef:2008 and Wood:2003) who observe that there is apparent lack of maintenance culture, and that focus has solely been on the construction of new buildings and pretty much total neglect of maintenance which commences immediately the builder leaves site. This practice therefore, makes a compelling case for studying the various factors affecting building maintenance with a view to recommending enabling systems as a solution to the identified problem.

Just like it has been observed by other researchers on the phenomenon of building maintenance (Waziri, et al;: 2013), a crisis looms in Kenya due to non-maintenance of building stocks. Built forms consisted of buildings and other infrastructural development are running down and losing their utility value due to lack of maintenance. This matter, though incessantly highlighted especially by the press dailies, does not seem to have captured the attention of policy makers and others relevant parties entrusted with the custody and use of the existing building stock.

Numerous factors affecting building maintenance have been revealed by an avalanche of studies. Assaf, for instance (Assaf: 1996), posits the argument that design and construction faults that affect maintenance of buildings are defects in both civil and architectural design, workmanship, materials, finishes and lack of a maintenance regime. Whatever factors that may be identified as a factor affecting building maintenance, the overarching single-most problem is the lack of a maintenance culture, as evidenced by lack of upkeep and repair.

Granted, our responses in design have been influenced heavily by borrowing blindly, without any guiding standards with regard to specifications of materials and finishes, from other so-called 'developed cultures'. This importation of solutions wholesale from other lands that have different climatic conditions will always prove inadequate despite what the facades may show. Besides, the cultures we are borrowing from may have a strongly grounded maintenance culture which we do not have. Many of our design solutions have been accepted in this environment uncritically and have over time been proven to be environmentally unfit.

Many examples abound on the design borrowings. Firstly is the case of flat roofs that were in vogue during the decades of seventies and eighties, which have posed major flaws due to cracks and leakages.

Secondly, conflicts relating to the differences in our climate and rainfall patterns require that our design elements often look at things from first principles rather than adopting other people's solutions. The pull towards aesthetic glamour can and does have its pitfalls. The practicalities of building must always seek to put the shelter aspect first, shelter from rain, from cold and other vagaries of the weather. It is when that fundamental goal of architecture is sacrificed for secondary issues that the sustainability of the work comes into question. Architecture that even briefly abrogates the essential aim of providing shelter will find itself unable to last for long.

Today, fashion seems to have led us toward the glass tower as an acceptable, indeed desirable, city form. The shortcomings of this new architecture can be felt by all who work in these new buildings and also by those who will be exposed to the glare and reflections that emanate from them. It is an architecture that runs counter to common sense and which in time shall be rendered and declared obsolete. To try and sustain comfortable working environments in these buildings will take more money than is affordable and without absorbing the body of the resultant strain.

A third reason therefore is indicated by the lack of rigorous examination of our environment as a prelude to the formulation of design response in our buildings. There is no momentum in the creation of responses in choice of materials, design of the building fabric, clarification of aesthetic appropriateness that recognizes the differences in our environment. This observation must be underlined by the further observation that building stock cannot be expected to deliver if in the first place it was inappropriate for the context it was placed in.

Coupled with this is the allocation of resources that would go toward rectifying the situation. Budgetary allocations for maintenance have been easy casualties in an era of austerity measures. It has to be expected that sooner or later a buildings will require major maintenance and that all the time the building fabric and services are in use, continuous maintenance attention is required and therefore expenditure. It is necessary that owners and managers begin to recognize the proper place of maintenance in their resource allocation and to respond positively. It does not look like a commonly held realisation that buildings will occasionally demand a coat of paint.

Underlying all this is the dearth of acceptance of the need to maintain. The information base that needs to be available and fully disseminated does not exist. The common building owner does not always appreciate the fickle nature of the material we use. There is almost an expectation that once a building is put up it can and should serve forever. It seems that only people with the technical training will fully appreciate and thereby anticipate the necessary commitment to material after a lapse of time. Public education on this matter is lacking and with it the chance to build an attitude to the well being of the building stock without which we cannot expect to get over the crisis. We need to develop a maintenance ethic, a culture that recognizes the inherent need to maintain buildings.

This maintenance ethic is lacking in Kenya, and this can be demonstrated by the attitude taken by institutions in the political, economic and educational sectors where maintenance is at best a peripheral concern.

In the event, facilities are deteriorating at an alarming rate with the attendant consequences in the decline in value, decline in performance standards an when looked at from a broad sociological dimension, they become contributors to the decline of social mores. The state of affairs that prevails in the condition of facilities in the nation cannot fail to have an effect on the well being of the people. This view is supported by the various post-mortem studies on the so called 'Modern Movement' in architecture, which has been in vogue in pretty much all countries of the world for most of this century.

Building stock in a state of perpetual decline means that resources have to be devoted to reconstruction and that the prosperity represented in those investments declines.

The effect of poor, or non-existent, maintenance is mainly felt in the urban areas. One reason is the prevailing densities in urban areas which lead to intense usage of buildings and facilities, but also due to the structural and financial weakness that have hampered greatly the local authorities. To address broadly the issue of a sustainable living environment, it may require thorough reforms in the administration of local areas. It is an issue, however, that cannot be ignored in the rural areas where meager resources are committed to the provisions of shelter.

Several forums have addressed the crisis of maintenance of especially public buildings in Kenya, and an emergent observation is that need for creation of a tradition for maintaining our building facilities does exist and is real. The realization envisages a situation where a reliable system of organization ought to be in place so as to address the issue when the need arises and, to continuously monitor the state of our building stock. To do this, it is necessary to institute measures at an institutional level from where a culture may permeate down to the general populace. It is necessary that prominent examples of a new attitude be set. Some of the areas where these can be instituted are outlined below but a high degree of commitment needs to be exercised if any of it is going to be useful.

Legislation for Maintenance

The law, as regards maintenance, is at the moment highly deficient and is hardly able to address the issue. The one glaring area of deficiency is in the setting of standards that have to be maintained. It must be appreciated though that the formulation of standards is itself and involving task and can only be accomplished by a wide spectrum of professionals.

The lack of maintenance standards calls for action form professional and the building industry. Areas that require to be addressed include the process of maintenance which in itself must include a framework for monitoring. It needs to be stated clearly who will do the monitoring.

It is necessary to state unambiguously what kind of standards we intend to keep as a nation in our building stock. We should be able to formulate some kind of guidance on what our buildings ought to look like and at what point the value of the stock ought to be rehabilitated. By so doing we shall be asserting the national interest in the value of our building stock, but more important we shall be creating a gauge upon which we may see when action requires to be taken and what action that may be.

The creation of new assets is part of the economic activity. The decimation of what exists however may, in many situations be regarded as counter to that. It is necessary to examine the possibilities of preserving what exists through renovation or rehabilitation before the option of demolition is considered. At the moment this country lacks guidelines in this aspect and formulation of such may be a priority. Laws do exist that allow historically important buildings to be preserved, it may be about time to exercise vigilance in a broader way to oversee buildings that may have economic importance and which currently may be going to waste through the euphoria of redevelopment.

Professional Practice

Professionals in the design team have a big role to play in ensuring a tradition recognizing the centrality of maintenance. In current practice the normal professional service has been narrowed as to preclude certain services that they may be useful in prolonging the life of buildings.

One such area is the study of feasibility. It is necessary that before commitment is made in investment, certain fundamentals be established regarding the demand for the facility and 'life cycle' costing. Chapter 525 of the Laws of Kenya which regulates the practice of Architects and Quantity Surveyors describes feasibility study as a special service not expected in the normal services offered by the Architect. In a normal engagement therefore, an Architect is not required to get into a feasibility study unless the client expressly asks for it, for which there will be an extra charge. In recognition of the role of a feasibility study in the management of building stock, it may not be far-fetched to make it a mandatory requirement for buildings that are especially of appreciable sizes.

Secondly, it should be required that the designer give some guidance as to maintenance needs. In much the same manner as when one purchases an electronic device, the developer of a building facility ought to get a manual of maintenance indication what and when elements will need attention. It is not always appreciated that all elements in a building deteriorate over time, some faster than others. The various categories of maintenance need to be spelt out in the frequency required of them.

In the current setup, contract documents allow for a defects liability period of only six months within which defects in a new building can be made good. No provision is made, however, for longer periods of assessment and this may be contributing to the state of negligence that one perceives in the buildings in Kenya. The professional community should now look toward the creation of frameworks that ensure continued assessment o buildings to preserve their worth for longer periods. To do this, it is necessary that information about products be made available both to the designers who specify them and to the builders who implement the designs. Whereas it is possible to make visual judgment on certain elements, other parts of a building will be hidden and hence require more complex analysis that only expert knowledge will allow for accurate prediction as far as longevity is concerned.

Thus without a reliable system to predict longevity, any system of maintenance will find itself breaking down. Maintenance involves expenditure and this translates to forward planning and budgetary control. In this kind of situation good management will require to have a forewarning as to what areas may require allocations and to what magnitude. It is in this light that information about the performance of building elements would become useful in building the culture of maintenance. Such information should be provided by manufacturers of building materials and finishes that then should be confirmed by statutory bodies, such as the Kenya Bureau of Standards (KBS).

One could site as a matter of illustration the usage of building material. The durability of materials in varied circumstances of application is central to the subject of sustainable building. The study of this should be an ongoing concern and sufficiently important to justify a fully fledged research institute on the lines of similar centre in agriculture and medicine. The recent creation within the University of Nairobi of a Housing and Building Research Institute is a step in the right direction and all those involved in the building industry must support and help to develop this institute. Among their major concerns must be an attempt to fill the gap on information regarding materials both in the popular use and in high technology.

The generation of information regarding the durability of materials and building elements is a key factor in the strategies that will keep buildings longer on the market. This information is however not always forthcoming and in the cases where a manufacturer provides it, the marketing slant sometimes gets the better of them. It is necessary to verify

this through an independent body which of course is not available in Kenya today. Beyond that Research into longevity should be given the seriousness befitting the critical wealth of the nation that buildings are.

The practice of maintenance of building brings to focus the critical position of the contractor. In maintenance the contractor tends to deal more directly with the client, and the contractor's advice is sought and taken seriously. But the place of the contractor during the design stage has never been recognized as anything more than a functionally who takes and implements decisions may be others. And yet, this is a key player in the creation of architecture and through his involvement amasses considerable experience which can be drawn upon to influence better design. The contractor as a full member of the design team is probably an overdue arrangement. Granted that it would involve major changes in current arrangements, it is an occasion that would contribute toward higher standards of building and thus longer life in them.

Business Community

In recognition of the fact raised earlier that building stock is part of a nation's wealth, the business fraternity must be ready to evolve and support structures that enable continuous maintenance. This argument must be seen in the context of the essential goal of the business community who would be concerned with the loss of invested value especially in property. The creation of such structures is in the best interest of the business community. These structures could take the form of incentives in various ways. The creations of incentives would be a prime mover in the effort to inculcate a maintenance ethic. In this regard, it would serve the role of a trigger rather than a reward.

Such incentives can be in the form of financial arrangements that for example qualify you to some funds after some time to be used for maintenance of a building. Such an arrangement can be worked out to form part of the agreements that facilitate mortgage financing or they could be maturing insurance arrangements. This would be one way of coping with the budgetary shortfalls by making money available for the exercise. This of course requires going hand in hand with the development and definition of standards as envisaged above.

Training Institutions

Training institutions dealing with the building professions tend to concentrate more on the creation and formulation of new buildings, and rarely are they seen to emphasise on the issue of taking care of existing stock. Yet those institutions are key shapers of tradition and attitudes. Thus Training institutions, as we are well aware, are able to inculcate a habit of maintenance by coupling formulation of new buildings with also the emphasis on building maintenance issues in their normal training programs.

The need for thorough research to create a pool of information that the professional could rely on has been expressed by others (Lee: 1996; Yiu: 2008 and Pitt: 1997). It is evident that information on the behaviour of materials over time and especially the effect of our climate has not been fully researched and thus practitioners are disadvantaged in this area. Two examples may be cited on this issue:

The issue of deterioration of concrete is receiving worldwide attention due to what has been recognized now as unduly early deterioration of concrete structures. Here in Kenya there is very little to indicate how our own structures are faring and we cannot thus draw the necessary lessons. It my well be that we need to be investing money in the rehabilitation of such structures but in the absence of authoritative knowledge on this area no action will be taken and the risk may continue to be with us for some time.

In the area of roofing methods preferred, it is clear that we have experienced insurmountable challenges with respect to flat roofs. Way back in 1986, the Government of Kenya did issue a ban on the use of flat roofs in buildings due to leakages and its attendant damages to the building fabric. Following this ban, subsequent developments have adopted pitched roofs, and even those with initially flat roofs have been retrofitted.

No serious study had been conducted to get to the heart of the matter but the issue was never in doubt. Flat roofs had been failing at a high rate. Whereas many factors must have contributed to the situation – such as the weather, quality of sealants and covering materials – there is no doubt that a contributory factor was lack of proper maintenance. But an authoritative research into this area could have identified the root course and hence give rise to proper design and maintenance approaches with regard to flat roofs. Training institutions can respond to the crisis in our environment by:

- Developing courses in maintenance as part of their curricula in the building professions and even better by treating the subject as a full academic concern thus allowing for particular specialization in this area.
- Delving more into research that would begin to accumulate a body of information on the performance of materials and structures which then would be available by those who work in this area.
- Creating short courses geared to sensitizing the practitioners of the place of maintenance in the scheme of things. In an era where the Universities are being challenged to find means of funding their programmes, this might just prove a boon to those institutions that are training for the industry.

Popular Media

The subject of the built environment has not received the attention it could from popular media. Only recently have we seen the first column on architecture and building in the mass circulation press. But there is indeed a lot of public interest in the nature of our built environment, and the media is an important tool in exposing and directing this interest into effective opinion.

In Britain in recent years, the public has been involved in a debate over directions of their architecture. The media has been the primary forum for this debate with the BBC devoting a whole Television series to the issues that arose. There is little doubt that the media can be a powerful force in attempting to ingrain a maintenance culture by sensitizing the public to the issue.

What is curious indeed is that business interests in the building industry do not seem to want to avail themselves to this area. No company seems to recognizing the marketing opportunity that is availed with a clean, aesthetically exciting

environment. This is more than an opportunity awaiting exploitation. It is a challenge to those who are making money in this area to turn some of it into public good.

Conclusion

What can be derived from the above discussion is the need that now exists to address the crisis of maintenance of the building stock through institutionalization. Key to this postulate is recognition by the necessary authorities that a crisis does indeed exist, and that an urgent solution is required. The effect on our economy emanating from dilapidation of our building structures is high and cannot be ignored in the calculations of our wasting wealth.

It is possible to put in place institutional structures that will indeed begin to address this issue at the level and with the seriousness it deserves. It means a necessary pooling of the varied specializations in the industry, from design professionals, contractors, manufacturers and developers. A wider role is also envisaged for the policy making organs notably the Ministry of Public Works and Housing. Policy formulation could also be led fairly effectively from the institutions of higher learning the Universities and Polytechnics.

In whichever way, we go about addressing the problem the economic angles must be recognized and continuously emphasized. It is national wealth, no less that is at stake.

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