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Potsherd Pavements: The Preservation of the Fragmented Heritage of Pre-Colonial Yorubaland Development

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The potsherd pavements of Yoruba heritage emerged notably between the 12th and 16th centuries, during which Ile-Ife, the spiritual and political centre of the Yoruba, was governed by a woman, Ooni Luwo Gbagida. These pavements, crafted from carefully arranged broken pottery, went beyond mere functionality. They embodied artistic expression, featuring detailed patterns and deep red hues that reflected the period's sophisticated aesthetics and cultural legacy. This study investigates the contemporary sustainability of these sites through a multi-site case study methodology, integrating archaeological documentation with ethnographic inquiry across Ile-Ife, Osogbo, and Ibadan. Primary data were gathered through semi-structured interviews and focus group discussions with 15 participants (N=15), including traditional leaders, local artisans, and heritage custodians, selected via snowball sampling. Findings reveal that insufficient institutional attention and the erosion of intangible knowledge have placed the cultural identity embodied by these sites at significant risk. The research documents a spectrum of heritage degradation: from the symbolic rupture and missing "concoction pots" in the royal groves of Ile-Ife, to the physical damage caused by mechanical workshops in Osogbo, and the total exhumation of pavements in Ibadan due to unchecked urban sprawl. The study concludes that the survival of these monuments depends on a transition from static preservation to a dynamic Sustainable Heritage Integration Model (SHIM). By synthesizing community engagement, legal safeguards, and the protection of intergenerational knowledge, the research offers a strategic framework to ensure that the sophisticated legacy of the 12th-century Yoruba world remains a resilient feature of the contemporary African landscape.
Keywords: Heritage conservation, Degradation, Potsherd pavement, Pre-colonial Yoruba, Urban Development

Introduction

Through intricate social systems, pre-colonial African architecture eloquently conveys its rich cultural and intellectual past. The Potsherd pavements, a prominent archaeological feature in Yorubaland, are especially associated with the societal development of the 12th to 16th centuries. Recent research has shed light on the distribution and cultural significance of these pavements, showing that they were used for both domestic and religious reasons (Ogundiran, 2022; Adeyemo *et al*., 2021). The potsherd pavements are noteworthy because they were constructed from broken crockery and served as both platforms and walkways for artistic and cultural endeavours (Adeyemo, 2022). Arranging them into pavements apparently became an art and technology of urban landscaping, which Adewumi (2001) compared to the pioneer Roman terracotta road-building material. Their longevity and artistry demonstrate sophisticated engineering abilities and intricate social structures, particularly during the 10th century under Ooni Lúwo Gbàgìdá, the first and only female ruler of Ile-Ife and a significant figure in Ife's history.

The historical, artistic, and ritual value of these pavements has been well documented in the available literature. Scholars such as Roth (2023), Ogundiran (2022), and Adeyemo *et al*. (2021) have highlighted the importance of these in communal rituals and sacred sites, offering deep insights into the Yoruba people's social and spiritual fabric. The elaborate patterns and placement of the pavements, which demonstrate a sincere concern for both people and the environment, also provide important archaeological evidence of early urban planning, social structures, and leadership. Nevertheless, a significant void remains in the scholarly discourse regarding long-term sustainability models for their preservation, despite this profound understanding of their symbolic and historical significance. The enduring legacy of these pavements as symbols of Yoruba ingenuity and identity is increasingly threatened by a lack of a sustainability plan, modern development and environmental factors, raising urgent questions about their future.

To address this gap, the present study moves beyond theoretical documentation to interrogate the "lived" state of these pavements across three distinct urban contexts: Ile-Ife, Osogbo, and Ibadan. By engaging directly with 15 key stakeholders, including traditional leaders and local artisans, this research seeks to bridge the divide between archaeological materiality and intangible cultural memory. The study aims not only to review sustainable methods and identify the modern obstacles to survival, ranging from functional replacement to total site exhumation, but also to propose a Sustainable

Heritage Integration Model (SHIM). This framework is designed to integrate preservation tactics with community engagement and cultural protection initiatives, ensuring that the engineering brilliance of the 12th century is not erased by the urban pressures of the 21st century.

The Potsherd Pavement

The archaeological prevalence of potsherd pavements across Southwestern Nigeria, including sites such as Ile-Ife, Osogbo, Imesi-Ile, and Ibadan, underscores their profound historical significance as integral components of urban infrastructure and cultural expression within the Yoruba civilisation (Chouin *et al*., 2022). Originating in the 9th to 12th centuries, these distinctive ceramic pavements, associated with Queen Luwo of Ile-Ife, signify advanced indigenous material art and technology used in cultural spaces and built environments (Adeyemo *et al*., 2021). These elaborate pavements were not merely functional, providing sustainable solutions against tropical erosion, but also served as aesthetic elements reflecting a sophisticated taste for beauty prevalent among the Yoruba people (Akintonde, 2016; Roth, 2022). Additionally, these pavements were fundamental to public festivals and ancestral parades, particularly during the prominence of Ilé-Ifẹ̀ in the mid-fourteenth century, where hundreds of ancestral figures were displayed along ornately paved streets (Ogundiran, 2022). They are regarded as a symbol of the city's historical and cultural identity, particularly during the 10th-century reign of Ooni Luwo Gbàgìdá (Ogundiran, 2022; Adeyemo *et al*., 2021). These pavements, made from carefully arranged broken pottery pieces, went beyond simple functional surfaces and became a form of artistic expression, featuring intricate patterns and rich red tones that showcased the era's sophisticated aesthetics and cultural heritage.

Archaeological studies have emphasized the importance of these pavements by using their appearance to mark key periods in Ile-Ife's history. This has resulted in the division of the city's past into "pre-pavement" and "post-pavement" eras, highlighting a significant shift in social complexity and urban development (Roth, 2022). Excavations have uncovered extensive courtyards with multiple layers of these durable pavements, which exhibit remarkable resilience to heavy foot traffic and outperform many modern surface materials. This durability proves the advanced engineering and craftsmanship of ancient Yoruba artisans (Aregbesola, 2019; Yakin & Totu, 2014; Adewumi, 2001). Some scholars even compare them to Roman terracotta used for European road construction, highlighting their technological sophistication. The use of potsherds was also a practical way to increase traction, ensuring safer passage and emphasizing a culture of cleanliness, especially for ceremonial processions (Adeyemo *et al*., 2021).

Such widespread use suggests a deep embedding of these pavements in the social and cultural fabric of the Yoruba people, transcending mere utilitarian purposes to become vital elements in commemorative and spiritual practices (Ogundiran, 2022). This integration highlights how these materials offer insights into the complex interplay between daily life, spiritual beliefs, and communal identity within ancient Yoruba society (Fatuyi, 2017; Ogundiran, 2022). Indeed, the meticulous arrangement of diverse ceramic fragments, sometimes incorporating pebbles or quartz, suggests a deliberate artistic intent beyond purely functional considerations, reflecting a societal value placed on intricate craftsmanship and communal aesthetics (Chouin et al., 2022). The strategic deployment of these pavements throughout ancient Yoruba cities, particularly at significant archaeological sites such as Ìta Yemòó and Lújúmò Compound in Ilé-Ifẹ̀, further emphasizes their role in delineating spatial organization and reinforcing social hierarchies (Roth, 2022).

Today, these pavements are not only valuable archaeological sites but also serve as enduring symbols of Yoruba civilization, contributing to the region's cultural heritage and tourism. They provide vital insights into the social structures of pre-colonial societies and remain a key area of study for understanding the richness of African heritage (Ogundiran, 2022).

Research Methodology

This study adopted a multi-site case study underpinned by a qualitative-descriptive research design. The research was structured to interrogate the materiality, cultural significance, and sustainability of potsherd pavements in three historically significant Yoruba cities: Ile-Ife, Osogbo, and Ibadan. The integration of archaeological and ethnographic enabled a holistic exploration of the pavements as both tangible and intangible heritage. Primary data were collected through field observation and interviews, while secondary data were drawn from archival records, and comparative literature.

Chouin *et al*. (2023) observed that research on the physical and chemical characteristics of pavements is minimal, as is the relevant literature. This research used the limited available literature to extract the necessary information and draw inferences about potsherd pavement materials. Documentation focused on observing variations in material patterns, specifically herringbone and basket-weave configurations, to assess the evolution of indigenous engineering. These physical attributes provide the baseline for evaluating sustainability, which this study defines through a tripartite lens: physical durability, defined as the

structural integrity and resistance of material components to environmental stressors. Cultural continuity relates to the persistence of intergenerational knowledge and the symbolic relevance of pavements within the contemporary community, and policy-based preservation, which hinges on the efficacy of institutional frameworks and urban planning in protecting heritage sites from modern encroachment.

The qualitative data collected from field notes, archival records, and interview transcripts were analysed using thematic analysis. This structured method included familiarizing with the data, creating open codes, and then consolidating these into broader themes. This careful approach helped ensure that the results went beyond mere anecdotes, offering a cohesive understanding of how potsherd pavements demonstrate resilience and adaptation.

The three selected sites, each representing a distinct historical and socio-cultural context, provided a comparative framework for understanding the evolution, adaptation, and resilience of potsherd pavements: Ile-Ife, as the cultural and technological nucleus of the Yoruba world, offered a baseline for understanding the original architectural logic, ritual significance, and political symbolism of potsherd pavements. Osogbo, with its rich artistic and spiritual heritage, enabled the exploration of regional adaptations and the integration of pavement technology into localized environmental and cultural contexts. Ibadan, a sprawling modern metropolis, served as a critical site for assessing the tensions between heritage preservation and urban expansion, offering insights into the challenges and opportunities of sustaining indigenous material culture in contemporary African cities.

This combination of data from archaeological surveys and ethnographic studies across these three sites enabled a comprehensive analysis to explore sustainability models for conserving this important aspect of African heritage. The research was conducted in strict adherence to ethical protocols regarding the study of human subjects and indigenous knowledge. Informed consent was obtained from all 15 participants prior to data collection, with a focus on transparency regarding the study's objectives. Efforts were made to ensure contributors' anonymity and dignity while respecting the communal ownership of the heritage being documented.

Results and Discussion

The case studies from Ife, Osogbo, and Ibadan reveal three distinct states of potsherd pavement preservation, highlighting the multifaceted threats they face.

In Ile-Ife, pavements are recognized as heritage, yet they suffer from "functional replacement" and cultural erosion. The Ita Yemoo site (Plate 1), a historically significant location with a herringbone pattern, has been replaced by a multipurpose hall. Within the Ife Palace, the presence of both straight and herringbone patterns suggests a diverse and intentional use of these patterns. Furthermore, the absence of the *egiri's oru* (concoction pot) from the Yemoo Grove pavement signifies a rupture in the site's cultural continuity. This loss of the "ritual centre" suggests that even where physical fragments remain, the intangible knowledge systems that once animated them are fading.

Plates 1a and b: Yemoo Grove in Ile-Ife a) Entrance view b) Close view of the Grove
Source: Adeyemo *et al.*, 2021

Plate 2: A close view of the potsherd arrangement
Source: Osasona, 2026

In Osogbo, the site highlights the effects of urban encroachment and economic pressures. It exemplifies the friction between heritage and modern economic survival. A recently uncovered near-herringbone-pattern pavement is now being used as a mechanical workshop, sustaining daily damage from vehicles and "cut-and-fill" activities (Plates 3a and b). Despite mediation efforts by heritage curators, the lack of policy-based preservation and government funding has stalled formal acquisition, leading to the site's rapid deterioration. This example demonstrates that even when a site is recognised, insufficient funding and political will can still lead to its loss.

Plates 3a and b: Approximately lost Osogbo Potsherd Pavements, due to the use of the site as a mechanical workshop
Source: Adeyemo *et al.*, 2021

The Ope-Odu site in Ibadan (Plate 4) represents the terminal point of heritage neglect. Unchecked suburban expansion has led to the complete excavation and destruction of the pavements. The absence of accountability is underscored by local accounts of "extractive" archaeology, in which researchers took samples without leaving any trace or protection for the site, resulting in the monument's total erasure.

Plate 4: The space of the completely exhumed potsherd pavement at Ope-Odu in Ibadan.
Source: Adeyemo, 2021

The results confirm that while the potsherd pavements demonstrate highly developed pre-colonial African engineering and craft, contemporary sustainability issues pose a significant threat to them. There is a transition from partial damage to destruction, as illustrated by case studies from Ife, Osogbo, and Ibadan.

Materiality and ancient engineering logic

Archaeological analysis of potsherd pavement samples reveals that they are predominantly composed of kaolinite, quartz, feldspar, mica, and various heavy minerals, with stone pavement components primarily consisting of silicon dioxide (Chouin *et al*., 2023). Orijemie and Ogiogwa (2016) also observed that pottery samples from Ope-Odu, Ibadan, contain kaolinite, quartz, feldspar, mica and some heavy minerals. The stone pavement is composed of silicon dioxide (silica or quartz). This mineralogical composition suggests a durable, chemically stable material suitable for load-bearing applications, further supporting the historical resilience observed in ancient Yoruba pavements (Mavroulidou *et al*., 2021). The inclusion of such diverse mineralogy suggests a deliberate selection of raw materials for ceramic production, possibly improving the physical properties of the resulting potsherds for later use in paving. This deliberate selection and repurposing of materials highlight an early, perhaps intuitive, understanding of circular-economy principles in ancient engineering practices (Schmidt *et al*., 2020). According to Al-Nawasir *et al*. (2025) and Tiwari *et al*. (2024), integrating waste materials into current construction methodologies, such as incorporating ceramic waste into cementitious grouts for pavements, offers a contemporary parallel to these ancient practices, aiming to achieve sustainable infrastructure by reducing reliance on landfills and promoting resource efficiency.

The intangible rupture

The ethnographic research reveals that the potsherd pavements were *made using Omi-Eku (a traditional liquid oil-and-water mix waste),* which was heated to a specific temperature to serve as the binding solvent, forming pavements from the broken pots' base material. And then the arrangement of the broken pots to form pavements in different patterns, primarily in beautiful herringbone patterns, to floor important Shrines, groves, pottery cum oil mills sites within and around Ife royal places, as seen even in the present day. This emphasises that the value of pavements extends beyond their physical form, encompassing their ritual and historical significance, as demonstrated by Holscher's (2014) five levels of meaning. The disappearance of the concoction pot marks a crucial rupture in this broader, non-physical understanding of cultural meaning. Unfortunately, cultural decline is accelerated, and incomplete preservation attempts result when physical artefacts are protected at the expense of the intangible knowledge they represent.

Obstacles to survival

The Osogbo case study highlights the legal and financial challenges associated with preserving cultural heritage. There is an apparent disconnect between the value of the legacy and concrete action, as evidenced by the government's refusal to buy the site despite the impending destruction. This underscores the importance of legal structures that safeguard discovered artefacts and provide funds for their acquisition. In Ibadan, the situation is even more dire, revealing a governance framework that views heritage as a barrier to urban development rather than a resource. This "unconscious" urban growth lacks the accountability required to sustain indigenous material culture. Without a shift toward integrated heritage management policies—which link legal protection with community economic incentives—the remaining potsherd pavements of Yorubaland face a trajectory toward total extinction.

Conclusion

The potsherd pavements of Ile-Ife, Osogbo, and Ibadan are more than archaeological artefacts; they are

sophisticated testimonies to pre-colonial Yoruba engineering and circular economic logic. However, the transition from partial damage in Ife to total exhumation in Ibadan underscores a crisis of institutional and cultural neglect. The sustainability of these pavements is not merely a matter of chemical stability or physical durability, but a question of political will and community engagement.

Proposed Policy Framework: The Sustainable Heritage Integration Model (SHIM)

Evidence from Ife, Osogbo, and Ibadan indicates that existing preservation approaches are mainly reactive and disjointed. To prevent the complete loss of potsherd pavements, this study introduces a Sustainable Heritage Integration Model (SHIM). This approach moves away from "exclusionary preservation" such as fencing off sites toward "inclusive integration," which involves embedding heritage within the urban landscape.

Strategic pillars of the SHIM framework

Heritage must be reclassified from a "static monument" to "cultural infrastructure." This requires municipal authorities in cities like Ibadan to include potsherd pavement sites in Urban Master Plans and GIS mapping. By doing so, heritage sites become mandatory considerations in Environmental Impact Assessments (EIAs) before any "cut-and-fill" or construction activities commence.

Incentive programme

To address the financial hurdles seen in Osogbo, the government should adopt a "stewardship" rather than an "ownership" model. Local landowners and workshop owners could receive tax incentives or small maintenance grants in exchange for protecting the pavements. This utilizes the community as the primary defense against site degradation.

Circular economy branding

Leveraging the mineralogical durability identified in this study (SiO_2 and kaolinite), preservation initiatives should rebrand these pavements as early examples of sustainable African engineering. This narrative appeal to international sustainability funders and links ancient Yoruba practices to modern global goals of resource efficiency and repurposing ceramic waste (Al-Nawasir *et al*., 2025). The rupture in cultural continuity can only be repaired by reconnecting the younger demographic to the material's symbolic weight. So, the other parts of the framework are;

Intangible restoration

Efforts should be made to restore missing ritual elements, such as the *egiri's oru* in the Ife palace, not just as physical replicas but through ceremonial reactivation involving traditional leaders, as a way of bringing back to life for the younger generation the significance of the intangible legacy of the pot.

Apprenticeship programmes

Integrating pavement construction techniques into local vocational training or art schools would ensure that the "know-how" of herringbone and basket-weave patterns survives beyond the current generation of elderly custodians.

By adopting the Sustainable Heritage Integration Model, the areas studied can move toward a preservation paradigm that respects the past while accommodating the inevitable growth of the modern African metropolis.

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