

Developing Sustainable Conservation Options For Characterised Built Cultural Heritage Features In Kaduna-Nigeria

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Abstract: *Contemporary man is a reflection of his heritage and conserving such legacy based on their value and status of deterioration, can be an essential avenue for guaranteeing sustainability. As a follow-up study, this paper specific purpose is to develop the most suitable model for sustainable heritage conservation, considering the effect of respondents' value and deterioration status. ANOVA was used to describe the varied effects of heritage value criteria and deterioration agents on the development of sustainable conservation options for heritage buildings and monuments by respondents within Kaduna metropolis. Amongst others, the study finds that government neglect of heritage features is the most significant cause of deterioration. Statistically, heritage value criteria were considered more significant than deterioration agents for sustainable conservation options. Finally, the paper recommended the need for conservation policy model for government agencies on conservation programs for sustainable heritages that encourage local community socio-cultural and economic benefit through tourism.*

Keywords: *Built Heritage, Conservation, Deterioration, Significant Value, Sustainability and Kaduna.*

I. INTRODUCTION

Professional architects do not only have a duty to provide services for their clients to relish but are to ensure the relevance of the products for the present and future generation of its users. It is therefore significant that architects' innovative connection should extend about subsequent generations in cases of preservation and conservation of built structures that engender sustainability of related genre of common interest (Fisher, 2015:14). A plethora of impressive structures that have decayed or are currently not effectively used abound within most urban centers. The socio-cultural, economic and environmental circumstances around the features when built or at their peak has changed over time. This change should be adapted to current realities to enable future generations to have an idea of what their history was and also to serve as part of global heritage itinerary as well as useful for tourism attraction that could be of economic and

cultural significance (Rausch, 2017). Some studies have argued that the Nigeria heritage-scape revealed that buildings of historical importance are mostly listed, but buildings with architectural value significance are conspicuously absent (Zubairu, Abdulrahman, Ayuba and Adedayo, 2012).

Similarly, Maina, Muhammad-Omar and Saad (2018) brought to light the lack of critical information on heritage buildings and their sustainability, particularly in the African built environment. It is, therefore, significant to characterise the architectural style, and types haven earlier identify the relevant colonial heritage features within Kaduna. The study will proceed to determine for development of suitable conservation options for the heritage features considering the respondents' perceptual preferences of heritage value and deterioration status.

This study proceeded from the earlier assessment of selected colonial heritage features within Kaduna metropolis. The heritage features documented as well as established the

relative importance index of deterioration and significant value as reported in Ryal-Net, Prucnal-Ogunsote and Ola-Adisa (2019). In the earlier study, heritage status of decay and the significant benefits assessed to establish the current state of built colonial heritage within Kaduna metropolis as is seen by the relevant experts. However, for this study development of sustainable conservation options of colonial built heritage within Kaduna metropolis was undertaken. Hopefully, the study findings could encourage tourism opportunities for all people through gauging and managing the effect of heritage value and their deterioration status as was also supported by Maina, Muhammad-Oumar and Sa'ad (2018). Such heritage sustainable conservation options will also aid in meeting the United Nation World Tourism Organisation (UNWTO) barometer aspirations for 2017 in the area of cultural value, diversity and heritage conservation as well as engender mutual understanding for peaceful coexistence (UNWTO, 2017). Current and future generations can enjoy the conserved features as identity beacons and tourist attraction for the city.

In Nigeria however, most state and federal institutions have made cosmetic attempts at managing heritage features and their tourism potentials; conversely, where genuine effort exist, they are done in a disjointed and uncoordinated manner (Bankole, 2013; Emeghara, 2015). Deisser and Njuguna (2016) contend that there is a need for a continuous rethinking of conservation principles and heritage management strategies due to their diverse and fluid nature. Therefore, this paper also argues that tourist economic-use services can serve as an impetus for sustainable conservation of heritage buildings and monuments as well as community-based development. Sustainable conservation is considered here as an integral medium by which renewal of architectural legacy is achievable for deteriorated heritage buildings and monuments (Research Team, nd; Ryal-Net, Prucnal-Ogunsote & Ola-Adisa, 2019). The challenge of giving the cultural, historical and social value of heritage equal status requires a critical thought on heritage sites and features management particularly in the African context (Maina, Muhammad-Oumar and Sa'ad, 2018; Sa'ad, 2016). Furthermore, there is a need for broad and acceptable criteria that could ensure heritage listing and conservation for sustainable development (Gibson & Pendlebury, 2009). The study purpose is essential to;

- ✓ Characterised Architectural attributes of selected colonial built heritage features in Kaduna metropolis.
- ✓ Determine the Sustainable conservation options for colonial built heritage features based on their established deterioration status and significant value in Kaduna.

HYPOTHESIS

H_0 : There is no significant effect of significant value criteria and deterioration status on sustainable conservation options of colonial heritage buildings and monuments towards enriching tourism prospects in Kaduna.

H_1 : There is a significant effect of significant value criteria and deterioration on sustainable conservation options of colonial heritage buildings and monuments towards enriching tourism prospects in Kaduna.

II. LITERATURE /THEORETICAL UNDERPINING

A further review of relevant variables for this study is undertaken to aid in contextualizing the specifics concepts on sustainable conservation of built heritage features.

CULTURAL BUILT HERITAGE (BUILDINGS AND MONUMENTS)

Heritage places wherever they are, have significance to the community for their cultural and socio-spiritual qualities, aesthetics and historical value or a combination of these qualities (DPIPWE, 2011). Therefore, societal essence, both past and present, is much determined by their heritage in all aspects of life. Principally by the Venice Charter of 1964, the scope of cultural heritage centred on physical elements such as historical monuments and buildings. In contemporary terms however it had broadened to include groups of buildings, historic urban and rural centres, landmark gardens and to non-physical heritage including environments, social factors and lately intangible values (Ahmad, 2006; Smith, 2011 & 2015). Heritage places have outstanding cultural, physical or natural significance, and it does form the platform for debating the concepts including policies related to conservation. Broadly, material or tangible heritage is categorised into cultural, natural and mixed cultural landscapes (ICOMOS, 1964, Silva, 2016). World heritage is undoubtedly the most visible international achievement of the modern movement in the conservation of cultural heritage (Jokilehto, 2018). In Table 1, a categorisation of the main component of cultural heritage features showed in detail. The heritage conservation concept evolved as a consequent of the 1931 Athens carter just before the second world war that subsequently cascaded the concern and restoration of destroyed historic buildings (Mehr, 2019).

S/Nos	Heritage Categorization	Remarks
1	Monuments: Architectural, sculpture & paintings, archaeological structures, inscriptions, cave dwellings and combinations of features.	Traditionally these were the first set of buildings that invoke the concept of architectural heritage and the need for their conservation.
2	Group of Buildings: Separate or connected buildings with homogenous of place on landscape.	Group of buildings form an integral part of cultural landscape heritage features and quite relevant for this particular study.
3	Sites (works of man or combined with nature. Areas including archaeological sites which are of Outstanding Universal Value(OUV) from historical, aesthetics, ethnological and anthropological point of view). Organically Evolved Landscape: Relics or fossil landscape, continuity	This landscape features are similarly significant for the study of indigenous settlements across the study area.

landscape.
Associated Cultural
landscape: Virtue of
powerful religious, artistic
or cultural association with
natural element rather than
material cultural evidence.

Source: Adapted from (CPWD, 2013; ICOMOS, 1964; Silva, 2016; UNESCO, 1972)

Table 1: Cultural Heritage Categorisation

At the second International Congress of Architects and Technicians of Historic monuments, significant heritage decisions birth The International Council on Monuments and Sites (ICOMOS) Venice charter of 1964. During the congress, it advocated that cultural heritage should maintain buildings and monuments to ensure social usefulness, within the original scale and historical setting (ICOMOS, 1964; Zaryn, 1995). Here then emanated the essence of this study on conserving Kaduna colonial heritage buildings and monuments. ICOMOS Charter (2003), affirmed that built heritage features served as a platform for preservation of historically significant structures within their cultural perspective. It is, therefore, the belief that this study will serve as a springboard for more detail studies of the Kaduna heritage features and thus establishing its identity as a colonially created cityscape. At the Zimbabwe ICOMOS 2003 general assembly, some heritage conservation principles and criteria set up the study, its analysis and corrective measures as well as the regulatory framework. These critical principles on heritage management covered their conservation processes, fortification, refurbishment and renovation. However, the critical anchored based for the concept were the outstanding universal value in terms of authenticity, integrity and material integrity.

Similarly, their operative transformative dynamics, uniqueness of heritage as well as the principles of taking no action on the cultural heritage until there is the certainty of pre-emptive benefit was agreed. Englehardt (2010) and further reinforced by Ryal-Net, Prucnal-Ogunsote and Ola-Adisa (2019) argued that built heritage incorporates material space for the immaterial expressions of culture. It also and constitutes one of the most varied, complex, and eloquent manifestations of tangible cultural heritage. It, therefore, means that each city and its cultural landscape features tell the story of the past—similarly, its current reality and even the future socio-cultural reality of the inhabitants. The heritage story should be determined continually, reviewed and reassess for apt application in the heritage conservation processes; hence this study attempt.

SUSTAINABILITY OF BUILT HERITAGE

Built Heritage conservation, including their sites, incorporates a process of sustain caring for the dwelling(s) to maintain their significant value concerning architectural, historical, aesthetic and cultural attributes. Based on a Report on "our Common Future" in 1987 by Brundtland it defined Sustainable development. It was tersely paraphrased by World Commission on Environment and Development report and cited in Munasighe (2019:27) as "...meeting the needs of the present generation without jeopardising the ability of future

generation to meet their needs". The sustainability concept anchored around the idea of economic, environmental and socio-cultural factors. Allu (2014) also averred that sustainability is centred around economic, social and environmental parameters. Theis and Tomkin (2012) further extended the argument by asserting that conservation relate directly to sustainability. In their studies Englehart (2010); Fisher (2015); Mydin, Ramli and Awang (2012) outline the heritage sustainable conservation parameters as being social and cultural values, environmental values as the general stakeholders' interest. Heritage sustainability conservation setting could, therefore, adopt the economics, environmental and social impartiality concept. Mehr (2019) argued that despite the varied adaptive reuse and conservation theories and principles that exist in various nations and the internationally accepted guidelines; there remain gaps in the actual practice of built heritage conservation options.

In Nigeria, the old secretariat building in Lagos as contended by Opara (2017) is considered the signature tune for the colonial/revivalist architectural heritage conservation of the late nineteen and twentieth-century and currently one of the listed building in Lagos. In Nigeria, the significant heritage features according to Wahlay (2015) and further affirmed by Ryal-Net, et al (2019) are; First storey building in Badagry-Lagos (1845), The Presbyterian Church Calabar (1846). Also is the Gobirau minaret in Katsina (Habe dynasty-250 years ago) and Egedege N'okaro residence Benin (1906), others are Tafawa Balewa square, and the National Theatre completed in 1976 for Festival of Arts and Culture (FESTAC) of 1977. All these significant cultural heritage features enumerated, require one form of sustenance or the other in terms of guarantee conservation archetypal. There are several other unique heritage sites, buildings and monuments that abound in Nigeria worthy of further careful study towards conservation (Ryal-Net, Prucnal-Ogunsote & Ola-Adisa, 2019). Considering that the heritage features are an essential part of our national heritage, they could serve as prominent tourist attractions. Here lay the claim of this study for conserving historical and commemorative structures for present and future generations. As a colonial town, Kaduna required administrative system and economic hub; therefore, structures were built that includes; private residences, offices, services and symbolic structures as bridges and entrance gates which form the concern of this study. The town grew from a small and scattered Gbagyi settlements that subsequently became the central nucleus of Northern Nigeria Protectorate; which harbours people across the country and even as far as from other West African countries (Bununu, Ludin & Hosni, 2015; Qurix & Suleiman, 2015).

CONSERVATION OF CULTURAL BUILT HERITAGE

Research Team (n.d) stated that conservation principally functions as a historical and architectural restorative channel. Towards achieving the revitalization of the heritage features; therefore; it is significant to understand the underlying significant strings and relationship within and amongst variables of concern. For this study, sustainable conservation hinged on heritage value and deterioration agents. Rojas (2007) argued that despite the significance of urban heritage in

conservation strategies and funding availability, its perception in its broad range is not fully comprehended. Hadjri and Boussaa (2007), in their paper, argued that conservation categorization established on the built spatial relationship. The spatial relationship concerning the various approaches for sustainable heritage conservation adopted in this study includes; preservation, repairs, maintenance, restoration, treatment, dismantling and relocation as well as reconstruction in consultation with users and local communities (Hadjri & Boussaa, 2007; Harun, 2011). It is worthy to note that cultural heritage features comprise of buildings, monuments, gardens, cemeteries, landscape and archaeological sites (CPWD, 2013). For this study, the conservation concern for the built heritage features is essential for buildings and monuments. These key features are the centre of colonial administration, trade and commerce in Kaduna urban centre and the Northern Nigeria Protectorate. These study substantially affirm the varied conservation processes and their specific applicability for the selected features towards intergenerational benefit.

DETERIORATION OF BUILT HERITAGE

Deterioration in buildings has to do with its physical component as well as its finishes, that do not meet its initially acceptable performance criterion. The decline of built heritage features often cover cracks, water penetration, animal and human activities (Mydin, Ramli & Awang, 2012). Deterioration of heritage buildings is classified based on various factors mainly as Natural (Environmental) and Man-made or Social (Mostafa, nd; Mydin, Ramli & Awang, 2012; UNESCO, 1972). The natural Factors includes; Mechanical agents, Electromagnetic (solar), Thermal agents, Chemical Agents, Biological Agents and Earth Movement. While the Man-Made factors of building deterioration are; Lack of public awareness, Government negligence, Vandalism, Tear and wear of usage, condensation as a result of gas and paraffin usage (Adapted from Mostafa, nd; Mydin, Ramli and Awang, 2012). It is this heritage deterioration attributes that define the perception and preferences of stakeholders within the study precinct, as well as best, determine the suitable choice of conservation prospect entirely appropriate and sustainable in any set environment.

SIGNIFICANT VALUES OF BUILT HERITAGE

Morgan (1914) opined that value is, in general, the same as meaning, or in valuation, meaning that is confirmed and enhanced with emphasis. Value, considered as the result of brains conversion of direct experience (immediate perception) into the meaning and actionable truth (a secondary judgment or conception). In heritage studies, the concept of Outstanding Universal Value (OUV) is prevalent; it has to do with the cultural value which transcends national borders and is considered relevant to the present and future human generation. The heritage with OUV should be endowed with integrity, authenticity and supportive management strategy as its safeguard (Jokelihto, 2018; Silva, 2016). It was also argued by Mehr (2019) that there are value creation and reusable prospect for built architectural designs and literature through

heritage conservation over the various generations. The heritage significance was elaborated by Scerri, Edwards and Foley (2016) as based on use state rather than the exchange rate. The heritage value in their context included the historical, architectural, political, socio-cultural, technological and economic value of the heritage features within Kaduna metropolis. Similar studies highlighted the various form of heritage significant values as further illustrated in Table 2.

Variable	Fakuyama (2000:98)	Torre & Mason (2002:10)	Maina (2012 & 2013)	Bianco; 2018:93; Ukabi, 2015:12)	Haroun, Bakr & Hassan (at press)
Cultural Heritage Values	Honesty Reciprocity Groups Information Political Affiliation Political Participation	Historical Cultural/ Symbolic Social Spiritual/ Religious Aesthetics	Social, Political, Economic, Legal System, Political System, Social Activities, Language, Gender, Religion, Education, Farming, Art and Crafts	Aesthetics Social Environmental Economic Traditional/ Conservational Others (Gender, Novel and Synthesis of form & space)	Architectural, Heritage, Social, Economic, Environment al

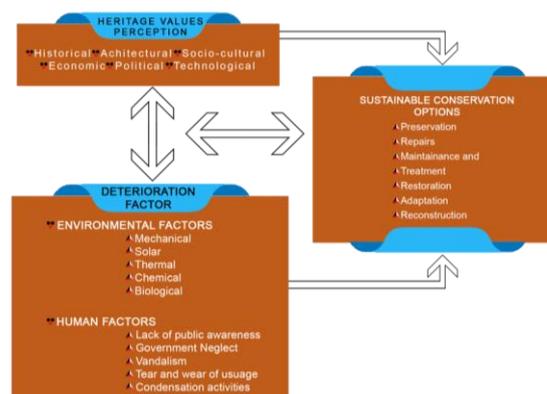
Source: Authors Desk Research (2019)

Table 2: Cultural Heritage Conservation Values Studies

The built heritage concepts here discussed is in respect to cultural relevance, their sustainability as well as the conservation processes as it is affected by significant heritage value and their deterioration status explained the perspective for this study. It is these crucial issues that underlay the concern of the paper and articulated for enhanced perception and applicability in the development of an appropriate conservation model of Kaduna selected colonial built heritage features.

III. CONCEPTUAL FRAMEWORK

The study perceptual preferences by respondents in terms of conceptual framework was hinged on observed key determinants and reviewed with respect to heritage values, their deterioration and how they variously determined options for heritage features sustainable conservation. The study challenge of proposing conservation options for sustainable colonial heritage buildings and monuments in Kaduna metropolis is being visualised under the perspectives of keys issues of heritage values perception and the causes of their deterioration as graphically illustrated in figure 1.



Source: Adapted from (DPIPWE, 2011; Fisher, 2015; Hadjri and Boussaa, 2007; Harun, 2011; Mydin, Ramli & Awang, 2012); The Allen Consulting, 2005 and UNESCO, 1972).

Figure 1: Conceptualization of Heritage Conservation Options

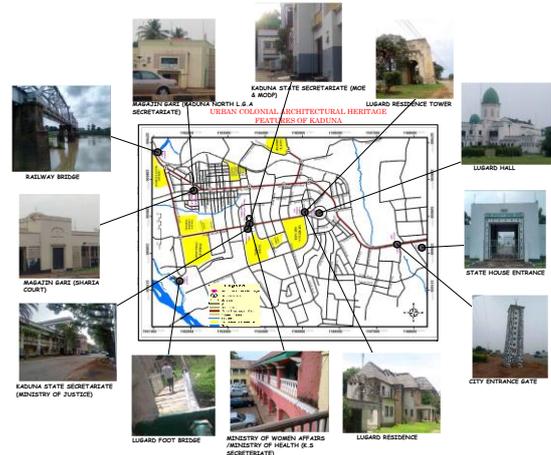
The perspective evolved for the study is towards establishing heritage worth as variously perceived as well as establishing the deterioration status recognised effects on selected colonial built heritage features across Kaduna metropolis. The decay and heritage value will hopefully ensure a sustainable heritage conservation prospects that could guarantee intergenerational benefits and enriched tourism opportunities (Fisher, 2015; Hadjri & Boussaa, 2007; Mydin Ramli & Awang, 2012).

The conceptual framework here aggregates the various study units of analysis in terms of what parameters are to be analysed. Similarly, the respondents are the key professionals in the built industry as well as conservation and tourism-related relevant experts (Allu, 2014; Jokilehto, 2018; Ryal-Net, Prucnal-Ogunsote & Ola-Adisa, 2019). One of the underlying assumptions for this particular research is the congregation of all heritage buildings as one unit and monuments as another unit. Similarly, for this research, the heritage value rating and deterioration agents' importance were measured as a unit. Heritage value and deterioration variables were primarily for ease of compilation and to serve as a guide for detail and specific categorisation in future research on conservation of colonial heritage buildings and monuments within Kaduna metropolis. This model is suitable to examine sustainable conservation options in heritage studies and applicable for other sites with or without modification which was similarly adduce by Somiah, Osei-Poku and Aidoo (2015) in conceptualising boat industry building in Australia and building sittings in Ghana. Correspondingly, The Allen Consulting Group (2013) argued on the importance of heritage value and deterioration setting towards reinforcing sustainability for intergenerational heritage benefits.

IV. METHODOLOGY

Kaduna is the Northern Nigeria protectorate capital, chosen and settled by Lord Lugard in 1912 at the height of the British colonial prowess in Nigeria. Initially met as mainly Gbagyi scattered settlements, Kaduna was later transformed to a colonial built administrative treasures belt and centre. The town was at inception settled by mostly by the colonial masters, with their dependents, supporting staff from West Africa colonies and partly the Southern Protectorate (Bununu, Ludin & Hosni, 2015). Other labourers and merchants from several parts of the North also form the core of the early settlers. Amongst the structures of relevance for administering the protectorate were; private residences, offices, services and symbolic structures as bridges and entrance gates. The heritage features identified for this study along Ali Akilu way, Ahmadu Bello way, Junction Road and Independence Way as well as off Swimming Pool Road in Kaduna- Nigeria and here categorised as buildings or monuments. The choice of the areas and routes was due to their historical significance and central role within the town layout during the colonial era.

These routes, as shown in Figure 2, also harbour virtually all the colonial administrative features of the 1900 to 1960 period in Kaduna, as is further explained in Table 3.



Source: Adapted from Google Earth (2019) and Ryal-Net, Prucnal-Ogunsote & Ola-Adisa (2019)

Figure 2: Kaduna Metropolis Layout showing the location of Selected Built Heritage Features

Stratified purposive sampling of colonial buildings heritage and monuments within Kaduna metropolis form the sample frame. Furthermore, with the aid of the convenience sampling method, design of selected heritage professionals' respondents was undertaken (Babbie, 2014; Suri & Rao, 2014). Eighty (80) questionnaires were purposively administered to the various respondents in the built environment and experts in heritage and conservation field within Kaduna urban area. With the use of four research assistants, fifty (50) of the questionnaires were duly filled and returned. Meanwhile, three (3) questionnaires were returned but not duly filled thus were considered invalid as earlier reported in Ryal-Net, Prucnal-Ogunsote & Ola-Adisa (2019). The study indicators developed used the theoretical approach and crucial conceptual frame from the literature on heritage significance value, agents of deterioration and their index of significance on sustainable conservation options for determining respondent preferences (Zancheti & Hidaka, 2011).

Based on The Allen Consulting Group (2005) report, it argued that ascertaining the critical study concern was effectively communicated as feedback on any questionnaires; the presented information and its appropriateness is vital. Thus the questionnaire instrument employed used internal consistency reliability to assess the results across the different items (Gusen, 2017). The significant heritage value range was 0.903, while 0.788 was the score for deterioration and sustainable conservation option has the value of 0.876 reliability test of Cronbach Alfa as similarly established in Ryal-Net et al. (2019). Therefore, since the Cronbach's Alfa values are all greater than 0.7; the instrument reliability affirmed through obtained information from respondents (Allu, 2014; Tarakol, 2011).

Inferential Statistic was used to analyses the objective by Linear Regression Formula;

$$Y_s = \beta_0 + \beta_1 X_1 + \beta_2 X_2$$

Where: Y_s = Sustainable Conservation options of Heritage Buildings and Monuments in Kaduna (Dependent Variable).

β_0 = Constant (Coefficient of intercepts),

X_1 = Heritage Value Criteria (Independent Variable)

X_2 = Agents of Deterioration (Independent Variable)

$\beta_1 \dots \dots \beta_2$ = regression coefficient of two (2) variables.

Inferential statistics (ANOVA) used in testing the significance of the overall conservation model at 95% level of significance. The significant value aid in examining the differences between groups variance in terms of the squared score means. Bell (2010) also averred that analysis of variance is significant because it makes use of the F-test in terms of the sum of squares standard deviation. In this case, it is the standard deviation of raw scores from the group mean that was used (Uji, 2009:141).

V. RESULT/FINDINGS

The colonial administrative core buildings identified and used in this study are; Hassan Katsina (State) House, LugardHall RoundAbout, Lord Lugard Residence/Water Tower, Kaduna state Secretariat Complex and Magajin Gari. The monuments identified included; The Northern City Entrance Obelisk, Kaduna Railway Junction Steel Bridge and the Lord Lugard Foot Bridge as extensively discussed with relevant pictorials in Ryal-Net, Prucnal-Ogunsote and Ola-Adisa (2019).

CHARACTERISATION OF SELECTED COLONIAL BUILT CULTURAL HERITAGE FEATURES

In Table 3, the architectural characteristics, including the heritage significant values, their deterioration agents and status as well as the suitable conservation options, are here stated. Similarly, the construction period, its architectural style, designers and contractors identified where feasible ensuring the invaluable relevance of the heritage features.

S/ Nos	Cultural Heritage Features	Location/ GPS Coordinates	Heritage Description	Heritage Previous Usage	Heritage Current Usage	Construction Date	Architectural Period/Style (1900 to 1960)	Developer (Designer/ Builder)	Architectural Characteristic of Heritage Features	Applicable Heritage Significant Value	Prime Heritage Deterioration Agents	Conservation Works (roof, ceilings, walls, openings, floors, finishes, services,)	Suitable Conservation Options	Remarks
Buildings														
1	Hassan Katsina (State) House	Along Ali Aki Road in Kawo (032984°E 116756°N)	It is mainly a bungalow, with portions that are one storey. .	Colonial Governor Administrative offices	State house, banquet hall and Deputy Governor's office	1950	Neoclassicism/Colonial	Uncertified entities	Arches, domes, parapet walls with very intriguing screen wall and glass blocks	Historical, political and	Government Neglect Tear and wear	Mainly on replacing roofs, and general renovation of all elements of the buildings. Later adaptation and extension works were incorporated in the complex.	Constant maintenance schedules for regular execution by relevant government ministry can guarantee its sustainable use and conservation.	Due to the frequency of its usage for major government banquet events, it often enjoys some measure of maintenance. However, considering its historical and political status there is need for more diligent and proactive maintenance schedule for action by relevant government agencies.
2	Lord Lugard Hall	Off Lugard Roundabout (032890°E 116545°N)	High voluminous and spacious spaces	Colonial era northern protectorate house of Chiefs	Kaduna State Legislative House of Assembly	1951	Neoclassical/Modernist	T. Scot & W. Corbett (RIBA) architects	Uses Islamic architectural features of dome, arches with isolated autonomous features	Historical/Political	Government neglect	Roof leakages leading to replacement of portions, ceilings and general redecoration	Regular maintenance schedules with appropriate renovation culture.	As the hub of legislative activities, the house should use their constituency project provisions toward maintaining the status of this historic edifice.
3	Lugard Residence/Water Tower	Adjacent LugardHall (032887°E 116506°N)	Spacious rooms and working areas with a fire place/chimney. Brick & concrete water tower	Lugard Residence and subsequent colonial governor	Abandoned and vandalised residence while the water tower is not in use	1920	Modern	Uncertified entities	High pitched roof, fireplace and chimney as well as water(watch) tower that served as point of surveillance of the town in its colonial renowned period.	Historical, political	Government neglect that lead to Vandalizations	Roof blown off then awarded to be replaced and provide general renovation. Unfortunately it end up serving as an avenue for vandalization of the key heritage elements of the building by the contractor and his agents.	Restoration and adaptation for historical/archival museum purpose.	The current administration has commissioned architects to make a proposal for the residence restoration and remodelling into a museum of colonial heritage in Kaduna and the North.
4	State Secretariat Complex	Along Independence way (032943°E 116337°N) and (032925°E 116352°N)	A two-wing complex of two storey at the core and one storey most of the remaining complex.	Colonial era administrative complex for civil service of Northern Nigeria	Secretariat complex for several ministries in current Kaduna state civil service	1950/51	Neoclassical	C. Hayes	Various Columns sizes with flat sculptured base relief.	Political(Administrative)	Government neglect as well as wear and tear. This are some of the most extensive buildings being visiting on a daily basis.	Part of the justice ministry roof was burnt during a fire incidence and leakages led to replacement of all roofing sheets and general redecoration. But the ministry of health and women affairs is mostly in tack.	Regular maintenance based on approved schedules	Observed several renovations works ongoing at the Ministry of Education, planning and finance sections. Unfortunately, some of the key features of the building that have survive for about seventy (70) years are being replace with finishes that cannot endure for five years without being worn-out.
5	Magajin Gari	Along Ahmadu Bello/Junction road (032829°E 116207°N)	Is a single storey building that is symbolic of aesthetic elegance	Native Authority administrative & judicial building	Kaduna North Local Government Secretaries and Shariah courts	1939	Neoclassical/Modernist	Colonial architect (No certification)	Uses shading features of verandas, screen wall, domes, parapet wall and pinnacles (Zankwaye)	Political (Judiciary& administrative)	Government neglect as well as wear and tear.	Roofing sheet replaced due to leakages and failed felt over the years	Maintenance on a regular basis	Received a lot of visitors as a local government activity hub as well as a major judiciary centre. Considering the lean resources of local government, the state government should consider maintaining it with other identified heritage.

S/ Nos	Cultural Heritage Features	Location/ GPS Coordinates	Heritage Description	Heritage Previous Usage	Heritage Current Usage	Construction Date	Architectural Period/Style (1900 to 1960)	Developer (Designer/ Builder)	Architectural Characteristic of Heritage features	Applicable Heritage Significant Value	Prime Heritage Deterioration Agents	Conservation Works (roof, ceilings, walls, openings, floors, finishes, services)	Suitable Conservation Options	Remarks
Monuments														
6	Northern City Entrance Obelisk	Along Ali Akilu Road at NDA junction (032980°E 116756°N)	Is made up of two columns on both sides of the road of about 6m height	Commemorative	Symbolic of colonial legacy	During visit of queen Elizabeth II to Kaduna in 1956	Modernist	Unknown but constructed by local craftsmen	Inclining Column using well cut stone works	Historical (commemorative) and Political	Thermal and chemical activities	Recently reconstructed with additional stonework shaped in the same pattern as original stone. Some stones were lost during removal and relocation to new position.	Regular maintenance and preservation of original fabric	Was recently relocated and reconstructed to allow for the expansion of the road from dual carriage to a six-lane way by the government of Kaduna State under Mallam Nasir El-Rufai.
7	Lugard Bridge Steel Foot Bridge	Located in Gamji Park off Swinning pool road, off Independence way (033075°E 116168°N)	It is foot bridge first built in Zunguru, but later transferred to Kaduna	Use a footbridge linking the two parts of the part divided by a gorge	Currently abandoned and timber floor finishes mostly dilapidated.	Constructed 1904 in Zunguru and re-erected in Kaduna garden in 1954	Neoclassical/Modernist	Colonial designer (Not certified)	Steel frames, beam with rail tracks on top	Historical, Technological	Thermal, Chemical as well as wear and tear.	Have not been attended to for a very long period. Infact only left as a relic now. Its relevance may be overtaken if it is not incorporated in any major upgrade proposal for the park development	Restoration and regular maintenance	The bridge need to be repaired urgently otherwise it will soon lost its key component. In this respect it will be needful to source to well-seasoned timber planks for possible replacement of rotten or failed portion.
8	Kaduna Junction Steel Railway Bridge	Along River Kaduna linking the North and Southern part by rail line. (032723°E 116188°N)	Made up of intricate steel frames as a technological marvel of its days	Rail line bridge	Rail line bridge	1925	Neoclassical/Modernist	Colonial designer (Not certified)	Steel frames, seasoned and polished timber planks on steel beams.	Economical & Technological feat of the period.	Thermal, Chemical and wear and tear	Repainting of steel works at interval and replacement of rails track accordingly on a regular basis.	Preservation of the basic Fabric	Due to its structural functionality, there is still a good level of railway authority maintenance which should be continued

Table 3: Characterisation of Selected Cultural Heritage Buildings and Monuments in Kaduna Colonial Period (1900 to 1960)

The architectural period ranges and their varied attributes as classified in the table in the preceding page showed the diversity and the influences across the different construction period and the international style and well as regionalism influence on the expressed architectural elements. These heritage buildings actually gave the town its initial architectural identity, before the post-independence modern movement and the subsequent architectural implants on the cityscape. These characteristics could serve as further source of research probing and analysis that could evolved a wide range of vista on the colonial heritage of Kaduna as an administrative capital of Northern Nigeria.

SUSTAINABLE CONSERVATION OPTIONS

Table 4 depicts the Relative Importance Index (RII) values of options for conservation that engender the protection of heritage buildings and monuments in Kaduna metropolis. It showed heritage building ranked the first in significantly influencing the conservation options, followed by Heritage monuments. Correctly, renovation in terms of maintenance and treatment was rated the highest attributes under heritage building as most critical that was preferred by respondents in the conservation process of building heritage features. The reconstruction option was the least preferred by the respondent in sustainable conservation of heritage buildings. Preservation (maintain fabric) which is ranked the highest type of maintenance for heritage monuments, is seen here as the most critical factor as perceived by respondents based on established value and deterioration effect on heritage monuments. Adaptation (change in function) was considered the least significant in determining conservation options for monuments in Kaduna metropolis.

Heritage and Conservation Options	HI	I	MS	S	HS	RII (%)	Rank
Heritage Building						75.4	1st
Maintenance and treatment (Renovation)	2	4	1	15	27	84.9	
Repairs of damaged sections	1	5	6	17	21	80.8	
Preservation (maintain fabric)	5	4	4	12	25	79.2	
Restoration (Return to earlier known state)	2	6	9	7	23	78.3	
Adaptation (Change in function)	2	9	16	12	6	64.9	
Reconstruction	6	9	12	12	8	63.0	
Heritage Monuments						72.2	2nd
Preservation (maintain fabric)	2	4	9	13	22	79.6	
Maintenance and treatment (Renovation)	3	3	9	15	19	78.0	
Repairs of damaged sections	3	4	12	13	18	75.6	
Restoration (Return to earlier known state)	3	10	9	7	21	73.2	
Reconstruction	7	9	11	9	11	63.4	
Adaptation (Change function)	2	13	13	15	4	62.6	

Note: Highly Insignificant-HI (1); Insignificant-I (2); Moderately Significant-MS (3); Significant-S (4) and Highly Significant-HS (5)

Source: Field Survey

Table 4: Options for Conservation Works of Heritage Buildings and Monuments

EFFECT OF HERITAGE VALUE CRITERIA AND DETERIORATION AGENT ON SUSTAINABLE CONSERVATION OPTIONS

The output from Table 5 indicates the results of fitting a multiple linear regression model to describe the relationship

between Sustainable Conservation option and two independent variables. The equation of the fitted model is Sustainable Conservation option = 1.4414 + 0.535522*Heritage value +0.108175*Agents of deterioration, Since the P-value in the ANOVA table is less than 0.05, there is a statistically significant relationship between the variables at the 95% confidence level.

Coefficients				
Model	Coefficient	Std. Error	t-Statistic	Prob.
β_0	1.4414	0.546464	2.637682	0.0113
Heritage value criteria	0.535522	0.143523	3.731265	0.0005
Agent of deterioration	0.108175	0.165784	0.652505	0.5173
ANOVA				
Source	Sum of Squares	Mean Square	F	Prob.
Regression	10.397	5.198	11.762	.000
Residual	20.772	.442		
Total	31.169			
R	R-squared	Adjusted R-squared	Std. Error of the Estimate	
0.578	0.334077	0.305740	.66480	

Dependent variable: Sustainable conservation options of heritage buildings and monuments in Kaduna.

Source: Field Survey

Table 5: Effect of heritage value criteria and agent of deterioration on sustainable conservation options of heritage buildings and monuments in Kaduna

The R-Squared statistic indicates that the model, as fitted, explains 33.4077% of the variability in Sustainable Conservation options. The adjusted R-squared statistic, which is more suitable for comparing models with different numbers of independent variables, is 30.574%.

Furthermore, in determining which of the independent variable coefficient influence or is statistically significant in the model, it can be seen that the heritage value criteria depicted to be statistically substantial since its p-value (0.0005) are less than 0.05 level of significance. Meanwhile, the agent of deterioration is statistically insignificant to model with $p > 0.05$ level of significance. The significance connotes that the heritage value criteria have a significant effect on sustainability conservation options of heritage buildings and monuments in Kaduna metropolis. The study findings surmised as here below stated;

- ✓ The built heritage features of the colonial period in Kaduna have several characteristics that range from their architectural period/style, design features of elements, construction period and materials. The heritage features also showed the diverse significant value and different agent and source of deteriorations which require a careful choice of suitable conservation option that can guarantee sustainability and tourism development for the intergenerational purposes.
- ✓ Heritage buildings have higher relative influence index of 75.4, with monuments having 72.2 on sustainable conservation options. Similarly, maintenance and treatment (renovation) conservation option has an index of 84.9 for buildings and 79.6 for monuments in Kaduna metropolis. The respondents' perception of the building value is core to any conservation work than the features'

level of deterioration. The finding above further affirms the place of value in heritage conservation, as variously argued (Edwards & Holland, 2013; Mydi, Ramli & Awang, 2012; Ryal-Net et al. 2019).

- ✓ There is an established relationship between the effects of deterioration and significant value of heritage features to their sustainable conservation option. However, sustainable conservation options model depicts statistically significant heritage value criteria comparative to an agent of deterioration that has an insignificant effect. The model adduced that significant respondents seem to identify more with buildings than monuments; nevertheless, the strategic place of the historical value of both monuments and heritage was, however, affirm (CPWD, 2013; Hadjri & Boussaa, 2007; Opara, 2017). Similarly, the constants contact and interaction of respondents with the buildings relative to monuments created the higher preference and sympathy for the buildings conservations. That means that if cultural heritage features conservation remains a focus for concern, their usefulness to current and future generation needs to ensure as was similarly argued by Jokilehto (2018) and Mehr (2019).

VI. DISCUSSION

The study discussion centred around the findings with respect to the characteristic of built heritage features, the significant value and the suitable conservation model of the colonial built heritage in Kaduna metropolis.

- ✓ The diverse characteristics of the colonial heritage built structures in Kaduna metropolis is a clear indication of the various architectural contributions to the city heritage over the years (Qurix and Suleiman, 2015). The built heritage characteristics are critical identity features that mark out colonial period in Kaduna metropolis.
- ✓ Findings in the study further affirm the strategic place of significant heritage value in conservation, as variously argued (Edwards & Holland, 2013; Mydi, Ramli & Awang, 2012; Ryal-Net et al. 2019). Therefore, for a successful conservation model of Kaduna colonial heritage features, there is the need for ensuring a clear understanding of the stakeholders' perceptual preferences and value of the elements under study.
- ✓ The conservation model adduced that significant respondents seem to identify more with buildings than monuments. Nevertheless, the strategic place of the historical value of both monuments and heritage was also affirmed (CPWD, 2013; Hadjri & Boussaa, 2007; Opara, 2017). Similarly, the constants contact and interaction of respondents with the buildings relative to the monuments can be said to have created a higher preference and sympathy for the buildings conservations. The higher attachment to build structures than monuments could imply that cultural heritage features conservation remains a focus for concern. Therefore, building structure's usefulness to current and future generation needs seems assured as was similarly argued by Jokilehto (2018) and Mehr (2019).

VII. IMPLICATION TO RESEARCH AND PRACTICE

More purposeful sustainable heritage buildings and monuments are attainable by careful conservation measures on each heritage structure depending on its essential need. Based on study findings the following are research and practice implications as here stated;

- ✓ Towards preserving the heritage identity of these features and maintaining the various architectural characteristics of the heritage features in the course of any conservation endeavour is for the benefit of all stakeholders. For experts they have an opportunity to understand the concerns and applied in their practice procedures, while government agencies will be more informed as they make critical decisions for the city planning and development. Ultimately, users and surrounding community's members could benefit through tourist social interaction and possible financial return.
- ✓ The sequence for conservation preference should be defined by each heritage due to the higher relative importance index of buildings over monuments within Kaduna metropolis. It will be a significant step before any conservation effort commences on an identified feature(s) by the expert in agreement with various critical stakeholders.
- ✓ For government, its agencies must apply the right legislation and management strategies for conservation of its heritage buildings first. Then the monuments values which shall serve as key tourism arrivals boosters for ensuring increased alternative revenue sources for conservation activities.
- ✓ The statement of significance will facilitate experts' collaboration to prepare progressive policy documents framework that pledges applicability of sustainable conservation principles for best application on unique heritage buildings and monuments conservation list.

VIII. CONCLUSION

In conclusion, the key colonial heritage characteristic of the Kaduna metropolis are as here identified and documented. Furthermore, the study was able to integrate the critical heritage significant value indicators and deterioration agents to determine most suitably significant heritage sustainable conservation options in Kaduna metropolis. By this, the study set in motion an evolving trend of value rating and deterioration assessment for conservation model. This model, if adopted, can enable forecasting suitable conservation options for enhanced tourism activities as well as points direction for planned architecturally and historically significant developments. Here from further detail studies could be undertaken to ascertain specific heritage buildings and monuments value as well as their status of deterioration for stakeholders' action.

FUTURE RESEARCH

Considering the lumping of the heritage features in this study while determining the respondents' optimal perception and preferences of significant value and status of deterioration the finding was limited to the holistic viewpoint and made it difficult for specific unit structure conservation intervention. Future studies of definite decay and significant value for ease of providing individual structures conservation schedule and management plan could further reinforce the strategic essence of conserving different buildings of historical, architectural and political significance within Kaduna metropolis. Furthermore, there is the need to ascertain the status and place of specific monuments within the metropolis and options available for their continual relevance in the future socio-cultural and economic interaction of city dwellers.

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